Monroe County Watershed Management Plan

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1. Introduction to the Monroe County Watershed Management Plan

Stormwater drainage systems in low-lying coastal areas are highly vulnerable to the impacts of climate change. Sea-level rise brings the most direct and chronic impacts, as the increased water level elevation of receiving water bodies and coastal groundwater tables inherently reduces the drainage potential for conventional, gravity-driven stormwater systems. The increased potential for extreme precipitation events due to climate change also threatens to exceed the drainage capacity of stormwater systems that, even if properly maintained and functioning, were originally designed under the assumption of historical climate conditions.

Large king tide events that have resulted in "sunny day" flooding have brought considerable attention to stormwater system vulnerability throughout southeast Florida over recent years. In some king tide events, the tidewater inundation of outfall pipes has caused reverse conveyance of saltwater through stormwater systems and an associated *discharge* from stormwater inflow structures into low-lying roads and yards. Although such flooding has often been observed – and is perhaps most obvious – on days without rainfall (i.e., "sunny days"), more severe flooding will inevitably result from the co-occurrence of large rainfall events with high tides that impede the regular functioning of stormwater discharge systems. In other instances, king tide events which may or may not be exacerbated by wind, have also resulted in longer-term inundation on streets.

In recognition of the fact that "floodplains and watershed change over time" due to "many natural and manmade changes," the 2017 Coordinator's Manual for the National Flood Insurance Program (NFIP) Community Rating System (CRS) introduced a series of credit options for "community efforts to anticipate" future flood risk in relation to climate change (FEMA 2017, pg. 110-15). Because sea-level rise is expected to be an increasingly critical issue for floodplain management, many of the credit options and assessment criteria for coastal communities specifically refer to studies of sea-level rise impact on future hydrologic conditions and the local drainage systems. These options are summarized in section 116.c of the Coordinator's Manual (FEMA 2017) as:

- *Credit is provided in Section 322.c for communities that provide information about areas (not mapped on the FIRM) that are predicted to be susceptible to flooding in the future because of climate change or **sea level rise**.*

- *To achieve CRS Class 1, a community must receive credit for using regulatory flood elevations in the V and coastal A Zones that reflect future conditions, including **sea level rise**.*

- *Credit is provided in Section 342.d when prospective buyers of a property are advised of the potential for flooding due to climate changes and/or **sea level rise**.*

- *Credit is provided in Section 412.d when the community's regulatory map is based on future-conditions hydrology, including **sea level rise**.*

- *Credit is provided in Section 432.k when a community accounts for **sea level rise** in managing its coastal A Zones.*

- *Credit is provided in Section 452.b for a coastal community whose watershed master plan addresses the impact of **sea level rise**.*

- *Credit is provided in Section 512.a, Steps 4 and 5, for flood hazard assessment and problem analysis that address areas likely to flood and flood problems that are likely to get worse in the future, including (1) changes in floodplain development and demographics, (2) development in the watershed, and (3) climate change or **sea level rise**.*

Importantly, the 2017 Coordinator's Manual notes that a mandatory prerequisite for a community to achieve CRS Class 4 status is that the community must "receive credit for managing the impacts of a 100-year storm and/or sea level rise, where applicable, based on a watershed management plan" (FEMA 2017, pg. 450-14). Each improvement in CRS Class rating (starting from a Class 10) translates into a 5% premium discount on qualifying NFIP policy-holders within the Special Flood Hazard Area (SFHA), meaning that a CRS Class 4 status makes qualified policy-holders within the community eligible for a 30% total premium discount. Because Monroe County is currently rated as a CRS Class 5 community, achieving CRS Class 4 status would result in an additional 5% premium discount for qualified NFIP policy-holders within the SFHA. Given that a qualified watershed management plan is defined as a mandatory prerequisite for CRS Class 4 status, any further NFIP premium discounts that Monroe County residents may receive through the CRS program will likely require the development and adoption of a watershed management plan that meets or exceeds the criteria outlined in the 2017 Coordinator's Manual.

CRS Watershed Master Plan – Prerequisites Section 452b:

(1) The community must have adopted a watershed master plan that evaluates the future conditions, including the impacts of a median projected sea level rise (based on the National Oceanic and Atmospheric Administration's (NOAA's) "intermediate-high" projection for the year 2100) on the local drainage system during multiple rainfall events, including the 100-year rainfall event.

(2) The community must have adopted regulatory standards that require onsite management of runoff from all storms up to and including the 25-year. The adopted regulatory standards must manage future peak flows so that they do not increase over present values.

(3) For any plan that is more than five years old, the community must evaluate the plan to ensure that it remains applicable to current conditions.

(4) WMP1 credit must be received in order to receive credit for any of the other items.

Monroe County Watershed Master Plan (WMP)
Credit Criteria for Watershed Master Planning:

WMP1

- Watershed master plan meets all of the criteria listed in Section 452.b.
- Monroe County LDC 114-3(f)(1)b.[1]
  Drainage and flood protection criteria. The surface water management system shall be designed using a 24-hour rainfall duration and 25-year return frequency in computing allowable off-site discharge rate. Flood protection and floodplain encroachment standards shall be those established in the Monroe County Land Development Regulations and Comprehensive Plan. If post-development conditions are such that a volume greater than the

[1] Section 114-3. Surface water criteria can be found at:
https://library.municode.com/fl/monroe_county/codes/land_development_code?nodeId=CH114DEST

retention and/or detention volume required for stormwater management is already being retained on site, that condition shall be maintained.

WMP3

- Plan provides onsite management of future peak flows and volumes so that they do not increase over present values. Monroe County LDC 114-3(f)(1)a.1 & 2.[2]

(1) Water quantity.

- Discharge. Off-site discharge is limited to amounts that will not cause adverse off-site impacts. These amounts are:
  - Historic discharges based on natural site drainage patterns; or
  - Amounts determined in previous South Florida Water Management District or the county permit actions.

Wetland Open Space Requirements.

- No development activities, except as provided for in this chapter, are permitted in submerged lands, mangroves, salt ponds, freshwater wetlands, freshwater ponds, or in undisturbed salt marsh and buttonwood wetlands; the open space requirement is 100 percent.
- Allocated density (dwelling units per acre) shall be assigned to freshwater wetlands and undisturbed salt marsh and buttonwood wetlands only for use as transferable development rights away from these habitats. Submerged lands, salt ponds, freshwater ponds and mangroves shall not be assigned any density or intensity.

This document has been created to provide the basis for meeting these requirements.

2. Monroe County and FEMA's Community Rating System

Monroe County's recent history with the FEMA CRS program includes the following:

- November 25, 2015 - Letter from FEMA acknowledging that the county was eligible to make application to the National Flood Insurance Community Program Community Rating System (CRS).
- April 28, 2016 – County submitted an application to join the CRS.
- October 1, 2016 – County entered the CRS as a CRS Class 6, affording a 20% discount on flood insurance purchased through the National Flood Insurance Program on structures in the Special Flood Hazard Area.
- October 1, 2017 – County modified their CRS Class to a CRS Class 5, affording a 25% discount on flood insurance purchased through the National Flood Insurance Program on structures in the Special Flood Hazard Area.

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[2] Section 114-3. Surface water criteria can be found at: https://library.municode.com/fl/monroe_county/codes/land_development_code?nodeId=CH114DEST

3. Initiatives to Address Sea Level Rise in Monroe County

A. GreenKeys: Monroe County Sustainability and Climate Action Plan

Monroe County prepared a GreenKeys Climate Change and Sustainability Plan, available at http://greenkeys.info/, which includes cross-cutting strategies and some road specific adaptation goals. Monroe County began the process of extensively planning for climate change and sea level rise through the development of a data-driven planning process that includes policy, project and data development. The planning process was initiated in 2013 and the County has taken several key steps to gather data and better refine its approach for climate and resiliency planning, including:

- Launch GreenKeys planning process (2013-2015), Final Planning Document (2015)
- Pilot Road Projects for Key Largo and Big Pine Key (2015-2016)
- Facility-specific adaptation planning:
    - Bayshore Manor Assisted Living Facility (2016-2017)
    - Harry Harris Park (2018-2019)
- Compilation of countywide mobile LiDAR (2018-2019)
- Roads Vulnerability Analysis and Capital Plan (Initiated 2019)[3]

Several key work products have focused more specifically on resiliency, adaptation and sea level rise risk. In particular a comprehensive vulnerability assessment was completed as part of the GreenKeys planning process. "Appendix C", the Sea Level Rise Vulnerability Assessment for Monroe County, Florida: Technical Appendix in Support of the GreenKeys! Sustainability and Climate Action Plan is the County's first analysis regarding sea level rise vulnerability.[4] Components of the assessment included analysis of ground elevation relative to current and future tidal heights for all public roads and buildings owned by Monroe County, as well as critical infrastructure that includes emergency response, law enforcement, wastewater facilities, water supply, schools, and electrical utilities. Assessments of land cover change and habitat vulnerability to sea level rise were also performed using tidal inundation models and custom scenarios of the Sea Level Affecting Marshes Model (SLAMM). An important outcome of the overall GreenKeys plan was a recognition that sea level rise planning will be an ongoing effort and that work needed to be done by the County to shore up datasets for future analysis.

A key recommendation of that planning effort was also for the County to secure better elevation data, so in 2017, the County initiated a scope of work to collect countywide mobile LiDAR. The scope included Mobile LiDAR scanning and data extraction for all of the roadway centerlines within the unincorporated County limits and also the development of spot elevations for first floor elevations for County facilities

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[3] The overall project work shall include, but not be limited to, adaptation measures based on a proposed acceptable level of service or range of level of service alternatives for roadway elevation, reconstruction of base and asphalt, drainage, potential pump stations, etc., landscape or other elements. It will also identify whether construction easements, private property purchases, etc. are needed for a particular alternative or solution, whether roadway elevation and/or storm water conveyance and treatment methods are needed. The recommended roadway adaptations shall include legally-required storm water capture, transport and treatment systems to meet the unique water quality standards applicable to Monroe County.

[4] Sea Level Rise Vulnerability Assessment for Monroe County, Florida: Technical Appendix in Support of the GreenKeys! Sustainability and Climate Action Plan, http://www.templatemodifiers.com/monroe-wp/wp-content/uploads/2016/12/Appendic-C-Monroe_TechnicalAppendix_Infrastructure_Habitat_12_27_15.pdf

located throughout the County. This dataset is nearing completion for us in upcoming County analytical efforts.

All of these initiatives are based on the GreenKeys Plan which serves as the County's overall response to climate change and sea level rise.

B. Pilot Roads Project: Twin Lakes and Big Pine Key[5]

The Pilot Project assessed the implications of sea level rise on the County's roadway improvement program in two communities. This effort was motivated by two significant events. The first was the release of the County's GreenKeys! Sustainability Action Plan ("GreenKeys! Plan") which made recommendations to address climate and sustainability issues throughout the County. The second was the King Tide Event of 2015, which due to a combination of tidal and storm conditions, caused long-term, disruptive flooding.

The County conducted this Pilot Project and engineering technical analysis based on a data driven method to identify the appropriate design response to potential sea level rise effects on roadways for two communities. The County's Team developed an approach to define alternatives for road improvements in the two pilot communities based on several elements:

- Assessed past tidal events in the Keys by analyzing a 20-year historic tidal record and determining the statistical probability of tidal flooding for certain events based on that assessment.
- Used the Intergovernmental Panel on Climate Change ("IPCC") AR5 Median and United States Army Corps of Engineers ("USACE") High sea level rise scenarios, used by the Southeast Florida Regional Climate Change Compact ("Compact"), to identify potential rates of increase expected over a 25-year road improvement project lifetime for the road improvements. The statistical assessment of tidal flood elevation recurrences was then recalculated after adding sea-level rise values of 0.72' (2040 IPCC-AR5 Median) and 1.21' (USACE High) onto the baseline 1992 mean sea level.
- Developed four design response strategies (6", 12", 18" and 28" of road elevation) to evaluate flooding impacts and the benefits gained from those responses.
- Compared design scenarios to tidal flooding recurrence in 2015 and in 2040 to define the performance of design options under various scenarios.
- Developed design cost estimates for the various identified road elevation scenarios to understand the relative differences in cost between various design options.
- Provided recommendations on implementation strategies for future road elevation and drainage improvements.

Stormwater solutions and designs were discussed as well as local factors that may influence design options such as elevations of adjacent properties and impacts to environmentally sensitive lands. The Final Report provides a technical basis for harmonizing future sea level rise impacts and a threshold for flooding (in terms of days not exceeded) that can be replicated. Appendix 1 creates a standard methodology for developing the elevations of future road improvement projects based on 1) future sea level rise projections and 2) not exceeding a certain number of days of flooding annually. Combined these two values create an initial target design elevation outlined in the Appendix 1 methodology.

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[5] GreenKeys: CE 2 .2 Pilot project to conduct a Comprehensive Feasibility Study for Enhanced Stormwater and Tidewater Criteria (prioritizing areas) for near-term areas subject to inundation risk, including nuisance flooding (in two locations).

The Final Report also includes a legal and policy overview including the state of the current law related to infrastructure, flooding and sea level rise implications. Applicable state law and case law are analyzed to answer questions related to a local government's duties for levels of service related to roads. An overview of case studies from other local governments (and agencies) that have begun to address levels of service related to flooding or future flooding, and have adopted policies doing so, is included in Part 2. A policy framework is included which is based on a three-pronged approach to:

1. Define a target "Design Criteria"
2. Evaluate a list of Local Conditions that may affect implementation
3. Create a designation for areas where the design criteria cannot be met

The Final Report includes recommendations for elevations in the Twin Lakes Community in Key Largo and the Sands Community in Big Pine Key as follows:

- In the Twin Lakes Community, the recommendation is that portions of the roadways be raised to approximately 5" of elevation NAVD88 (4.4 inches as noted in technical material) to provide flooding relief, and extend the life of the road to 2040.
- In the Sands Community, the recommendation is that portions of the roadways be raised to approximately 11" of elevation NAVD88 (10.3 inches as noted in technical material) based on a similar assessment.

Ultimately, as a result of this Project, the County adopted a Resolution (028-2017) (attached to this document) to establish interim design standards for roads (and corresponding stormwater systems) until the County can assess its vulnerabilities at an engineering level on a more comprehensive scale. The Resolution also authorized development of a procurement document to analyze the impacts of sea level rise and develop a capital planning effort on a countywide basis.[6]

Lessons learned from this effort have been valuable, but the larger County effort will be better able to provide the information needed to support a fully developed capital planning program going forward. That said, this Pilot Project, and the specific recommendations identified for the two communities resulting from it, serve as a basis to move forward to the design and implementation phases. This will continue the process of developing valuable results-oriented information for future use. The Pilot Road projects are currently in the design and permitting phase with construction (including stormwater features) anticipated in the next two-year timeframe.

[6] Resolution (028-2017) applicable provisions:

- WHEREAS, the methodology for development of flood level estimates for the two communities identifies water elevations that represents values for an allowable annual flooding return period (not to exceed 7 days) and also includes sea level rise projections (IPCC AR5 Median from the Southeast Regional Climate Compact's Unified Sea Level Rise Projection, 2015) in determining desired final roadway elevations for road improvement projects; and
- THEREFORE BE IT RESOLVED, 2. The Recommendations and Appendix 1 Methodology from the Final Report for the Monroe County Pilot Roads Project: The Sands and Twin Lakes Communities will serve as an appropriate Interim Standard for determining the elevation of road improvement project until a Revised Standard is developed in the future.

C. Monroe County Comprehensive Plan[7]

In 2013, Monroe County updated its Comprehensive Plan addressing climate and sea level rise issues in multiple places. Most notably, the County added an Energy and Climate Element that contains most of the new Goals, Objectives and Policies the County is pursuing related to sea level rise. These Goals, Objectives and Policies serve as an initial guide for the County to 1) develop better data sources to characterize risk and 2) commit to enhanced decision-making relative to the best available data regarding climate science and vulnerability.

There are numerous key provisions relative to planning for the impact of future sea level rise:

- Policy 1501.1.5 Monroe County will support local and regional modeling and monitoring programs, as resources permit, to assure the most current locally specific data is considered in the 2030 Comprehensive Plan and Land Development Code updates. This may include but is not be limited to programs designed to monitor surface water quality (including temperature), sea level rise, hydrologic and geologic conditions, groundwater quality and levels, precipitation and groundwater withdrawals from resources that the County depends upon (including those outside County lines). The County shall make such data available to the public.
- Goal 1502 Monroe County shall incorporate the best available data and science, into its policy and planning decisions for infrastructure, recognizing the uncertainty associated with long range climate change predictions.
- Objective 1502.1 In conjunction with future updates to the 2030 Comprehensive Plan and land development regulations, the County shall update the data and assumptions related to climate change impacts to infrastructure based on the latest scientific predictions and observed (monitored) impacts. Monroe County shall also consider climate change impacts such as increased temperatures, sea level rise, potentially shifting habitat and ecosystem types and the need to withstand increased storm surge in evaluating public infrastructure decisions.
- Policy 1502.1.1 Prior to incorporating a new project to the Capital Improvements Element, Monroe County shall assure that it is reviewed for recommendations to increase resiliency and account for the impacts from climate change, including but not limited to, sea level rise and storm surge. Monroe County shall evaluate financial expenditures to fund repairs, reconditioning of deteriorating infrastructure and new infrastructure improvements within or proximate to vulnerable areas to manage public investments appropriately. Monroe County shall focus on level of service standards, as one of the points of analysis, to assure that infrastructure useful life and service expectations can be met in the face of climate change impacts.
- Policy 1502.1.5 Within five (5) years after the adoption of the 2030 Comprehensive Plan, Monroe County shall initiate an inventory of existing and planned infrastructure up to the 2030 horizon, based upon the vulnerability mapping identified in Policy 1502.1.4, for capacity to accommodate projected sea-level rise over the life expectancy of that infrastructure. Monroe County shall identify the infrastructure within those areas, its useful life and any retrofits or capital projects necessary to address the impacts of sea level rise. These strategies may include defense, accommodation, or and retreat projects, or not building planned infrastructure in vulnerable locations, to address the impacts of sea level rise. Monroe County will consider developing design criteria, in conjunction with a broader asset management planning process.

[7] Monroe County Year 2030 Comprehensive Plan, Policy Document *available at:* https://www.monroecounty-fl.gov/DocumentCenter/View/4606/2030-MC-Comp-Plan-revision-3?bidId=.

- Policy 1502.1.6 Within five (5) years after the adoption of the 2030 Comprehensive Plan, Monroe County shall consider incorporating a planning, design and permitting standard for infrastructure and public facilities that may include a sea level rise assumption of 3”-7” by 2030 as developed by the Southeast Regional Climate Compact. The County shall review and update sea level rise projections when new and pertinent data is available. (The 3”-7” by 2030 is based on a 2010 baseline -- if adjusted to a 1992 baseline it would result in 6” to 10” by 2030 above the 1992 mean sea level).
- Policy 1502.1.7 Monroe County shall ensure that new, renovated and replacement public facilities and infrastructure, such as streets and bridges, water and wastewater treatment plants, police stations and fire stations, and any other public facilities that the County has authority over, are designed in a manner which considers the useful life of public facilities and infrastructure. The County shall also consider the potential impacts from climate change, including rising sea levels and shoreline stabilization needs, on its infrastructure and public facilities.
- Policy 1502.1.9 Monroe County shall coordinate with appropriate agencies to monitor changes to minimum road elevation standards which may be specific to Monroe County due to its unique exposure to climate change and sea level rise impacts. This could also include enhanced stormwater management requirements and resurfacing requirements for certain transportation segments.
- Policy 1502.1.10 Within five (5) years after the adoption of the 2030 Comprehensive Plan, Monroe County shall review land development regulations that address stormwater management considerations for sea level rise impacts. To the extent practicable, Monroe County shall incorporate green infrastructure or passive alternatives that maximize land preservation over impervious or “active” infrastructure. Such alternatives could include the reconditioning and reuse of septic tanks, increased use of rainwater harvesting techniques, such as cisterns and other water storage techniques. Monroe County shall determine if land development regulation amendments are needed to address increased retention requirements and other topographic or infiltration considerations which may influence stormwater management requirements. Monroe County shall also consider the ability to meet water quality requirements related to stormwater management regulations and if there are any impacts from climate change that may jeopardize the County’s ability to meet those requirements.
- Goal 1503 Monroe County shall address energy and climate issues in the built environment by: encouraging green development practices; reducing waste; enhancing transportation choices; and educating the community about the need to reduce energy use and prepare for climate change impacts. Objective 1503.1 To address the impacts of GHGEs and climate change, Monroe County shall promote energy efficiency across all sectors of energy use, public and private sector, in the built environment.
- Objective 1503.1 To address the impacts of GHGEs and climate change, Monroe County shall promote energy efficiency across all sectors of energy use, public and private sector, in the built environment.
- Policy 1503.1.2 Within seven (7) years after the adoption of the Comprehensive Plan, Monroe County may include climate change impacts as a factor in determining appropriate levels of development.
- Policy 1503.1.4 Monroe County shall review the most updated FEMA maps within one (1) year of their release and evaluate floor elevation requirements, as necessary, for all new construction in vulnerable areas.
- Policy 1503.1.7 Within five (5) years after the adoption of the 2030 Comprehensive Plan, Monroe County shall determine the appropriate climate change considerations (including but not limited

to, emergency management, flood risk, storm surge, threats to potable water supply, the potential for changing habitat and landscapes, the need for shoreline stabilization and the potential impacts to infrastructure necessary to serve proposed uses) to evaluate when reviewing land use amendments.

- Policy 1503.1.8 Within five (5) years after the adoption of the 2030 Comprehensive Plan, Monroe County shall develop a shoreline stabilization strategy to protect and enhance the built and natural environments from erosion and sea level rise impacts prioritizing natural green infrastructure approaches. Monroe County shall assure shoreline stabilization strategies are found to be in the public interest in light of that area's vulnerability to climate change impacts. Monroe County shall also consider public access to beaches, minimizing adverse impacts to coastal processes and resources, impacts to neighboring properties, and the values and functions of beaches and coastal/marine systems, relative to shoreline stabilization strategies.
- Objective 1503.4 In coordination with the next update to the County's emergency management policies, Monroe County shall coordinate with municipalities, the Florida Division of Emergency Management, and other applicable agencies to further review and incorporate sea-level rise considerations and climate change.
- Policy 1503.4.1 Within five (5) years after the adoption of the 2030 Comprehensive Plan, Monroe County shall review its post-disaster redevelopment plan and land development regulations to include, as appropriate, consideration of climate change impacts, repetitive loss structures and shoreline stabilization needs.
- Policy 1503.4.2 In coordination with the next update to emergency management policies, Monroe County shall determine any impacts to hurricane evacuation timeframes exacerbated by a 3"-7" increase in sea-level rise by 2030 on transportation facilities.

D. Monroe County Coastal Storm Risk Management Study

In 2018, Monroe County executed an Agreement with the U.S. Army Corps of Engineers to develop a Coastal Storm Risk Management Study, through an allocation of Federal funds provided through Public Law 115-123. The Study Agreement will target completion of the feasibility study within 3 years at a total cost of no more than $3 million.

The purpose of the Florida Keys Coastal Storm Risk Management Study is to identify measures to reduce storm damage to coastal infrastructure. Specifically, the Study will assess the risk to the County's only evacuation route from the Florida Keys, the U.S 1 corridor among other areas, due to Sea Level Change, storm risk, storm surge, evolving weather patterns and other changing conditions which pose a potential risk to Monroe County. The U.S. 1 corridor is an important State of Florida public transportation facility. Given the geography of Monroe County, and in particular it's the length and low-lying nature, the time-frame and organization required to evacuate the population for storm events in the Keys is unique. But, U.S. 1 also serves as the County's primary transportation artery throughout the entire Florida Keys including unincorporated County and its five (5) municipalities. This investigation would include a study of the vulnerability of the only route available to vehicles that are evacuating the Keys under an evacuation order, and consider coastal alternatives that would reduce the risk and vulnerability to the critical facility among other areas.

The Florida Keys Study will address how present and future risk to coastal storm hazard and changes to mean sea level will affect coastal areas supporting the integrity of U.S 1. The overall goal of the Study approach is to analyze all information through one functional geospatial lens to produce estimates of existing and future coastal vulnerability through a connected and synchronized view of all integrated products. Potential measures to reduce risk and vulnerability, such as natural shoreline protection, wave reduction measures, and non-structural measures for critical infrastructure could be considered. Natural and nature-based features would be analyzed to improve the resiliency and sustainability of the coastal system. Upon completion of the Coastal Storm Risk Management Study, projects identified could receive some level of Federal cost share for implementation.

E. FDOT Study of Roadway Base Clearance for State Roads in Monroe County

The Florida Department of Transportation (FDOT) District 6 Planning and Environmental Management Office (PLEMO) has prepared a Study (November 2018) for all State Highways in Monroe County to review where the roadway pavement base clearance requirements may be affected by future sea level rise. Sea level rise will increase the groundwater levels in coastal areas and as a result will increase the Design High Water (DHW) elevation for pavement base clearance.

Base clearance above high water is critical for good pavement performance and to achieve the required compaction and stability during construction operations, as cited in the FDOT Flexible Pavement Design Manual and FDOT research report BD543-13. In areas of low base clearance, significant construction problems are likely and additional costs such as dewatering may be required to achieve compaction. The information identifies roadway segments where potential pavement treatment or reconstruction may be required to meet base clearance requirements in the future. The results of this screening study are intended to be used to identify roadway segments where sub-standard base clearance conditions may occur in the future.

F. NOAA Grant Work[8]

Executed in 2016, the grant *"Advancing Understanding of Risk: Increasing Accuracy of Hazard Damage Assessment Tools by Improving Base Data and Analyzing Opportunities and Barriers for Use in Adaptation Planning"* will be completed in June 2019. The grant project team spans four (4) states (Florida, Georgia, North Carolina and South Carolina) and highlights include:

1. Establish regional best practices for digitization of building footprints and archival Elevation Certificates for floodplain structures as a basis for more precise flood hazard damage cost assessments using FEMA's HAZUS tool. The Monroe County GIS Department has digitized all of the Elevation Certificates, including private residences and public facilities, on file with the Monroe County Floodplain Managers into a GIS database.
2. Utilize the data, hazard assessments, and community engagement results to inform the local hazard planning, policy, and legal framework in order to build local government capacity to

[8] GreenKeys: CE 3 .2 Build local government capacity to better understand local coastal hazard risks, and analyze the legal and policy factors that impact adaptation responses (NOAA grant). End products will include:

- A participatory VCAPS assessment for Monroe County;
- HAZUS damage valuations and visualizations for County;
- Law and policy analysis of issues directly affecting local adaptation capabilities;
- Regional analysis comparing how the state and local regulatory environment impacts resilience planning and adaptation.

GreenKeys: CE 3 .3 Complete Phase 2 of the NOAA grant creating digital record of Elevation Certificates for homes, buildings and facilities. Create a policy to ensure that the County uses, integrates, and improves the Elevation Certificate record to promote higher confidence in flood risk assessments.

address coastal risks. In August 2017, the Monroe County Public Works Department supplied PI Jason Evans with a list of stormwater outfalls of unknown invert elevation and unknown condition in the Lower Keys. Over the course of four days, Evans worked with technicians from the Public Works Department to gather elevation data from these outfalls using an OPUS-GPS receiver. This information was collated into a GIS Geodatabase with full metadata, and supplied to the Monroe County GIS Department in December 2017.

3. Analyze and compare across the four partner communities the impact of improved elevation data to HAZUS damage assessments, the utilization of OCM tools in the partner communities and the significance of the variations in state and local law and policy among the communities in order to assess the effectiveness of a regional approach.

A key component of this grant has been to link modeling and policy tools to leverage previous County efforts for sea level rise planning. The scope of work provides a starting point to link future sea level risk with the opportunity to improve the County's score in CRS. The County has already exhibited a commitment in creating a broad policy framework within its Comprehensive Plan to begin identifying coastal risk and through its GreenKeys initiatives. This NOAA grant has enabled the County to take that framework and put it to action by developing a strong data driven foundation to plan for future risk, link that to direct opportunities that will benefit constituents through advanced planning (CRS) and communicate those efforts to the community to gain support. By tailoring the sea level rise identification of risks to CRS, the outcomes will have direct positive impacts to the community.

This grant has resulted in field work to collect structure data, summaries of future predicted impacts and recognition and development of strategies to mitigate for impacts to address impacts. These strategies build upon previous work project team members have already completed in the County's GreenKeys initiatives, but also work done since that Plan was completed in 2015 and enhanced data collection efforts through field work and analyzing structure data. This grant work includes review of HAZUS results and structural data available through the Florida Department of Transportation (FDOT) primarily related to the US-1 transportation facilities (where stormwater structure data exists).

The balance of this report addresses the work completed as part of the NOAA grant relevant to the CRS credit information described in previous sections.

4. Flood Vulnerability Assessment for Monroe County: Stormwater Drainage Systems, essential facilities, and other County-owned structures

A. Stormwater Infrastructure Inventory

Monroe County's most recently adopted Stormwater Management Master Plan (SMMP) was completed in August 2001 (Camp Dresser & McKee Inc. 2001). Assessments and analyses performed for the SMMP found that "only 10 to 20 percent of residential areas in the Keys have stormwater systems of any type" and that "40% of the residential areas visited had nuisance flooding concerns related to standing water" (Camp Dresser & McKee, pg. EX-6). A field inventory completed for the SMMP documented a total of 254 stormwater drainage structures throughout the County, with the most extensive formal stormwater drainage system noted along commercial areas of US 1. The SMMP noted that Monroe County at that time lacked a geographic information systems (GIS) database for stormwater and recommended that the inventory data within the SMMP could be used "at a later date to populate a Stormwater Management GIS for the County" (Camp Dresser & McKee, pg. 2.4-3). A recent sea-level rise vulnerability assessment for Monroe County similarly noted development of a Stormwater Management GIS as a priority for future flood resilience and climate change planning purposes.[9]

In accordance with these recommendations, Monroe County's Public Works and Engineering Services began a comprehensive and updated field inventory of County-owned stormwater drainage infrastructure in June 2017. This inventory focused on stormwater structures that feed into underground drainage systems and/or discharge stormwater into tidally influenced surface waters. Point location and field attribute data were gathered for structures using global positioning system (GPS) devices. The inventoried infrastructure included 300 catch basins, 41 injection wells, 67 manholes, 84 trench drains, and 37 pipe outfalls for stormwater drainage systems owned and maintained by Monroe County. These collected field data were then organized into a series of geographic information system (GIS) files by the Monroe County GIS Department.

Upon completion of this initial Stormwater Management GIS inventory dataset, the Director of Engineering Services, Judy Clarke, P.E., developed a priority list of pipe outfalls for further collection of high-quality point elevation data. Priority outfalls were selected based on:

- The knowledge of Monroe County Public Works and Engineering staff, and/or
- Public complaints of nuisance flooding (including both tidal and rainfall-driven nuisance flooding) in the associated stormwater drainage basins.

In August 2017, Dr. Jason Evans coordinated with Monroe County Public Works and Engineering Services to collect point elevation data and field attribute information for sixteen priority pipe outfalls using an iGage X-900S-OPUS GNSS receiver system. Data from the iGage receiver were processed by Evans using the NOAA National Geodetic Survey Online Positioning User System (OPUS) and all collected field data were appended into Monroe County's Stormwater Management GIS.[10] Bare ground elevation estimates (as referenced to NAVD88) for the twenty-one additional pipe outfalls and all other inventoried infrastructure within the Stormwater Management GIS were extracted from a 5 ft horizontal resolution Digital Elevation Model (DEM) developed by the South Florida Water Management District (SFWMD 2018).[11]

In October 2018, Evans coordinated with Monroe County Public Works and Engineering Services and Florida Department of Transportation (FDOT) to collect GPS location and field attribute data for an additional set of 99 stormwater structures (including 98 catch basins and 1 outfall) located along the US 1 corridor in Key Largo and Tavernier. None of the inventoried structures within this US 1 corridor appeared to be owned or maintained by Monroe County, and most of the visited structures showed visible

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[9] *Id*.

[10] Root mean square error (RMSE) estimates of OPUS-collected elevation data for the sixteen outfalls ranged between 1 and 2.5 inches.

[11] The DEM was derived from a 2007-2008 LIDAR project by the Florida Department of Emergency Management. The underlying LIDAR data meet a published vertical 95% confidence level accuracy standard of +/- 7 inches (OCM 2017). Field data collection for outfalls using the iGage GPS and OPUS post-processing indicated that top of pipe elevations were, on average, 2.5 feet lower than elevations returned from the bare ground LIDAR DEM. For outfalls where no point elevation data was obtained using the iGage, the top of pipe elevation was therefore estimated as 2.5 feet below the bare ground LIDAR. The methods and assumptions for these elevation estimates at each outfall are recorded within the attribute fields for the Monroe County Stormwater Management GIS.

markers indicating jurisdiction by FDOT. Point ground elevation data using the iGage X-900s-OPUS GNSS receiver were collected for five of the catch basins and the one outfall. Bare ground elevation estimates for all other inventoried catch basins along the US 1 corridor were extracted from the SFWMD (2018) DEM using a similar process employed for the original Monroe County inventory dataset. All of the location and attribute data developed from the October 2018 field inventory were then appended into the Monroe County Stormwater Management GIS.

In June 2019, Monroe County supplied the project team with coordinates for an additional set of 72 trench drains along the US 1 corridor in unincorporated Monroe County. Bare ground elevation estimates for these trench drains were also extracted from the SWWMD (2018) DEM and appended into the Monroe County Stormwater Management GIS.[12] As of the writing of this report, the Monroe County Stormwater Management GIS contains a total of 398 catch basins, 41 injection wells, 67 manholes, 145 trench drains, and 38 outfalls.

B. Sea-Level Rise Projections

A primary criterion for a CRS Class 4 compliant watershed master plan in "coastal communities with no natural or constructed channels" is an evaluation of "future conditions, including the impacts of a median projected sea level rise (based on the National Oceanographic and Atmospheric Administration's (NOAA's) 'intermediate-high' projection for the year 2100) on the local drainage system during multiple rainfall events, including the 100-year rainfall event" (FEMA 2017, pg. 450-15). Using historical data at the Key West tide gauge as the base reference, the 2100 NOAA intermediate-high sea-level rise projection for Monroe County is calculated as 4.13 feet above 1992 mean sea level. Accordingly, a watershed management plan for Monroe County that is compliant with CRS Class 4 guidelines must minimally analyze impacts from at least 4.13 feet of sea-level rise on the functioning of the local drainage infrastructure during a 100-year rainfall event.

As a signatory to the Southeast Florida Regional Climate Change Compact (Compact), Monroe County has committed to develop sea-level rise vulnerability assessments and adaptation actions for making local infrastructure more resilient to flooding impacts from a range of future sea-level rise scenarios. The Compact (2015) has defined a unified sea-level rise projection range (including lower and upper bounds) for use in the 2030, 2060, and 2100 planning horizons. As shown in Table 1, the minimum sea-level rise projection required for a CRS Class 4 compliant watershed management (i.e., the NOAA intermediate-high projection of 4.13' by 2100) plan falls between the lower (i.e., IPCC AR5 Median) and upper (i.e., USACE High) sea-level rise bounds that the Compact (2015) recommends for most regular infrastructure through the years 2030 and 2060.

For the sake of concision, all results and visualizations for the stormwater assessments in this report refer only to the NOAA intermediate-high projection. However, the basic data developed and stored within the Monroe County Stormwater Management GIS database can be readily utilized to develop additional assessments of other sea-level rise scenarios that may be necessitated by future updates of technical projection guidance and/or compliance with other policy and planning processes.

[12] These 72 trench drains are incorporated in tabular analyses within this watershed management plan, but are not included in Map Series 1-6, which was developed prior to the availability of this new inventory data. We note that ongoing field reconnaissance and coordination with FDOT is necessary to ensure maintenance of a complete inventory of stormwater structures along the US 1 corridor, or in other areas of the unincorporated County, that are directly owned and maintained by FDOT and additional entities other than Monroe County.

Table 1: Southeast Florida Regional Climate Change Compact Unified Sea-Level Rise Projection.[13]

Projection Year	SEFRCC Low[14]	NOAA Intermediate-High	SEFRCC High[15]
2030	0.50’	0.69’	0.83’
2060	1.17’	1.82’	2.17’
2100	2.58’	4.13’	5.08’

C. Regular Tidal Flooding of Stormwater Infrastructure

Following a technical process similar to the one implemented previous in the Sea Level Rise Vulnerability Assessment for Monroe County (2016), we utilized the NOAA VDatum 3.4 tool (Yang et al. 2012) to develop a grid-based conversion from NAVD88 to mean-higher high water (MHHW) and mean lower low water (MLLW) tidal datum values (as currently defined by the 1992 National Tidal Datum Epoch (NTDE)) throughout the Florida Keys. Using these VDatum transformations, all NAVD88-based elevation data (including bare ground height and, where available, invert elevations for top and bottom of pipe structures) for each stormwater structure was transformed into localized estimates of height above both 1992 MHHW and 1992 MLLW. Calculations of the relative heights of infrastructure above estimated MHHW and MLLW in the years 2030, 2060, and 2100 under the NOAA intermediate-high sea-level rise projection were then developed by subtracting the relevant values in Table 1 from the 1992 base MHHW and MLLW levels. For example, a catch basin with a ground level grate height of 2.00’ above 1992 MHHW would be calculated as 1.31’relative to 2030 MHHW (2.00’ – 0.69’), as 0.18’ relative to 2060 MHHW (2.00’ – 1.82’), and -2.13’relative to 2100 MHHW (2.00’ – 4.13’).

Summary tabular results (Tables 2 & 3) and visualizations (Map Series 1-4) of sea-level rise vulnerability for catch basins, manholes, injection wells, and trench drains utilize the calculated bare ground height of the infrastructure relative to MHHW and MLLW as thresholds for projected functional failure due to sea-level rise if no adaptation action is taken. All infrastructure that is flagged as having a negative elevation relative to a future MHHW value would be minimally expected to be a source of daily tidal discharge (i.e., during each day’s average highest high tide). All infrastructure that is flagged as having a negative elevation relative to a future MLLW value would be expected to be continuously non-functional (i.e., inundated by tidewater even during each day’s average lowest low tide). While impacts are relatively isolated and localized for 2030 (with no structures showing inundation at MLLW), approximately one half of the inventoried structures show the potential for tidewater flooding at 2060 MHHW. By 2100, the majority of inventoried stormwater structures show inundation at MLLW and almost all stormwater structures located outside of the US 1 corridor show the potential for tidewater discharge impacts at MHHW.

Table 2: Monroe County and FDOT stormwater drainage infrastructure (including percent of total inventory) with calculated bare ground heights lower than projected mean higher high water (MHHW) by sea-level rise scenario.

Year	**Catch Basins (398)**	**Injection Wells (41)**	**Trench Drains (145)**	**Manholes (67)**
2030	9 (2.2%)	N/A	3 (2.1%)	N/A
2060	148 (37.2%)	24 (58.5%)	38 (26.2%)	41 (61.2%)
2100	295 (74.1%)	40 (97.6%)	101 (69.7%)	62 (92.5%)

[13]All values are relative to 1992 mean sea level (MSL), as defined by the 1992 National Tidal Datum Epoch (NTDE).
[14] IPCC AR5 Median.
[15] USACE High.

Table 3: Monroe County and FDOT stormwater drainage infrastructure (including percent of total inventory) with calculated bare ground heights lower than projected mean lower low water (MLLW) by sea-level rise scenario.

Year	Catch Basins (398)	Injection Wells (41)	Trench Drains (145)	Manholes (67)
2030	N/A	N/A	N/A	N/A
2060	3 (0.8%)	N/A	4 (2.8%)	2 (3.0%)
2100	260 (65.3%)	35 (85.4%)	75 (51.7%)	59 (88.1%)

For stormwater outfalls, the calculated top of pipe elevation relative to MHHW and MLLW is used as the threshold for flagging projected infrastructure failure due to sea-level rise if no adaptation action is taken (Table 4; Map Series 1-4). For outfalls that are flagged as having a negative top of pipe elevation relative to MHHW, the outfall pipe is projected to be completely inundated during each day's average highest high tide. For outfalls that are flagged as having a negative top of pipe elevation relative to MLLW, the top of the outfall pipe is projected to be almost continuously inundated by tidewater. Complete tidal inundation of the outfall pipe inland represents a potential source of stormwater infrastructure failure point for two reasons: 1) tidewater backflow can substantially reduce the potential for volumetric discharge of stormwater, thereby increasing the potential for freshwater flooding during rainfall events; and 2) the outfall becomes a potential source of tidewater flooding through the stormwater system and into low-lying inland areas, thereby increasing the potential for saltwater flooding within the drainage basin.

Because most direct pipe discharges into tidal waters in Monroe County were built many decades ago (i.e., prior to the initiation of modern stormwater control standards first implemented in the 1970s and 1980s), it is perhaps not surprising that the elevations for a substantial portion of these outfall structures are calculated as below the NTDE MHHW from 1992 (60.5%) and that additional outfalls show impacts with 2010 MHHW (71.1%). However, it is notable that almost one quarter of inventoried outfalls show inundation at or below the 1992 MLLW (23.7%), with additional outfalls showing projected impacts at 2010 MLLW (28.9%). These results suggesting an already existing impairment of drainage capacity in stormwater outfalls due to past sea-level rise are generally consistent with observations of widespread occurrences of nuisance flooding (i.e., street flooding without structural damage) during heavy rainfall events throughout Monroe County from as early as the 1990s (as reported in the Monroe County SMMP; Camp Dresser and McKee, Inc. 2001), as well as the more recent field observations of nuisance and tidal flooding in low-lying drainage basins reported by Monroe County Public Works and Engineering Services staff. Almost all inventoried outfalls are projected to show complete inundation at MLLW by 2100 and would be expected to have little to functional drainage capacity in the absence of substantial adaptation actions (e.g., installation of drainage pumps, elevation of land areas through fill activities, construction of impervious barriers, etc.) within the built environment.

A complete tabular dataset of stormwater structures inventoried and assigned a structure identification number by Monroe County with estimated top elevations relative to NAVD88, tidal datums (MLLW and MHHW) at 1992 base sea level, and adjusted tidal datums for the NOAA Intermediate-High sea-level rise projection at the 2030, 2060, and 2100 is provided in Appendix Tables 1-5.[16]

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[16] Structures owned by entities other than Monroe County are inventoried and maintained within the Monroe County Stormwater GIS database and also included in the overall vulnerability assessment of this main report. This approach recognizes that all elements of the stormwater system in Monroe County, including those structures not directly owned and maintained by Monroe County, should be inventoried for the purpose of coordinated floodplain planning, management, and mitigation. However, the stormwater structure lists in Appendix Tables 1-5 are more narrowly intended to inform capital improvement budgeting <u>by the Monroe County government</u>. For this reason, these Appendix Tables only include structures directly owned and maintained by Monroe County.

Table 4: Monroe County and FDOT stormwater drainage outfall infrastructure (including percent of total inventory) with top of pipe elevation lower than projected mean higher high water (< MHHW) and mean lower low water (< MLLW) by sea-level rise projection year.

Pipe Outfalls (38)		
Year	**< MHHW**	**< MLLW**
1992	23 (60.5%)	9 (23.7%)
2010	27 (71.1%)	11 (28.9%)
2030	32 (84.2%)	16 (42.1%)
2060	37 (97.4%)	29 (76.3%)
2100	37 (97.4%)	37 (97.4%)

D. Extreme Event Scenarios in Hazus-MH

The Multi-Hazard Loss Estimation Methodology (Hazus) is a standardized methodology created by FEMA to estimate potential losses from earthquakes, hurricane winds, and floods. The Hazus Flood Hazard Model is used to estimate riverine and coastal floods as well as potential damage to buildings, infrastructure, and land use. The Hazus Coastal Flood Hazard Model component includes computations from FEMA's erosion, Wave Height Analysis for Flood Insurance Studies (WHAFIS), and RUNUP models to develop estimates of flood height under a defined coastal flooding event for the study area (FEMA 2013). The outputs from the Coastal Flood Hazard Model are flood depth grids that describe the projected depth and extent of flood waters above ground height for the modeled flood event. These depth grids are then used to model the impacts of the projected flood event on essential facilities, property, and economic activity within the study area.

For this project we used the Coastal Flood Model in Hazus-MH Version 3.1 (a freely downloadable add-on to ESRI's ArcGIS 10.2.2 software) to develop water level estimates for a series of 100-year return interval flood event scenarios for Monroe County. A base case Coastal Flood Model scenario was run in Hazus-MH using current stillwater elevation[17] heights for a 100-year storm surge along the Monroe County coastline. These stillwater elevations were defined by coastal transects from FEMA's current Flood Insurance Study for Monroe County and an assumed 1992 baseline for mean sea level (MSL). Three additional future conditions scenarios that account for sea-level rise projections within adjusted 100-year flood heights were also run within the Coastal Flood Model: 1) 14" of sea-level rise, which is the 2060 "Low" scenario defined by the Southeast Florida Regional Climate Change Compact; 2) 26" of sea-level rise, which is the 2060 "High" scenario defined by the Southeast Florida Regional Climate Change Compact; and 3) 4.13' of sea-level rise, which is the NOAA Intermediate-High sea-level rise projection for 2100 as referenced to the Key West tide gauge.

[17] Stillwater elevation refers to the height of a coastal flood without the additional height associated with wave action. The Hazus Coastal Flood Model adds wave height onto the stillwater elevation.

Summary of Structure Impacts by Sea Level Rise Scenario (All Scenarios)

Structure/Facility Type	2030 (.69' SLR)		2060 (1.82' SLR)		2100 (4.13' SLR)	
	Low	High	Low	High	Low	High
Catch Basins (398 Total)	0	9	3	148	260	295
Injection Wells (41 Total)	0	0	0	24	35	40
Manholes (67 Total)	0	0	2	41	59	62
Trench Drains (145 Total)	0	3	4	38	75	101
Pipe Outfalls (38 Total)	16	32	29	37	37	37

Note:

- "Low" = Monroe County and FDOT stormwater drainage infrastructure with calculated bare ground heights lower than projected mean lower low water (MLLW) by sea-level rise scenario (lowest low tide of the day). Impact at MLLW means continuously non-functional (no functionality at all).
- "High" = Monroe County and FDOT stormwater drainage infrastructure with calculated bare ground heights lower than projected mean higher high water (MHHW) by sea-level rise scenario (highest high tide of the day). Impact at MHHW means non-functional around high tide (less or no functional capability).
- Pipe outfall analysis is based upon the top of pipe elevation being lower than the MHHW and MLLW by sea level rise scenario. Impact means inundation at "end of pipe" and reduced or eliminated drainage capacity.

E. Stormwater Drainage with 100-Year Flood and Sea-Level Rise

To evaluate the impacts of extreme event flood impacts on stormwater drainage within Monroe County, we extracted relevant flood depth grid information from two Hazus Coastal Flood Hazard Model scenarios at the locations for all inventoried infrastructure within the Monroe County Stormwater Management GIS: 1) the "base" case that models the 100-year coastal flood height using a 1992 mean sea level (MSL) reference relative to NAVD88; and 2) the 2100 sea-level rise scenario that defined MSL as 4.13' higher than the 1992 base case condition. All stormwater features at locations that Hazus modeled as being completely overtopped by floodwaters were identified and flagged, as these features would presumably be nonfunctional for stormwater drainage purposes over the course of these events.

Results of these Hazus assessments, as summarized in Table 5 and visualized in Map Series 5, project that almost all stormwater features in unincorporated Monroe County – aside from those located along the relative high ground of the US 1 corridor in Key Largo – would be inundated by floodwaters from a 100-Year coastal flooding event under the base case condition. By 2100, substantial portions of the stormwater infrastructure along the US 1 corridor in Key Largo (Map Series 6) are also projected to show inundation by floodwaters due to the exacerbating impacts of sea-level rise on the projected flood event height.

The structures that do not show complete overtopping from floodwaters under either scenario would almost certainly be impacted by elevated groundwater associated with storm surge propagation through the limestone substrate (Reich et al. 2001). Therefore, it is highly probable that most inventoried stormwater infrastructure features would experience volumetric overload from rainfall inputs during a 100-Year coastal flood event, even under an assumption of current sea level conditions.[18] It is highly unlikely that any of the currently inventoried stormwater management features – including those not flagged as inundated by the Hazus overlays – in the inhabited areas of unincorporated Monroe County could be expected to show drainage functionality during a 100-Year flood event that occurred on top of a projected sea-level rise of 4.13 feet.

Due to the unique island geography and high storm surge potential within the Florida Keys, it is infeasible to develop a stormwater system capable of managing the volume of water associated with 100-Year storm surge events. Mandatory evacuations well in advance of an approaching storm will continue to be the best policy for protecting human life against the peril of storm surge flooding. For private property, maintenance of the existing freeboard requirement of 1 foot above the 100-Year base flood elevation (BFE), as defined by the current Flood Insurance Rate Map (FIRM), provides some risk buffer for the higher 100-Year BFE heights that will presumably be associated with up to 1 foot of sea-level rise.

Table 5: Monroe County and FDOT stormwater drainage infrastructure (including percent of total inventory) showing above ground inundation from the Hazus 100-Year Coastal Hazard Flood Model.[19]

Scenario	Catch Basins (398)	Injection Wells (41)	Trench Drains (145)	Manholes (67)	Outfalls (38)
Base	338 (84.9%)	41 (100%)	109 (75.2%)	67 (100%)	38 (100%)
2100 SLR	365 (91.7%)	41 (100%)	115 (79.3%)	67 (100%)	38 (100%)

F. Essential and Public Facilities

Monroe County supplied the project team with a GIS-based inventory containing point locations for a total of 301 County-owned buildings and other essential facilities. Elevation Certificates with finished floor elevation for 23 of these facilities were located by the Monroe County Floodplain Coordinator's office and digitized into the GIS file. The NOAA VDatum tool (Yang et al. 2012) was used to transform all Elevation Certificate data originally referenced to the National Geodetic Vertical Datum of 1929 (NGVD29) into NAVD88.[20] Overlays of this infrastructure data with the flood depth grids for the base case, 2060, and 2100 Hazus-MH Coastal Flood Model scenarios were then developed using Hazus-MH. The inventory of these facilities and associated base scenario Hazus-MH Coastal Flood Model results for Monroe County are provided in Table 6 (Disaster Preparation and Response facilities), Table 7 (Essential Services), Table 8 (Utilities), Table 9 (Hazardous), and Table 10 (Other). Results of the Hazus-MH Coastal Flood Model with

[18] The Monroe County SMMP (Camp Dresser & McKee 2001) defines a stormwater management system design standard for capturing volumetric discharge from a 24-hour, 25-Year storm event. According the National Weather Service (2019), the 24-Hour, 25-Year rainfall event for Key West International Airport is defined as 9.9 inches, while the 100-Year, 24-Hour rainfall event is 14.1 inches. Thus, the 100-Year precipitation event exceeds the design standard for modern stormwater infrastructure by 4.2 inches (42.4%) over a 24-hour period, indicating the likelihood of volumetric overload from a 100-Year event even without the compounding factor of elevated tidewater infiltration. The Monroe County Local Mitigation Strategy (Monroe LMS 2015) notes that the 1980 "Veteran's Day Storm" produced 23 inches of rain over a 24-hour period in the Key West area, thereby exceeding the published 100-Year precipitation event by almost 9 inches (63.6%).

[19] The "Base" event represents projected flooding from a 100-Year model storm at 1992 mean sea level, while 2100 SLR represents projected flooding a 100-Year model storm with 4.13' of sea-level rise relative to 1992.

[20] A default finished floor elevation of 2 feet above adjacent ground level was assumed for all facilities without Elevation Certificate data. Average value for finished floor elevation above adjacent ground level for buildings with Elevation Certificates was 3.25 feet.

sea-level rise scenarios for 2060 (Low of 14” and High of 26”) and 2100 (4.13’) are provided in Table 11 (Disaster Preparation and Response facilities), Table 12 (Essential Services), Table 13 (Utilities), Table 14 (Hazardous), and Table 15 (Other).

Table 6: Inventory of Disaster Preparation and Response Facilities with Base Scenario Hazus-MH Coastal Flood Model Results.[21]

Building	Address	Type	Elev Cert	Depth	FIRM Zone
Marathon Government Center Annex	490 63rd Street Ocean	Alternate EOC	No	3.08	100-Year
Big Pine Vol Fire Station/EMS #13	Key Deer Blvd	Disaster Recovery Center	No	3.71	100-Year
Saint Peter's Catholic Church	Saint Peter's Drive	Disaster Recovery Center	No	3.24	100-Year
San Pablo Church	550 122nd Street	Disaster Recovery Center	No	0.58	100-Year
EMS & MCSO Substation	20950 Overseas Hwy	EMS	Yes	1.35	100-Year
Florida Keys Ambulance Service	91421 Overseas Hwy #10	EMS	No	5.44	100-Year
Key Largo Ambulance	98600 Overseas Hwy	EMS	No	N/A	N/A
Medical 6 Station	3301 Overseas Hwy	EMS	No	N/A	100-Year
Medical 9 Station	151 Marine Ave	EMS	No	N/A	100-Year
City of Marathon / EOC	9805 Overseas Hwy	EOC	No	3.08	100-Year
Emergency Communication Building	10600 Aviation Boulevard	EOC	No	0.30	100-Year
Key Largo EOC	#1 East Drive	EOC	No	N/A	500-Year
Conch Key Fire Station/EMS #17	South Conch Avenue	Fire	No	6.64	100-Year
Fire Station #1	3103 Overseas Highway	Fire	No	3.82	100-Year
Fire Station #13	390 Key Deer Boulevard	Fire	No	4.24	100-Year
Fire Station #17	10 Conch Avenue	Fire	No	6.64	100-Year
Fire Station #19	74070 Overseas Highway	Fire	Yes	4.58	100-Year
Fire Station #9	28 Emerald Drive	Fire	No	7.76	100-Year
Islamorada Fire\EMS #20	81850 Overseas Hwy	Fire	No	N/A	N/A
Key Largo Fire Rescue #24	East Drive	Fire	No	N/A	500-Year
Key West Fire Station #3	1525 Kennedy Ave	Fire	No	4.70	100-Year

[21] Elev Cert column indicates if facility's finished floor elevation was modeled using Elevation Certificate data from the Monroe County Floodplain Coordinator's office ("Yes") or an assumed value of 2 feet above ground level ("No"). Depth is reported as feet above finished floor elevation values as based on the depth grid from the Hazus-MH Coastal Flood Model. There is much higher confidence in model values for facilities with Elevation Certificate data as compared to those with finished floor elevation values estimated from ground level elevation, and estimates for facilities without Elevation Certificates should be adjusted after field surveys. FIRM Zone indicates the flood zone delineation for the facility's location within the current Flood Insurance Rate Map for Monroe County.

Building	Address	Type	Elev Cert	Depth	FIRM Zone
KW Central Fire Station #1	1600 North Roosevelt Ave	Fire	No	2.28	100-Year
KW Fire Station Angela Street #2	525 Angela Street	Fire	No	N/A	N/A
KWIA Fire/Rescue #4	3471 S Roosevelt Blvd	Fire	No	4.96	100-Year
Layton Volunteer Fire Dept #18	68260 Overseas Hwy	Fire	No	4.70	100-Year
Lower Sugarloaf Fire Station #10	17097 Overseas Hwy	Fire	No	3.82	100-Year
Marathon Fire Station/EMS #14	8900 Overseas Hwy	Fire	No	N/A	100-Year
Marathon Vol Fire Dept Station 1	3299 Overseas Hwy	Fire	No	3.82	100-Year
North Key Largo Fire Station #25	220 Reef Drive	Fire	No	N/A	N/A
Ocean Reef Club Fire Station #26	100 Anchor Drive	Fire	No	-0.65	100-Year
Park-Old Volunteer Fire Station	276 Avenue F	Fire	No	5.29	100-Year
Stock Island Fire Station #8	6180 2nd Street	Fire	No	2.59	100-Year
Tavernier Fire Station	Marine Ave	Fire	No	N/A	100-Year
Tavernier Vol Fire Dept/EMS #22	151 Marine Ave	Fire	No	N/A	100-Year
Tax Collector's Office	3493 S Roosevelt Boulevard	Fire	No	5.62	100-Year
Naval Air Station Key West	Boca Chica Field	Military	No	4.66	100-Year
Naval Facility	Trumbo Point	Military	No	0.64	100-Year
U.S. Air Force Tethrostat Site	Blimp Road	Military	No	N/A	100-Year
U.S.C.G. Base Key West	Trumbo Point Complex	Military	No	1.92	100-Year
U.S.C.G. Marathon	1800 Overseas Hwy	Military	No	3.86	100-Year
U.S.C.G. Plantation Key	183 Palermo Drive	Military	No	7.98	100-Year
KW Police Station	1604 N Roosevelt Blvd	Police	No	2.28	100-Year
MCSO Administrative Building	5525 College Road	Police	No	4.79	100-Year
MCSO Detention Facility	2981 Ocean Terrace	Police	No	3.34	100-Year
MCSO Roth Building	50 High Point Road	Police	No	0.24	100-Year
MCSO Substation	3113 Overseas Highway	Police	No	0.57	100-Year
Monroe County Sheriff's Department	50 High Point Rd	Police	Yes	-1.20	100-Year
Monroe County Sheriff's Department	86800 Overseas Hwy	Police	No	N/A	100-Year

Building	Address	Type	Elev Cert	Depth	FIRM Zone
Monroe County Sheriff's Sub, Marathon	3103 Overseas Highway	Police	Yes	2.16	100-Year
Plantation Key MCSO Sub-Station	88770 Overseas Hwy	Police	Yes	N/A	N/A
Stock Island MCSO Jail Facility	5501 College Road	Police	No	2.88	100-Year
Big Coppitt Fire Station/EMS #9	28 Emerald Drive	Refuge of Last Resort	No	1.64	100-Year
Casa Marina	1500 Reynolds Street	Refuge of Last Resort	No	N/A	100-Year
Island Christian School	83400 Overseas Hwy	Refuge of Last Resort	No	-0.15	100-Year
Key Largo Bay Beach	103800 Overseas Highway	Refuge of Last Resort	No	4.45	100-Year
Sheraton Resort Key Largo	103800 Overseas Highway	Refuge of Last Resort	No	0.70	100-Year
St. James Episcopal Plantation Key	87500 Overseas Highway	Refuge of Last Resort	No	0.95	500-Year
Bernstein Park	3rd Street	Staging	No	6.46	100-Year
Clay Sterling Baseball Fields	Roosevelt Blvd and Kennedy Drive	Staging	No	2.51	100-Year
Friendship Park Key Largo	US 1 and Hibiscus Lane	Staging	No	N/A	500-Year
Ft. Zachary Taylor Recreation Area	601 Howard England Way	Staging	No	N/A	100-Year
Island Christian School Field	83400 Overseas Hwy	Staging	No	1.54	100-Year
Jose Marti Park	Roosevelt Blvd & Jose Marti Dr	Staging	No	4.11	100-Year
Key West Bight Parking Area	West End of Margaret St	Staging	No	5.45	100-Year
Kmart Parking Lot	MM 50 Overseas Hwy	Staging	No	2.69	100-Year
Knight's Key Campground Field	Knight's Key	Staging	No	6.94	100-Year
Monroe County Public Library	101485 Overseas Highway	Staging	Yes	N/A	100-Year
Plantation Yacht Harbor	Plantation Yacht Harbor	Staging	No	6.04	100-Year
Salt Ponds Bunker Area	Government Road	Staging	No	2.73	100-Year
San Pablo Catholic Church Field	550 122nd Street Ocean	Staging	No	5.65	100-Year
Sigsbee Park & Community Center	Sigsbee Blvd & Arthur Sawyer Rd	Staging	No	1.84	100-Year
Tavernier Towne Parking Lot	Tavernier Towne	Staging	No	2.58	100-Year
Tommy Roberts Stadium	Kennedy Dr	Staging	No	3.80	100-Year

Table 7: Inventory of Essential Services Facilities with Base Scenario Hazus-MH Coastal Flood Model Results.[22]

Building	Address	Type	Elev Cert	Depth	FIRM Zone
Big Pine Flea Market	30250 Overseas Highway	DMS	No	4.38	100-Year
Big Pine School	30220 Overseas Highway	DMS	No	3.02	100-Year
E Shore Drive Site	East Shore Dr	DMS	No	6.51	100-Year
Island Christian School Site	83250 Overseas Hwy	DMS	No	1.01	100-Year
Marathon Airport East	10600 Aviation Blvd	DMS	No	1.81	100-Year
Marathon Airport West	9400 Overseas Hwy	DMS	No	2.74	100-Year
Port Bougainville	State Rd 905	DMS	No	6.67	100-Year
Rockland Investment	121 US 1	DMS	No	2.80	100-Year
Sugarloaf School	255 Crane Blvd	DMS	No	N/A	100-Year
Tavernier Airport Site	135 N. Airport Rd	DMS	No	0.47	100-Year
AARP/Senior Center	50 High Point Road	Health	No	-0.91	100-Year
Bayshore Manor	5200 College Road	Health	Yes	3.00	100-Year
Blue Heron Teen Center	30451 Lyttons Way	Health	No	0.50	100-Year
Health Center	3333 Overseas Highway	Health	No	5.93	100-Year
Health Department	3333 Overseas Highway	Health	No	5.93	100-Year
Key West Convalescent Center	5860 College Road	Health	No	6.01	100-Year
Key West Senior Center	1200 Truman Avenue	Health	No	0.19	500-Year
Plantation Key Convalescent Center	48 Highpoint Road	Health	No	2.24	100-Year
Senior Center/AARP	535 33rd Street	Health	No	4.14	100-Year
#65 County Offices	MM 88.5 US 1	Local government	Yes	2.57	100-Year
Animal Shelter	105951 Overseas Highway	Local government	No	N/A	N/A
Animal Shelter	10550 Aviation Boulevard	Local government	No	2.91	100-Year
Animal Shelter (lease)	5230 College Road	Local government	No	4.15	100-Year
Animal Shelter Kennels	5427 College Road	Local government	Yes	4.28	100-Year

[22] Elev Cert column indicates if facility's finished floor elevation was modeled using Elevation Certificate data from the Monroe County Floodplain Coordinator's office ("Yes") or an assumed value of 2 feet above ground level ("No"). Depth is reported as feet above finished floor elevation values as based on the depth grid from the Hazus-MH Coastal Flood Model. There is much higher confidence in model values for facilities with Elevation Certificate data as compared to those with finished floor elevation values estimated from ground level elevation, and estimates for facilities without Elevation Certificates should be adjusted after field surveys. FIRM Zone indicates the flood zone delineation for the facility's location within the current Flood Insurance Rate Map for Monroe County.

Building	Address	Type	Elev Cert	Base	FIRM Zone
Animal Shelter Marathon	10550 Aviation Boulevard	Local government	Yes	N/A	100-Year
Animal Shelter Office	5427 College Road	Local government	Yes	4.17	100-Year
Annex Court House, Jackson Square	530 Whitehead Street	Local government	No	N/A	N/A
Carpenter's Shop	88000 Overseas Highway	Local government	No	N/A	500-Year
Carpentry Shop	3583 S Roosevelt Boulevard	Local government	No	5.50	100-Year
Carpentry Shop	10600 Aviation Boulevard	Local government	No	0.61	100-Year
City of Marathon / City Offices	9805 Overseas Hwy	Local government	No	2.71	100-Year
Clerk of Court	3117 Overseas Highway	Local government	No	3.67	100-Year
Control Rooms	88000 Overseas Highway	Local government	No	N/A	500-Year
Court Room B (temporary)	88820 Overseas Highway	Local government	No	-0.85	100-Year
Courthouse	3117 Overseas Highway	Local government	No	3.67	100-Year
Crew Room & Storage Shed	88000 Overseas Highway	Local government	No	N/A	100-Year
Crowne Plaza La Concha	430 Duval St	Local government	No	N/A	N/A
Facilities Maintenance Office	3583 S Roosevelt Boulevard	Local government	No	4.65	100-Year
Fleet Garage	10600 Aviation Boulevard	Local government	No	1.82	100-Year
Fleet Maintenance Garage	3583 S Roosevelt Boulevard	Local government	No	3.09	100-Year
Fleet Maintenance Office	3583 S Roosevelt Boulevard	Local government	No	4.30	100-Year
Freeman Justice Center, Jackson Sq.	302 Fleming	Local government	No	N/A	N/A
Gato Building	1100 Simonton Street	Local government	No	N/A	N/A
Government Annex	490 63rd Street	Local government	No	2.95	100-Year
Government Center	2798 Overseas Highway	Local government	No	0.57	100-Year
Government Center Carpenter Shop	50 High Point Road	Local government	No	1.32	100-Year
Government Center Ellis Building	50 High Point Road	Local government	No	-1.07	100-Year
Government Complex, Jackson Square	530 Whitehead Street	Local government	No	N/A	N/A
Harvey Government Center	1200 Truman Ave	Local government	No	-0.80	500-Year
HGC Sprinkler Building	1200 Truman Avenue	Local government	No	0.19	500-Year
Islamorada County Library	81840 Overseas Hwy	Local government	Yes	N/A	500-Year
Key Colony Beach Auditorium	600 West Ocean Dr.	Local government	No	2.49	100-Year

Building	Address	Type	Elev Cert	Base	FIRM Zone
Key West City Hall	510 Greene Street	Local government	No	6.29	100-Year
Key West Port/Transit Authority	620 Palm Ave	Local government	No	3.93	100-Year
KW City Hall (Annex)	604 Simonton Street	Local government	No	N/A	N/A
M. C. Library Marathon	MM 48 Overseas Hwy	Local government	No	3.06	100-Year
M. C. Mosquito Control Marathon	503 107th St.	Local government	No	2.07	100-Year
M. C. Public Works Key West	3583 S Roosevelt Blvd	Local government	No	5.50	100-Year
M. C. Public Works Marathon	10600 Aviation Blvd	Local government	No	0.85	100-Year
M.C. Mosquito Control	18 Aquamarine Dr.	Local government	No	2.19	100-Year
Marathon Detention Facility	3891 Ocean Terrace	Local government	No	3.34	100-Year
Medical Examiner	56639 Overseas Highway	Local government	No	5.47	100-Year
Medical Examiner's Morgue	56639 Overseas Highway	Local government	No	5.58	100-Year
Monroe County Courthouse	500 Whitehead Street	Local government	Yes	N/A	N/A
Monroe County Superintendent's Office	241 Trumbo Road	Local government	No	3.58	100-Year
Monroe County Supervisor of Elections	530 Whitehead Street	Local government	Yes	N/A	N/A
Monroe County Tax Collector	3101 Overseas Hwy	Local government	No	0.57	100-Year
Murray E. Nelson Government Center	102050 Overseas Hwy	Local government	No	-0.19	500-Year
PK Courthouse	88000 Overseas Highway	Local government	No	-0.54	100-Year
Plantation Detention Center	53 Highpoint Road	Local government	No	-0.74	100-Year
Plantation Key Govt. Center	88820 Overseas Highway	Local government	Yes	N/A	100-Year
Plantation Key Public Works Yard	186 Key Heights Dr.	Local government	No	N/A	100-Year
Public Library	213 Key Deer Boulevard (lease)	Local government	No	0.50	100-Year
Public Library	101485 Overseas Highway	Local government	No	N/A	100-Year
Public Library	3251 Overseas Highway	Local government	No	3.06	100-Year
Public Library (lease)	81830 Overseas Highway	Local government	No	N/A	N/A
Public Works	300 Magnolia Street	Local government	No	2.59	100-Year
Public Works Office	10600 Aviation Boulevard	Local government	No	0.30	100-Year
Sign Shop	3583 S Roosevelt Boulevard	Local government	No	5.30	100-Year
Sign Shop Office	3583 S Roosevelt Boulevard	Local government	No	5.30	100-Year

Building	Address	Type	Elev Cert	Base	FIRM Zone
Spottswood Building-Public Works	88770 Overseas Highway	Local government	No	N/A	N/A
Stock Island Public Service Building	5100 College Road	Local government	No	-0.81	100-Year
Storage Shed	3583 S Roosevelt Boulevard	Local government	No	3.82	100-Year
SubCourt Building	3117 Overseas Highway	Local government	No	2.56	100-Year
Tax Collector's Office	3101 Overseas Highway	Local government	No	2.49	100-Year
Teen Center	3491 S. Roosevelt Blvd	Local government	Yes	3.94	100-Year
Marathon Manor	320 Sombrero Beach Road	Nursing	No	3.00	100-Year
Academy at Ocean Reef	395 South Harbor Dr	School	No	N/A	100-Year
Coral Shores High School	89901 Old Hwy,	School	No	N/A	N/A
Florida Keys Community College	5901 College Road	School	No	2.44	100-Year
Gerald Adams School	5800 College Road	School	No	-0.16	100-Year
Glynn Archer School	1302 White Street	School	No	0.31	500-Year
Horace O'Bryant Middle School	1105 Leon Street	School	No	3.96	100-Year
Hurricane Island Outward Bound School	100693 Overseas Highway	School	No	N/A	N/A
Key Largo Elementary/Middle School	10400 Overseas Hwy	School	No	N/A	500-Year
Key West High School	2100 Flagler Ave	School	No	-1.14	100-Year
Marathon High School	350 Sombrero Beach Road	School	No	N/A	100-Year
Marathon Lutheran School	325 112nd St Gulf	School	No	0.86	100-Year
Mary Immaculate Star of the Sea	700 Truman Ave	School	No	0.49	N/A
May Hill Public Library	700 Fleming Street	School	No	N/A	N/A
Montessori Children's School	1221 Varela St	School	No	-0.18	500-Year
Montessori Elementary School Charter	1127 United St	School	No	-0.30	500-Year
Montessori in Key Largo	99341 Overseas Highway	School	No	N/A	N/A
Pace Lower Keys School	3130 Flagler Ave	School	No	4.14	100-Year
Pace Upper Keys School	89015 Overseas Highway	School	No	N/A	100-Year
Plantation Key School	100 Lake Rd	School	No	N/A	100-Year
Poinciana Elementary School	1407 Kennedy Dr	School	No	-0.13	100-Year
Sigsbee Elementary School	Sigsbee Park Navy Complex	School	No	1.44	100-Year

Building	Address	Type	Elev Cert	Base	FIRM Zone
St. Justin Catholic Key Largo	105500 Overseas Hwy	School	No	N/A	N/A
Stanley Switlik Elementary School	3400 Overseas Hwy	School	No	3.80	100-Year
Sugarloaf Elementary/Middle School	Crane Blvd	School	No	-0.61	100-Year
Treasure Village Montessori Charter School	86731 Overseas Hwy	School	No	3.36	100-Year
FDOT Marathon Operation Center	3100 Overseas Hwy	State government	No	1.62	100-Year
Marathon Govt. Center State Building	2788 Overseas Hwy	State government	No	-0.17	100-Year
Air Cargo America	3491 S. Roosevelt Blvd	Transportation	Yes	3.80	100-Year
Card Sound Toll Offices & Plaza	Card Sound Road	Transportation	No	5.15	100-Year
Key West International Airport	3501 S Roosevelt Blvd	Transportation	Yes	5.99	100-Year
Marathon Airport	9400 Overseas Hwy	Transportation	No	2.32	100-Year
Ocean Reef Club Airport	60 Barracuda Ln	Transportation	No	4.26	100-Year
Sugarloaf Airfield	5 Bat Tower Rd	Transportation	No	7.68	100-Year
Summerland Airfield	200 W. Shore Dr.	Transportation	No	4.67	100-Year

Table 8: Inventory of Utilities Facilities with Base Scenario Hazus-MH Coastal Flood Model Results.[23]

Building	Address	Type	Elev Cert	Depth	FIRM Zone
Bell South Key Largo	94930 Overseas Hwy	Communication	No	1.42	100-Year
Bell South Sugarloaf	MM 20 Overseas Hwy	Communication	No	3.83	100-Year
Big Pine Key Bell South Building	30769 Avenue A	Communication	No	1.00	100-Year
Translator Tower	NAS Sigsbee	Communication	No	5.59	100-Year
Translator Tower	58100 Crain Street	Communication	No	6.52	100-Year
WFKZ FM 103.1	93351 Overseas Hwy	Communication	No	2.19	100-Year
FKEC Administration Bldg.	91605 Overseas Hwy - Ocean	Energy	No	N/A	100-Year
FKEC Ellis Facility Islamorada	80571 Old Highway	Energy	No	N/A	100-Year
FKEC Generating Plant	3421 Overseas Hwy	Energy	No	1.71	100-Year
FKEC Key Largo Substation	98401 Overseas Hwy	Energy	No	N/A	500-Year
FKEC Moody Facility Key Largo	105901 Overseas Hwy	Energy	No	N/A	N/A
FKEC Operations Complex	91630 Overseas Hwy - Bayside	Energy	No	N/A	100-Year
Fleet	87831 Overseas Highway	Energy	No	N/A	N/A
Gato Generator Building	1100 Simonton Street	Energy	No	N/A	N/A
Generator Building	3117 Overseas Highway	Energy	No	2.56	100-Year
Generator Building, Jackson Square	500 Whitehead Street	Energy	No	N/A	N/A
Keys Energy Services Facility Big Coppitt	MM 10 Overseas Hwy	Energy	No	5.66	100-Year
Keys Energy Services Facility Cudjoe Key	Blimp Road	Energy	No	1.09	100-Year
Keys Energy Services Generating Plant	Stock Island Generating Facility	Energy	No	-0.03	100-Year
Keys Energy Services Main Office	1001 James Street	Energy	No	5.31	100-Year
Keys Energy Services Substation	MM 6 Overseas Hwy	Energy	No	1.98	100-Year
Keys Energy Services Substation	1007 Kennedy Drive	Energy	No	2.80	100-Year
Baypoint Wastewater Treatment Plant		Wastewater	No	7.04	100-Year
Big Coppitt Wastewater Treatment Plant		Wastewater	No	3.46	100-Year

[23] Elev Cert column indicates if facility's finished floor elevation was modeled using Elevation Certificate data from the Monroe County Floodplain Coordinator's office ("Yes") or an assumed value of 2 feet above ground level ("No"). Depth is reported as feet above finished floor elevation values as based on the depth grid from the Hazus-MH Coastal Flood Model. There is much higher confidence in model values for facilities with Elevation Certificate data as compared to those with finished floor elevation values estimated from ground level elevation, and estimates for facilities without Elevation Certificates should be adjusted after field surveys. FIRM Zone indicates the flood zone delineation for the facility's location within the current Flood Insurance Rate Map for Monroe County.

Building	Address	Type	Elev Cert	Base	FIRM Zone
Cudjoe Wastewater Treatment Plant		Wastewater	No	0.15	100-Year
Duck Key Wastewater Treatment Plant		Wastewater	No	0.63	100-Year
Key Haven Wastewater Treatment Plant		Wastewater	No	6.32	100-Year
Key Largo Wastewater Treatment Plant		Wastewater	No	5.94	100-Year
KW Resort Utilities Wastewater Treatment Plant		Wastewater	No	3.33	100-Year
Layton Wastewater Treatment Plant		Wastewater	No	2.36	100-Year
North Key Largo Wastewater Treatment Plant		Wastewater	No	4.26	100-Year
FKAA Booster Station	3375 Overseas Hwy	Water	No	3.88	100-Year
FKAA Booster Station	MM 27 Overseas Hwy	Water	No	4.82	N/A
FKAA Operations Center	3200 Overseas Hwy	Water	No	3.51	100-Year
FKAA RO Plant & Storage Facility	7200 Front Street	Water	No	1.12	100-Year
FKAA Storage Facility	5226 College Road	Water	No	2.72	100-Year
FKAA Admin/Pump Station	91620 Overseas Hwy	Water	No	-0.42	100-Year
FKAA Main Office	1100 Kennedy Bkvd	Water	No	3.71	100-Year
FKAA Pumping Station	MM 70 Overseas Hwy	Water	No	2.05	100-Year
FKAA Storage Facility	Dredger's Key Road	Water	No	N/A	100-Year

Table 9: Inventory of Hazardous Facilities with Base Scenario Hazus-MH Coastal Flood Model Results.[24]

Building	Address	Type	Elev Cert	Depth	FIRM Zone
Fuel Island/Pumps	88000 Overseas Highway	Hazardous materials	No	N/A	500-Year
Fuel Island/Pumps	3583 S Roosevelt Boulevard	Hazardous materials	No	3.82	100-Year
Fuel Island/Pumps	10600 Aviation Boulevard	Hazardous materials	No	0.80	100-Year
Fuel Storage Facility	Trumbo Point	Hazardous materials	No	4.06	100-Year
Fuel Tank (8,000 gallon)	3583 S Roosevelt Boulevard	Hazardous materials	No	3.82	100-Year
Fuel Tank (8,000 gallons)	88000 Overseas Highway	Hazardous materials	No	N/A	500-Year
Fuel Tank 8,000 gallon	10600 Aviation Boulevard	Hazardous materials	No	0.25	100-Year
Key Largo Landfill	1180 County Road 905	Hazardous materials	No	N/A	N/A
Key Largo Transfer Station	1180 County Road 905	Hazardous materials	No	-0.47	500-Year
Key West Landfill	5300 College Rd	Hazardous materials	No	N/A	100-Year
Shelter (old fuel island)	3583 S Roosevelt Boulevard	Hazardous materials	No	3.09	100-Year
Shelter (old fuel island)	10600 Aviation Boulevard	Hazardous materials	No	0.84	100-Year
Transfer Station	67901 Overseas Highway	Hazardous materials	No	4.46	100-Year
Transfer Station (2 buildings)	740 Blimp Road	Hazardous materials	No	5.51	100-Year
Cudjoe Landfill	Blimp Road	Waste	No	N/A	100-Year

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Table 10: Inventory of Other Facilities with Base Scenario Hazus-MH Coastal Flood Model Results.[25]

Building	Address	Type	Elev Cert	Base	FIRM Zone
East Martello Fort Battery	3501 S Roosevelt Boulevard	Historical	No	4.13	100-Year
East Martello Fort Citadel	3501 S Roosevelt Boulevard	Historical	No	5.25	100-Year
East Martello Towers/Museum	3501 S Roosevelt Boulevard	Historical	Yes	3.90	100-Year
Historic Courthouse, Jackson Square	500 Whitehead Street	Historical	No	N/A	N/A
Historic Jail, Jackson Square	530 Whitehead Street	Historical	No	N/A	N/A
Historic Tavernier School	148 Georgia Street	Historical	No	N/A	N/A
Light Keepers House	938 Whitehead Street	Historical	No	N/A	500-Year
Lighthouse Museum/Curator's Quarters	938 Whitehead Street	Historical	Yes	N/A	500-Year
Stiglitz House	30150 South Street	Historical	No	6.29	100-Year
West Martello	1000 Atlantic Boulevard	Historical	No	N/A	100-Year
West Martello Towers	1100 Atlantic Boulevard	Historical	Yes	-1.35	100-Year
Bay Point Park	5 W Circle Drive	Recreation	No	6.51	100-Year
Bernstein Park	6751 5th Street	Recreation	No	6.33	100-Year
Blue Heron Park	30451 Lyttons Way	Recreation	No	4.68	100-Year
Boys & Girls Club	3491 S Roosevelt Boulevard	Recreation	No	5.29	100-Year
BPK Park Community Building	31009 Atlantis Drive	Recreation	No	4.25	100-Year
BPK Park Residence	31009 Atlantis Drive	Recreation	No	7.22	100-Year
Founders Park Community Center	87000 Overseas Hwy	Recreation	Yes	-1.20	N/A
Harry Harris Park Concession	50 E Beach Road	Recreation	No	4.19	100-Year
Harry Harris Park Restrooms	50 E Beach Road	Recreation	No	4.81	100-Year
Harry Harris Park Trailer	50 E Beach Road	Recreation	No	4.81	100-Year
Harry Harris Toll Kiosk	50 E Beach Road	Recreation	No	4.85	100-Year
Higgs Beach Concession	1000 Atlantic Boulevard	Recreation	No	6.32	100-Year
Higgs Beach Dog Park	1000 Atlantic Boulevard	Recreation	No	5.09	100-Year

[25] Elev Cert column indicates if facility's finished floor elevation was modeled using Elevation Certificate data from the Monroe County Floodplain Coordinator's office ("Yes") or an assumed value of 2 feet above ground level ("No"). Depth is reported as feet above finished floor elevation values as based on the depth grid from the Hazus-MH Coastal Flood Model. There is much higher confidence in model values for facilities with Elevation Certificate data as compared to those with finished floor elevation values estimated from ground level elevation, and estimates for facilities without Elevation Certificates should be adjusted after field surveys. FIRM Zone indicates the flood zone delineation for the facility's location within the current Flood Insurance Rate Map for Monroe County.

Building	Address	Type	Elev Cert	Base	FIRM Zone
Higgs Beach Pavilion 1	1000 Atlantic Boulevard	Recreation	No	5.80	100-Year
Higgs Beach Pavilion 2	1000 Atlantic Boulevard	Recreation	No	5.69	100-Year
Higgs Beach Pier	1000 Atlantic Boulevard	Recreation	No	9.74	100-Year
Higgs Beach Playground	1000 Atlantic Boulevard	Recreation	No	4.89	100-Year
Higgs Beach Restaurant	1000 Atlantic Boulevard	Recreation	No	4.20	100-Year
Higgs Beach Restrooms	1000 Atlantic Boulevard	Recreation	No	5.80	100-Year
Higgs Beach Shed	1000 Atlantic Boulevard	Recreation	No	6.37	100-Year
Higgs Beach Tennis Court	1000 Atlantic Boulevard	Recreation	No	4.12	100-Year
Key Largo Community Park	500 St. Croix	Recreation	No	1.26	500-Year
Key Largo Park Building	500 St. Croix	Recreation	No	1.23	100-Year
Key Largo Park Concession	500 St Croix	Recreation	No	0.91	500-Year
Key Largo Park Duplex	500 St. Croix	Recreation	No	1.88	100-Year
Key Largo Park Pavilion	500 St. Croix	Recreation	No	1.46	100-Year
Key Largo Park PW Service Building	500 St Croix	Recreation	No	1.80	100-Year
Old Settlers Park	Mile Marker 91.9	Recreation	No	5.13	100-Year
Rowell's Marina	104550 Overseas Highway	Recreation	No	-0.60	N/A
Sunset Point Park	20 Sunset Road	Recreation	No	2.24	100-Year
Veterans Aerobic Plant	39900 Overseas Highway	Recreation	No	2.77	100-Year
Veterans Park Pavilions	39900 Overseas Highway	Recreation	No	2.77	100-Year
Veterans Park Restrooms	39900 Overseas Highway	Recreation	No	2.77	100-Year
Watson Field Park	30150 Key Deer Boulevard	Recreation	No	6.07	100-Year
Wilhelmina Harvey Park	260 Avenue F	Recreation	No	5.29	100-Year

Table 11: Hazus-MH Flood Depth Exposure for Disaster Preparation and Response Facilities with Potential Future Hydrologic Conditions.[26]

Building	Type	2060 Low	2060 High	2100 Int-High
Marathon Government Center Annex	Alternate EOC	4.49	5.08	7.21
Big Pine Vol Fire Station/EMS #13	Disaster Recovery Center	4.88	5.88	7.84
Saint Peter's Catholic Church	Disaster Recovery Center	4.41	5.41	7.37
San Pablo Church	Disaster Recovery Center	1.99	2.58	4.71
EMS & MCSO Substation	EMS	2.52	3.52	5.48
Florida Keys Ambulance Service	EMS	6.36	5.62	7.75
Key Largo Ambulance	EMS	N/A	N/A	N/A
Medical 6 Station	EMS	-0.30	-1.61	0.70
Medical 9 Station	EMS	N/A	0.05	2.36
City of Marathon / EOC	EOC	4.49	5.08	7.21
Emergency Communication Building	EOC	1.71	2.30	4.43
Key Largo EOC	EOC	N/A	N/A	N/A
Conch Key Fire Station/EMS #17	Fire	8.05	9.60	11.73
Fire Station #1	Fire	2.12	5.82	7.95
Fire Station #13	Fire	5.41	6.41	8.37
Fire Station #17	Fire	8.05	9.60	11.73
Fire Station #19	Fire	5.99	7.67	9.80
Fire Station #9	Fire	8.93	9.93	11.89
Islamorada Fire\EMS #20	Fire	N/A	N/A	N/A
Key Largo Fire Rescue #24	Fire	N/A	N/A	N/A
Key West Fire Station #3	Fire	5.87	6.87	8.83
KW Central Fire Station #1	Fire	3.45	4.45	6.41
KW Fire Station Angela Street #2	Fire	-0.30	0.70	3.01
KWIA Fire/Rescue #4	Fire	6.13	7.13	9.09
Layton Volunteer Fire Dept #18	Fire	6.11	6.70	8.83

[26] Future conditions for 100-Year Hazus-MH Coastal Flood Models included sea-level rise of 14” for 2060 Low, 26” for 2060 High; and 4.13’ for 2100 Intermediate High. Addresses and method for determining finished floor elevation for each facility are described in Table 6. All numeric values are in flood depth feet above finished floor elevation.

Building	Type	2060 Low	2060 High	2100 Int-High
Lower Sugarloaf Fire Station #10	Fire	4.99	5.99	7.95
Marathon Fire Station/EMS #14	Fire	-0.36	2.09	4.40
Marathon Vol Fire Dept Station 1	Fire	2.12	5.82	7.95
North Key Largo Fire Station #25	Fire	N/A	0.40	2.71
Ocean Reef Club Fire Station #26	Fire	0.77	1.82	3.95
Park-Old Volunteer Fire Station	Fire	6.46	7.46	9.42
Stock Island Fire Station #8	Fire	3.76	4.76	6.72
Tavernier Fire Station	Fire	N/A	0.05	2.36
Tavernier Vol Fire Dept/EMS #22	Fire	N/A	0.05	2.36
Tax Collector's Office	Fire	6.79	7.79	9.76
Naval Air Station Key West	Military	5.83	6.83	8.79
Naval Facility	Military	1.81	2.81	4.77
U.S. Air Force Tethrostat Site	Military	N/A	N/A	N/A
U.S.C.G. Base Key West	Military	3.09	4.09	6.05
U.S.C.G. Marathon	Military	5.27	5.86	7.99
U.S.C.G. Plantation Key	Military	9.36	11.00	13.13
KW Police Station	Police	3.45	4.45	6.41
MCSO Administrative Building	Police	5.96	6.96	8.92
MCSO Detention Facility	Police	3.42	5.34	7.47
MCSO Roth Building	Police	1.09	2.78	4.91
MCSO Substation	Police	1.81	2.57	4.70
Monroe County Sheriff's Department	Police	-0.35	1.34	3.47
Monroe County Sheriff's Department	Police	N/A	0.83	3.14
Monroe County Sheriff's Substation, Marathon	Police	3.57	4.16	6.29
Plantation Key MCSO Sub-Station	Police	-0.69	0.85	3.16
Stock Island MCSO Jail Facility	Police	4.05	5.05	7.01
Big Coppitt Fire Station/EMS #9	Refuge of Last Resort	2.81	3.81	5.77
Casa Marina	Refuge of Last Resort	-1.14	-0.14	2.17

Building	Type	2060 Low	2060 High	2100 Int-High
Island Christian School	Refuge of Last Resort	1.08	2.62	4.75
Key Largo Bay Beach	Refuge of Last Resort	5.62	6.90	9.03
Sheraton Resort Key Largo	Refuge of Last Resort	1.56	2.75	4.88
St. James Episcopal Plantation Key	Refuge of Last Resort	2.36	3.32	5.45
Bernstein Park	Staging	7.63	8.63	10.59
Clay Sterling Baseball Fields	Staging	3.68	4.68	6.64
Friendship Park Key Largo	Staging	N/A	0.30	2.61
Ft. Zachary Taylor Recreation Area	Staging	-1.36	-0.36	1.95
Island Christian School Field	Staging	2.89	4.52	6.65
Jose Marti Park	Staging	5.28	6.28	8.24
Key West Bight Parking Area	Staging	6.62	7.62	9.58
Kmart Parking Lot	Staging	4.10	4.69	6.82
Knight's Key Campground Field	Staging	8.35	8.94	11.07
Monroe County Public Library	Staging	N/A	N/A	N/A
Plantation Yacht Harbor	Staging	7.42	7.93	10.06
Salt Ponds Bunker Area	Staging	3.90	4.90	6.86
San Pablo Catholic Church Field	Staging	7.06	7.65	9.78
Sigsbee Park & Community Center	Staging	3.01	4.01	5.97
Tavernier Towne Parking Lot	Staging	4.00	2.45	4.58
Tommy Roberts Stadium	Staging	4.97	5.97	7.93

Table 12: Hazus-MH Flood Depth Exposure for Essential Services Facilities with Potential Future Hydrologic Conditions.[27]

Building	Type	2060 Low	2060 High	2100 Int-High
Big Pine Flea Market	DMS	5.55	6.55	8.51
Big Pine School	DMS	4.19	5.19	7.15
E Shore Drive Site	DMS	7.68	8.68	10.64
Island Christian School Site	DMS	2.20	3.83	5.96
Marathon Airport East	DMS	3.22	3.81	5.94
Marathon Airport West	DMS	3.59	4.74	6.87
Port Bougainville	DMS	7.70	7.70	9.83
Rockland Investment	DMS	3.97	4.97	6.93
Sugarloaf School	DMS	N/A	-1.62	0.69
Tavernier Airport Site	DMS	1.88	1.54	3.67
AARP/Senior Center	Health	0.23	1.70	3.83
Bay Shore Manor	Health	4.17	5.17	7.13
Bayshore Manor Convalescent Center	Health	4.52	5.52	7.48
Blue Heron Teen Center	Health	1.67	2.67	4.63
Health Center	Health	3.95	7.93	10.06
Health Department	Health	3.95	7.93	10.06
Key West Convalescent Center	Health	7.18	8.18	10.14
Key West Senior Center	Health	1.36	2.36	4.32
Plantation Key Convalescent Center	Health	3.32	5.00	7.13
Senior Center/AARP	Health	2.17	6.14	8.27
#65 County Offices	Local government	3.59	5.24	7.37
Animal Shelter	Local government	N/A	N/A	N/A
Animal Shelter	Local government	4.32	4.91	7.04
Animal Shelter (lease)	Local government	5.32	6.32	8.28
Animal Shelter Kennels	Local government	5.45	6.45	8.41

[27] Future conditions for 100-Year Hazus-MH Coastal Flood Models included sea-level rise of 14” for 2060 Low, 26” for 2060 High; and 4.13’ for 2100 Intermediate High. Addresses and method for determining finished floor elevation for each facility are described in Table 7. All numeric values are in flood depth feet above finished floor elevation.

Building	Type	2060 Low	2060 High	2100 Int-High
Animal Shelter Marathon	Local government	-0.72	-0.13	2.00
Animal Shelter Office	Local government	5.34	6.34	8.30
Annex Court House, Jackson Square	Local government	N/A	N/A	N/A
Carpenter's Shop	Local government	-0.18	1.38	3.69
Carpentry Shop	Local government	6.67	7.67	9.63
Carpentry Shop	Local government	2.02	2.61	4.74
City of Marathon / City Offices	Local government	3.85	4.71	6.84
Clerk of Court	Local government	4.96	5.67	7.80
Control Rooms	Local government	-0.29	1.25	3.56
Court Room B (temporary)	Local government	0.22	1.77	3.90
Courthouse	Local government	4.96	5.67	7.80
Crew Room & Storage Shed	Local government	-0.29	1.25	3.56
Crowne Plaza La Concha	Local government	N/A	N/A	N/A
Facilities Maintenance Office	Local government	5.82	6.82	8.78
Fleet Garage	Local government	3.23	3.82	5.95
Fleet Maintenance Garage	Local government	4.26	5.26	7.22
Fleet Maintenance Office	Local government	5.47	6.47	8.43
Freeman Justice Center, Jackson Sq.	Local government	-0.16	0.84	3.15
Gato Building	Local government	N/A	-0.92	1.39
Government Annex	Local government	4.36	4.95	7.08
Government Center	Local government	1.84	2.57	4.70
Government Center Carpenter Shop	Local government	2.25	3.94	6.07
Government Center Ellis Building	Local government	0.09	1.58	3.71
Government Complex, Jackson Square	Local government	N/A	N/A	N/A
Harvey Government Center	Local government	0.37	1.37	3.33
HGC Sprinkler Building	Local government	1.36	2.36	4.32
Islamorada County Library	Local government	N/A	N/A	0.08
Key Colony Beach Auditorium	Local government	3.36	4.49	6.62

Building	Type	2060 Low	2060 High	2100 Int-High
Key West City Hall	Local government	7.46	8.46	10.42
Key West Port/Transit Authority	Local government	5.10	6.10	8.06
KW City Hall (Annex)	Local government	N/A	-0.95	1.36
M. C. Library Marathon	Local government	3.95	5.06	7.19
M. C. Mosquito Control Marathon	Local government	3.48	4.07	6.20
M. C. Public Works Key West	Local government	6.67	7.67	9.63
M. C. Public Works Marathon	Local government	1.85	2.85	4.98
M.C. Mosquito Control	Local government	3.36	4.36	6.32
Marathon Detention Facility	Local government	3.42	5.34	7.47
Medical Examiner	Local government	6.88	7.47	9.60
Medical Examiner's Morgue	Local government	6.99	7.58	9.71
Monroe County Courthouse	Local government	N/A	N/A	N/A
Monroe County Superintendent's Office	Local government	4.75	5.75	7.71
Monroe County Supervisor of Elections	Local government	N/A	N/A	N/A
Monroe County Tax Collector	Local government	1.81	2.57	4.70
Murray E. Nelson Government Center	Local government	0.88	1.68	3.81
PK Courthouse	Local government	0.47	2.05	4.18
Plantation Detention Center	Local government	0.39	2.00	4.13
Plantation Key Govt. Center	Local government	N/A	-1.49	0.64
Plantation Key Public Works Yard	Local government	-0.18	1.38	3.69
Public Library	Local government	1.67	2.67	4.63
Public Library	Local government	N/A	N/A	N/A
Public Library	Local government	3.95	5.06	7.19
Public Library (lease)	Local government	N/A	N/A	N/A
Public Works	Local government	4.00	5.69	7.82
Public Works Office	Local government	1.71	2.30	4.43
Sign Shop	Local government	6.47	7.47	9.43
Sign Shop Office	Local government	6.47	7.47	9.43

Building	Type	2060 Low	2060 High	2100 Int-High
Spottswood Building-Public Works	Local government	-0.54	0.97	3.28
Stock Island Public Service Building	Local government	0.36	1.36	3.32
Storage Shed	Local government	4.99	5.99	7.95
SubCourt Building	Local government	3.97	4.56	6.69
Tax Collector's Office	Local government	3.79	4.49	6.62
Teen Center	Local government	5.11	6.11	8.07
Marathon Manor	Nursing	4.41	5.00	7.13
Academy at Ocean Reef	School	-0.73	0.96	3.27
Coral Shores High School	School	N/A	N/A	N/A
Florida Keys Community College	School	3.61	4.61	6.57
Gerald Adams School	School	1.01	2.01	3.97
Glynn Archer School	School	1.48	2.48	4.44
Horace O'Bryant Middle School	School	5.13	6.13	8.09
Hurricane Island Outward Bound School	School	N/A	-0.25	2.06
Key Largo Elementary/Middle School	School	N/A	-1.15	1.16
Key West High School	School	0.03	1.03	2.99
Marathon High School	School	N/A	-1.17	1.14
Marathon Lutheran School	School	2.26	2.86	4.99
Mary Immaculate Star of the Sea	School	1.66	2.66	4.62
May Hill Public Library	School	N/A	-1.13	1.18
Montessori Children's School	School	0.99	1.99	3.95
Montessori Elementary School Charter	School	0.87	1.87	3.83
Montessori in Key Largo	School	N/A	N/A	N/A
Pace Lower Keys School	School	5.31	6.31	8.27
Pace Upper Keys School	School	-0.53	1.16	3.47
Plantation Key School	School	N/A	N/A	N/A
Poinciana Elementary School	School	1.04	2.04	4.00
Sigsbee Elementary School	School	2.61	3.61	5.57

Building	Type	2060 Low	2060 High	2100 Int-High
St. Justin Catholic Key Largo	School	N/A	N/A	N/A
Stanley Switlik Elementary School	School	3.18	5.80	7.93
Sugarloaf Elementary/Middle School	School	0.56	1.56	3.52
Treasure Village Montessori Charter School	School	4.44	5.74	7.87
FDOT Marathon Operation Center	State government	2.54	3.62	5.75
Marathon Govt. Center State Building	State government	0.04	1.83	3.96
Air Cargo America	Transportation	4.97	5.97	7.93
Card Sound Toll Offices & Plaza	Transportation	6.56	6.78	8.91
Key West International Airport	Transportation	7.16	8.16	10.12
Marathon Airport	Transportation	3.45	4.32	6.45
Ocean Reef Club Airport	Transportation	5.29	6.62	8.75
Sugarloaf Airfield	Transportation	8.85	9.85	11.81
Summerland Airfield	Transportation	5.84	6.84	8.80

Table 13: Hazus-MH Flood Depth Exposure for Utilities with Potential Future Hydrologic Conditions. [28]

Building	Type	2060 Low	2060 High	2100 Int-High
Bell South Key Largo	Communication	2.79	4.48	6.61
Bell South Sugarloaf	Communication	5.00	6.00	7.96
Big Pine Key Bell South Building	Communication	2.17	3.17	5.13
Translator Tower	Communication	6.76	7.76	9.72
Translator Tower	Communication	7.79	8.52	10.65
WFKZ FM 103.1	Communication	3.14	4.82	6.95
FKEC Administration Bldg.	Energy	N/A	N/A	N/A
FKEC Ellis Facility Islamorada	Energy	N/A	0.78	3.09
FKEC Generating Plant	Energy	0.38	3.71	5.84
FKEC Key Largo Substation	Energy	N/A	-0.42	1.89
FKEC Moody Facility Key Largo	Energy	N/A	-1.21	1.11
FKEC Operations Complex	Energy	N/A	N/A	N/A
Fleet	Energy	N/A	0.98	3.29
Gato Generator Building	Energy	N/A	-1.26	1.05
Generator Building	Energy	3.97	4.56	6.69
Generator Building, Jackson Square	Energy	N/A	N/A	N/A
Keys Energy Services Facility Big Coppitt	Energy	6.83	7.83	9.79
Keys Energy Services Facility Cudjoe Key	Energy	2.26	3.26	5.22
Keys Energy Services Generating Plant	Energy	1.14	2.14	4.10
Keys Energy Services Main Office	Energy	6.48	7.48	9.44
Keys Energy Services Substation	Energy	3.15	4.15	6.11
Keys Energy Services Substation	Energy	3.97	4.97	6.93
Baypoint Wastewater Treatment Plant	Wastewater	8.21	9.21	11.17
Big Coppitt Wastewater Treatment Plant	Wastewater	4.63	5.63	7.59
Cudjoe Wastewater Treatment Plant	Wastewater	1.32	2.32	4.28

[28] Future conditions for 100-Year Hazus-MH Coastal Flood Models included sea-level rise of 14” for 2060 Low, 26” for 2060 High; and 4.13’ for 2100 Intermediate High. Addresses and method for determining finished floor elevation for each facility are described in Table 8. All numeric values are in flood depth feet above finished floor elevation.

Building	Type	2060 Low	2060 High	2100 Int-High
Duck Key Wastewater Treatment Plant	Wastewater	2.04	2.63	4.76
Key Haven Wastewater Treatment Plant	Wastewater	7.49	8.49	10.45
Key Largo Wastewater Treatment Plant	Wastewater	7.04	8.26	10.39
KW Resort Utilities Wastewater Treatment Plant	Wastewater	4.50	5.50	7.46
Layton Wastewater Treatment Plant	Wastewater	3.75	4.36	6.49
North Key Largo Wastewater Treatment Plant	Wastewater	5.29	6.62	8.75
F.K.A.A. Booster Station	Water	2.00	5.88	8.01
F.K.A.A. Booster Station	Water	5.99	6.99	8.95
F.K.A.A. Operations Center	Water	2.07	5.51	7.64
F.K.A.A. RO Plant & Storage Facility	Water	2.29	3.29	5.25
F.K.A.A. Storage Facility	Water	3.89	4.89	6.85
FKAA Admin/Pump Station	Water	0.64	1.51	3.64
FKAA Main Office	Water	4.88	5.88	7.84
FKAA Pumping Station	Water	3.22	4.22	6.18
FKAA Storage Facility	Water	N/A	0.35	2.31

Table 14: Hazus-MH Flood Depth Exposure for Hazardous Facilities with Potential Future Hydrologic Conditions. [29]

Building	Type	2060 Low	2060 High	2100 Int-High
Fuel Island/Pumps	Hazardous materials	-0.12	1.42	3.73
Fuel Island/Pumps	Hazardous materials	4.99	5.99	7.95
Fuel Island/Pumps	Hazardous materials	2.22	2.80	4.93
Fuel Storage Facility	Hazardous materials	5.23	6.23	8.19
Fuel Tank (8,000 gallon)	Hazardous materials	4.99	5.99	7.95
Fuel Tank (8,000 gallons)	Hazardous materials	-0.29	1.25	3.56
Fuel Tank 8,000 gallon	Hazardous materials	1.66	2.25	4.38
Key Largo Landfill	Hazardous materials	N/A	N/A	N/A
Key Largo Transfer Station	Hazardous materials	0.66	2.16	4.29
Key West Landfill	Hazardous materials	N/A	N/A	N/A
Shelter (old fuel island)	Hazardous materials	4.26	5.26	7.22
Shelter (old fuel island)	Hazardous materials	2.25	2.84	4.97
Transfer Station	Hazardous materials	5.87	6.46	8.59
Transfer Station (2 buildings)	Hazardous materials	6.68	7.68	9.64
Cudjoe Landfill	Waste	N/A	-1.41	0.90

[29] Future conditions for 100-Year Hazus-MH Coastal Flood Models included sea-level rise of 14” for 2060 Low, 26” for 2060 High; and 4.13’ for 2100 Intermediate High. Addresses and method for determining finished floor elevation for each facility are described in Table 9. All numeric values are in flood depth feet above finished floor elevation.

Table 15: Hazus-MH Flood Depth Exposure for Other Facilities with Potential Future Hydrologic Conditions.[30]

Building	Type	2060 Low	2060 High	2100 Int-High
East Martello Fort Battery	Historical	5.30	6.30	8.26
East Martello Fort Citadel	Historical	6.42	7.42	9.38
East Martello Towers/Museum	Historical	5.07	6.07	8.03
Historic Courthouse, Jackson Square	Historical	N/A	N/A	N/A
Historic Jail, Jackson Square	Historical	N/A	N/A	N/A
Historic Tavernier School	Historical	N/A	-0.29	2.02
Light Keepers House	Historical	N/A	N/A	N/A
Lighthouse Museum/Curator's Quarters	Historical	N/A	N/A	N/A
Stiglitz House	Historical	7.46	8.46	10.42
West Martello	Historical	N/A	N/A	N/A
West Martello Towers	Historical	-1.35	-1.35	-1.35
Bay Point Park	Recreation	7.68	8.68	10.64
Bernstein Park	Recreation	7.50	8.50	10.46
Blue Heron Park	Recreation	5.85	6.85	8.81
Boys & Girls Club	Recreation	6.46	7.46	9.42
BPK Park Community Building	Recreation	5.42	6.42	8.38
BPK Park Residence	Recreation	8.39	9.39	11.35
Founders Park Community Center	Recreation	-1.20	-1.20	-1.20
Harry Harris Park Concession	Recreation	5.60	7.29	9.42
Harry Harris Park Restrooms	Recreation	6.23	7.91	10.04
Harry Harris Park Trailer	Recreation	6.23	7.91	10.04
Harry Harris Toll Kiosk	Recreation	6.28	7.96	10.09
Higgs Beach Concession	Recreation	7.49	8.49	10.45
Higgs Beach Dog Park	Recreation	6.26	7.26	9.22
Higgs Beach Pavilion 1	Recreation	6.97	7.97	9.93

[30] Future conditions for 100-Year Hazus-MH Coastal Flood Models included sea-level rise of 14” for 2060 Low, 26” for 2060 High; and 4.13’ for 2100 Intermediate High. Addresses and method for determining finished floor elevation for each facility are described in Table 10. All numeric values are in flood depth feet above finished floor elevation.

Building	Type	2060 Low	2060 High	2100 Int-High
Higgs Beach Pavilion 2	Recreation	6.86	7.86	9.82
Higgs Beach Pier	Recreation	10.91	11.91	13.87
Higgs Beach Playground	Recreation	6.06	7.06	9.02
Higgs Beach Restaurant	Recreation	5.37	6.37	8.33
Higgs Beach Restrooms	Recreation	6.97	7.97	9.93
Higgs Beach Shed	Recreation	7.54	8.54	10.50
Higgs Beach Tennis Court	Recreation	5.29	6.29	8.25
Key Largo Community Park	Recreation	2.68	4.36	6.49
Key Largo Park Building	Recreation	2.64	4.32	6.45
Key Largo Park Concession	Recreation	2.32	4.01	6.14
Key Largo Park Duplex	Recreation	2.85	4.54	6.67
Key Largo Park Pavilion	Recreation	2.87	4.56	6.69
Key Largo Park PW Service Building	Recreation	2.70	4.22	6.35
Old Settlers Park	Recreation	6.55	8.23	10.36
Rowell's Marina	Recreation	-0.07	1.24	3.37
Sunset Point Park	Recreation	3.65	5.05	7.18
Veterans Aerobic Plant	Recreation	3.94	4.94	6.90
Veterans Park Pavilions	Recreation	3.94	4.94	6.90
Veterans Park Restrooms	Recreation	3.94	4.94	6.90
Watson Field Park	Recreation	7.24	8.24	10.20
Wilhelmina Harvey Park	Recreation	6.46	7.46	9.42

G. Comprehensive Flood Damage Assessment

The Hazus-MH Coastal Flood Model was used to develop damage assessments for the 100-Year coastal flood on over 37,000 properties with detailed parcel-level characteristics. Characteristics used in the damage assessment included 2014 assessed valuations, land use and occupancy types, building construction materials, finished floor substructure type, and year of construction for each parcel with a building across Monroe County and associated municipalities. Site characteristics also for over 3,900 structures in unincorporated Monroe County also included digitized site-level Elevation Certificate data and associated survey-quality finished floor elevation. This Elevation Certificate data was originally digitized by Monroe County staff in 2015-2016 and made available to the project team in 2017. Assumed finished floor elevations for buildings without Elevation Certificate information were based on floor substructure type and year of construction, as summarized in Table 16. The break point of 1975 for assuming higher finished floor elevation types by floor type is based on Monroe County code requiring structures built after December 31, 1974 to meet or exceed the adopted base flood elevation (https://www.monroecounty-fl.gov/692/Building-Requirements).

Table 16: Finished floor elevation assumptions for buildings without Elevation Certificates.

Floor Type	Year Built	Finished Floor Elevation (Feet Above Ground)
Slab or Unknown	Pre-1975	1
Slab or Unknown	Post-1975	2
Pier	Pre-1975	3
Pier	Post-1975	4

Damage assessments were then performed for the base 100-Year flood within the Hazus-MH Coastal Flood Model (Map Series 7), as well as the 2060 Low (Map Series 8), 2060 High (Map Series 9), and 2100 Intermediate-High (Map Series 10) sea-level rise scenarios. Table 17 provides a summary of the dollar values-based property damage assessments for all considered flood scenarios across all of Monroe County.

Table 17: Hazus Damage Assessment.

Hazus-MH 10-0-Year Coastal Flood Scenario	% Structures Damaged	Losses (2014 $)
Base (Current sea level)	80.3%	$5,849,424,000
2060 Low (14” sea-level rise)	85.4%	$7,369,148,000
2060 High (26” sea-level rise)	87.5%	$8,806,929,000
2100 Int-High (4.13’ sea-level rise)	92.9%	$11,085,958,000

5. STRATEGY FOR ADDRESSING COUNTYWIDE VULNERABILITIES

As stated, sea level rise planning has become a standard consideration in numerous elements of County land and infrastructure decision-making. While the County has an ongoing comprehensive effort to better plan for sea level rise vulnerability, one of the key questions is how will the County respond to future sea level rise vulnerability? Data collection has been a cornerstone of that effort. Part of that data collection effort is contained within this document creating a dataset for stormwater infrastructure. The work done under the NOAA grant has afforded the County the opportunity to pursue managing the impacts of a 100-year storm and/or sea level rise consistent with CRS credit guidance.

A. Secure the Data: Elevation Data[31] (Timeframe for Completion: 2019)

The County is currently finalizing the collection of a LiDAR dataset to develop a more accurate representation of ground elevations in the developed portion of the County to help guide important planning and design activities in preparation for sea level rise. The work is to develop ground elevations and structural elevations in the County. This effort includes Mobile LiDAR scanning and data extraction for all of the roadway centerlines within the unincorporated County limits and also the development of spot elevations for first floor elevations for County facilities located throughout the County.

The work has been primarily focused on developing information that the County may use to consider long-term environmental changes expected in the County. The data generated by this effort will supply the County with the data platform it needs to guide decisions that will help avoid or mitigate such concerns. The County is interested in determining more accurate elevations for road rights-of-way (ROW) and other land areas, and obtaining information on the land and building first floor elevations as a means of improving its long-term decision-making. The anticipated uses include:

- Identifying road elevations and surrounding land elevations to be used in roadway planning and design.
- Identify land elevations in low-lying areas of the County that are currently covered by foliage in order to better identify flood elevations in such areas.
- Determine land and facility elevations to enable sea level rise planning and design efforts.
- Obtaining "first floor" and surrounding natural grade elevations for public and private structures, as well as building envelope dimensions.
- Other tasks (all requiring more accurate land elevation data).

The County recognizes that the benefit of the mobile LiDAR will extend beyond the study of topography, flooding, and sea level rise to other uses in the developed areas of the County. The County wishes to use this information for other infrastructure projects in the near future. The desired outcome of this effort is to identify, to the greatest extent possible, accurate land elevations in areas of the County that are of interest to various County agencies. This data will be used in numerous future planning and infrastructure decisions related to adaptation.

[31] GreenKeys: GO 1 .4 Develop more accurate elevation data (LIDAR) County-wide.

B. Develop Accurate Vulnerability Information for Roads and Stormwater: Countywide Roads Analysis[32] (Timeframe for Completion: 2019-2021)[33]

In the 5-Year GreenKeys Work Plan, a Countywide Roads Analysis was recommended: 2-14 "Conduct a County-wide roads analysis to identify near-term roads subject to inundation risk, including nuisance flooding. This will include researching where related green infrastructure would be appropriate." In the next 1-2 years, the County will finalize a roads vulnerability analysis and resulting recommendations for adaptation measures in the form of a long-term Roadway Adaptation Implementation Plan for elevating roads maintained by Monroe County that are vulnerable to sea level rise. This vulnerability analysis project shall be designed to lessen the frequency and severity of flooding from sea level rise and storms, and decrease predicted flood damage to those roads.

The overall project work shall include, but not be limited to, adaptation measures based on a proposed acceptable level of service or range of level of service alternatives for roadway elevation, reconstruction of base and asphalt, drainage, potential pump stations, etc., landscape or other elements. It will also identify whether construction easements, private property purchases, etc. are needed for a particular alternative or solution, whether roadway elevation and/or storm water conveyance and treatment methods are needed. The recommended roadway adaptations shall include legally-required stormwater capture, transport and treatment systems to meet the unique water quality standards applicable to Monroe County considered. Cost benefit analysis, policy considerations, funding strategies and other services will be considered. Engagement of stakeholders and residents shall be included as a means of gathering information and gaining feedback on potential neighborhood recommendations. In addition, an analysis and recommendation(s) will be made as to potential maximum levels and days of allowable flooding per year (level of service). An analysis and recommendations for green infrastructure shall be included, using vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments. These concepts shall also be examined for any compromises to design functionality and may not be applicable in every area. The final deliverables will include, but not be limited to, the vulnerability analysis, policy analysis, cost benefit analysis, funding strategy, optional services that were proposed and accepted, and a Roads Implementation Plan that includes specific recommendations for road adaptations for the next 5, 10, 15, 20 and 25 years for the vulnerable segments of roadways and also looks at potential options for years 2060 and 2100. A list of projects shall be included for future capital improvements in the County's annual roads budget.

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[32] GreenKeys: GO 1 .5 Update vulnerability assessments on Monroe County buildings based upon GreenKeys! modeling data and updated LIDAR data.

GreenKeys: Goal 2: Mitigate impacts from inundation and nuisance flooding to County roads and support efforts by FDOT to mitigate impacts on FDOT-managed roads within the County.

[33] Resolution (028-2017), THEREFORE BE IT RESOLVED:

…

3. In order to determine the countywide impacts of establishing a uniform methodology for incorporating sea level rise projections into future road improvement projects, the Board of County Commissioners hereby directs staff to move forward with a Countywide Roads Analysis project to identify near-term roads subject to inundation risk, including nuisance flooding.

4. The Board of County Commissioners hereby directs staff to budget funds in the FY17/18 budget for the Countywide Roads Analysis project.

C. Set Policy Based on Future Vulnerability: Future Stormwater Design Standards (Timeframe for Completion: 2023)

Upon the completion of the LiDAR elevation data collection, and in conjunction with use of that data in the development of the stormwater master plan, the County will develop a policy framework for mitigation of future risk and damage. This is a specific requirement within the Countywide Roads Analysis (Section 1.1B):

> The County must prepare now to identify the roads subject to inundation over the short and long-term, and prepare a plan of action for identifying which roads will require considerations including: adaptations such as elevation, the level of inundation and frequency to be contemplated, the type and height of existing mean high water, the groundwater elevation, the type and height of adaptation measure proposed, storm water management, potential funding strategies, and a policy analysis of the "levels of service" the County may or may not be able to provide to residents given the challenges of cost versus the level of sea level rise the County is facing. These considerations should also result in a method of ranking road project priorities and factors to be considered in doing so.

Scope of Services, Section 2.02:

> The primary objective of the project is to analyze the impacts of current and projected levels of sea level rise on all roads (and potentially bridges) that the County maintains and to develop an implementation plan and timeline to adapt roads for sea level rise. Factors such as population density, environmental and site conditions, as well as frequency of flooding should all be factored into the Implementation Work Plan. The vulnerability analysis and modeling will build on the County's mobile LiDAR elevation data currently being collected, and previous modeling work conducted by the County to increase the understanding of tidal flooding behavior on County maintained roads.
>
> The work will look at impacts to roads as well as the benefits and costs to offset these impacts and to what level impacts can be offset. The differing environmental conditions from the Upper to Lower Keys and between ocean and bay side of the Keys should be identified and evaluated in order to develop appropriate strategies for adaptation. *The results shall also be used to determine new policy considerations and design criteria for what the acceptable levels of service should be (an annual average allowance of 7-days of tidal flooding per year is the Interim standard set during the pilot roads project).*
>
> Also included in this scope of work is harmonizing the technical and policy basis for mitigation and adaptation strategies and projects. New policy approaches may be needed to support technical recommendations and that account for future flood risk, level of service decisions (such as for less populous areas that may also be subject to the largest impacts of sea level rise), regulatory strategies for permitting with other agencies, prioritization on current, continued and future levels of service, storm water features, and funding strategies for long term decision-making. An analysis of implementation strategies should be compiled and incorporated into the final Plan document.

The County has already committed to an Interim Design Standard (Resolution 28-2017) and will revisit that design standard in conjunction with the completion of the Countywide Roads Analysis.

D. Long Range Planning: Integration with the Comprehensive Plan (Timeframe for Completion: 2021)

With upgraded elevation data and enhanced road, stormwater and capital planning, the completion of the Countywide Roads Analysis, the County will also revisit Comprehensive Plan Goals, Objectives and Policies to accomplish two goals: 1) update the Comprehensive Plan to comply with state law and 2) integrate new data based on the work products described herein. On two levels, updated data and capital planning will be integrated into the Monroe County Comprehensive Plan:

1. Updates to the Energy and Climate Element, the Conservation and Coastal Management Element and other appropriate Elements
2. Updates to the Capital Improvements Element (for near term projects) (Five-Year Schedule of Capital Improvements, Last Version: 2016)

Florida law requires an update of the Comprehensive Plan pursuant to Section 163.3191, F.S. (1), at least once every 7 years, to determine if plan amendments are necessary to reflect changes in state requirements since the last update of the comprehensive plan, and notify the state land planning agency as to its determination. Monroe County will be due to complete that review by May 1, 2021.[34] Florida law also requires that the Comprehensive Plan maintain a schedule of capital improvements and review it annually. It must include a five-year timeframe and identify the funding status of projects.[35] To not only comply with state law, the update of the Comprehensive Plan provides an opportunity to integrate new information as part of the County's strategy to address vulnerabilities.

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[34] http://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/evaluation-and-appraisal-of-comprehensive-plans

[35] Section 163.3177(3)(a), F.S.: The comprehensive plan shall contain a capital improvements element designed to consider the need for and the location of public facilities in order to encourage the efficient use of such facilities and set forth:

1. A component that outlines principles for construction, extension, or increase in capacity of public facilities, as well as a component that outlines principles for correcting existing public facility deficiencies, which are necessary to implement the comprehensive plan. The components shall cover at least a 5-year period.
2. Estimated public facility costs, including a delineation of when facilities will be needed, the general location of the facilities, and projected revenue sources to fund the facilities.
3. Standards to ensure the availability of public facilities and the adequacy of those facilities to meet established acceptable levels of service.
4. A schedule of capital improvements which includes any publicly funded projects of federal, state, or local government, and which may include privately funded projects for which the local government has no fiscal responsibility. Projects necessary to ensure that any adopted level-of-service standards are achieved and maintained for the 5-year period must be identified as either funded or unfunded and given a level of priority for funding.

(b) The capital improvements element must be reviewed by the local government on an annual basis. Modifications to update the 5-year capital improvement schedule may be accomplished by ordinance and may not be deemed to be amendments to the local comprehensive plan.

6. CONCLUSIONS

Monroe County continues to be a leader in the development of data and policy for sea level rise based on best available information. The County has committed funding, secured grant dollars and developed other partnerships to accomplish several key goals:

1. Launch and maintain an effective sea level rise planning program (GreenKeys) that has identified vulnerabilities, data gaps and developed a continually-updated approach for decision-making.
2. Successfully participate in FEMA's Community Rating System Program.
3. Identify strategies and approaches to create a long-term capital planning program for sea level rise adaptation.

The County has also been successful at adopting policies into its Comprehensive Plan and focus in the coming years on actual design criteria for stormwater and roads based on its new long-term planning initiatives and scope of work for road adaptation. With this Watershed Management Plan, the County is now on a path to fully integrate Comprehensive Planning, Capital Improvements and participation in the FEMA Community Rating System.

APPENDICES/MAPS

Appendix Table 1[36]: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Appendix Table 2: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Injection Wells, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Appendix Table 3: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Manholes, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Appendix Table 4: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Trench Drains, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Appendix Table 5: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Outfalls (Top of Pipe), including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level.

Map Series 2: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Tidal Flooding, 2030 Low (6”) and 2030 High (10") Sea-Level Rise.

Map Series 3: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Tidal Flooding, 2060 Low (14”) and 2060 High (26") Sea-Level Rise.

Map Series 4: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Tidal Flooding, 2100 Intermediate-High Sea-Level Rise.

Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level).

Map Series 6: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Hazus-MH 100-Year Coastal Flood, 2100 Intermediate-High (4.13’) Sea-Level Rise.

Map Series 7: Hazus-MH 100-Year Coastal Flood Model Damage Assessment for Monroe County, Baseline Scenario (1992 Sea-Level).

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[36] The stormwater structure lists in Appendix Tables 1-5 are more narrowly intended to inform capital improvement budgeting by the Monroe County government. For this reason, these Appendix Tables only include structures directly owned and maintained by Monroe County.

Map Series 8: Hazus-MH 100-Year Coastal Flood Model Damage Assessment for Monroe County 2060 Low Sea-Level Rise (14”) & 2014 Assessed Valuations.

Map Series 9: Hazus-MH 100-Year Coastal Flood Model Damage Assessment for Monroe County 2060 High Sea-Level Rise (26”) & 2014 Assessed Valuations.

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB68	0.21	0.78	1.49	0.09	0.80	-1.04	-0.33	-3.35	-2.64
CB71	0.25	0.82	1.55	0.13	0.86	-1.00	-0.27	-3.31	-2.58
CB69	0.48	1.05	1.76	0.36	1.07	-0.77	-0.06	-3.08	-2.37
CB35	0.59	1.19	1.84	0.50	1.15	-0.63	0.02	-2.94	-2.29
CB12	0.60	1.21	1.85	0.52	1.16	-0.61	0.03	-2.92	-2.28
CB16	0.62	1.22	1.88	0.53	1.19	-0.60	0.06	-2.91	-2.25
CB50	0.61	1.21	1.88	0.52	1.19	-0.61	0.06	-2.92	-2.25
CB291	0.43	0.42	1.90	-0.27	1.21	-1.40	0.08	-3.71	-2.23
CB15	0.66	1.27	1.91	0.58	1.22	-0.55	0.09	-2.86	-2.22
CB13	0.68	1.29	1.93	0.60	1.24	-0.53	0.11	-2.84	-2.20
CB70	0.66	1.22	1.95	0.53	1.26	-0.60	0.13	-2.91	-2.18
CB9	0.72	1.32	1.97	0.63	1.28	-0.50	0.15	-2.81	-2.16
CB18	0.73	1.33	1.98	0.64	1.29	-0.49	0.16	-2.80	-2.15
CB32	0.74	1.34	1.99	0.65	1.30	-0.48	0.17	-2.79	-2.14
CB11	0.74	1.33	2.01	0.64	1.32	-0.49	0.19	-2.80	-2.12
CB5	0.77	1.38	2.02	0.69	1.33	-0.44	0.20	-2.75	-2.11
CB277	0.63	0.65	2.03	-0.04	1.34	-1.17	0.21	-3.48	-2.10
CB266	0.66	0.72	2.03	0.03	1.34	-1.10	0.21	-3.41	-2.10
CB275	0.66	0.69	2.04	0.00	1.35	-1.13	0.22	-3.44	-2.09
CB4	0.79	1.40	2.04	0.71	1.35	-0.42	0.22	-2.73	-2.09
CB58	0.78	1.36	2.05	0.67	1.36	-0.46	0.23	-2.77	-2.08
CB253	0.61	0.60	2.06	-0.09	1.37	-1.22	0.24	-3.53	-2.07
CB251	0.64	0.63	2.09	-0.06	1.40	-1.19	0.27	-3.50	-2.04
CB276	0.72	0.75	2.10	0.06	1.41	-1.07	0.28	-3.38	-2.03
CB257	0.69	0.68	2.11	-0.01	1.42	-1.14	0.29	-3.45	-2.02
CB67	0.86	1.43	2.14	0.74	1.45	-0.39	0.32	-2.70	-1.99
CB298	0.75	0.76	2.15	0.07	1.46	-1.06	0.33	-3.37	-1.98
CB290	0.70	0.68	2.15	-0.01	1.46	-1.14	0.33	-3.45	-1.98

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB3	0.91	1.51	2.16	0.82	1.47	-0.31	0.34	-2.62	-1.97
CB252	0.72	0.71	2.17	0.02	1.48	-1.11	0.35	-3.42	-1.96
CB65	0.92	1.50	2.20	0.81	1.51	-0.32	0.38	-2.63	-1.93
CB284	0.78	0.77	2.20	0.08	1.51	-1.05	0.38	-3.36	-1.93
CB49	0.92	1.49	2.21	0.80	1.52	-0.33	0.39	-2.64	-1.92
CB48	0.93	1.51	2.21	0.82	1.52	-0.31	0.39	-2.62	-1.92
CB261	0.82	0.83	2.21	0.14	1.52	-0.99	0.39	-3.30	-1.92
CB274	0.84	0.88	2.21	0.19	1.52	-0.94	0.39	-3.25	-1.92
CB33	0.97	1.57	2.22	0.88	1.53	-0.25	0.40	-2.56	-1.91
CB285	0.82	0.80	2.24	0.11	1.55	-1.02	0.42	-3.33	-1.89
CB114	0.96	0.69	2.24	0.00	1.55	-1.13	0.42	-3.44	-1.89
CB109	0.94	0.59	2.27	-0.10	1.58	-1.23	0.45	-3.54	-1.86
CB64	1.02	1.59	2.29	0.90	1.60	-0.23	0.47	-2.54	-1.84
CB51	1.04	1.63	2.30	0.94	1.61	-0.19	0.48	-2.50	-1.83
CB170	0.84	0.83	2.31	0.14	1.62	-0.99	0.49	-3.30	-1.82
CB297	0.99	0.63	2.31	-0.06	1.62	-1.19	0.49	-3.50	-1.82
CB60	1.04	1.61	2.31	0.92	1.62	-0.21	0.49	-2.52	-1.82
CB6	1.07	1.67	2.32	0.98	1.63	-0.15	0.50	-2.46	-1.81
CB254	0.89	0.88	2.33	0.19	1.64	-0.94	0.51	-3.25	-1.80
CB59	1.06	1.65	2.33	0.96	1.64	-0.17	0.51	-2.48	-1.80
CB258	0.93	0.92	2.34	0.23	1.65	-0.90	0.52	-3.21	-1.79
CB26	1.10	1.70	2.36	1.01	1.67	-0.12	0.54	-2.43	-1.77
CB215	1.09	1.13	2.37	0.44	1.68	-0.69	0.55	-3.00	-1.76
CB283	0.95	0.94	2.38	0.25	1.69	-0.88	0.56	-3.19	-1.75
CB264	1.02	1.06	2.40	0.37	1.71	-0.76	0.58	-3.07	-1.73
CB1	1.15	1.75	2.40	1.06	1.71	-0.07	0.58	-2.38	-1.73
CB10	1.14	1.73	2.40	1.04	1.71	-0.09	0.58	-2.40	-1.73
CB192	1.13	1.19	2.40	0.50	1.71	-0.63	0.58	-2.94	-1.73

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	**Top Elevation (NAVD88)**	**1992 MHHW**	**1992 MLLW**	**2030 MHHW**	**2030 MLLW**	**2060 MHHW**	**2060 MLLW**	**2100 MHHW**	**2100 MLLW**
CB263	1.03	1.06	2.41	0.37	1.72	-0.76	0.59	-3.07	-1.72
CB108	1.09	0.74	2.41	0.05	1.72	-1.08	0.59	-3.39	-1.72
CB55	1.18	1.77	2.45	1.08	1.76	-0.05	0.63	-2.36	-1.68
CB256	1.03	1.02	2.46	0.33	1.77	-0.80	0.64	-3.11	-1.67
CB37	1.21	1.81	2.46	1.12	1.77	-0.01	0.64	-2.32	-1.67
CB299	1.06	1.06	2.46	0.37	1.77	-0.76	0.64	-3.07	-1.67
CB14	1.21	1.82	2.46	1.13	1.77	0.00	0.64	-2.31	-1.67
CB29	1.21	1.81	2.46	1.12	1.77	-0.01	0.64	-2.32	-1.67
CB73	1.18	1.75	2.46	1.06	1.77	-0.07	0.64	-2.38	-1.67
CB54	1.20	1.78	2.46	1.09	1.77	-0.04	0.64	-2.35	-1.67
CB272	1.11	1.17	2.48	0.48	1.79	-0.65	0.66	-2.96	-1.65
CB262	1.10	1.12	2.48	0.43	1.79	-0.70	0.66	-3.01	-1.65
CB36	1.23	1.83	2.48	1.14	1.79	0.01	0.66	-2.30	-1.65
CB2	1.24	1.84	2.49	1.15	1.80	0.02	0.67	-2.29	-1.64
CB279	1.09	1.08	2.49	0.39	1.80	-0.74	0.67	-3.05	-1.64
CB34	1.25	1.85	2.50	1.16	1.81	0.03	0.68	-2.28	-1.63
CB156	1.04	1.03	2.50	0.34	1.81	-0.79	0.68	-3.10	-1.63
CB76	1.16	1.23	2.51	0.54	1.82	-0.59	0.69	-2.90	-1.62
CB78	1.15	1.20	2.51	0.51	1.82	-0.62	0.69	-2.93	-1.62
CB19	1.26	1.87	2.52	1.18	1.83	0.05	0.70	-2.26	-1.61
CB31	1.27	1.87	2.52	1.18	1.83	0.05	0.70	-2.26	-1.61
CB196	1.20	1.32	2.52	0.63	1.83	-0.50	0.70	-2.81	-1.61
CB66	1.26	1.83	2.54	1.14	1.85	0.01	0.72	-2.30	-1.59
CB62	1.27	1.85	2.55	1.16	1.86	0.03	0.73	-2.28	-1.58
CB83	1.14	1.13	2.56	0.44	1.87	-0.69	0.74	-3.00	-1.57
CB259	1.16	1.16	2.57	0.47	1.88	-0.66	0.75	-2.97	-1.56
CB161	1.09	1.10	2.57	0.41	1.88	-0.72	0.75	-3.03	-1.56
CB30	1.34	1.94	2.59	1.25	1.90	0.12	0.77	-2.19	-1.54

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB289	1.15	1.14	2.59	0.45	1.90	-0.68	0.77	-2.99	-1.54
CB268	1.23	1.30	2.60	0.61	1.91	-0.52	0.78	-2.83	-1.53
CB234	1.25	1.32	2.60	0.63	1.91	-0.50	0.78	-2.81	-1.53
CB249	1.00	0.96	2.60	0.27	1.91	-0.86	0.78	-3.17	-1.53
CB233	1.26	1.33	2.61	0.64	1.92	-0.49	0.79	-2.80	-1.52
CB75	1.27	1.33	2.61	0.64	1.92	-0.49	0.79	-2.80	-1.52
CB77	1.25	1.30	2.62	0.61	1.93	-0.52	0.80	-2.83	-1.51
CB61	1.35	1.92	2.62	1.23	1.93	0.10	0.80	-2.21	-1.51
CB194	1.32	1.42	2.63	0.73	1.94	-0.40	0.81	-2.71	-1.50
CB105	2.15	2.46	2.63	1.77	1.94	0.64	0.81	-1.67	-1.50
CB210	1.23	1.20	2.63	0.51	1.94	-0.62	0.81	-2.93	-1.50
CB79	1.24	1.27	2.63	0.58	1.94	-0.55	0.81	-2.86	-1.50
CB300	1.24	1.25	2.64	0.56	1.95	-0.57	0.82	-2.88	-1.49
CB286	1.21	1.20	2.64	0.51	1.95	-0.62	0.82	-2.93	-1.49
CB80	1.26	1.28	2.64	0.59	1.95	-0.54	0.82	-2.85	-1.49
CB28	1.39	1.99	2.65	1.30	1.96	0.17	0.83	-2.14	-1.48
CB72	1.37	1.94	2.65	1.25	1.96	0.12	0.83	-2.19	-1.48
CB181	1.18	1.19	2.66	0.50	1.97	-0.63	0.84	-2.94	-1.47
CB25	1.41	2.01	2.66	1.32	1.97	0.19	0.84	-2.12	-1.47
CB197	1.32	1.42	2.67	0.73	1.98	-0.40	0.85	-2.71	-1.46
CB63	1.39	1.97	2.67	1.28	1.98	0.15	0.85	-2.16	-1.46
CB112	1.31	0.97	2.67	0.28	1.98	-0.85	0.85	-3.16	-1.46
CB27	1.41	2.01	2.67	1.32	1.98	0.19	0.85	-2.12	-1.46
CB81	1.28	1.28	2.71	0.59	2.02	-0.54	0.89	-2.85	-1.42
CB189	1.45	1.51	2.71	0.82	2.02	-0.31	0.89	-2.62	-1.42
CB250	1.27	1.25	2.74	0.56	2.05	-0.57	0.92	-2.88	-1.39
CB232	1.39	1.46	2.74	0.77	2.05	-0.36	0.92	-2.67	-1.39
CB202	1.48	1.54	2.74	0.85	2.05	-0.28	0.92	-2.59	-1.39

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB204	1.35	1.35	2.75	0.66	2.06	-0.47	0.93	-2.78	-1.38
CB235	1.42	1.49	2.76	0.80	2.07	-0.33	0.94	-2.64	-1.37
CB280	1.37	1.35	2.79	0.66	2.10	-0.47	0.97	-2.78	-1.34
CB17	1.54	2.15	2.80	1.46	2.11	0.33	0.98	-1.98	-1.33
CB184	1.50	1.47	2.81	0.78	2.12	-0.35	0.99	-2.66	-1.32
CB255	1.39	1.38	2.82	0.69	2.13	-0.44	1.00	-2.75	-1.31
CB174	1.38	1.38	2.86	0.69	2.17	-0.44	1.04	-2.75	-1.27
CB218	1.59	1.62	2.90	0.93	2.21	-0.20	1.08	-2.51	-1.23
CB180	1.42	1.43	2.90	0.74	2.21	-0.39	1.08	-2.70	-1.23
CB20	1.65	2.24	2.90	1.55	2.21	0.42	1.08	-1.89	-1.23
CB193	1.62	1.70	2.92	1.01	2.23	-0.12	1.10	-2.43	-1.21
CB201	1.66	1.73	2.93	1.04	2.24	-0.09	1.11	-2.40	-1.20
CB206	1.52	1.51	2.93	0.82	2.24	-0.31	1.11	-2.62	-1.20
CB265	1.57	1.62	2.94	0.93	2.25	-0.20	1.12	-2.51	-1.19
CB220	1.62	1.64	2.94	0.95	2.25	-0.18	1.12	-2.49	-1.19
CB52	1.68	2.26	2.94	1.57	2.25	0.44	1.12	-1.87	-1.19
CB191	1.68	1.74	2.95	1.05	2.26	-0.08	1.13	-2.39	-1.18
CB167	1.47	1.48	2.95	0.79	2.26	-0.34	1.13	-2.65	-1.18
CB260	1.56	1.56	2.96	0.87	2.27	-0.26	1.14	-2.57	-1.17
CB24	1.71	2.30	2.96	1.61	2.27	0.48	1.14	-1.83	-1.17
CB195	1.66	1.78	2.98	1.09	2.29	-0.04	1.16	-2.35	-1.15
CB175	1.55	1.56	3.04	0.87	2.35	-0.26	1.22	-2.57	-1.09
CB190	1.78	1.84	3.04	1.15	2.35	0.02	1.22	-2.29	-1.09
CB128	1.81	1.83	3.04	1.14	2.35	0.01	1.22	-2.30	-1.09
CB292	1.68	1.74	3.05	1.05	2.36	-0.08	1.23	-2.39	-1.08
CB296	1.69	1.75	3.06	1.06	2.37	-0.07	1.24	-2.38	-1.07
CB282	1.63	1.62	3.07	0.93	2.38	-0.20	1.25	-2.51	-1.06
CB278	1.69	1.69	3.10	1.00	2.41	-0.13	1.28	-2.44	-1.03

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB200	1.73	1.83	3.11	1.14	2.42	0.01	1.29	-2.30	-1.02
CB21	1.86	2.45	3.12	1.76	2.43	0.63	1.30	-1.68	-1.01
CB7	1.85	2.43	3.12	1.74	2.43	0.61	1.30	-1.70	-1.01
CB99	0.63	1.70	3.12	1.01	2.43	-0.12	1.30	-2.43	-1.01
CB287	1.70	1.69	3.13	1.00	2.44	-0.13	1.31	-2.44	-1.00
CB208	1.73	1.71	3.14	1.02	2.45	-0.11	1.32	-2.42	-0.99
CB273	1.78	1.83	3.14	1.14	2.45	0.01	1.32	-2.30	-0.99
CB82	1.73	1.72	3.15	1.03	2.46	-0.10	1.33	-2.41	-0.98
CB98	1.85	1.99	3.16	1.30	2.47	0.17	1.34	-2.14	-0.97
CB177	1.66	1.64	3.19	0.95	2.50	-0.18	1.37	-2.49	-0.94
CB183	1.88	1.86	3.19	1.17	2.50	0.04	1.37	-2.27	-0.94
CB106	1.97	1.61	3.19	0.92	2.50	-0.21	1.37	-2.52	-0.94
CB269	1.83	1.91	3.20	1.22	2.51	0.09	1.38	-2.22	-0.93
CB217	1.91	1.93	3.20	1.24	2.51	0.11	1.38	-2.20	-0.93
CB213	1.82	1.84	3.23	1.15	2.54	0.02	1.41	-2.29	-0.90
CB166	1.75	1.76	3.23	1.07	2.54	-0.06	1.41	-2.37	-0.90
CB157	1.77	1.77	3.24	1.08	2.55	-0.05	1.42	-2.36	-0.89
CB288	1.82	1.80	3.25	1.11	2.56	-0.02	1.43	-2.33	-0.88
CB101	1.83	1.83	3.25	1.14	2.56	0.01	1.43	-2.30	-0.88
CB243	1.51	1.40	3.26	0.71	2.57	-0.42	1.44	-2.73	-0.87
CB53	2.03	2.61	3.29	1.92	2.60	0.79	1.47	-1.52	-0.84
CB179	1.82	1.83	3.31	1.14	2.62	0.01	1.49	-2.30	-0.82
CB8	2.04	2.63	3.31	1.94	2.62	0.81	1.49	-1.50	-0.82
CB176	1.82	1.81	3.32	1.12	2.63	-0.01	1.50	-2.32	-0.81
CB123	2.10	2.11	3.32	1.42	2.63	0.29	1.50	-2.02	-0.81
CB162	1.86	1.86	3.34	1.17	2.65	0.04	1.52	-2.27	-0.79
CB267	1.98	2.04	3.34	1.35	2.65	0.22	1.52	-2.09	-0.79
CB301	1.87	1.87	3.34	1.18	2.65	0.05	1.52	-2.26	-0.79

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB198	2.00	2.07	3.35	1.38	2.66	0.25	1.53	-2.06	-0.78
CB216	2.06	2.09	3.35	1.40	2.66	0.27	1.53	-2.04	-0.78
CB146	2.09	2.00	3.36	1.31	2.67	0.18	1.54	-2.13	-0.77
CB248	1.72	1.65	3.37	0.96	2.68	-0.17	1.55	-2.48	-0.76
CB22	2.11	2.72	3.37	2.03	2.68	0.90	1.55	-1.41	-0.76
CB188	2.11	2.15	3.37	1.46	2.68	0.33	1.55	-1.98	-0.76
CB148	2.11	2.01	3.38	1.32	2.69	0.19	1.56	-2.12	-0.75
CB240	1.63	1.53	3.38	0.84	2.69	-0.29	1.56	-2.60	-0.75
CB164	1.85	1.82	3.39	1.13	2.70	0.00	1.57	-2.31	-0.75
CB130	2.17	2.17	3.39	1.48	2.70	0.35	1.57	-1.96	-0.74
CB113	2.00	1.61	3.39	0.92	2.70	-0.21	1.57	-2.52	-0.74
CB118	2.18	2.20	3.40	1.51	2.71	0.38	1.58	-1.93	-0.73
CB92	1.34	1.11	3.41	0.42	2.72	-0.71	1.59	-3.02	-0.72
CB293	2.04	2.11	3.41	1.42	2.72	0.29	1.59	-2.02	-0.72
CB107	2.19	1.89	3.43	1.20	2.74	0.07	1.61	-2.24	-0.70
CB270	2.07	2.14	3.44	1.45	2.75	0.32	1.62	-1.99	-0.69
CB150	2.18	2.08	3.45	1.39	2.76	0.26	1.63	-2.05	-0.68
CB149	2.18	2.08	3.45	1.39	2.76	0.26	1.63	-2.05	-0.68
CB129	2.23	2.26	3.46	1.57	2.77	0.44	1.64	-1.87	-0.67
CB199	2.09	2.12	3.46	1.43	2.77	0.30	1.64	-2.01	-0.67
CB100	2.04	2.04	3.46	1.35	2.77	0.22	1.64	-2.09	-0.67
CB119	2.24	2.27	3.46	1.58	2.77	0.45	1.64	-1.86	-0.67
CB224	2.16	2.19	3.47	1.50	2.78	0.37	1.65	-1.94	-0.66
CB110	2.12	1.82	3.48	1.13	2.79	0.00	1.66	-2.31	-0.65
CB271	2.12	2.18	3.49	1.49	2.80	0.36	1.67	-1.95	-0.64
CB185	2.19	2.17	3.49	1.48	2.80	0.35	1.67	-1.96	-0.64
CB227	2.18	2.22	3.49	1.53	2.80	0.40	1.67	-1.91	-0.64
CB207	2.09	2.07	3.50	1.38	2.81	0.25	1.68	-2.06	-0.63

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB97	2.23	2.37	3.50	1.68	2.81	0.55	1.68	-1.76	-0.63
CB237	2.14	2.21	3.50	1.52	2.81	0.39	1.68	-1.92	-0.63
CB241	1.75	1.64	3.51	0.95	2.82	-0.18	1.69	-2.49	-0.62
CB223	2.20	2.24	3.51	1.55	2.82	0.42	1.69	-1.89	-0.62
CB152	2.25	2.16	3.52	1.47	2.83	0.34	1.70	-1.97	-0.61
CB127	2.30	2.31	3.53	1.62	2.84	0.49	1.71	-1.82	-0.60
CB242	1.79	1.68	3.54	0.99	2.85	-0.14	1.72	-2.45	-0.59
CB219	2.21	2.23	3.56	1.54	2.87	0.41	1.74	-1.90	-0.57
CB244	1.80	1.69	3.56	1.00	2.87	-0.13	1.74	-2.44	-0.57
CB134	2.31	2.32	3.58	1.63	2.89	0.50	1.76	-1.81	-0.55
CB111	2.24	1.94	3.60	1.25	2.91	0.12	1.78	-2.19	-0.53
CB117	2.34	2.35	3.60	1.66	2.91	0.53	1.78	-1.78	-0.53
CB23	2.36	2.96	3.61	2.27	2.92	1.14	1.79	-1.17	-0.52
CB102	2.21	2.22	3.62	1.53	2.93	0.40	1.80	-1.91	-0.51
CB86	1.56	1.32	3.62	0.63	2.93	-0.50	1.80	-2.81	-0.51
CB133	2.42	2.42	3.64	1.73	2.95	0.60	1.82	-1.71	-0.49
CB132	2.45	2.42	3.67	1.73	2.98	0.60	1.85	-1.71	-0.46
CB87	1.66	1.43	3.73	0.74	3.04	-0.39	1.91	-2.70	-0.40
CB153	2.41	2.35	3.73	1.66	3.04	0.53	1.91	-1.78	-0.40
CB205	2.34	2.36	3.73	1.67	3.04	0.54	1.91	-1.77	-0.40
CB303	2.26	2.26	3.73	1.57	3.04	0.44	1.91	-1.87	-0.40
CB236	2.34	2.37	3.74	1.68	3.05	0.55	1.92	-1.76	-0.39
CB90	1.71	1.47	3.77	0.78	3.08	-0.35	1.95	-2.66	-0.36
CB91	1.71	1.48	3.78	0.79	3.09	-0.34	1.96	-2.65	-0.35
CB125	2.57	2.56	3.80	1.87	3.11	0.74	1.98	-1.57	-0.33
CB211	2.42	2.40	3.82	1.71	3.13	0.58	2.00	-1.73	-0.31
CB94	2.50	2.60	3.84	1.91	3.15	0.78	2.02	-1.53	-0.29
CB96	2.56	2.70	3.84	2.01	3.15	0.88	2.02	-1.43	-0.29

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB294	2.48	2.56	3.84	1.87	3.15	0.74	2.02	-1.57	-0.29
CB178	2.34	2.33	3.84	1.64	3.15	0.51	2.02	-1.80	-0.29
CB88	1.78	1.55	3.85	0.86	3.16	-0.27	2.03	-2.58	-0.28
CB165	2.37	2.37	3.85	1.68	3.16	0.55	2.03	-1.76	-0.28
CB131	2.63	2.61	3.85	1.92	3.16	0.79	2.03	-1.52	-0.28
CB124	2.63	2.64	3.86	1.95	3.17	0.82	2.04	-1.49	-0.27
CB126	2.66	2.65	3.88	1.96	3.19	0.83	2.06	-1.48	-0.25
CB238	2.52	2.59	3.89	1.90	3.20	0.77	2.07	-1.54	-0.24
CB225	2.58	2.62	3.89	1.93	3.20	0.80	2.07	-1.51	-0.24
CB239	2.14	2.04	3.89	1.35	3.20	0.22	2.07	-2.09	-0.24
CB231	2.57	2.63	3.90	1.94	3.21	0.81	2.08	-1.50	-0.23
CB89	1.85	1.61	3.91	0.92	3.22	-0.21	2.09	-2.52	-0.22
CB147	2.64	2.55	3.92	1.86	3.23	0.73	2.10	-1.58	-0.21
CB137	2.65	2.66	3.92	1.97	3.23	0.84	2.10	-1.47	-0.21
CB209	2.51	2.50	3.92	1.81	3.23	0.68	2.10	-1.63	-0.21
CB163	2.40	2.39	3.93	1.70	3.24	0.57	2.11	-1.74	-0.20
CB154	2.60	2.57	3.94	1.88	3.25	0.75	2.12	-1.56	-0.19
CB103	2.54	2.56	3.95	1.87	3.26	0.74	2.13	-1.57	-0.18
CB151	2.69	2.58	3.96	1.89	3.27	0.76	2.14	-1.55	-0.17
CB145	2.65	2.59	3.96	1.90	3.27	0.77	2.14	-1.54	-0.17
CB212	2.56	2.54	3.96	1.85	3.27	0.72	2.14	-1.59	-0.17
CB121	2.74	2.75	3.97	2.06	3.28	0.93	2.15	-1.38	-0.16
CB214	2.59	2.61	3.97	1.92	3.28	0.79	2.15	-1.52	-0.16
CB247	2.26	2.17	3.98	1.48	3.29	0.35	2.16	-1.96	-0.15
CB245	2.22	2.11	3.98	1.42	3.29	0.29	2.16	-2.02	-0.15
CB84	1.93	1.70	3.99	1.01	3.30	-0.12	2.17	-2.43	-0.14
CB93	1.93	1.69	3.99	1.00	3.30	-0.13	2.17	-2.44	-0.14
CB104	1.55	2.44	4.01	1.75	3.32	0.62	2.19	-1.69	-0.12

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB120	2.78	2.80	4.01	2.11	3.32	0.98	2.19	-1.33	-0.12
CB186	2.71	2.71	4.01	2.02	3.32	0.89	2.19	-1.42	-0.12
CB56	2.74	3.32	4.01	2.63	3.32	1.50	2.19	-0.81	-0.12
CB222	2.69	2.75	4.02	2.06	3.33	0.93	2.20	-1.38	-0.11
CB85	1.96	1.73	4.02	1.04	3.33	-0.09	2.20	-2.40	-0.11
CB136	2.77	2.73	4.02	2.04	3.33	0.91	2.20	-1.40	-0.11
CB295	2.66	2.75	4.03	2.06	3.34	0.93	2.21	-1.38	-0.10
CB144	2.77	2.71	4.09	2.02	3.40	0.89	2.27	-1.42	-0.04
CB246	2.39	2.28	4.14	1.59	3.45	0.46	2.32	-1.85	0.01
CB122	2.92	2.95	4.14	2.26	3.45	1.13	2.32	-1.18	0.01
CB203	2.86	2.89	4.14	2.20	3.45	1.07	2.32	-1.24	0.01
CB57	2.89	3.47	4.16	2.78	3.47	1.65	2.34	-0.66	0.03
CB135	2.92	2.88	4.16	2.19	3.47	1.06	2.34	-1.25	0.03
CB228	2.85	2.90	4.17	2.21	3.48	1.08	2.35	-1.23	0.04
CB138	2.95	2.99	4.17	2.30	3.48	1.17	2.35	-1.14	0.04
CB226	2.90	2.93	4.21	2.24	3.52	1.11	2.39	-1.20	0.08
CB187	2.92	2.94	4.22	2.25	3.53	1.12	2.40	-1.19	0.09
CB221	2.93	2.96	4.24	2.27	3.55	1.14	2.42	-1.17	0.11
CB116	2.98	2.97	4.27	2.28	3.58	1.15	2.45	-1.16	0.14
CB160	2.83	2.83	4.30	2.14	3.61	1.01	2.48	-1.30	0.17
CB230	2.98	3.04	4.31	2.35	3.62	1.22	2.49	-1.09	0.18
CB45	3.05	3.64	4.31	2.95	3.62	1.82	2.49	-0.49	0.18
CB182	3.00	3.00	4.31	2.31	3.62	1.18	2.49	-1.13	0.18
CB143	3.02	2.98	4.35	2.29	3.66	1.16	2.53	-1.15	0.22
CB229	3.08	3.13	4.40	2.44	3.71	1.31	2.58	-1.00	0.27
CB169	2.95	2.94	4.45	2.25	3.76	1.12	2.63	-1.19	0.32
CB140	3.20	3.15	4.50	2.46	3.81	1.33	2.68	-0.98	0.37
CB171	3.06	3.06	4.53	2.37	3.84	1.24	2.71	-1.07	0.40

Appendix Table 1: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Catch Basins, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
CB168	3.21	2.98	4.62	2.29	3.93	1.16	2.80	-1.15	0.49
CB115	3.35	3.33	4.64	2.64	3.95	1.51	2.82	-0.80	0.51
CB44	3.43	4.02	4.69	3.33	4.00	2.20	2.87	-0.11	0.56
CB155	3.01	2.92	4.71	2.23	4.02	1.10	2.89	-1.21	0.58
CB302	3.26	3.26	4.73	2.57	4.04	1.44	2.91	-0.87	0.60
CB42	3.49	4.09	4.75	3.40	4.06	2.27	2.93	-0.04	0.62
CB173	3.31	3.31	4.79	2.62	4.10	1.49	2.97	-0.82	0.66
CB281	3.37	3.13	4.80	2.44	4.11	1.31	2.98	-1.00	0.67
CB139	3.57	3.53	4.88	2.84	4.19	1.71	3.06	-0.60	0.75
CB159	3.41	3.41	4.89	2.72	4.20	1.59	3.07	-0.72	0.76
CB141	3.60	3.55	4.89	2.86	4.20	1.73	3.07	-0.58	0.76
CB74	3.69	4.30	4.94	3.61	4.25	2.48	3.12	0.17	0.81
CB158	3.61	3.60	5.08	2.91	4.39	1.78	3.26	-0.53	0.95
CB172	3.66	3.66	5.14	2.97	4.45	1.84	3.32	-0.47	1.01
CB47	4.02	4.60	5.30	3.91	4.61	2.78	3.48	0.47	1.17
CB142	4.00	3.95	5.32	3.26	4.63	2.13	3.50	-0.18	1.19
CB43	4.15	4.75	5.41	4.06	4.72	2.93	3.59	0.62	1.28
CB95	4.09	4.19	5.43	3.50	4.74	2.37	3.61	0.06	1.30
CB46	4.19	4.77	5.46	4.08	4.77	2.95	3.64	0.64	1.33
CB40	7.40	8.00	8.65	7.31	7.96	6.18	6.83	3.87	4.52
CB41	7.77	8.38	9.03	7.69	8.34	6.56	7.21	4.25	4.90
CB39	10.04	10.64	11.29	9.95	10.60	8.82	9.47	6.51	7.16
CB38	10.22	10.82	11.47	10.13	10.78	9.00	9.65	6.69	7.34

Appendix Table 2: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Injection Wells, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
IW13	0.81	1.30	2.10	0.61	1.41	-0.52	0.28	-2.83	-2.03
IW8	1.80	2.11	2.27	1.88	1.58	0.29	0.45	-2.02	-1.86
IW18	0.91	0.92	2.39	0.69	1.70	-0.90	0.57	-3.21	-1.74
IW24	0.95	0.95	2.44	0.72	1.75	-0.87	0.62	-3.18	-1.69
IW23	1.05	1.06	2.54	0.83	1.85	-0.76	0.72	-3.07	-1.59
IW17	1.07	1.08	2.55	0.85	1.86	-0.74	0.73	-3.05	-1.58
IW19	1.14	1.15	2.62	0.92	1.93	-0.67	0.80	-2.98	-1.51
IW27	1.19	1.19	2.67	0.96	1.98	-0.63	0.85	-2.94	-1.46
IW28	1.24	1.25	2.73	1.02	2.04	-0.57	0.91	-2.88	-1.40
IW21	1.29	1.30	2.78	1.07	2.09	-0.52	0.96	-2.83	-1.35
IW10	1.60	1.24	2.81	1.01	2.12	-0.58	0.99	-2.89	-1.32
IW29	1.35	1.36	2.83	1.13	2.14	-0.46	1.01	-2.77	-1.30
IW14	1.56	2.05	2.84	1.82	2.15	0.23	1.02	-2.08	-1.29
IW26	1.43	1.44	2.92	1.21	2.23	-0.38	1.10	-2.69	-1.21
IW15	1.59	1.56	2.99	1.33	2.30	-0.26	1.17	-2.57	-1.14
IW20	1.57	1.58	3.06	1.35	2.37	-0.24	1.24	-2.55	-1.07
IW38	1.41	1.30	3.17	1.07	2.48	-0.52	1.35	-2.83	-0.96
IW12	2.01	1.69	3.23	1.46	2.54	-0.13	1.41	-2.44	-0.90
IW7	1.84	1.86	3.25	1.63	2.56	0.04	1.43	-2.27	-0.88
IW36	1.52	1.41	3.28	1.18	2.59	-0.41	1.46	-2.72	-0.85
IW25	1.80	1.81	3.28	1.58	2.59	-0.01	1.46	-2.32	-0.85
IW22	1.77	1.76	3.30	1.53	2.61	-0.06	1.48	-2.37	-0.83
IW35	1.55	1.44	3.31	1.21	2.62	-0.38	1.49	-2.69	-0.82
IW40	1.58	1.48	3.34	1.25	2.65	-0.34	1.52	-2.65	-0.79
IW39	1.58	1.48	3.34	1.25	2.65	-0.34	1.52	-2.65	-0.79
IW34	1.59	1.48	3.36	1.25	2.67	-0.34	1.54	-2.65	-0.77
IW6	1.99	2.00	3.40	1.77	2.71	0.18	1.58	-2.13	-0.73
IW1	2.13	2.23	3.47	2.00	2.78	0.41	1.65	-1.90	-0.66

Appendix Table 2: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Injection Wells, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

IW11	2.27	1.86	3.48	1.63	2.79	0.04	1.66	-2.27	-0.65
IW37	1.77	1.66	3.53	1.43	2.84	-0.16	1.71	-2.47	-0.60
IW32	1.98	1.87	3.75	1.64	3.06	0.05	1.93	-2.26	-0.38
IW33	2.01	1.90	3.78	1.67	3.09	0.08	1.96	-2.23	-0.35
IW5	2.59	2.73	3.86	2.50	3.17	0.91	2.04	-1.40	-0.27
IW41	2.16	2.06	3.92	1.83	3.23	0.24	2.10	-2.07	-0.21
IW4	2.75	2.88	4.02	2.65	3.33	1.06	2.20	-1.25	-0.11
IW31	2.38	2.28	4.15	2.05	3.46	0.46	2.33	-1.85	0.02
IW30	2.42	2.32	4.18	2.09	3.49	0.50	2.36	-1.81	0.05
IW16	3.03	2.80	4.44	2.57	3.75	0.98	2.62	-1.33	0.31
IW3	3.52	3.62	4.86	3.39	4.17	1.80	3.04	-0.51	0.73
IW9	3.83	3.42	4.99	3.19	4.30	1.60	3.17	-0.71	0.86
IW2	4.05	4.15	5.38	3.92	4.69	2.33	3.56	0.02	1.25

Appendix Table 3: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Manholes, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
MH11	0.38	0.95	1.66	0.26	0.97	-0.87	-0.16	-3.18	-2.47
MH10	0.46	1.02	1.74	0.33	1.05	-0.80	-0.08	-3.11	-2.39
MH16	0.67	1.27	1.92	0.58	1.23	-0.55	0.10	-2.86	-2.21
MH37	0.73	1.32	2.00	0.63	1.31	-0.50	0.18	-2.81	-2.13
MH18	0.74	1.31	2.02	0.62	1.33	-0.51	0.20	-2.82	-2.11
MH14	0.77	1.37	2.03	0.68	1.34	-0.45	0.21	-2.76	-2.10
MH22	0.85	1.46	2.10	0.77	1.41	-0.36	0.28	-2.67	-2.03
MH35	0.86	1.44	2.13	0.75	1.44	-0.38	0.31	-2.69	-2.00
MH20	0.85	1.42	2.13	0.73	1.44	-0.40	0.31	-2.71	-2.00
MH34	0.89	1.47	2.17	0.78	1.48	-0.35	0.35	-2.66	-1.96
MH32	0.93	1.54	2.18	0.85	1.49	-0.28	0.36	-2.59	-1.95
MH30	0.93	1.53	2.18	0.84	1.49	-0.29	0.36	-2.60	-1.95
MH36	0.92	1.51	2.19	0.82	1.50	-0.31	0.37	-2.62	-1.94
MH27	0.98	1.57	2.24	0.88	1.55	-0.25	0.42	-2.56	-1.89
MH19	0.96	1.54	2.24	0.85	1.55	-0.28	0.42	-2.59	-1.89
MH28	1.04	1.65	2.29	0.96	1.60	-0.17	0.47	-2.48	-1.84
MH59	0.96	0.97	2.36	0.28	1.67	-0.85	0.54	-3.16	-1.77
MH17	1.10	1.70	2.36	1.01	1.67	-0.12	0.54	-2.43	-1.77
MH62	0.95	0.94	2.37	0.25	1.68	-0.88	0.55	-3.19	-1.76
MH38	1.12	1.70	2.40	1.01	1.71	-0.12	0.58	-2.43	-1.73
MH15	1.16	1.76	2.42	1.07	1.73	-0.06	0.60	-2.37	-1.71
MH29	1.20	1.80	2.45	1.11	1.76	-0.02	0.63	-2.33	-1.68
MH13	1.20	1.80	2.45	1.11	1.76	-0.02	0.63	-2.33	-1.68
MH63	1.12	1.11	2.54	0.42	1.85	-0.71	0.72	-3.02	-1.59
MH21	1.25	1.83	2.54	1.14	1.85	0.01	0.72	-2.30	-1.59
MH57	1.16	1.15	2.59	0.46	1.90	-0.67	0.77	-2.98	-1.54
MH31	1.38	1.98	2.63	1.29	1.94	0.16	0.81	-2.15	-1.50
MH7	1.36	1.40	2.76	0.71	2.07	-0.42	0.94	-2.73	-1.37

Appendix Table 3: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Manholes, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
MH9	1.39	1.43	2.77	0.74	2.08	-0.39	0.95	-2.70	-1.36
MH58	1.44	1.43	2.87	0.74	2.18	-0.39	1.05	-2.70	-1.26
MH49	1.53	1.64	2.88	0.95	2.19	-0.18	1.06	-2.49	-1.25
MH8	1.56	1.63	2.90	0.94	2.21	-0.19	1.08	-2.50	-1.23
MH64	1.39	1.35	2.91	0.66	2.22	-0.47	1.09	-2.78	-1.22
MH50	1.68	1.75	2.94	1.06	2.25	-0.07	1.12	-2.38	-1.19
MH43	1.48	1.47	2.94	0.78	2.25	-0.35	1.12	-2.66	-1.19
MH48	1.62	1.74	2.95	1.05	2.26	-0.08	1.13	-2.39	-1.18
MH26	1.74	2.33	3.00	1.64	2.31	0.51	1.18	-1.80	-1.13
MH44	1.57	1.56	3.03	0.87	2.34	-0.26	1.21	-2.57	-1.10
MH65	1.46	1.37	3.08	0.68	2.39	-0.45	1.26	-2.76	-1.05
MH41	1.86	2.45	3.13	1.76	2.44	0.63	1.31	-1.68	-1.00
MH47	1.89	1.99	3.19	1.30	2.50	0.17	1.37	-2.14	-0.94
MH61	1.84	1.85	3.24	1.16	2.55	0.03	1.42	-2.28	-0.89
MH1	1.26	1.02	3.32	0.33	2.63	-0.80	1.50	-3.11	-0.81
MH51	2.03	2.01	3.34	1.32	2.65	0.19	1.52	-2.12	-0.79
MH53	2.02	2.08	3.35	1.39	2.66	0.26	1.53	-2.05	-0.78
MH46	2.17	2.24	3.44	1.55	2.75	0.42	1.62	-1.89	-0.69
MH2	1.40	1.17	3.47	0.48	2.78	-0.65	1.65	-2.96	-0.66
MH42	2.01	2.00	3.47	1.31	2.78	0.18	1.65	-2.13	-0.66
MH55	2.22	2.29	3.58	1.60	2.89	0.47	1.76	-1.84	-0.55
MH3	1.53	1.30	3.60	0.61	2.91	-0.52	1.78	-2.83	-0.53
MH45	2.40	2.45	3.66	1.76	2.97	0.63	1.84	-1.68	-0.47
MH56	1.94	1.87	3.66	1.18	2.97	0.05	1.84	-2.26	-0.47
MH60	2.29	2.31	3.67	1.62	2.98	0.49	1.85	-1.82	-0.46
MH66	2.21	2.20	3.67	1.51	2.98	0.38	1.85	-1.93	-0.46
MH4	1.62	1.38	3.68	0.69	2.99	-0.44	1.86	-2.75	-0.45
MH54	2.27	2.26	3.70	1.57	3.01	0.44	1.88	-1.87	-0.43

Appendix Table 3: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Manholes, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
MH67	2.24	2.23	3.70	1.54	3.01	0.41	1.88	-1.90	-0.43
MH23	2.78	3.39	4.04	2.70	3.35	1.57	2.22	-0.74	-0.09
MH5	2.02	1.79	4.09	1.10	3.40	-0.03	2.27	-2.34	-0.04
MH52	3.12	3.16	4.43	2.47	3.74	1.34	2.61	-0.97	0.30
MH40	3.25	3.84	4.52	3.15	3.83	2.02	2.70	-0.29	0.39
MH6	2.70	2.51	4.76	1.82	4.07	0.69	2.94	-1.62	0.63
MH33	3.88	4.47	5.14	3.78	4.45	2.65	3.32	0.34	1.01
MH39	3.94	4.55	5.19	3.86	4.50	2.73	3.37	0.42	1.06
MH12	4.25	4.83	5.52	4.14	4.83	3.01	3.70	0.70	1.39
MH24	7.57	8.17	8.82	7.48	8.13	6.35	7.00	4.04	4.69
MH25	10.56	11.16	11.81	10.47	11.12	9.34	9.99	7.03	7.68

Appendix Table 4: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Trench Drains, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
TD51	-0.14	0.44	1.14	-0.25	0.45	-1.38	-0.68	-3.69	-2.99
TD47	0.21	0.82	1.46	0.13	0.77	-1.00	-0.36	-3.31	-2.67
TD34	0.22	0.65	1.57	-0.04	0.88	-1.17	-0.25	-3.48	-2.56
TD37	0.57	1.03	1.81	0.34	1.12	-0.79	-0.01	-3.10	-2.32
TD29	0.65	1.22	1.82	0.53	1.13	-0.60	0.00	-2.91	-2.31
TD73	0.67	1.24	1.87	0.55	1.18	-0.58	0.05	-2.89	-2.26
TD48	0.63	1.24	1.88	0.55	1.19	-0.58	0.06	-2.89	-2.25
TD53	0.62	1.20	1.89	0.51	1.20	-0.62	0.07	-2.93	-2.24
TD40	0.70	1.30	1.95	0.61	1.26	-0.52	0.13	-2.83	-2.18
TD3	0.76	1.34	1.97	0.65	1.28	-0.48	0.15	-2.79	-2.16
TD18	0.86	1.43	2.04	0.74	1.35	-0.39	0.22	-2.70	-2.09
TD52	0.81	1.39	2.09	0.70	1.40	-0.43	0.27	-2.74	-2.04
TD35	0.75	1.18	2.10	0.49	1.41	-0.64	0.28	-2.95	-2.03
TD112	1.71	2.00	2.16	1.31	1.47	0.18	0.34	-2.13	-1.97
TD36	0.95	1.40	2.22	0.71	1.53	-0.42	0.40	-2.73	-1.91
TD2	1.02	1.60	2.23	0.91	1.54	-0.22	0.41	-2.53	-1.90
TD113	1.79	2.09	2.24	1.40	1.55	0.27	0.42	-2.04	-1.89
TD1	1.04	1.62	2.25	0.93	1.56	-0.20	0.43	-2.51	-1.88
TD30	1.13	1.69	2.30	1.00	1.61	-0.13	0.48	-2.44	-1.83
TD110	1.06	0.80	2.30	0.11	1.61	-1.02	0.48	-3.33	-1.83
TD39	1.14	1.71	2.33	1.02	1.64	-0.11	0.51	-2.42	-1.80
TD46	1.24	1.83	2.49	1.14	1.80	0.01	0.67	-2.30	-1.64
TD118	1.24	1.33	2.53	0.64	1.84	-0.49	0.71	-2.80	-1.60
TD91	1.29	1.35	2.55	0.66	1.86	-0.47	0.73	-2.78	-1.58
TD4	1.36	1.93	2.56	1.24	1.87	0.11	0.74	-2.20	-1.57
TD90	1.23	1.22	2.62	0.53	1.93	-0.60	0.80	-2.91	-1.51
TD111	2.19	2.49	2.64	1.80	1.95	0.67	0.82	-1.64	-1.49
TD80	1.27	1.16	2.66	0.47	1.97	-0.66	0.84	-2.97	-1.47

Appendix Table 4: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Trench Drains, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
TD108	1.42	1.12	2.79	0.43	2.10	-0.70	0.97	-3.01	-1.34
TD114	2.32	2.63	2.79	1.94	2.10	0.81	0.97	-1.50	-1.34
TD89	1.45	1.45	2.84	0.76	2.15	-0.37	1.02	-2.68	-1.29
TD72	1.73	2.30	2.93	1.61	2.24	0.48	1.11	-1.83	-1.20
TD71	0.82	0.60	2.95	-0.09	2.26	-1.22	1.13	-3.53	-1.18
TD117	1.87	2.08	3.09	1.39	2.40	0.26	1.27	-2.05	-1.04
TD5	1.97	2.55	3.16	1.86	2.47	0.73	1.34	-1.58	-0.97
TD87	1.76	1.76	3.18	1.07	2.49	-0.06	1.36	-2.37	-0.95
TD60	1.21	1.13	3.19	0.44	2.50	-0.69	1.37	-3.00	-0.94
TD75	1.95	1.85	3.31	1.16	2.62	0.03	1.49	-2.28	-0.82
TD77	1.90	1.76	3.33	1.07	2.64	-0.06	1.51	-2.37	-0.80
TD83	2.01	1.88	3.39	1.19	2.70	0.06	1.57	-2.25	-0.74
TD38	1.69	1.71	3.41	1.02	2.72	-0.11	1.59	-2.42	-0.72
TD84	2.03	1.91	3.41	1.22	2.72	0.09	1.59	-2.22	-0.72
TD13	1.28	1.11	3.42	0.42	2.73	-0.71	1.60	-3.02	-0.71
TD86	2.09	2.11	3.43	1.42	2.74	0.29	1.61	-2.02	-0.70
TD82	2.18	2.10	3.47	1.41	2.78	0.28	1.65	-2.03	-0.66
TD85	1.76	1.64	3.54	0.95	2.85	-0.18	1.72	-2.49	-0.59
TD42	1.54	1.43	3.54	0.74	2.85	-0.39	1.72	-2.70	-0.59
TD16	1.45	1.26	3.58	0.57	2.89	-0.56	1.76	-2.87	-0.55
TD70	1.47	1.27	3.58	0.58	2.89	-0.55	1.76	-2.86	-0.55
TD106	2.36	2.25	3.65	1.56	2.96	0.43	1.83	-1.88	-0.48
TD76	2.35	2.27	3.70	1.58	3.01	0.45	1.88	-1.86	-0.43
TD74	2.51	3.09	3.71	2.40	3.02	1.27	1.89	-1.04	-0.42
TD33	1.70	1.46	3.76	0.77	3.07	-0.36	1.94	-2.67	-0.37
TD32	1.71	1.47	3.77	0.78	3.08	-0.35	1.95	-2.66	-0.36
TD79	2.41	2.34	3.78	1.65	3.09	0.52	1.96	-1.79	-0.35
TD88	2.37	2.36	3.78	1.67	3.09	0.54	1.96	-1.77	-0.35

Appendix Table 4: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Trench Drains, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
TD109	2.43	2.10	3.81	1.41	3.12	0.28	1.99	-2.03	-0.32
TD63	1.70	1.50	3.81	0.81	3.12	-0.32	1.99	-2.63	-0.32
TD78	2.46	2.38	3.82	1.69	3.13	0.56	2.00	-1.75	-0.31
TD81	2.61	2.52	3.85	1.83	3.16	0.70	2.03	-1.61	-0.28
TD98	2.65	2.55	3.87	1.86	3.18	0.73	2.05	-1.58	-0.26
TD104	2.66	2.56	3.89	1.87	3.20	0.74	2.07	-1.57	-0.24
TD105	2.70	2.60	3.92	1.91	3.23	0.78	2.10	-1.53	-0.21
TD69	2.81	3.37	3.94	2.68	3.25	1.55	2.12	-0.76	-0.19
TD68	2.86	3.42	3.99	2.73	3.30	1.60	2.17	-0.71	-0.14
TD102	2.79	2.69	4.01	2.00	3.32	0.87	2.19	-1.44	-0.12
TD100	2.81	2.71	4.04	2.02	3.35	0.89	2.22	-1.42	-0.09
TD107	2.76	2.64	4.05	1.95	3.36	0.82	2.23	-1.49	-0.08
TD103	2.82	2.72	4.05	2.03	3.36	0.90	2.23	-1.41	-0.08
TD54	2.00	1.84	4.05	1.15	3.36	0.02	2.23	-2.29	-0.08
TD55	2.00	1.84	4.06	1.15	3.37	0.02	2.24	-2.29	-0.07
TD66	2.93	3.49	4.06	2.80	3.37	1.67	2.24	-0.64	-0.07
TD93	2.83	2.74	4.07	2.05	3.38	0.92	2.25	-1.39	-0.06
TD94	2.86	2.78	4.12	2.09	3.43	0.96	2.30	-1.35	-0.01
TD95	2.88	2.79	4.13	2.10	3.44	0.97	2.31	-1.34	0.00
TD58	2.11	1.96	4.17	1.27	3.48	0.14	2.35	-2.17	0.04
TD67	3.08	3.64	4.21	2.95	3.52	1.82	2.39	-0.49	0.08
TD11	2.07	1.90	4.21	1.21	3.52	0.08	2.39	-2.23	0.08
TD10	2.10	1.93	4.23	1.24	3.54	0.11	2.41	-2.20	0.10
TD57	2.23	2.07	4.29	1.38	3.60	0.25	2.47	-2.06	0.16
TD56	2.23	2.07	4.29	1.38	3.60	0.25	2.47	-2.06	0.16
TD26	2.16	1.99	4.29	1.30	3.60	0.17	2.47	-2.14	0.16
TD15	2.18	2.00	4.31	1.31	3.62	0.18	2.49	-2.13	0.18
TD92	3.11	3.03	4.39	2.34	3.70	1.21	2.57	-1.10	0.26

Appendix Table 4: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Trench Drains, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
TD28	2.26	2.08	4.39	1.39	3.70	0.26	2.57	-2.05	0.26
TD96	3.17	3.08	4.41	2.39	3.72	1.26	2.59	-1.05	0.28
TD101	3.21	3.11	4.44	2.42	3.75	1.29	2.62	-1.02	0.31
TD97	3.16	3.07	4.44	2.38	3.75	1.25	2.62	-1.06	0.31
TD27	2.33	2.16	4.46	1.47	3.77	0.34	2.64	-1.97	0.33
TD14	2.33	2.16	4.47	1.47	3.78	0.34	2.65	-1.97	0.34
TD65	3.43	3.99	4.56	3.30	3.87	2.17	2.74	-0.14	0.43
TD24	2.43	2.26	4.57	1.57	3.88	0.44	2.75	-1.87	0.44
TD115	3.13	3.06	4.62	2.37	3.93	1.24	2.80	-1.07	0.49
TD25	2.49	2.32	4.62	1.63	3.93	0.50	2.80	-1.81	0.49
TD99	3.51	3.41	4.74	2.72	4.05	1.59	2.92	-0.72	0.61
TD116	3.29	3.27	4.75	2.58	4.06	1.45	2.93	-0.86	0.62
TD59	2.83	2.75	4.81	2.06	4.12	0.93	2.99	-1.38	0.68
TD12	2.80	2.63	4.93	1.94	4.24	0.81	3.11	-1.50	0.80
TD7	3.01	2.79	5.14	2.10	4.45	0.97	3.32	-1.34	1.01
TD8	3.03	2.81	5.16	2.12	4.47	0.99	3.34	-1.32	1.03
TD9	3.05	2.83	5.18	2.14	4.49	1.01	3.36	-1.30	1.05
TD64	4.60	5.11	5.73	4.42	5.04	3.29	3.91	0.98	1.60
TD31	4.45	4.23	6.52	3.54	5.83	2.41	4.70	0.10	2.39
TD43	4.54	4.33	6.66	3.64	5.97	2.51	4.84	0.20	2.53
TD23	4.74	4.53	6.86	3.84	6.17	2.71	5.04	0.40	2.73
TD20	4.78	4.57	6.90	3.88	6.21	2.75	5.08	0.44	2.77
TD22	4.80	4.59	6.92	3.90	6.23	2.77	5.10	0.46	2.79
TD49	4.89	4.61	7.08	3.92	6.39	2.79	5.26	0.48	2.95
TD21	5.00	4.79	7.13	4.10	6.44	2.97	5.31	0.66	3.00
TD120	7.62	8.18	8.80	7.49	8.11	6.36	6.98	4.05	4.67
TD123	7.76	8.32	8.95	7.63	8.26	6.50	7.13	4.19	4.82
TD45	7.87	8.33	9.31	7.64	8.62	6.51	7.49	4.20	5.18

Appendix Table 4: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Trench Drains, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
TD136	8.10	8.70	9.36	8.01	8.67	6.88	7.54	4.57	5.23
TD144	8.16	8.56	9.51	7.87	8.82	6.74	7.69	4.43	5.38
TD121	8.84	9.41	10.02	8.72	9.33	7.59	8.20	5.28	5.89
TD17	7.91	7.75	10.04	7.06	9.35	5.93	8.22	3.62	5.91
TD141	8.85	9.43	10.11	8.74	9.42	7.61	8.29	5.30	5.98
TD50	8.20	8.44	10.12	7.75	9.43	6.62	8.30	4.31	5.99
TD122	8.94	9.50	10.12	8.81	9.43	7.68	8.30	5.37	5.99
TD41	8.25	8.50	10.15	7.81	9.46	6.68	8.33	4.37	6.02
TD140	8.97	9.41	10.22	8.72	9.53	7.59	8.40	5.28	6.09
TD124	9.12	9.68	10.31	8.99	9.62	7.86	8.49	5.55	6.18
TD19	9.29	9.83	10.47	9.14	9.78	8.01	8.65	5.70	6.34
TD127	9.23	9.80	10.47	9.11	9.78	7.98	8.65	5.67	6.34
TD138	9.24	9.60	10.49	8.91	9.80	7.78	8.67	5.47	6.36
TD6	9.53	10.08	10.71	9.39	10.02	8.26	8.89	5.95	6.58
TD125	9.55	10.13	10.76	9.44	10.07	8.31	8.94	6.00	6.63
TD126	9.60	10.16	10.84	9.47	10.15	8.34	9.02	6.03	6.71
TD61	9.48	9.98	10.86	9.29	10.17	8.16	9.04	5.85	6.73
TD139	9.51	10.09	11.07	9.40	10.38	8.27	9.25	5.96	6.94
TD119	9.99	10.53	11.17	9.84	10.48	8.71	9.35	6.40	7.04
TD137	9.95	10.55	11.20	9.86	10.51	8.73	9.38	6.42	7.07
TD142	9.96	10.51	11.22	9.82	10.53	8.69	9.40	6.38	7.09
TD133	9.95	10.45	11.31	9.76	10.62	8.63	9.49	6.32	7.18
TD131	10.17	10.60	11.56	9.91	10.87	8.78	9.74	6.47	7.43
TD62	10.52	11.05	11.74	10.36	11.05	9.23	9.92	6.92	7.61
TD135	10.49	11.05	11.76	10.36	11.07	9.23	9.94	6.92	7.63
TD44	9.85	9.87	11.98	9.18	11.29	8.05	10.16	5.74	7.85
TD132	10.63	11.08	11.99	10.39	11.30	9.26	10.17	6.95	7.86
TD129	10.84	11.41	12.10	10.72	11.41	9.59	10.28	7.28	7.97

Appendix Table 4: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Trench Drains, including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
TD145	9.97	9.99	12.10	9.30	11.41	8.17	10.28	5.86	7.97
TD134	11.19	11.76	12.48	11.07	11.79	9.94	10.66	7.63	8.35
TD143	11.34	11.94	12.59	11.25	11.90	10.12	10.77	7.81	8.46
TD130	12.11	12.66	13.38	11.97	12.69	10.84	11.56	8.53	9.25
TD128	12.50	13.08	13.75	12.39	13.06	11.26	11.93	8.95	9.62

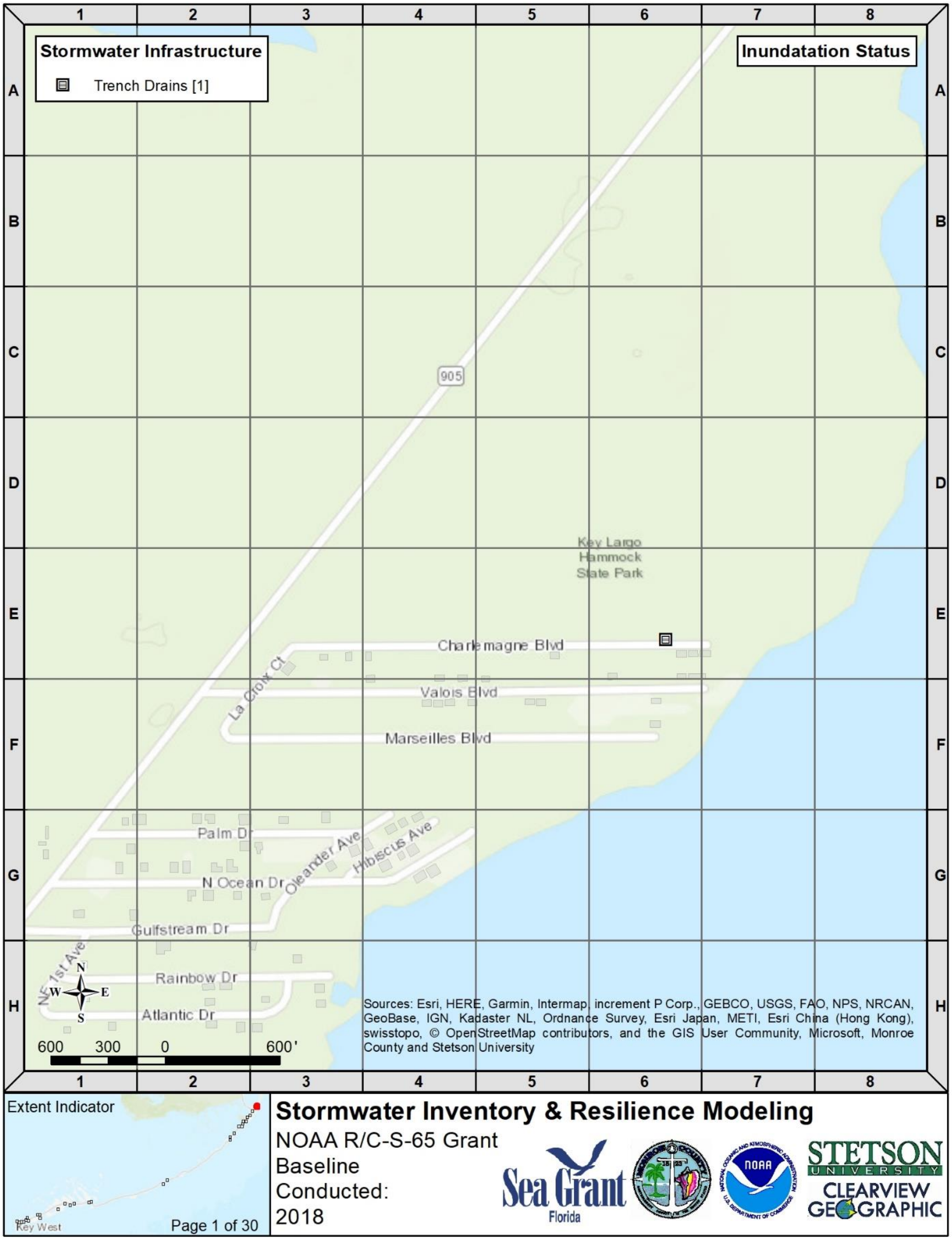
Appendix Table 5: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Outfalls (Top of Pipe), including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
OF30	-3.80	-3.83	-2.58	-4.52	-3.27	-5.65	-4.40	-7.96	-6.71
OF9	-2.76	-2.67	-1.39	-3.36	-2.08	-4.49	-3.21	-6.80	-5.52
OF31	-2.50	-2.52	-1.28	-3.21	-1.97	-4.34	-3.10	-6.65	-5.41
OF28	-2.50	-2.55	-1.27	-3.24	-1.96	-4.37	-3.09	-6.68	-5.40
OF8	-1.87	-1.85	-0.49	-2.54	-1.18	-3.67	-2.31	-5.98	-4.62
OF5	-1.73	-1.66	-0.48	-2.35	-1.17	-3.48	-2.30	-5.79	-4.61
OF2	-1.95	-1.98	-0.41	-2.67	-1.10	-3.80	-2.23	-6.11	-4.54
OF26	-1.51	-1.60	-0.24	-2.29	-0.93	-3.42	-2.06	-5.73	-4.37
OF33	-1.67	-1.76	-0.16	-2.45	-0.85	-3.58	-1.98	-5.89	-4.29
OF18	-1.37	-1.37	0.11	-2.06	-0.58	-3.19	-1.71	-5.50	-4.02
OF12	-1.30	-1.31	0.16	-2.00	-0.53	-3.13	-1.66	-5.44	-3.97
OF32	-1.11	-1.50	0.29	-2.19	-0.40	-3.32	-1.53	-5.63	-3.84
OF34	-0.94	-1.29	0.43	-1.98	-0.26	-3.11	-1.39	-5.42	-3.70
OF21	-0.97	-0.97	0.51	-1.66	-0.18	-2.79	-1.31	-5.10	-3.62
OF4	-0.72	-0.64	0.54	-1.33	-0.15	-2.46	-1.28	-4.77	-3.59
OF15	-0.81	-0.81	0.67	-1.50	-0.02	-2.63	-1.15	-4.94	-3.46
OF6	-0.60	-0.60	0.73	-1.29	0.04	-2.42	-1.09	-4.73	-3.40
OF23	-0.67	-0.68	0.77	-1.37	0.08	-2.50	-1.05	-4.81	-3.36
OF7	-0.44	-0.41	0.87	-1.10	0.18	-2.23	-0.95	-4.54	-3.26
OF36	-0.40	-0.40	1.08	-1.09	0.39	-2.22	-0.74	-4.53	-3.05
OF20	-0.32	-0.32	1.15	-1.01	0.46	-2.14	-0.67	-4.45	-2.98
OF1	-0.11	0.03	1.20	-0.66	0.51	-1.79	-0.62	-4.10	-2.93
OF35	-0.07	-0.42	1.29	-1.11	0.60	-2.24	-0.53	-4.55	-2.84
OF16	0.14	0.14	1.62	-0.55	0.93	-1.68	-0.20	-3.99	-2.51
OF22	0.14	0.14	1.62	-0.55	0.93	-1.68	-0.20	-3.99	-2.51
OF10	0.08	0.00	1.71	-0.69	1.02	-1.82	-0.11	-4.13	-2.42
OF38	0.29	0.29	1.77	-0.40	1.08	-1.53	-0.05	-3.84	-2.36

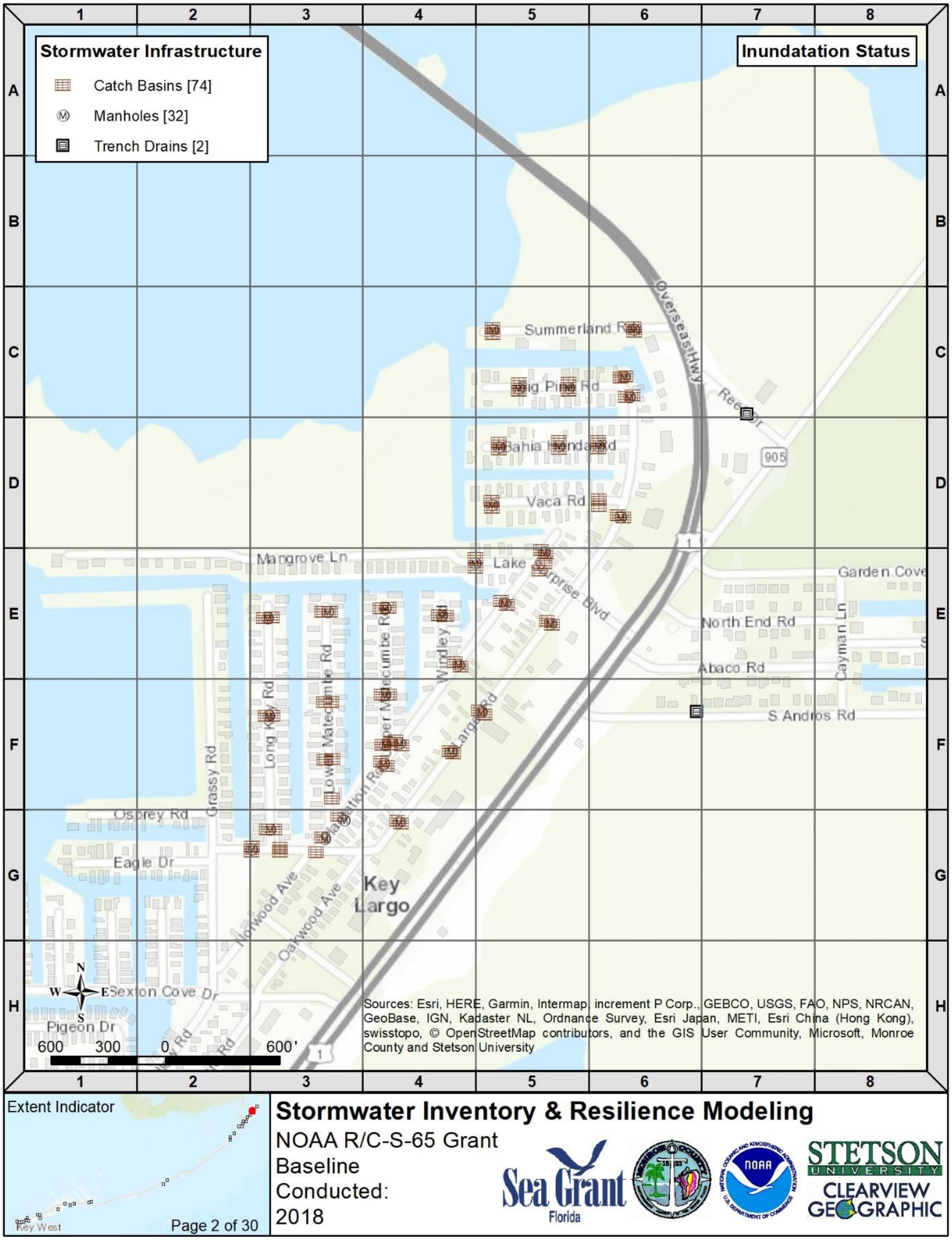
Appendix Table 5: Estimated Geodetic Elevation and Mean Tidal Range Elevations for Monroe County Stormwater Outfalls (Top of Pipe), including Future Estimates of Tidal Elevation under the NOAA Intermediate-High Sea-Level Rise Scenario at 2030, 2060, and 2100, as sorted by MLLW.

Structure ID	Top Elevation (NAVD88)	1992 MHHW	1992 MLLW	2030 MHHW	2030 MLLW	2060 MHHW	2060 MLLW	2100 MHHW	2100 MLLW
OF24	0.36	0.36	1.77	-0.33	1.08	-1.46	-0.05	-3.77	-2.36
OF17	0.32	0.32	1.80	-0.37	1.11	-1.50	-0.02	-3.81	-2.33
OF14	0.36	0.36	1.84	-0.33	1.15	-1.46	0.02	-3.77	-2.29
OF11	0.21	0.12	1.84	-0.57	1.15	-1.70	0.02	-4.01	-2.29
OF29	0.72	0.69	1.94	0.00	1.25	-1.13	0.12	-3.44	-2.19
OF37	0.47	0.47	1.95	-0.22	1.26	-1.35	0.13	-3.66	-2.18
OF13	0.74	0.73	2.20	0.04	1.51	-1.09	0.38	-3.40	-1.93
OF3	1.08	1.18	2.45	0.49	1.76	-0.64	0.63	-2.95	-1.68
OF25	1.31	1.30	2.78	0.61	2.09	-0.52	0.96	-2.83	-1.35
OF27	1.66	1.60	2.93	0.91	2.24	-0.22	1.11	-2.53	-1.20

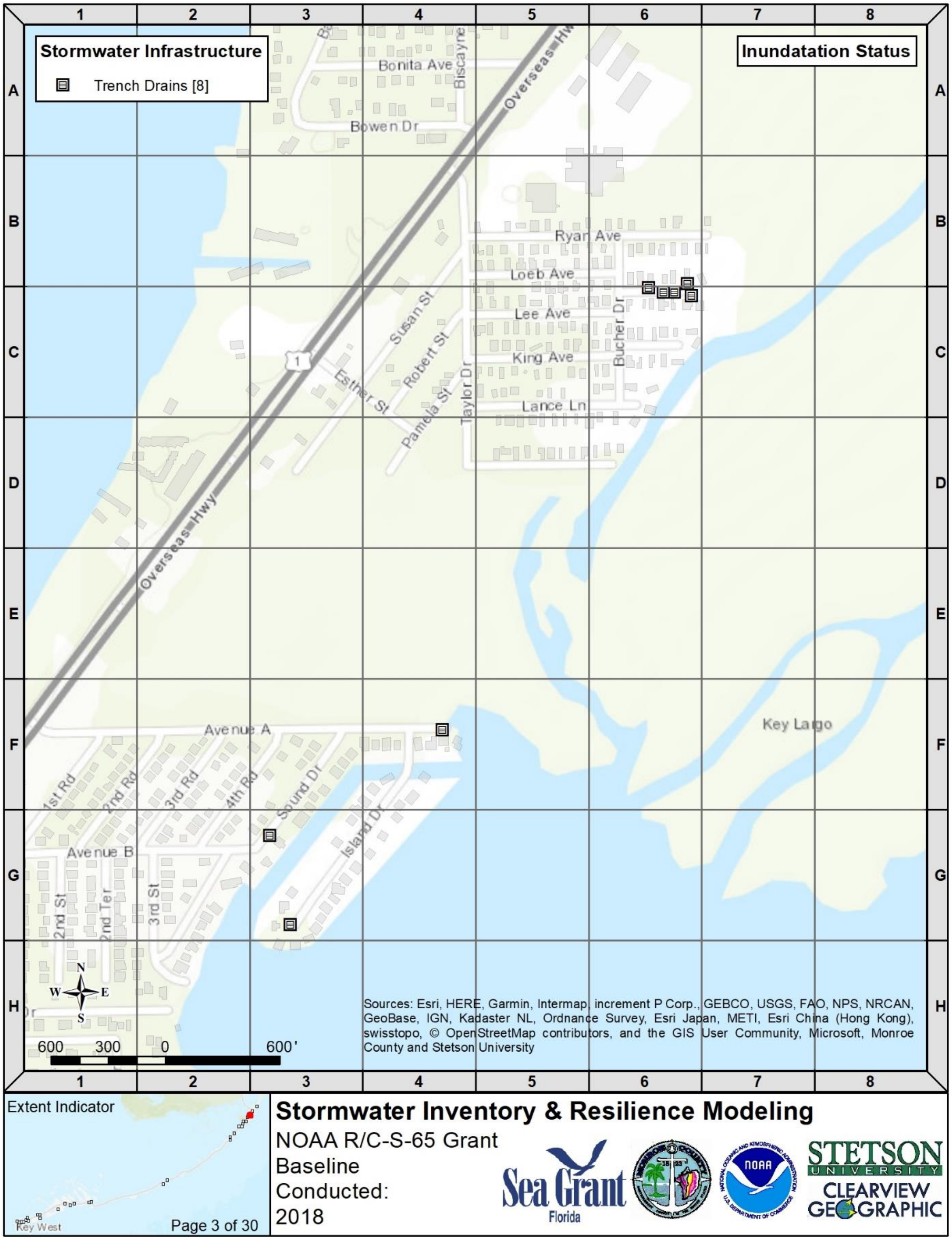
Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level



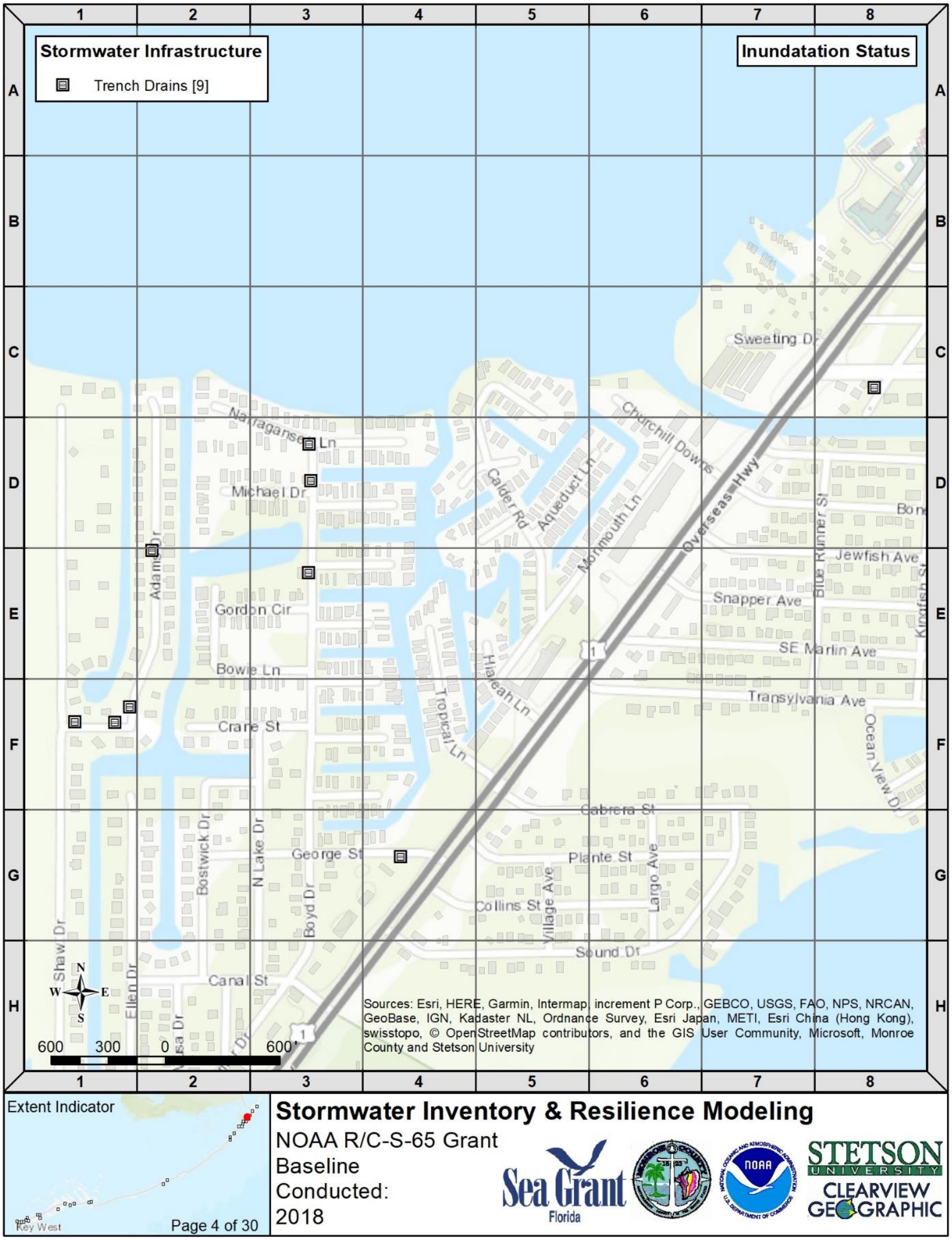
Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level



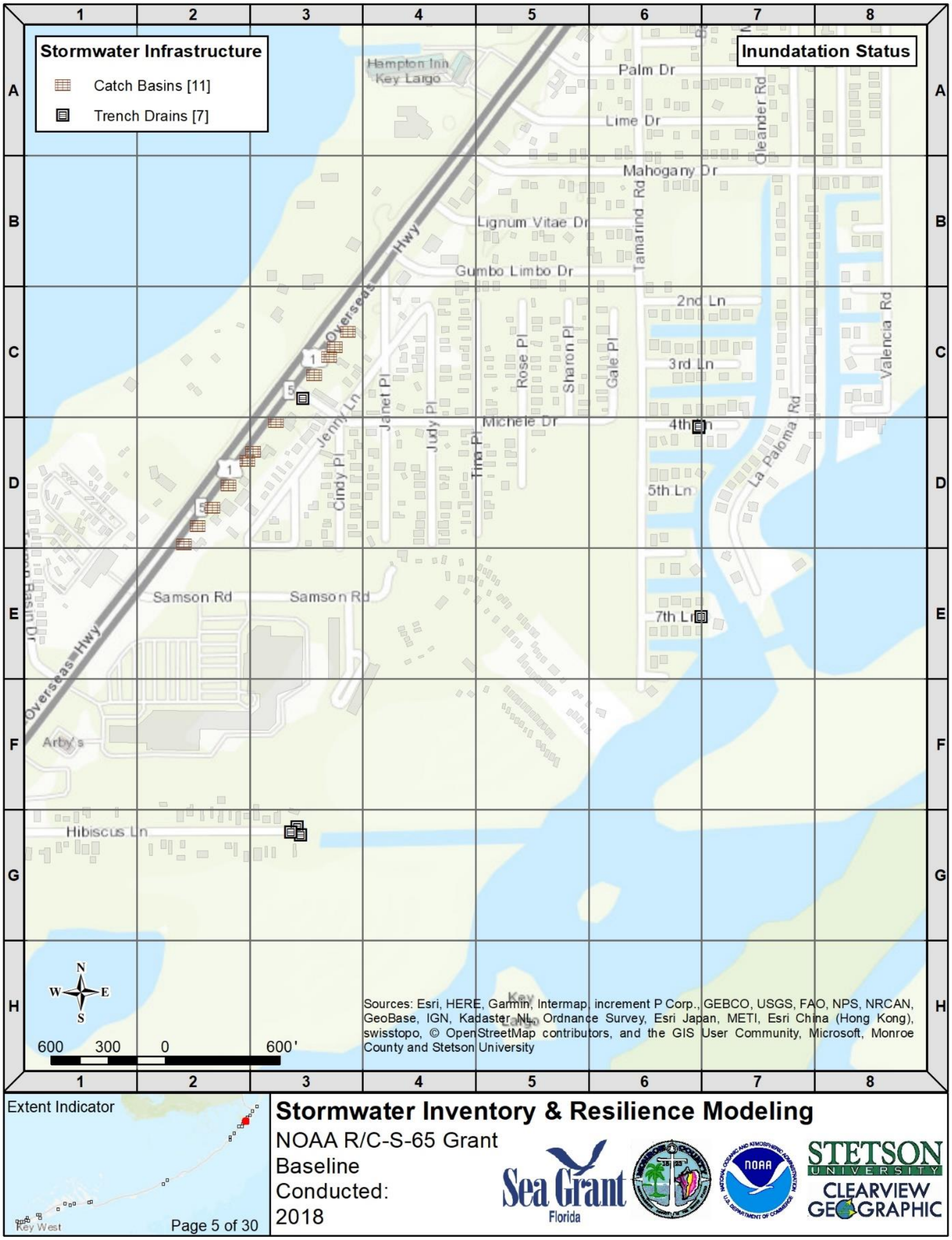
Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level



Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level



Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level



Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level

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2018

Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level

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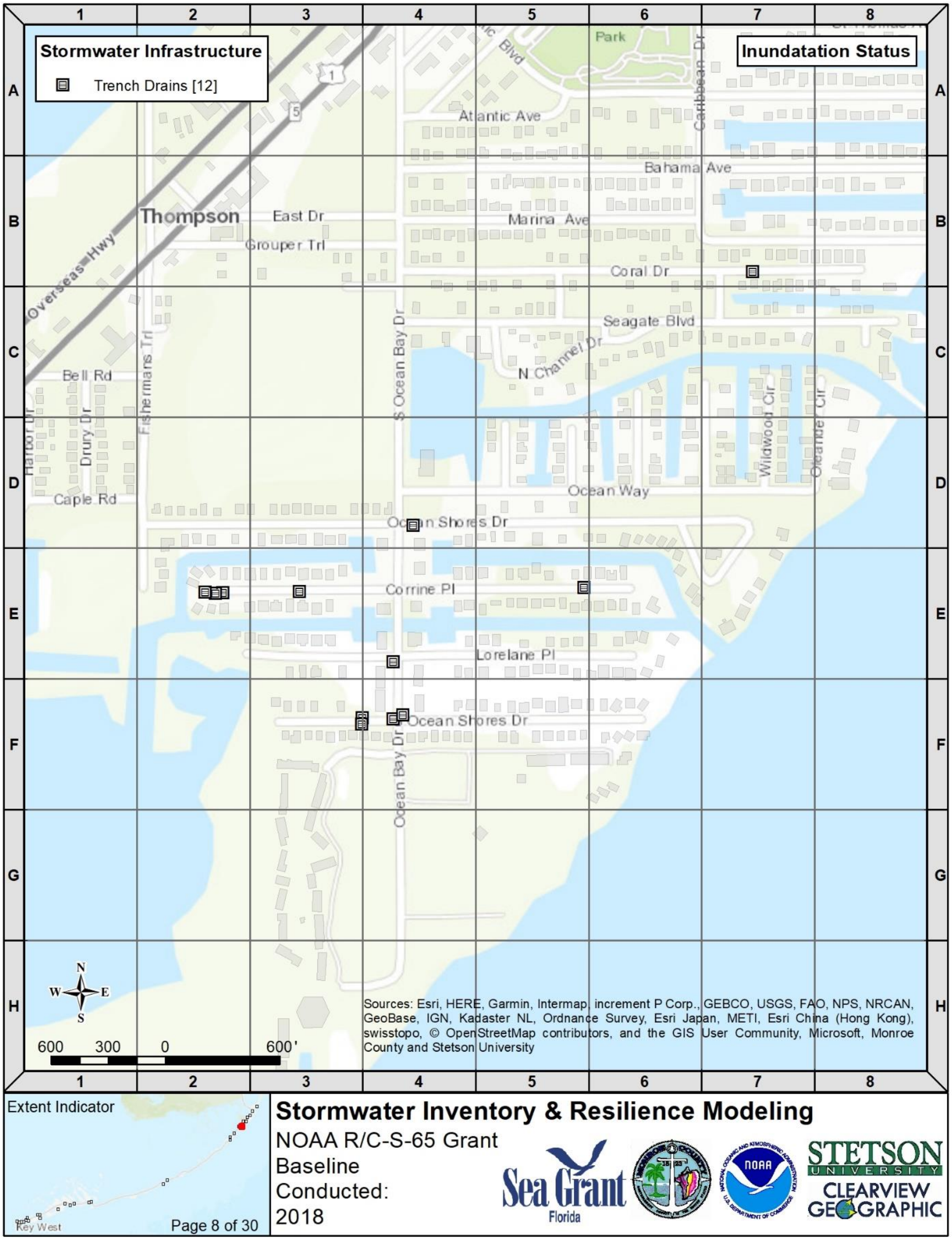

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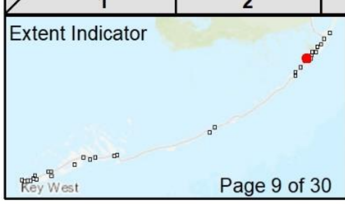

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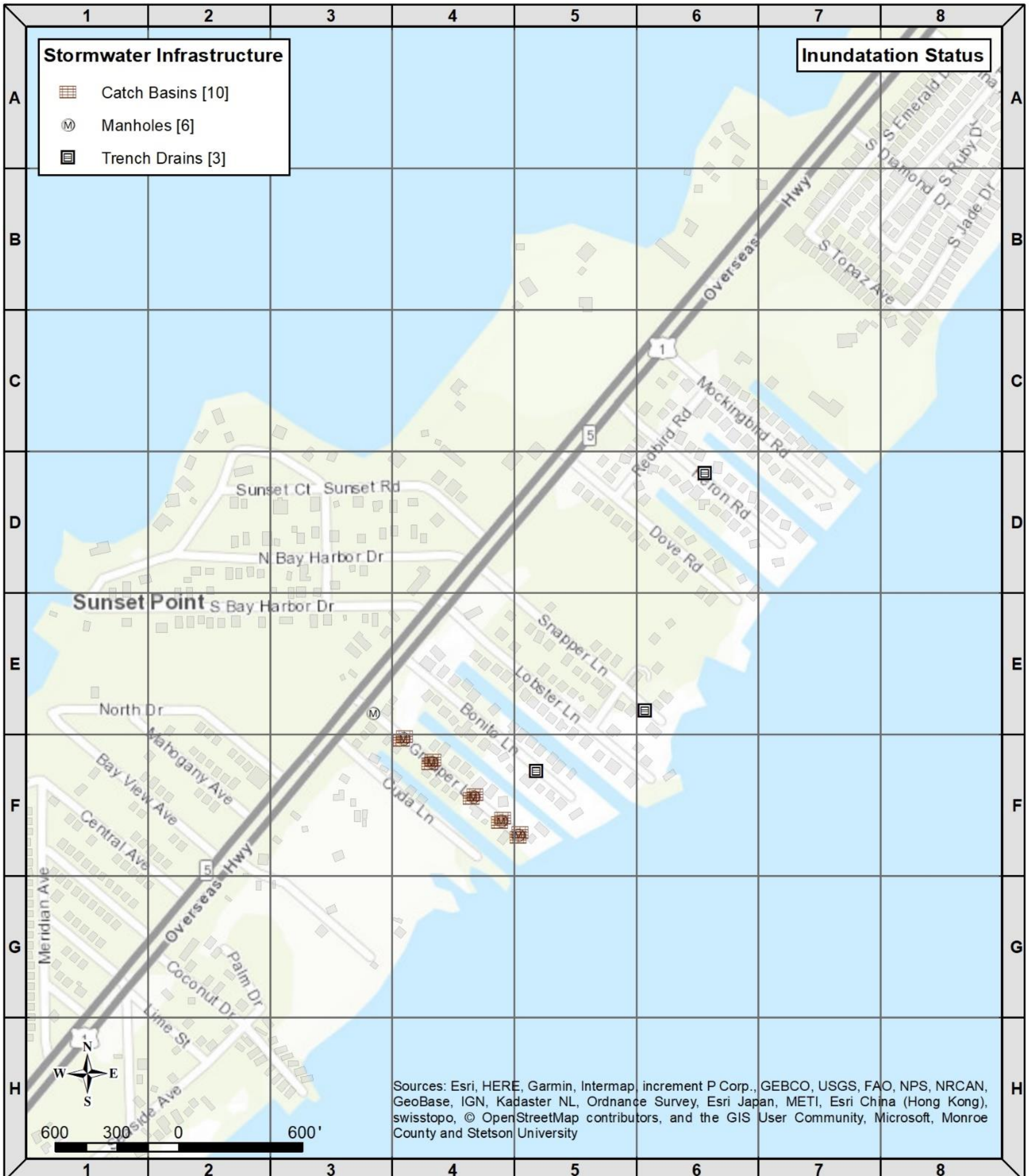

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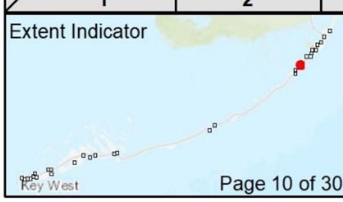

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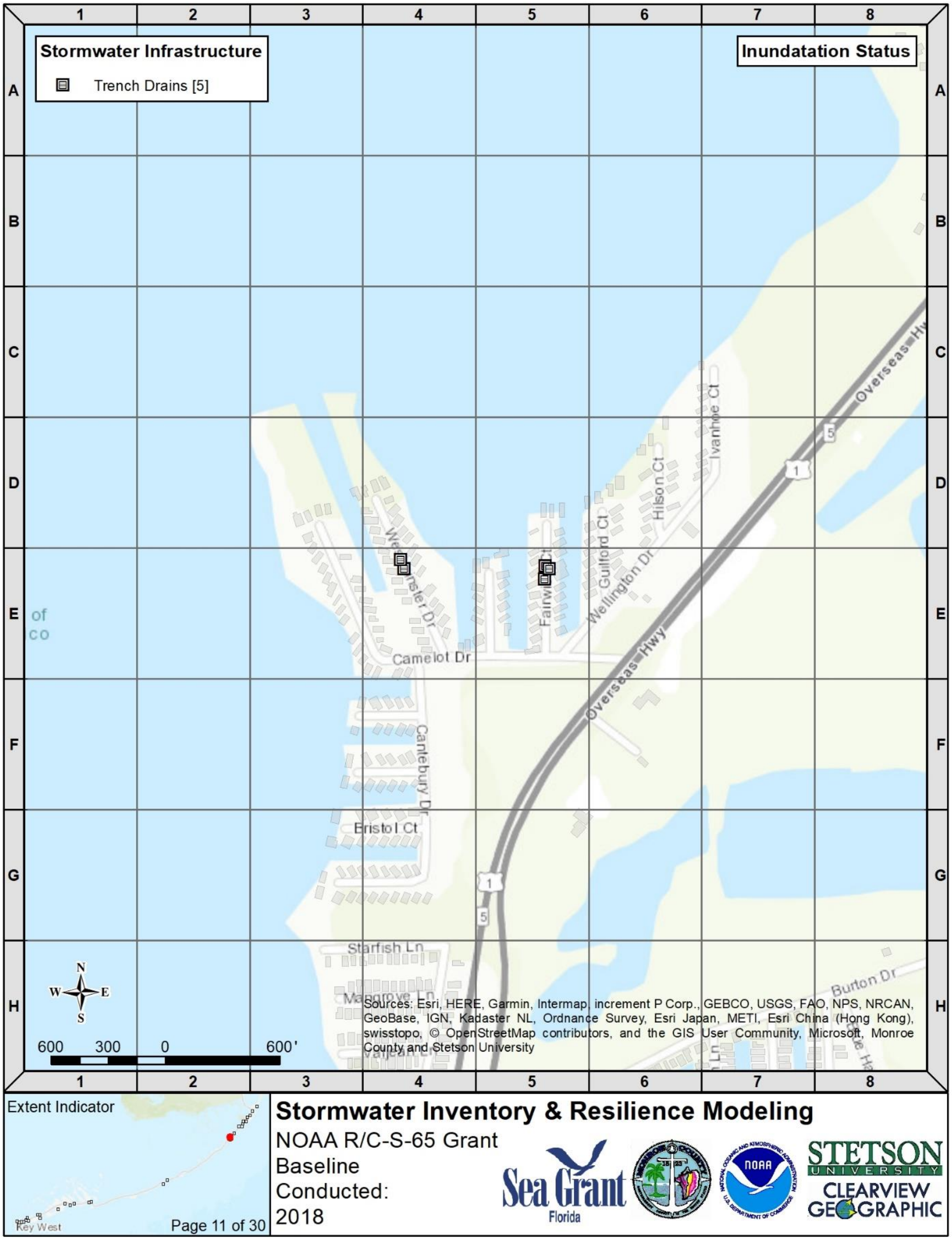

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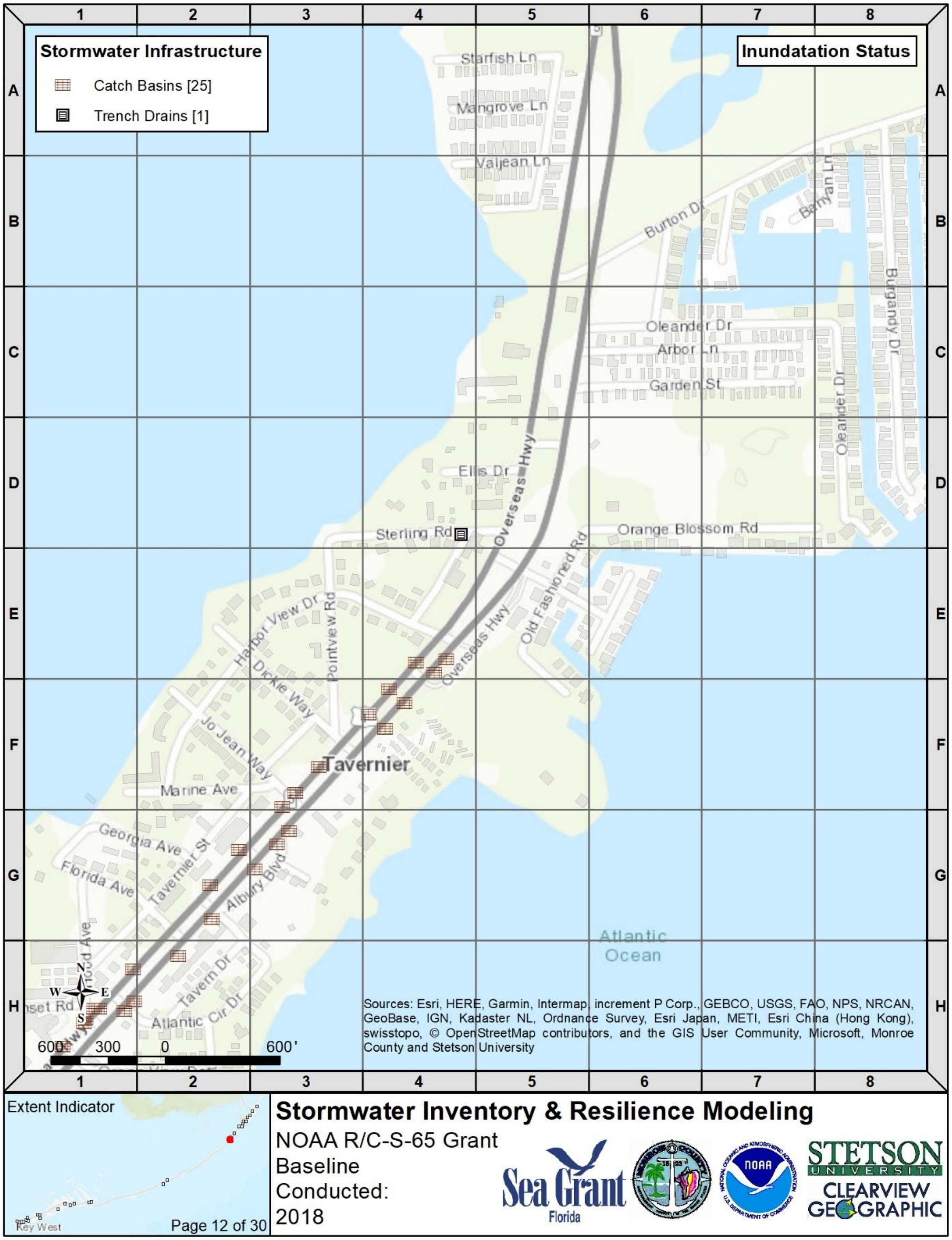
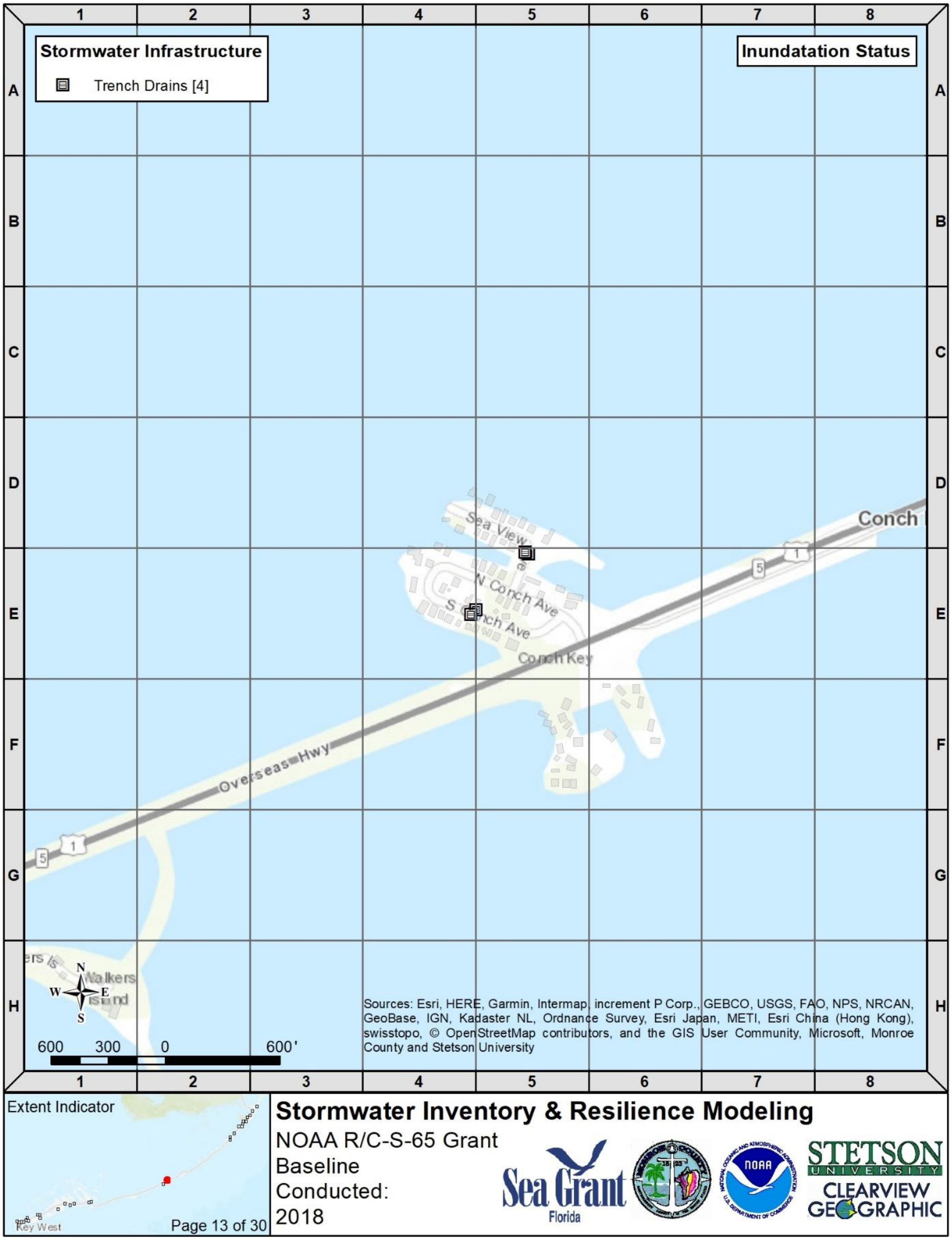


Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level



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Extent Indicator

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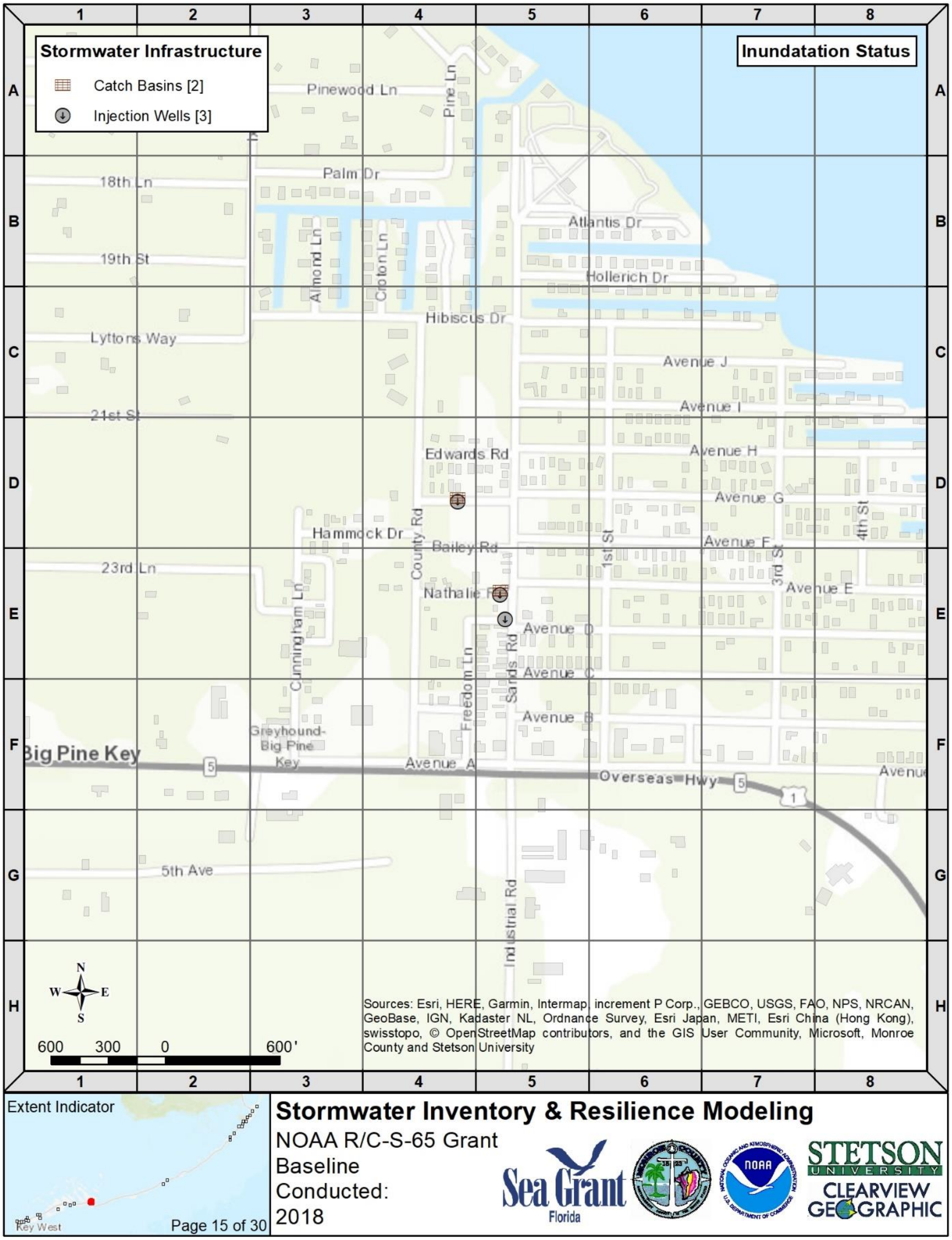

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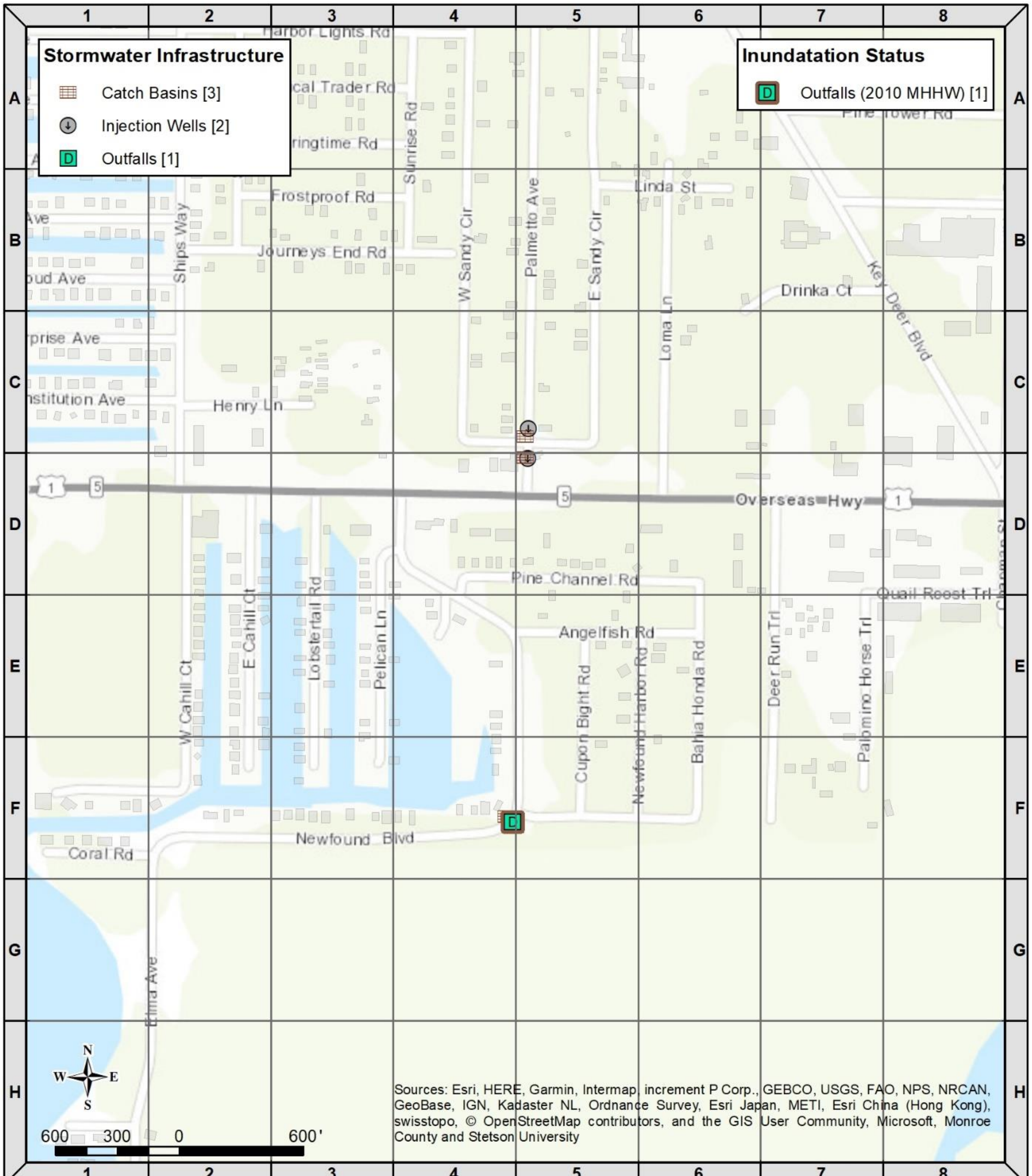
2018

Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level



Extent Indicator

Key West

Stormwater Inventory & Resilience Modeling

NOAA R/C-S-65 Grant

Baseline

Conducted:

2018

Sea Grant Florida

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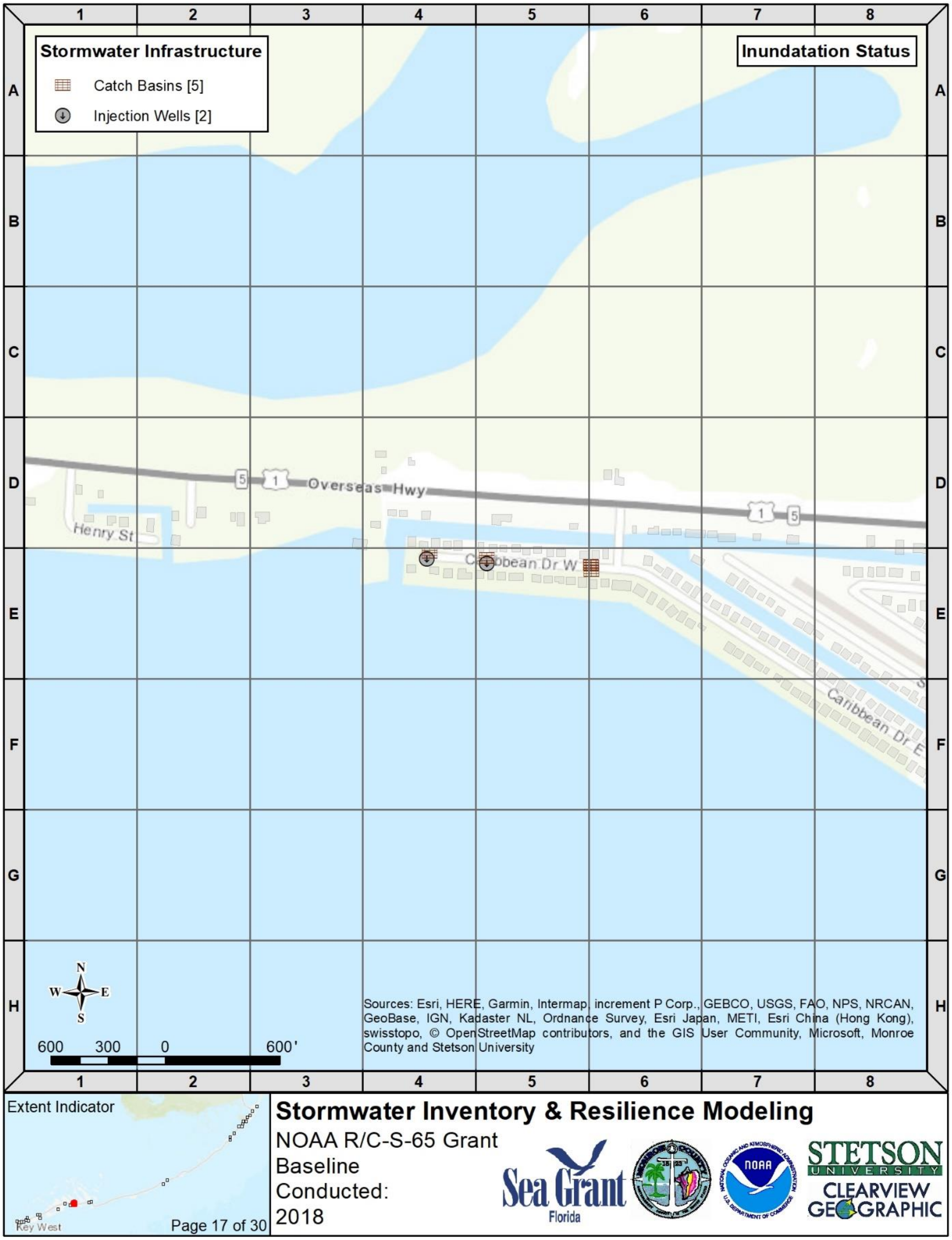
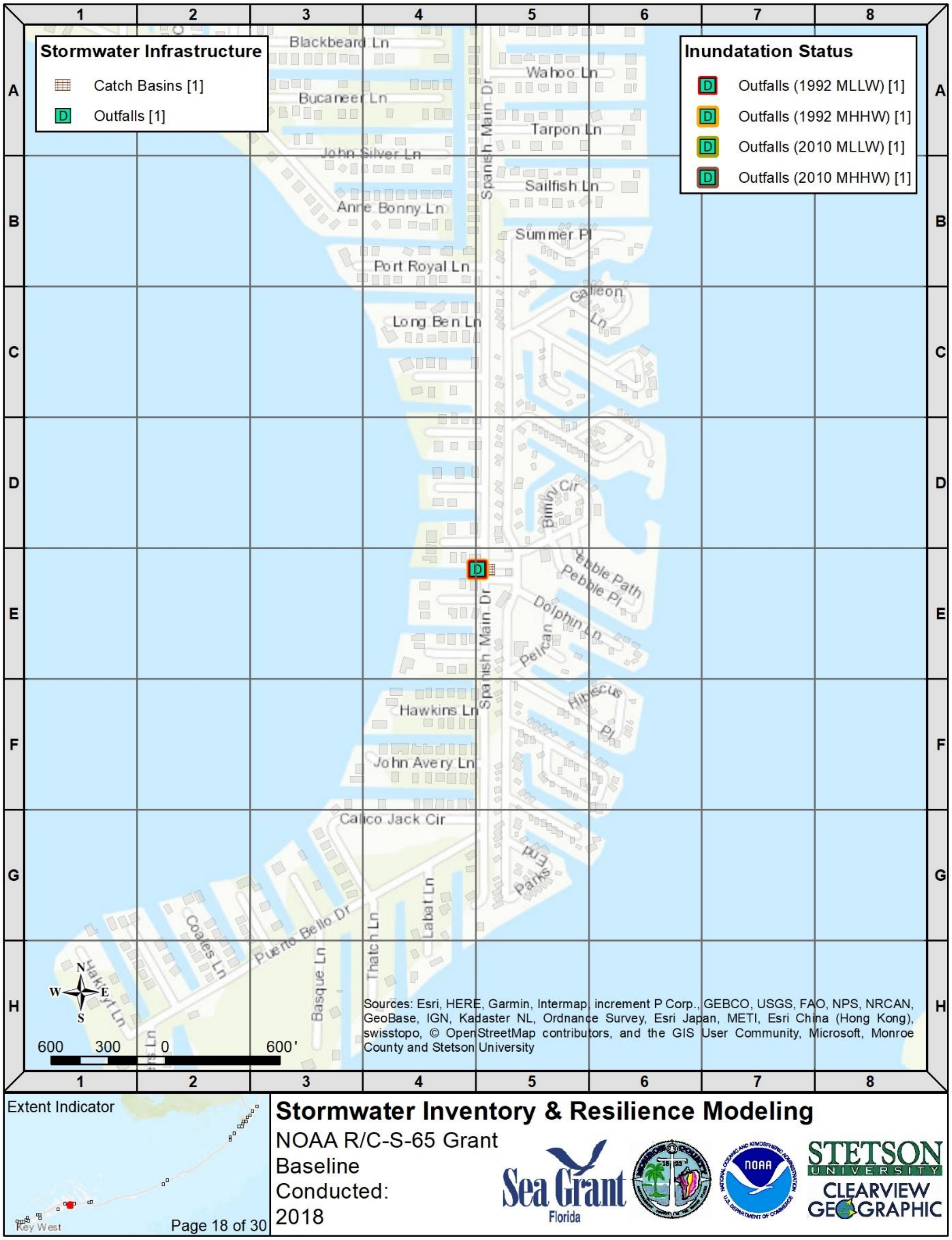


Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level



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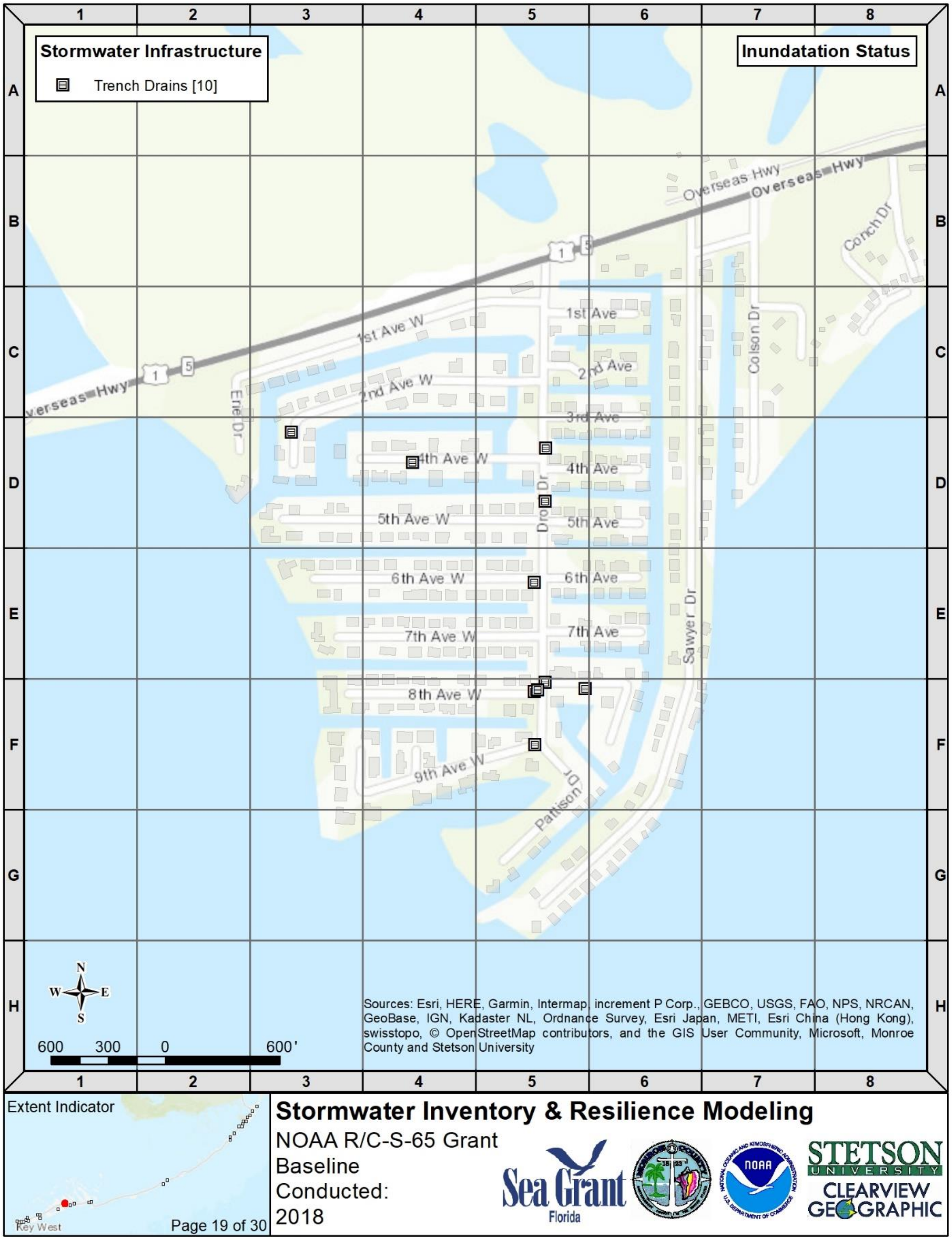

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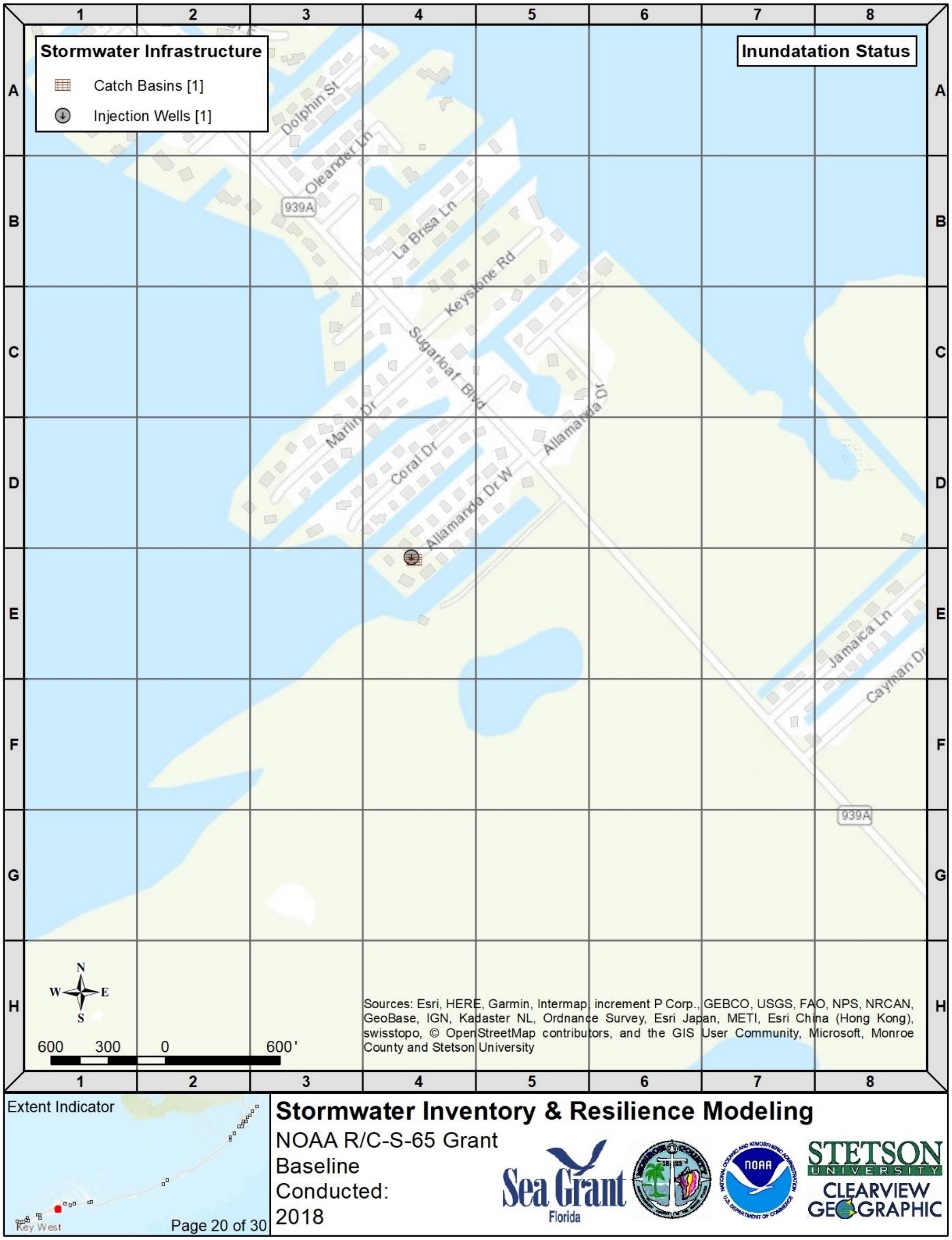

Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level

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Stormwater Inventory & Resilience Modeling
NOAA R/C-S-65 Grant
Baseline
Conducted:
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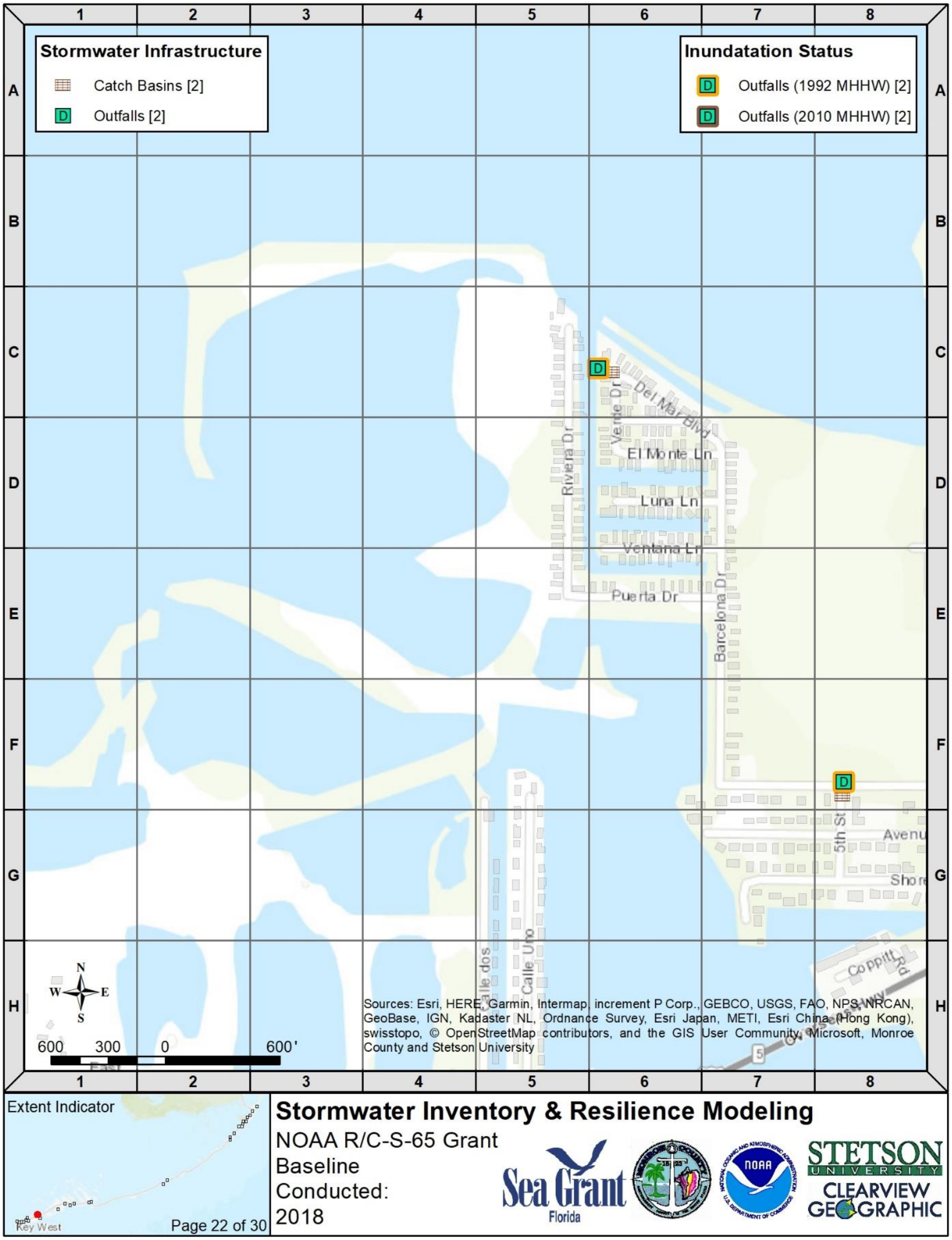

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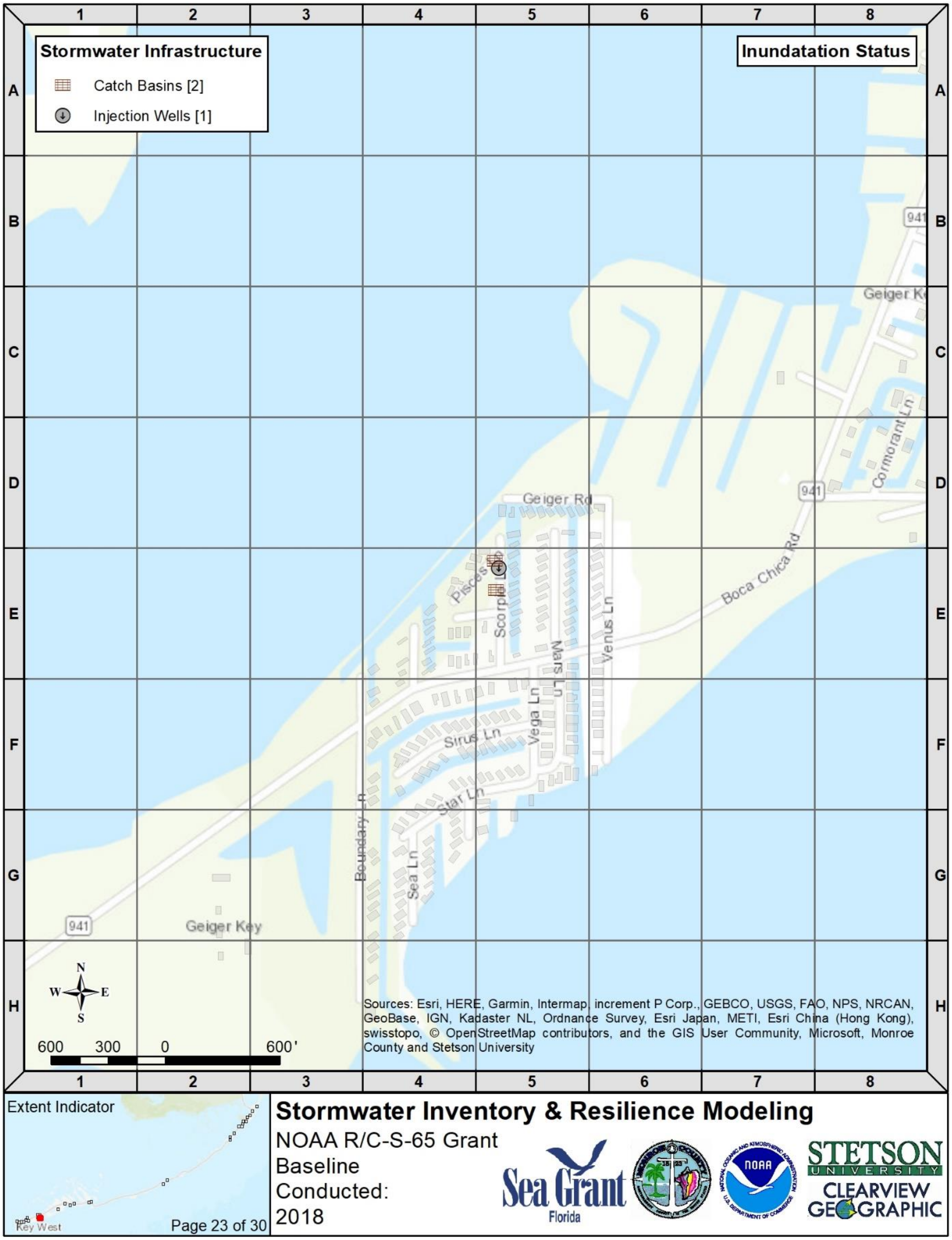

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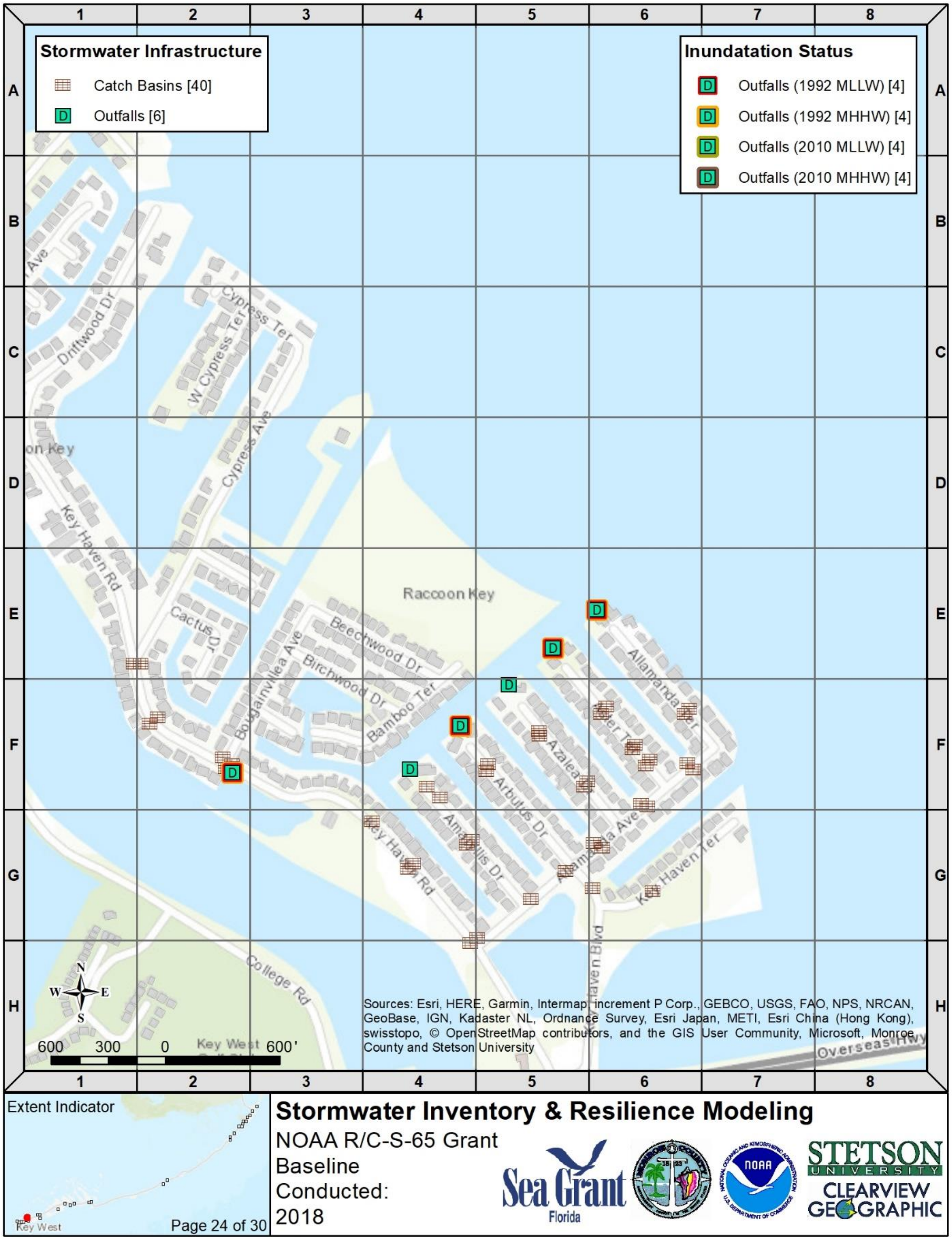

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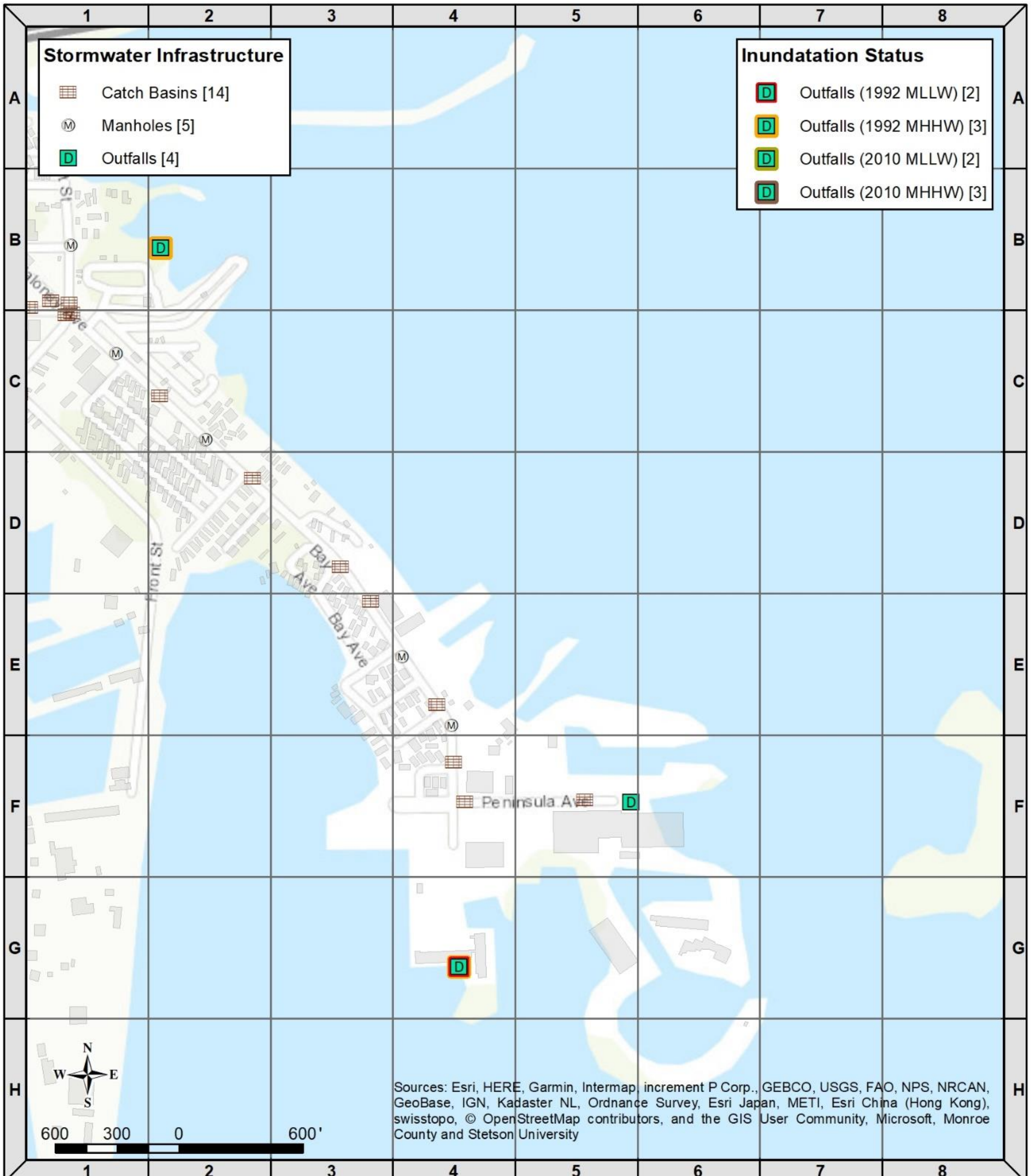

Stormwater Inventory & Resilience Modeling

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Baseline

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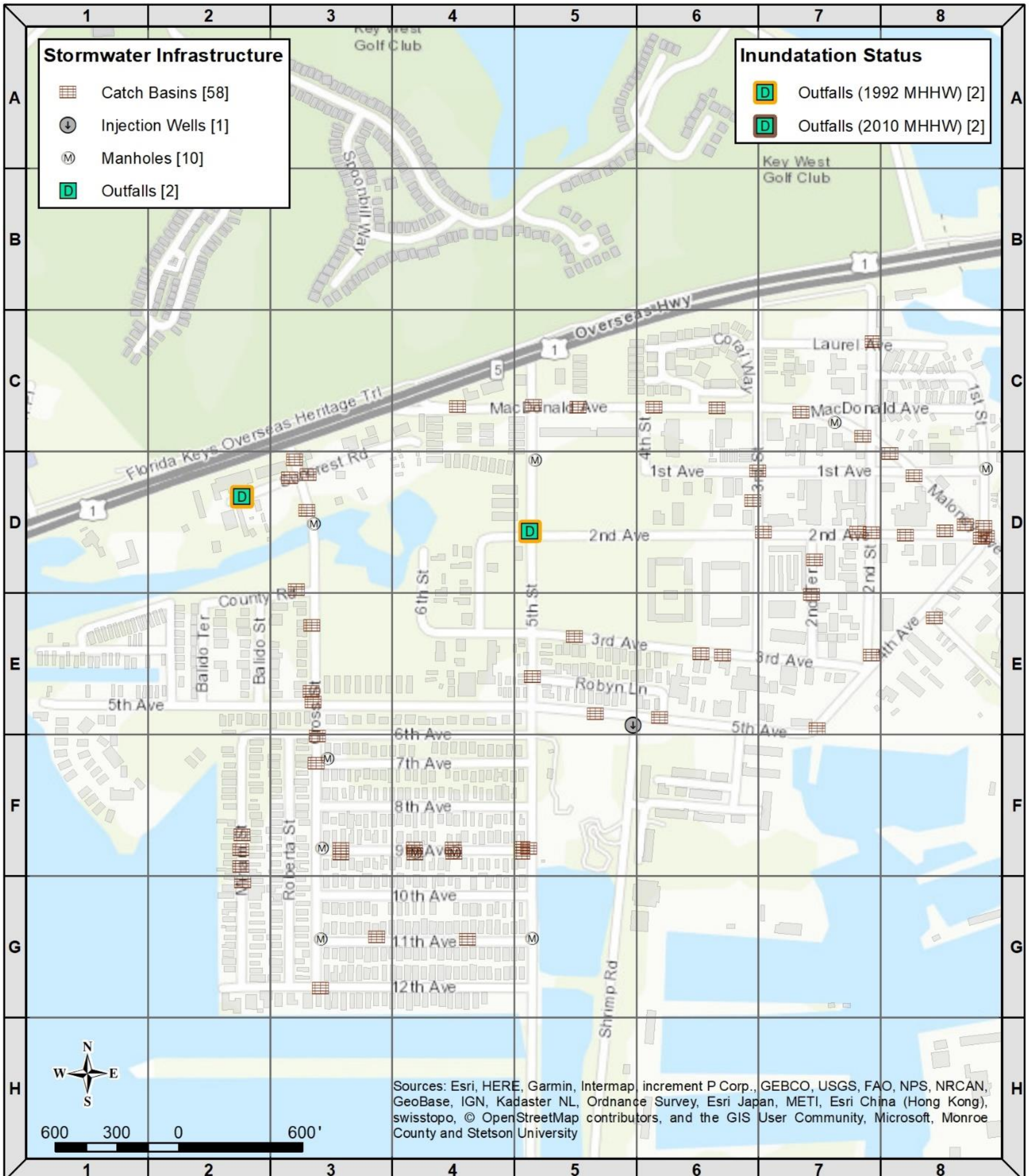

Extent Indicator

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Baseline

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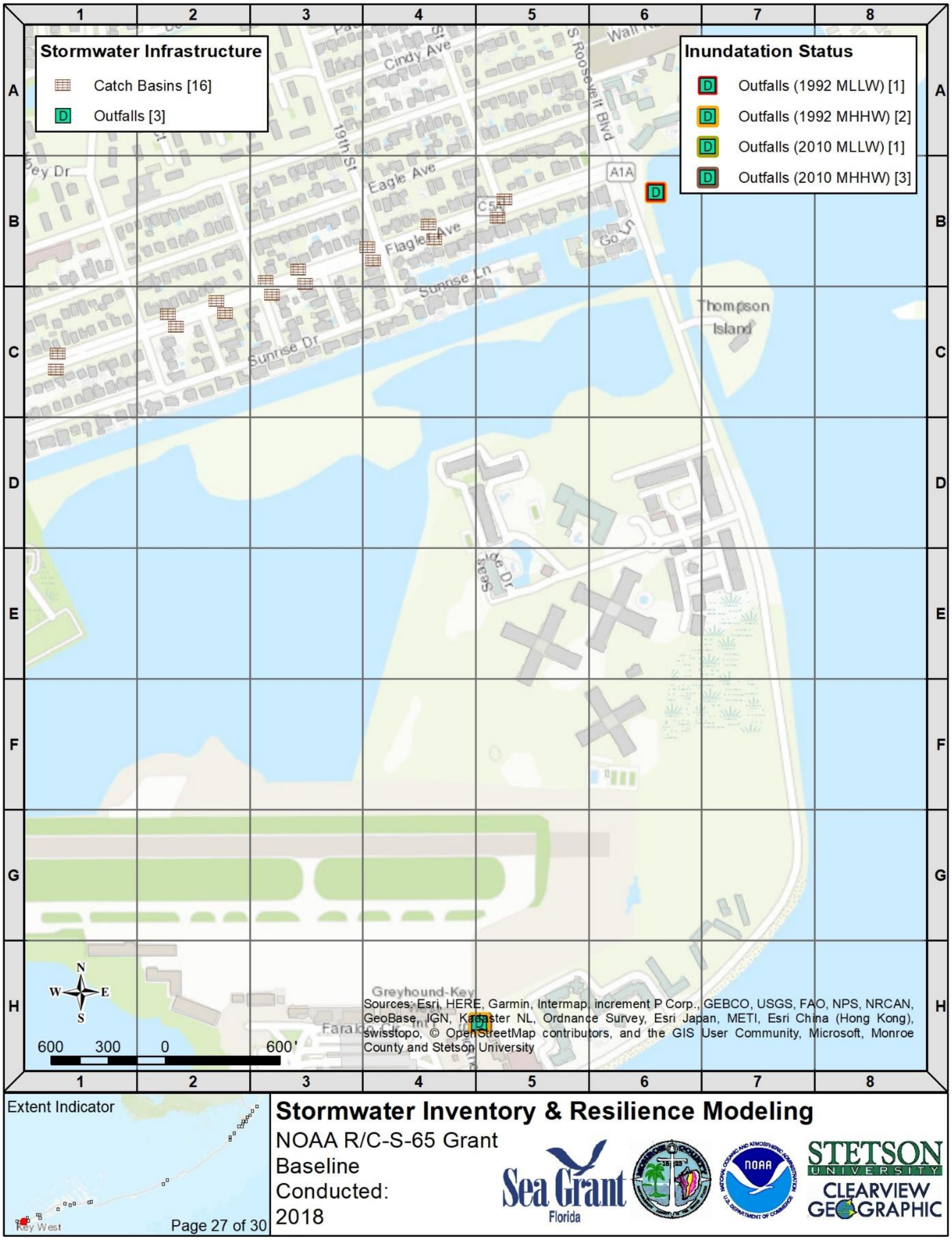

Map Series 1: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Existing Tidal Flooding, 1992 – 2010 Sea Level

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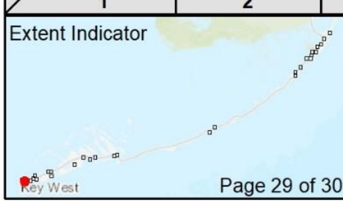

Stormwater Inventory & Resilience Modeling

NOAA R/C-S-65 Grant
Baseline
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2018

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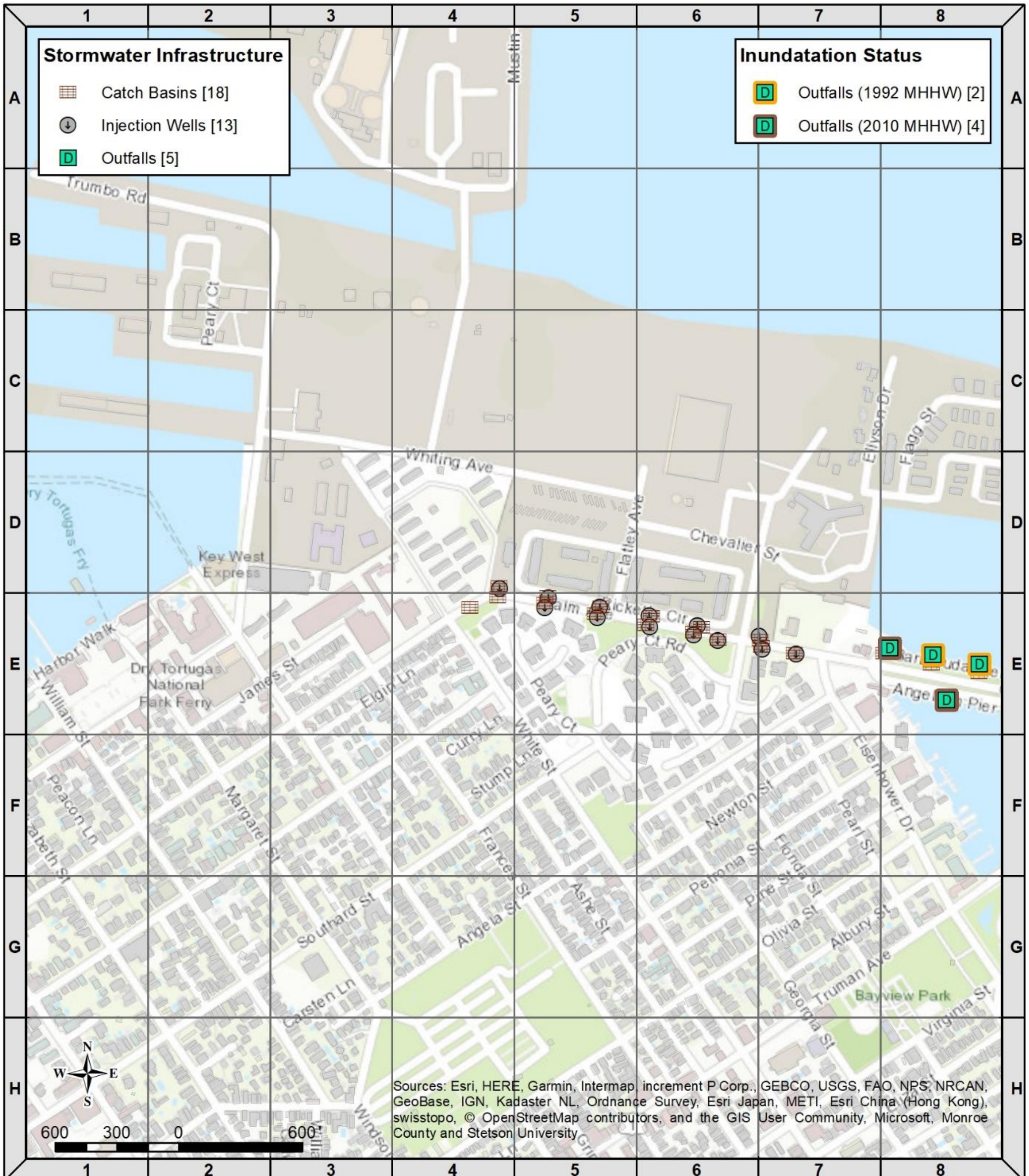

Extent Indicator

Key West

Stormwater Inventory & Resilience Modeling

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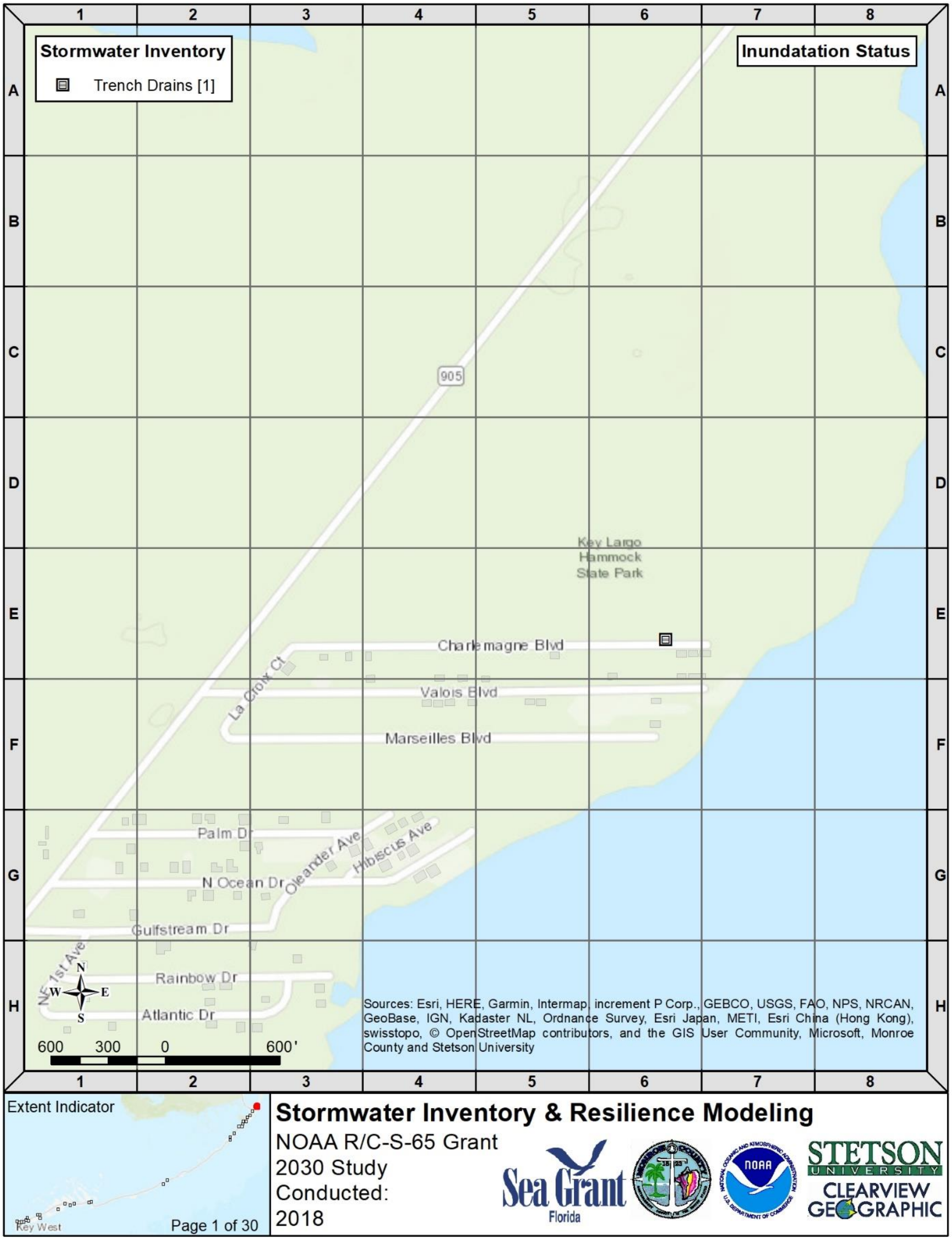
Map Series 2: Monroe County Stormwater Infrastructure Inventory with
Potential Future Vulnerability to Tidal Flooding, 2030 Low (6”) and 2030 High (10") Sea-Level Rise



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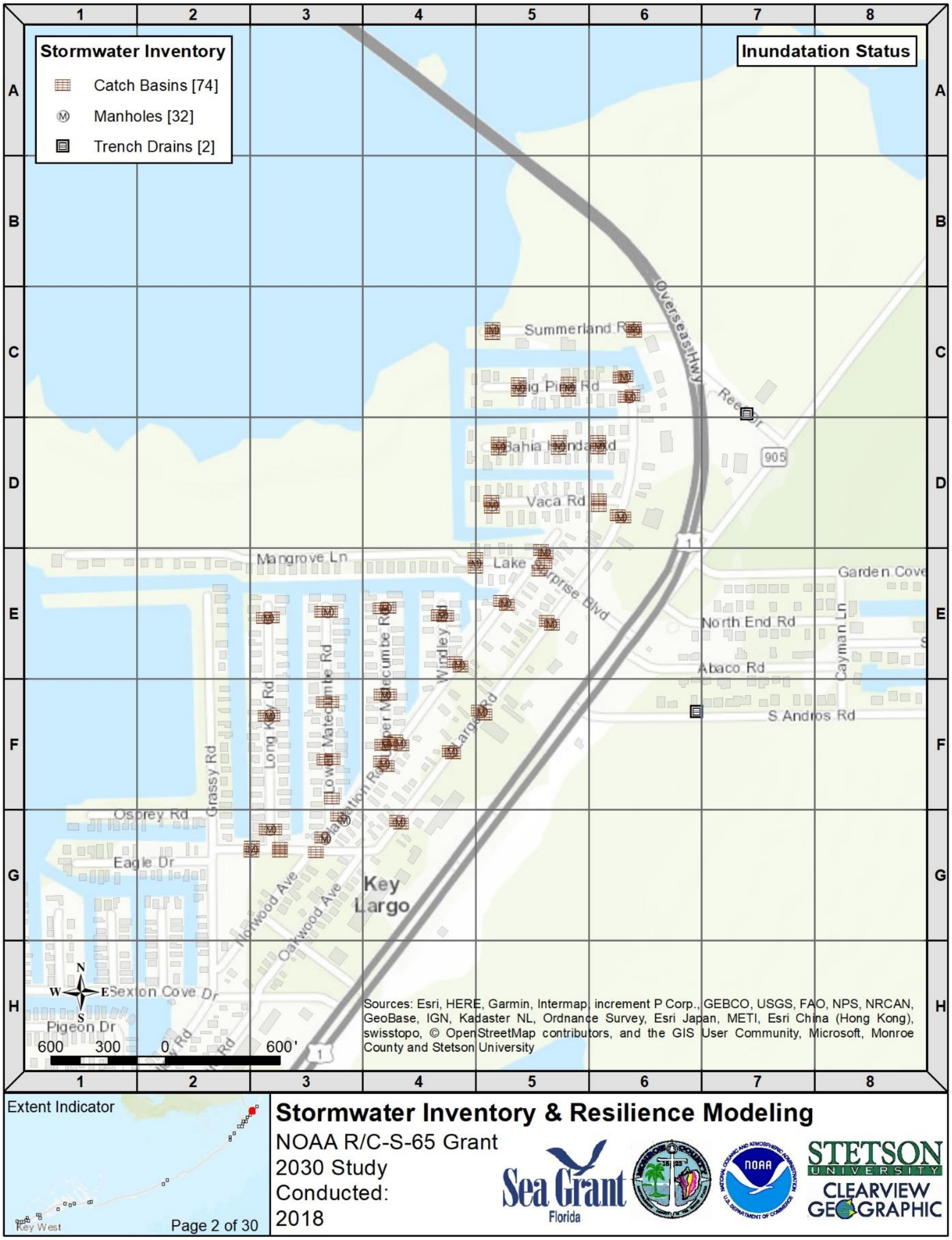

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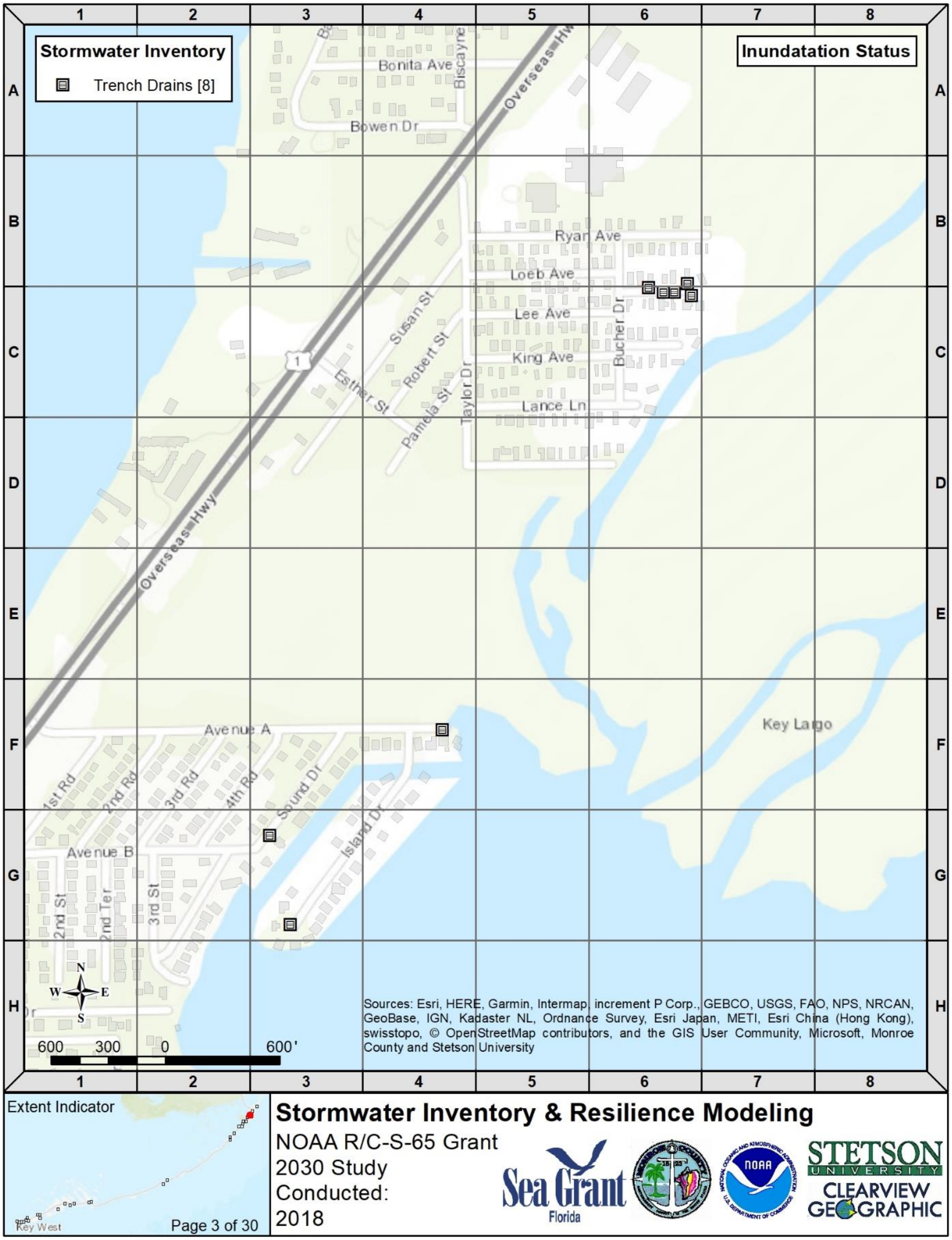

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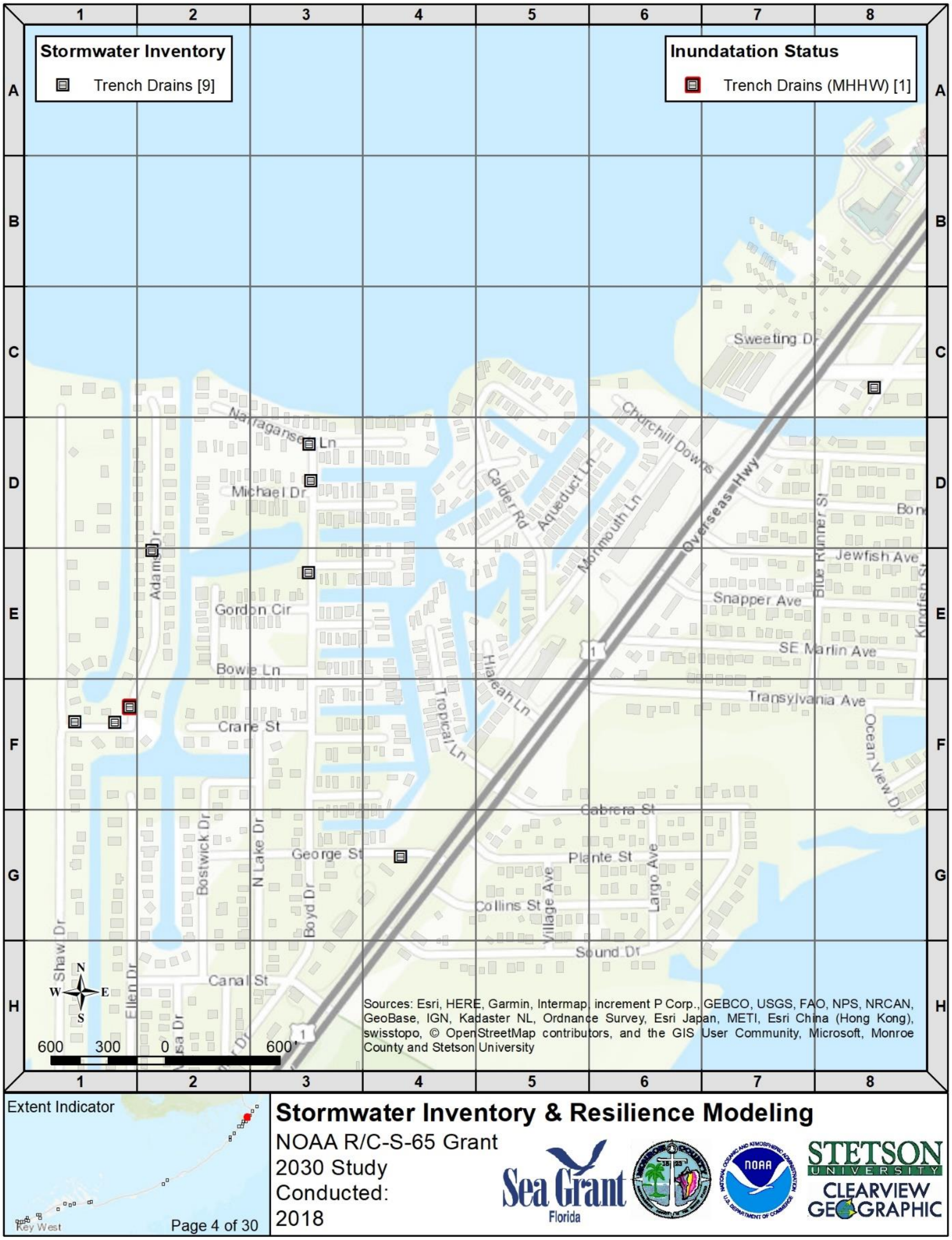

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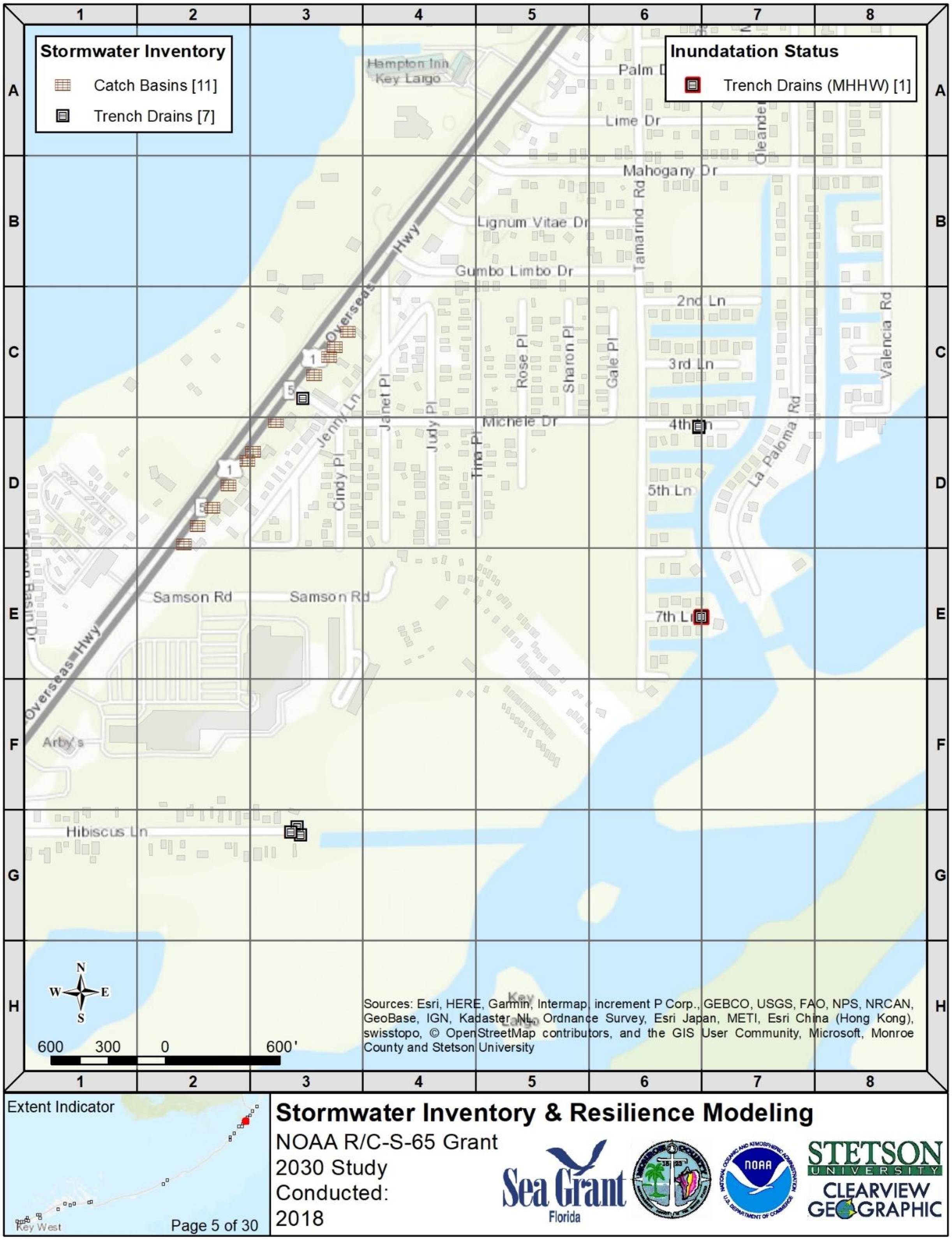

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Map Series 2: Monroe County Stormwater Infrastructure Inventory with
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Potential Future Vulnerability to Tidal Flooding, 2030 Low (6”) and 2030 High (10") Sea-Level Rise

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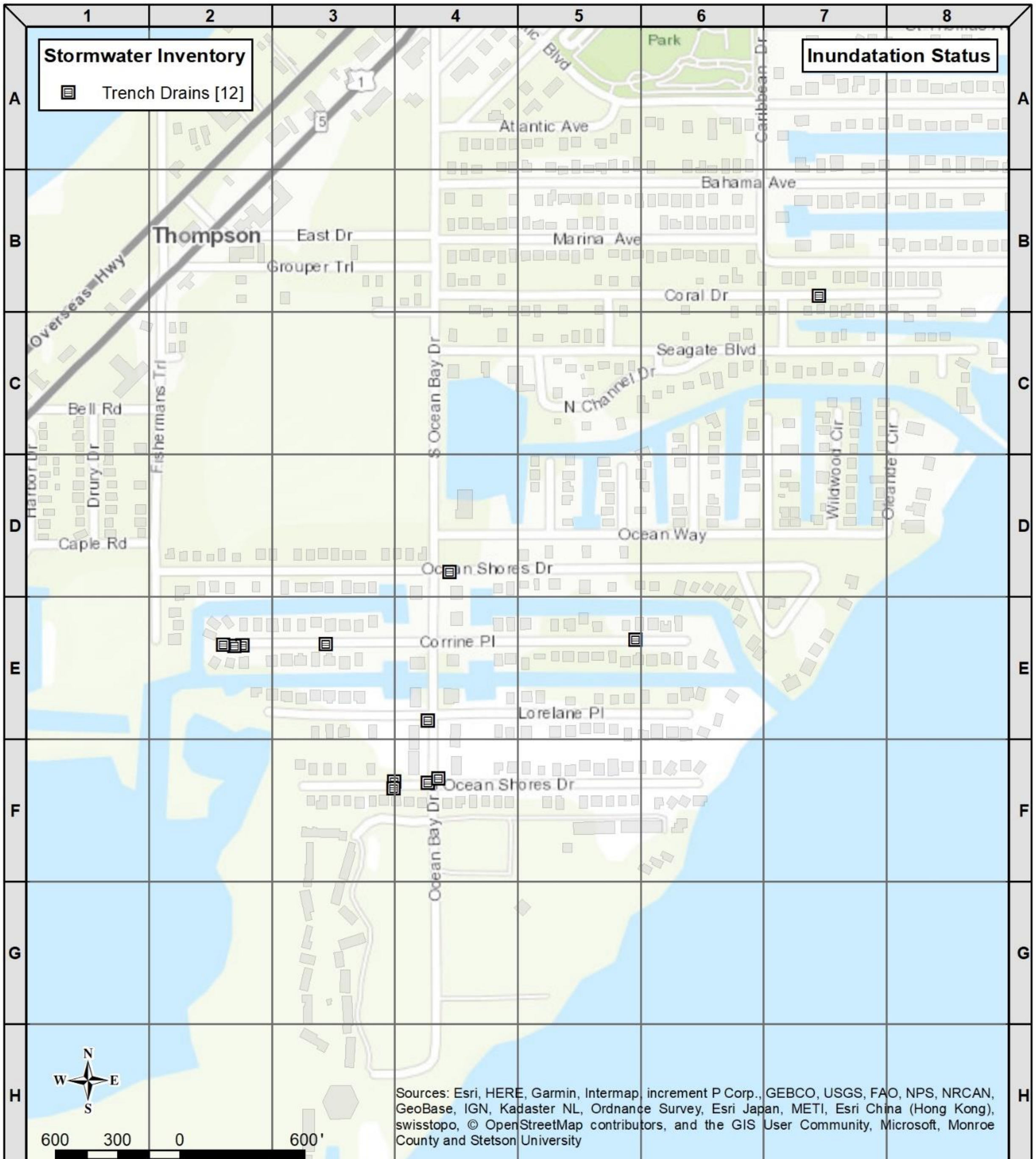

Extent Indicator

Key West

Stormwater Inventory & Resilience Modeling

NOAA R/C-S-65 Grant
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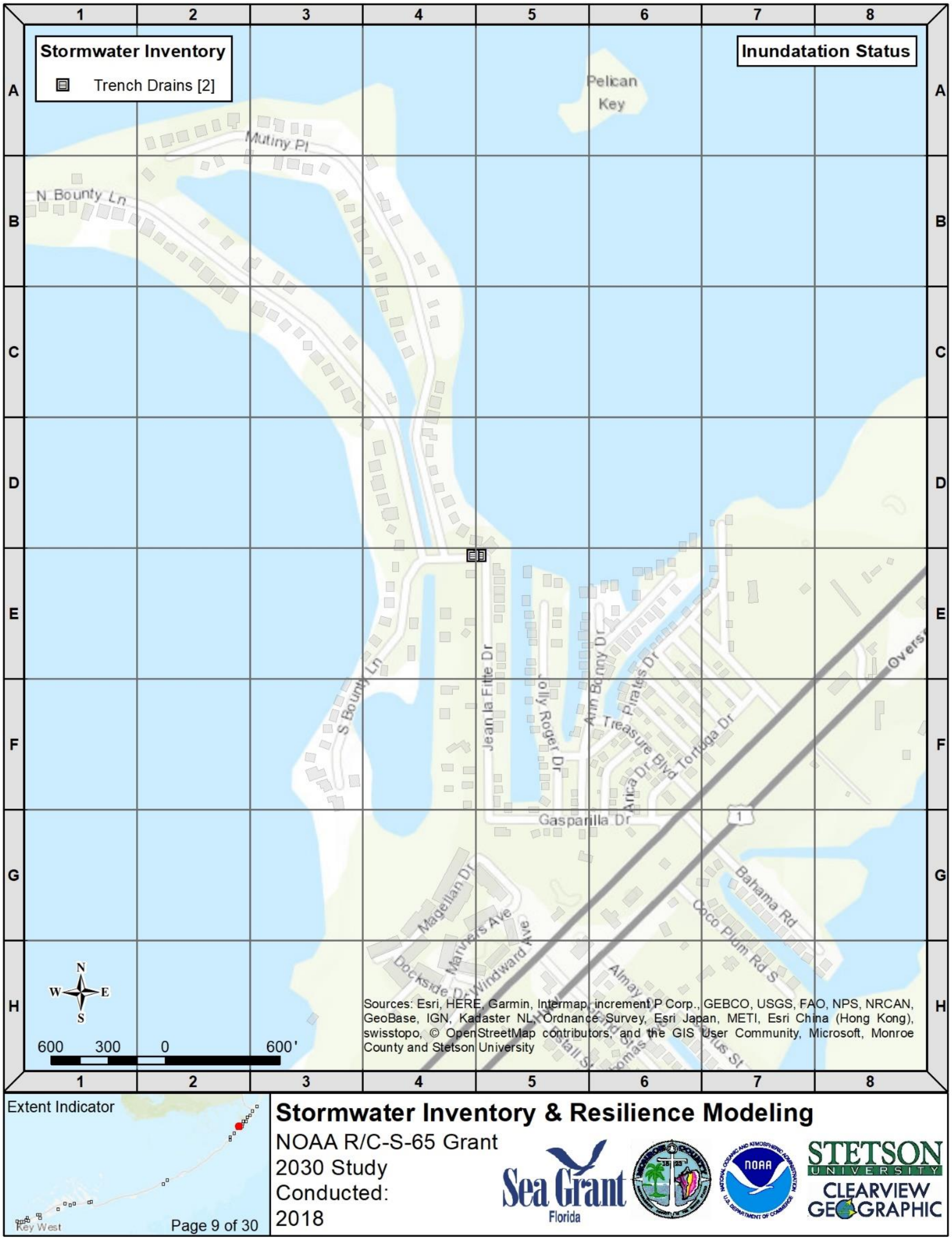

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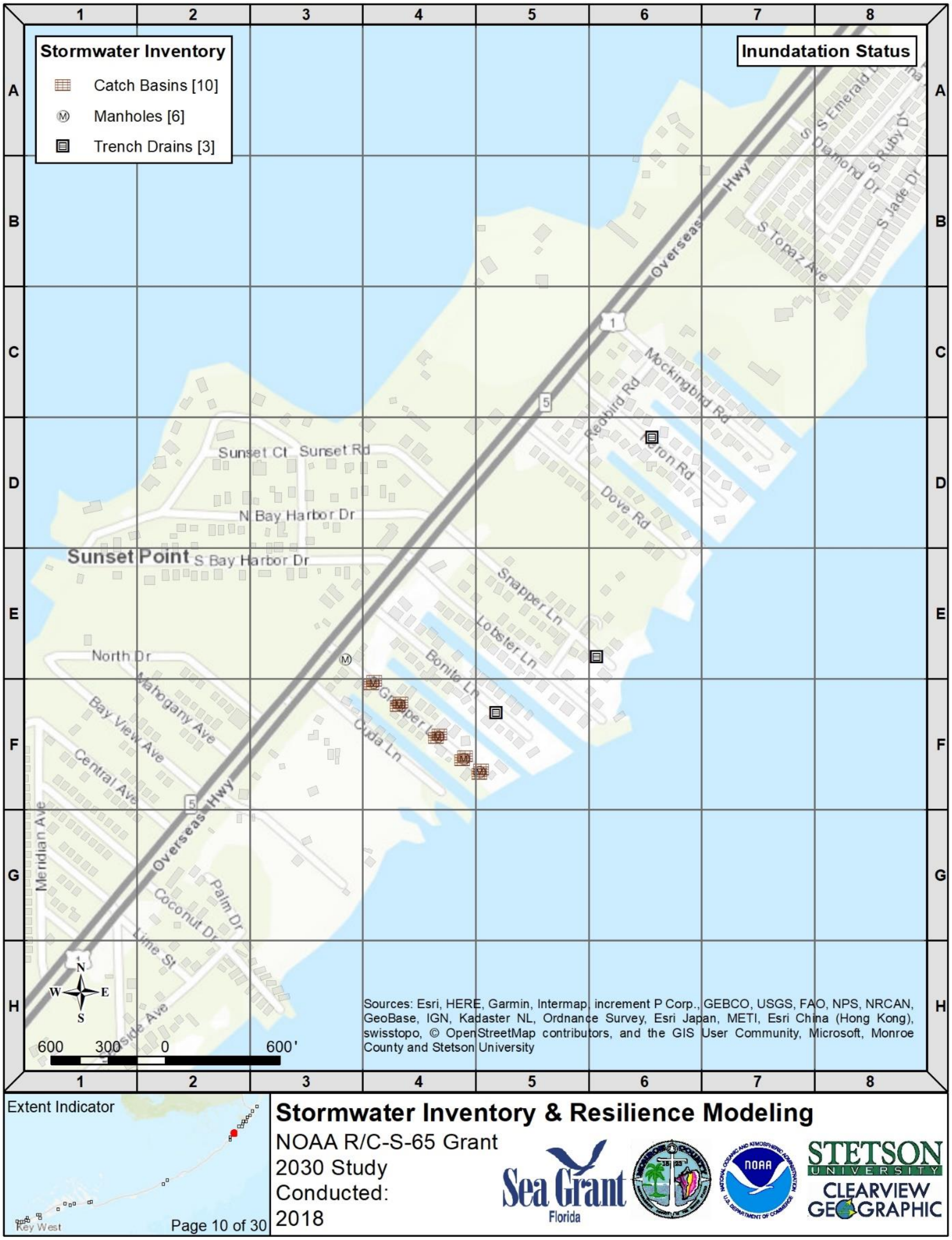

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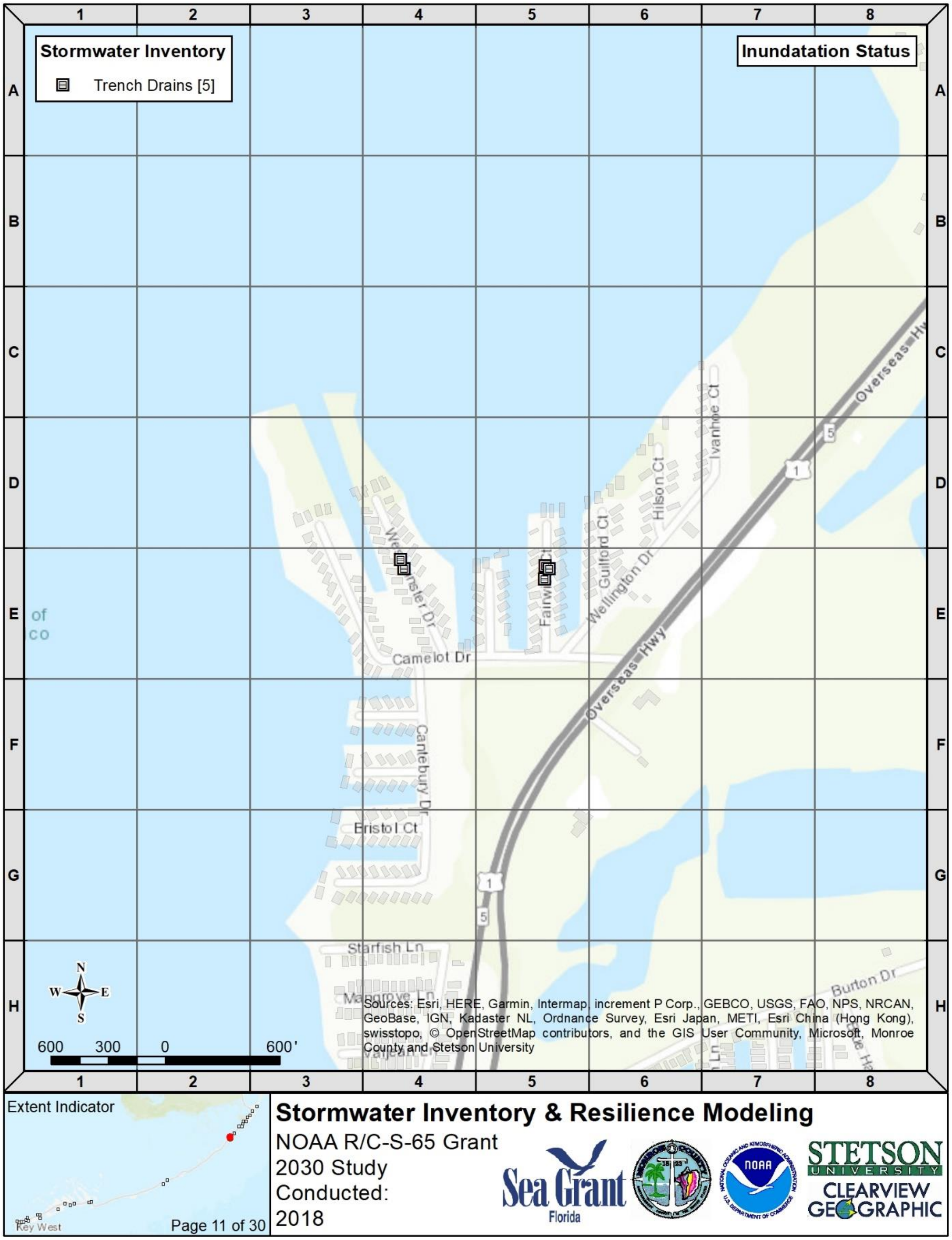

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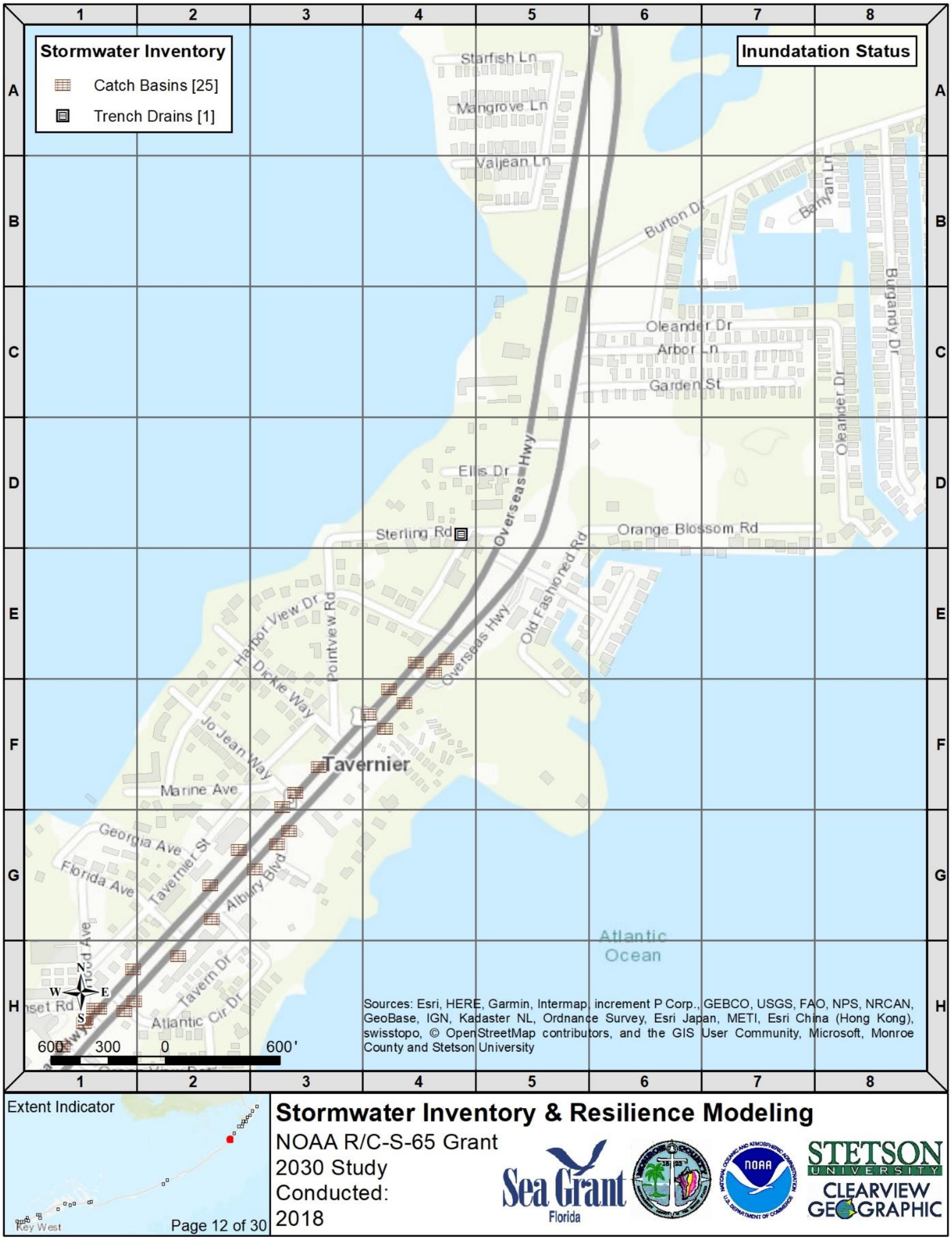

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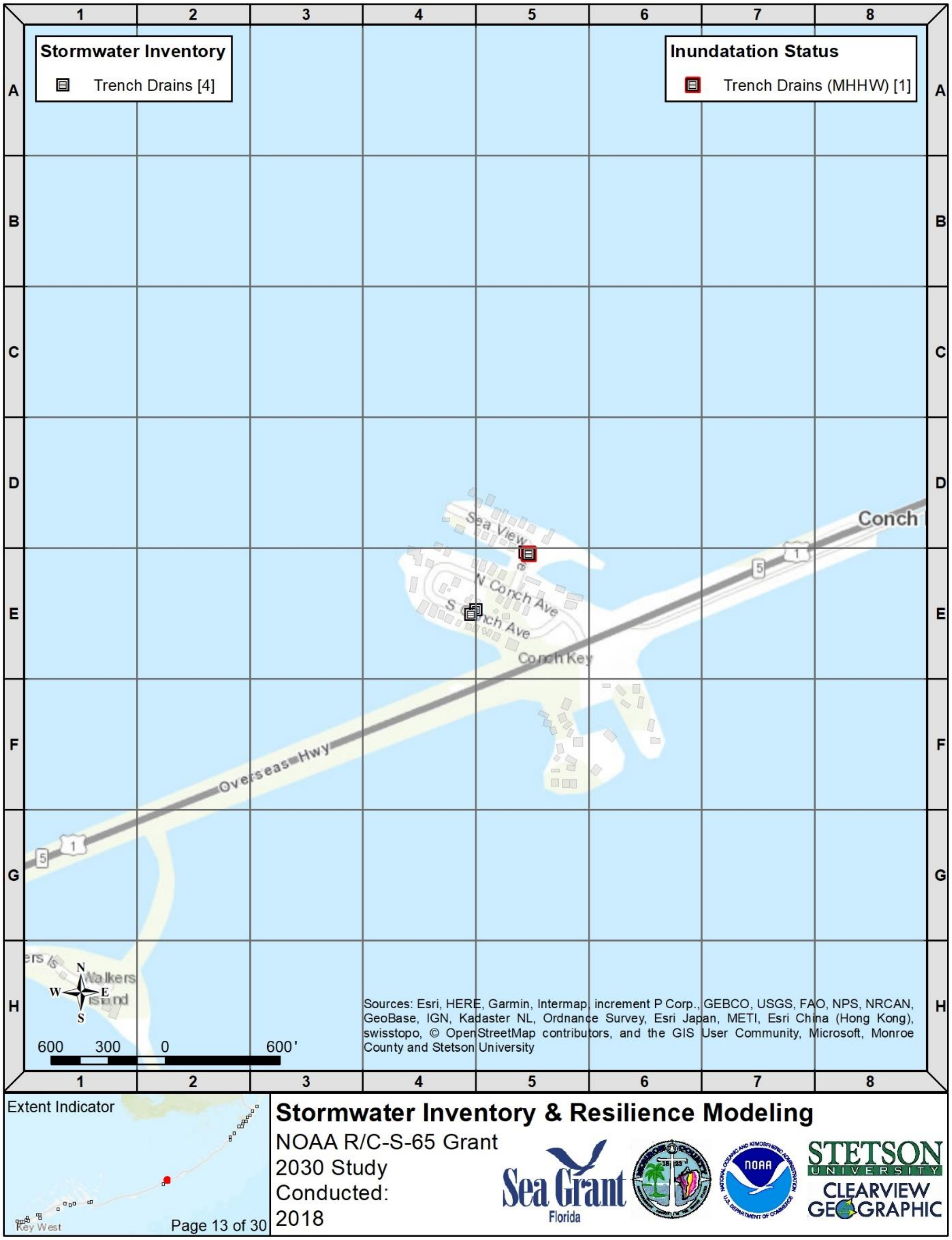

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Extent Indicator

Stormwater Inventory & Resilience Modeling
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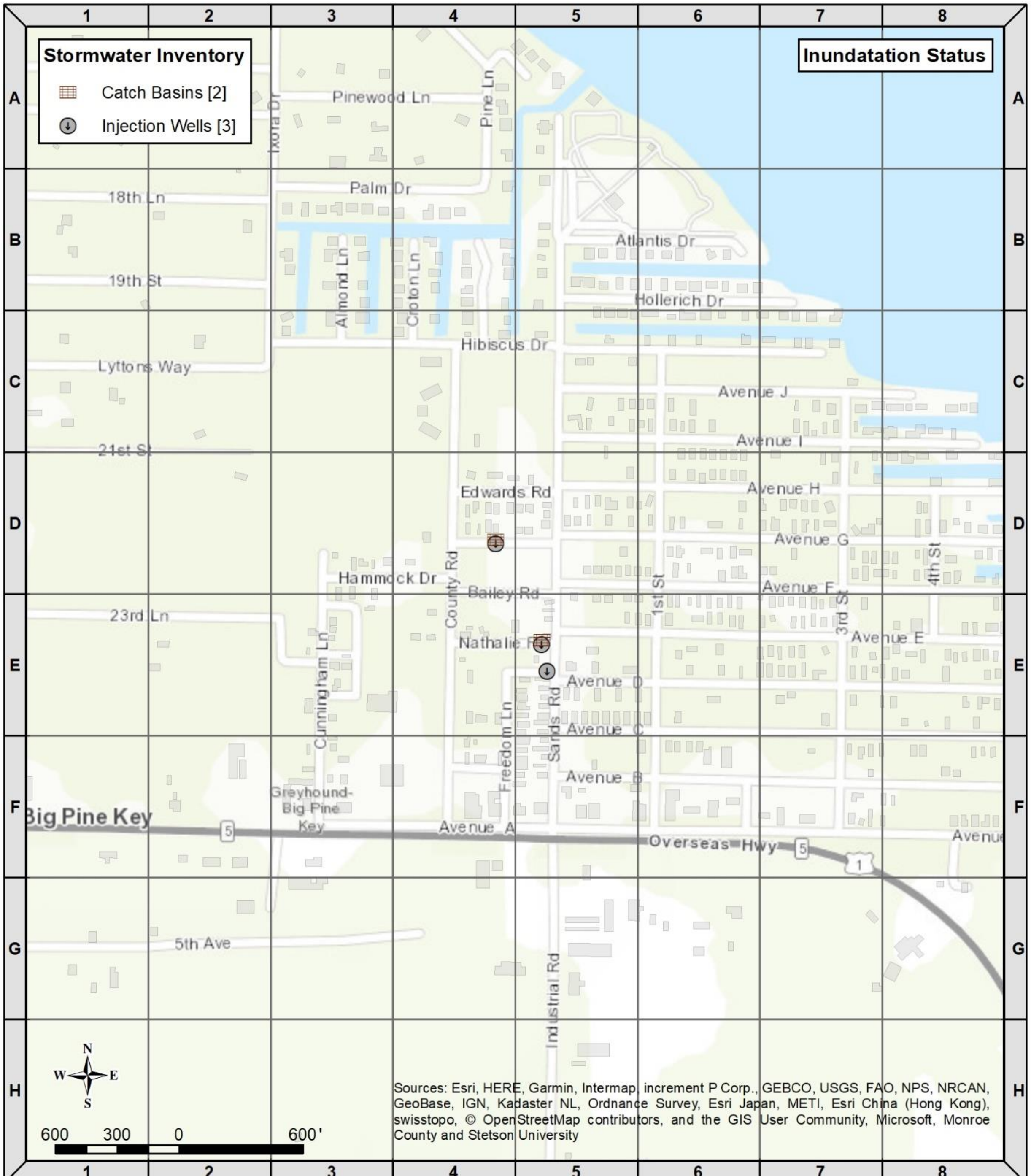

Extent Indicator

Key West

Stormwater Inventory & Resilience Modeling

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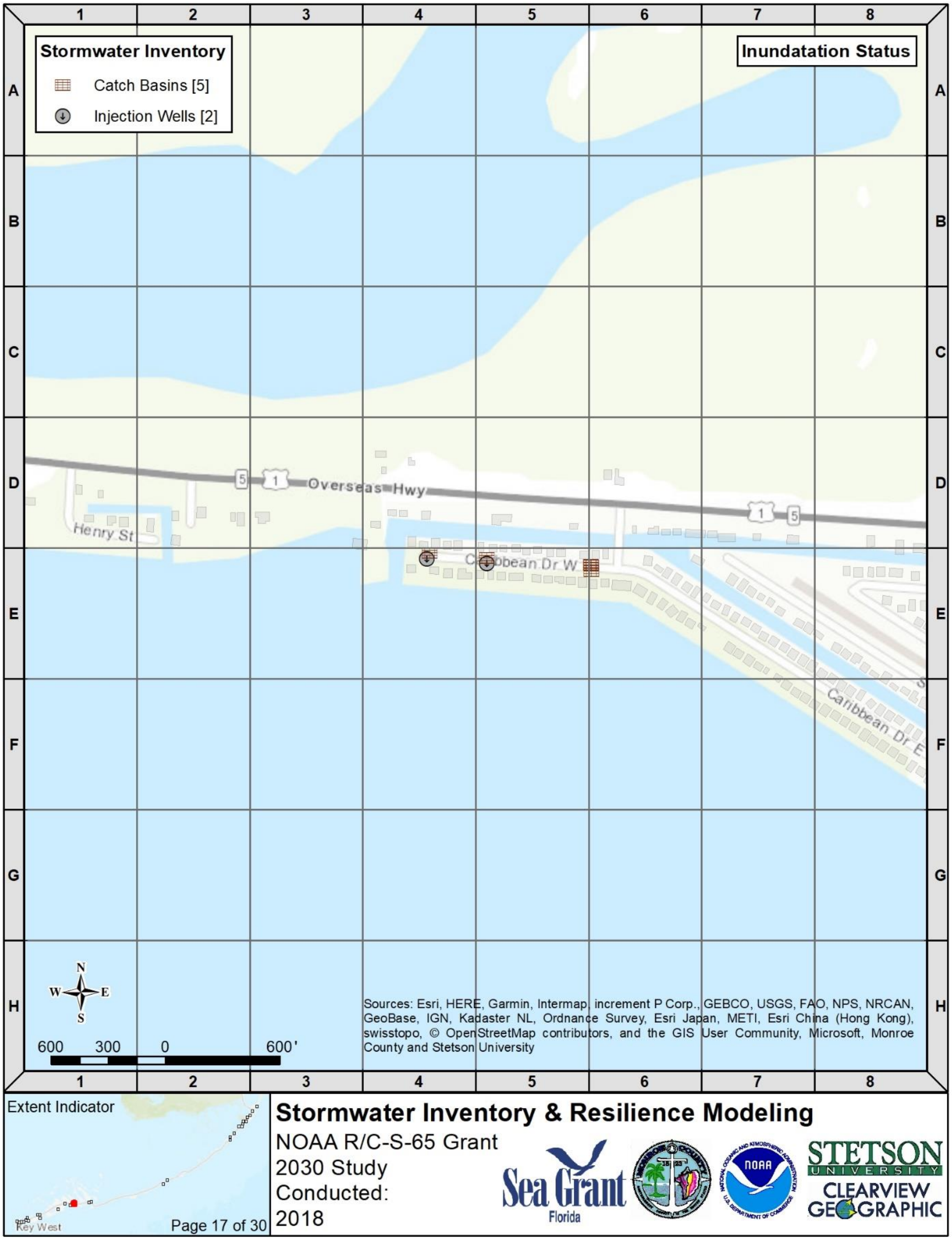

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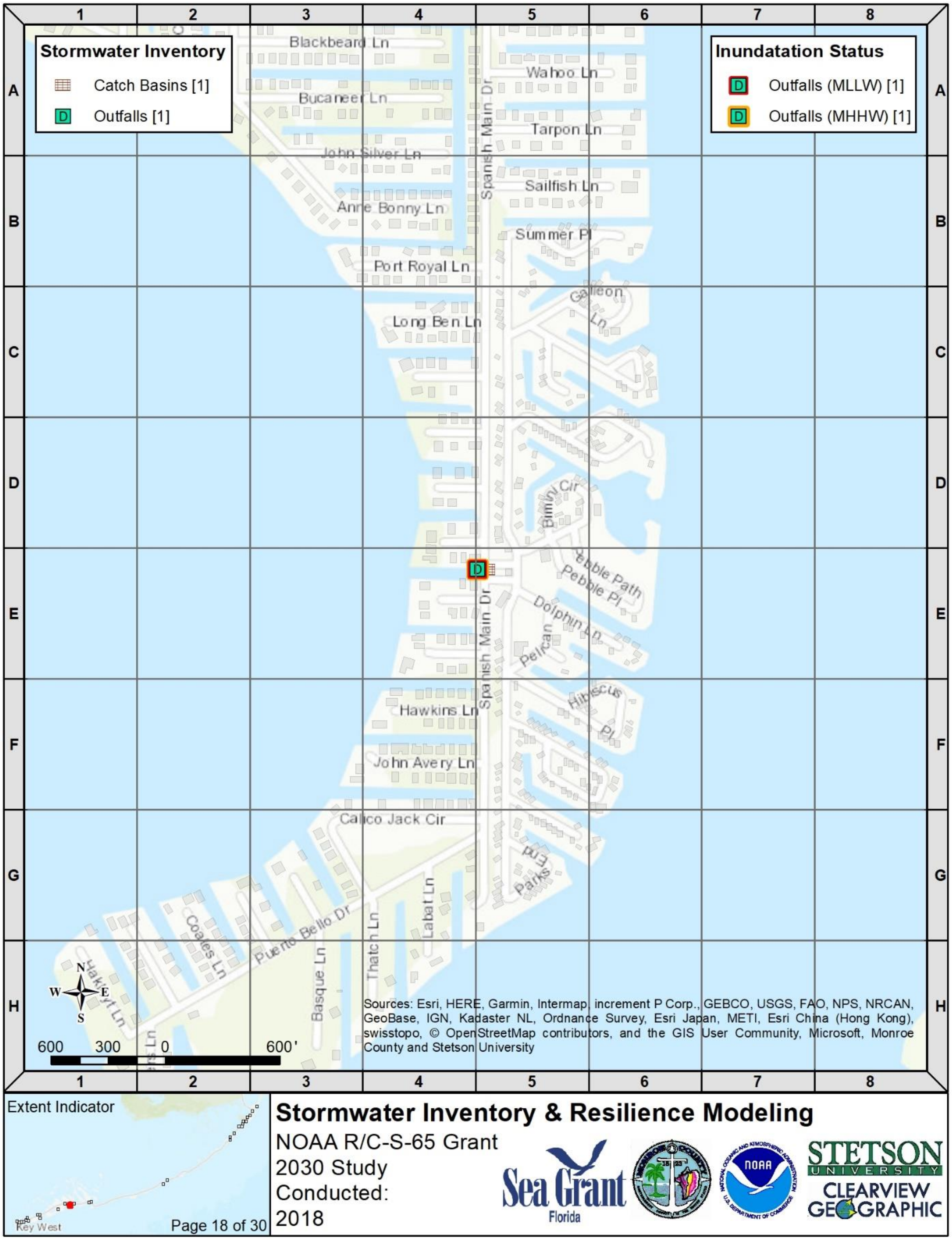

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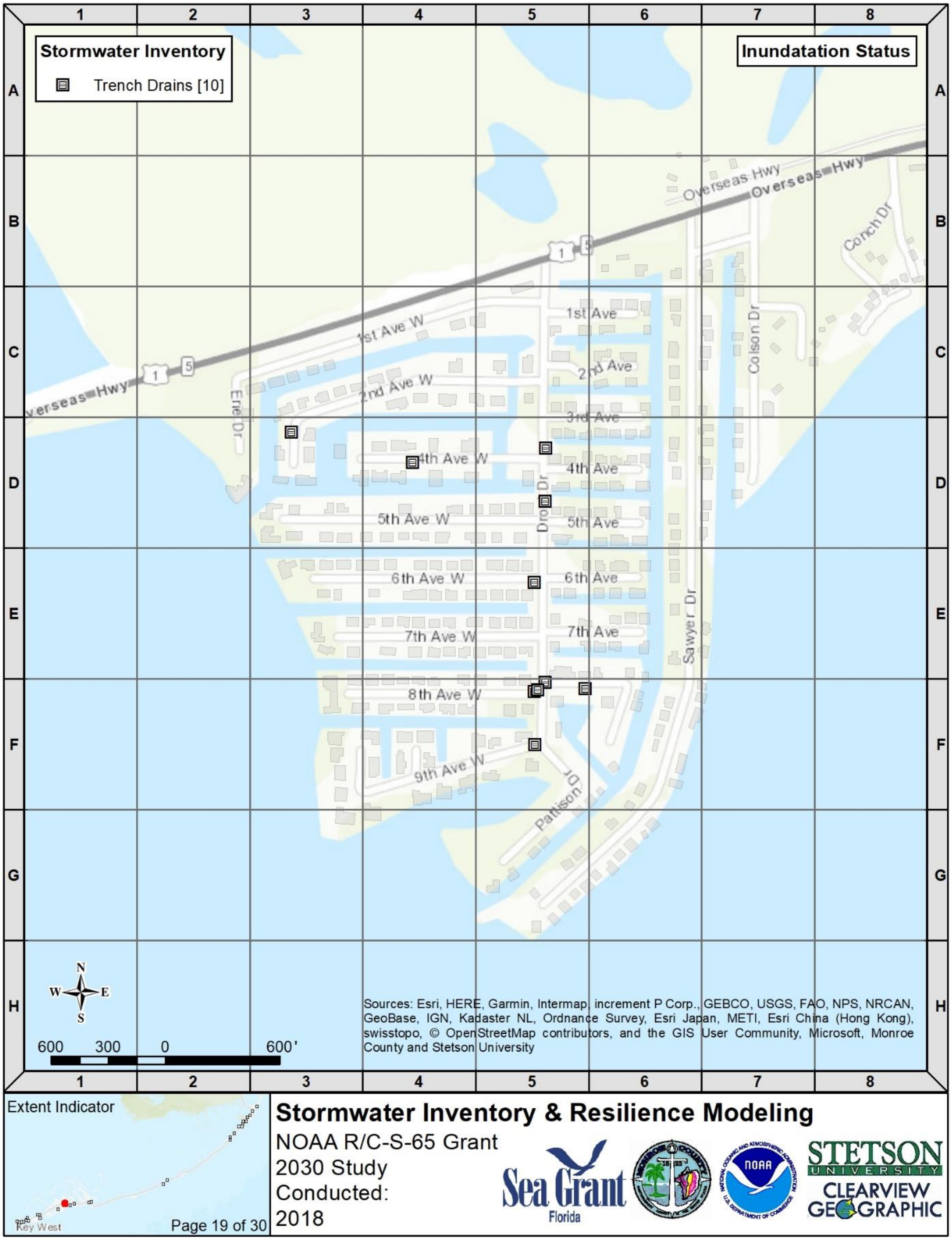

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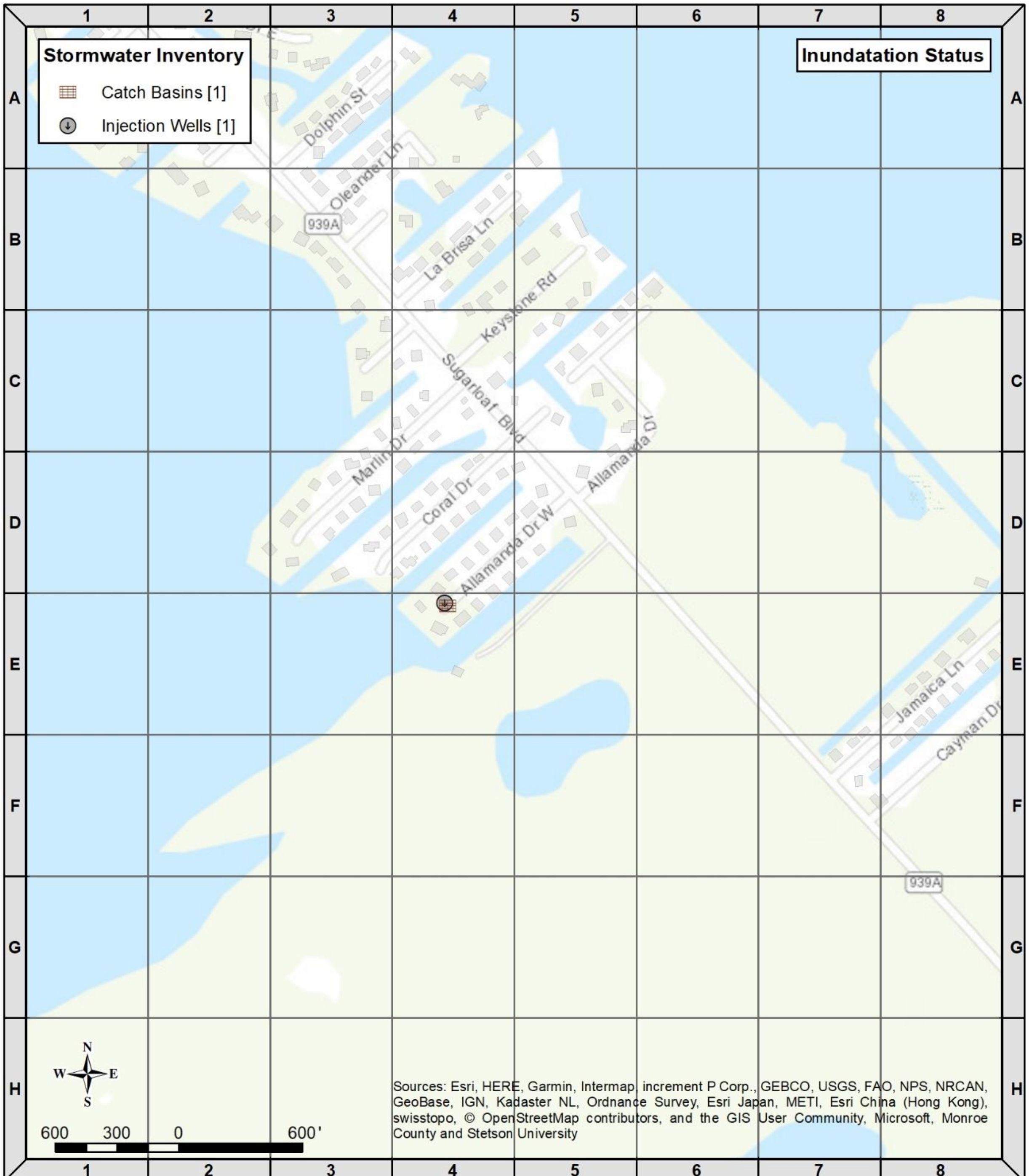

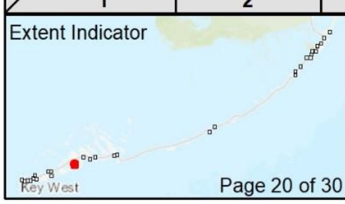

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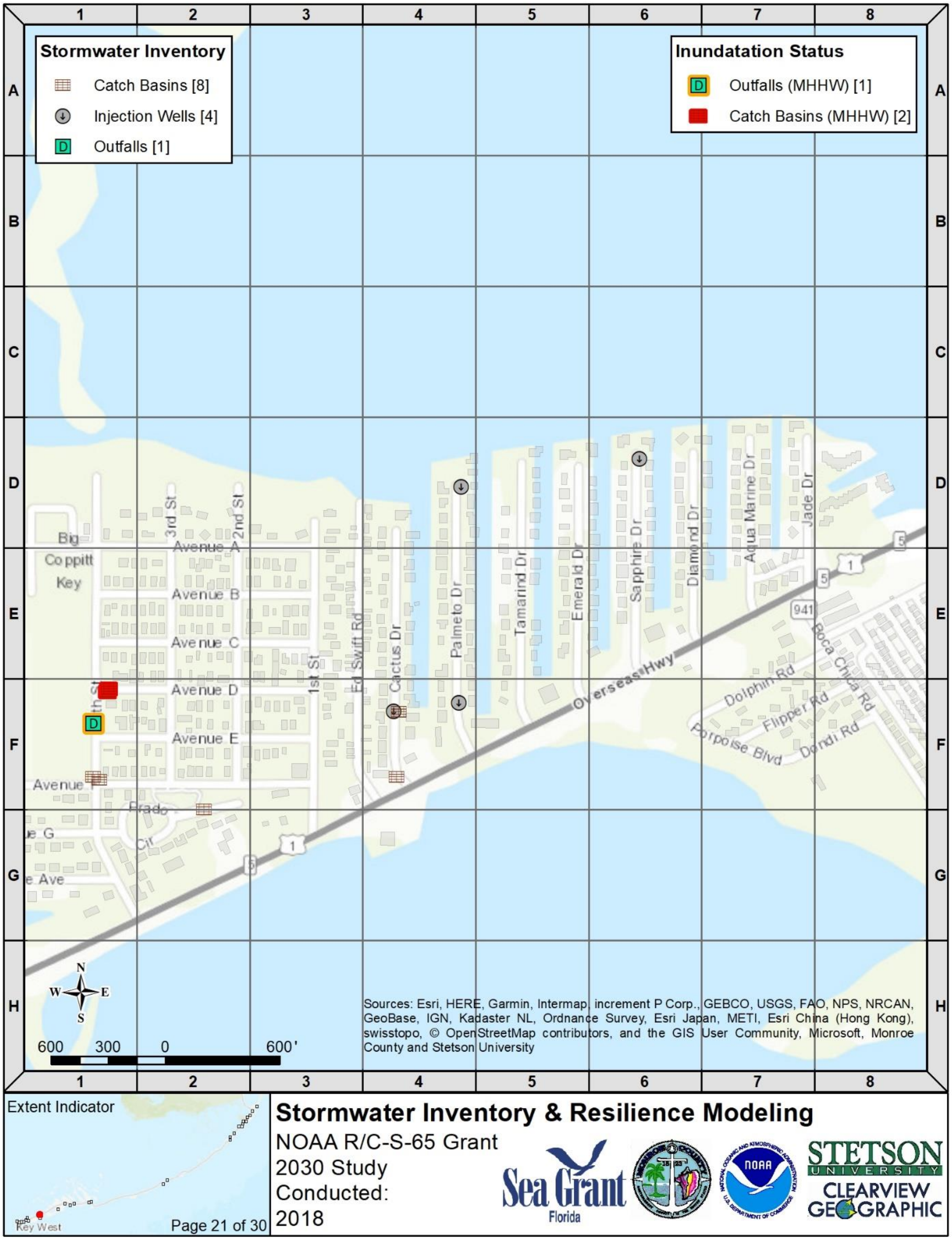

Stormwater Inventory & Resilience Modeling
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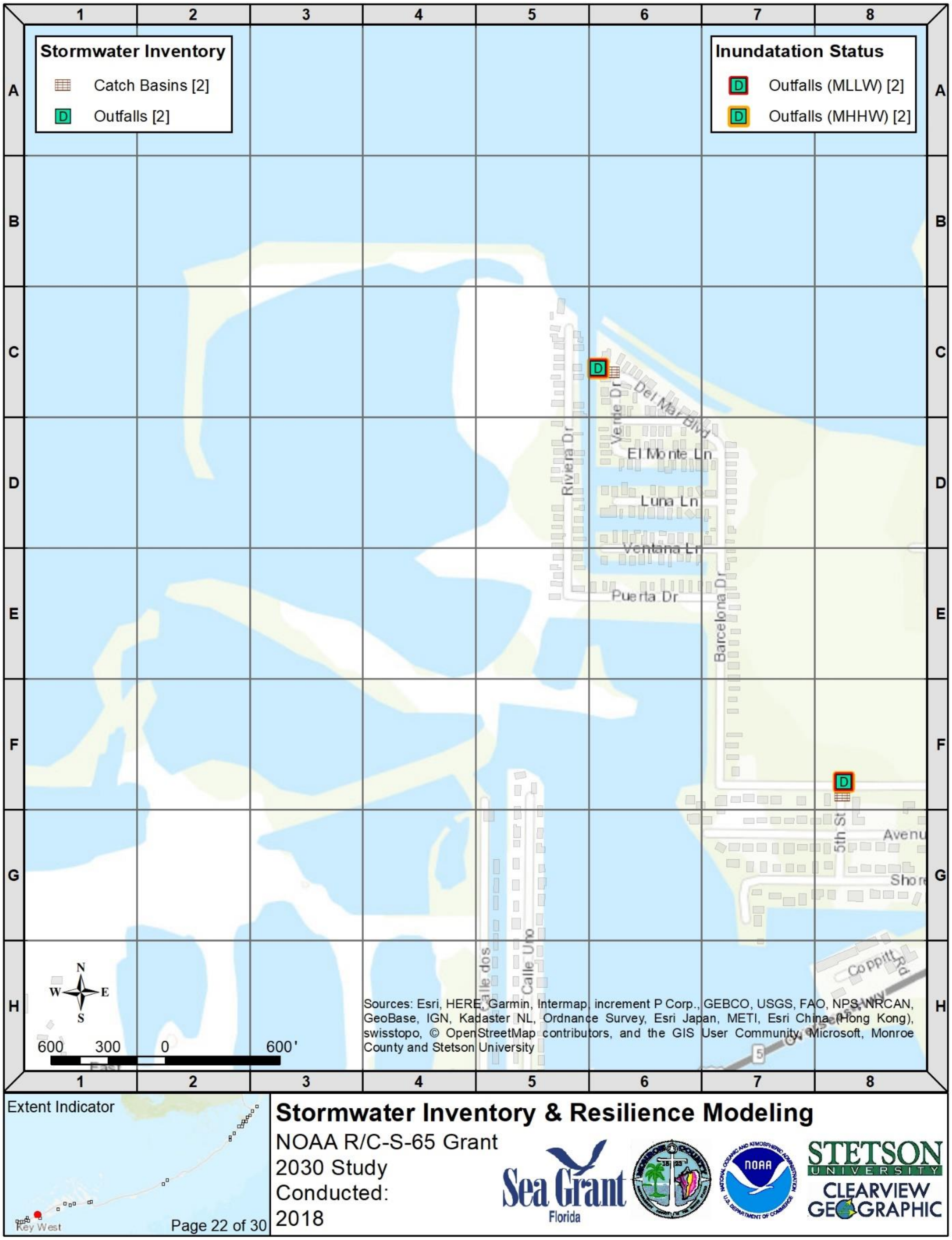

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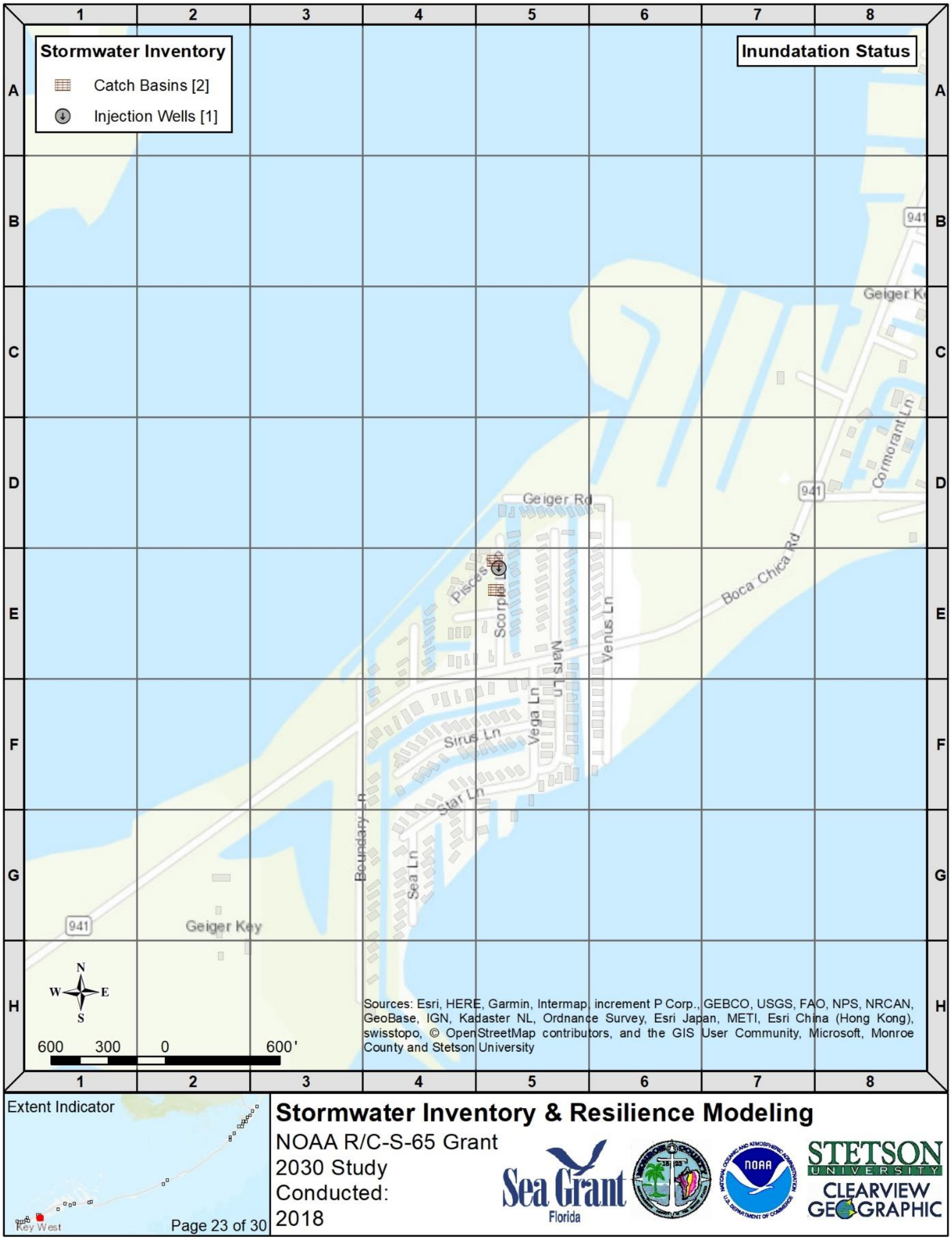

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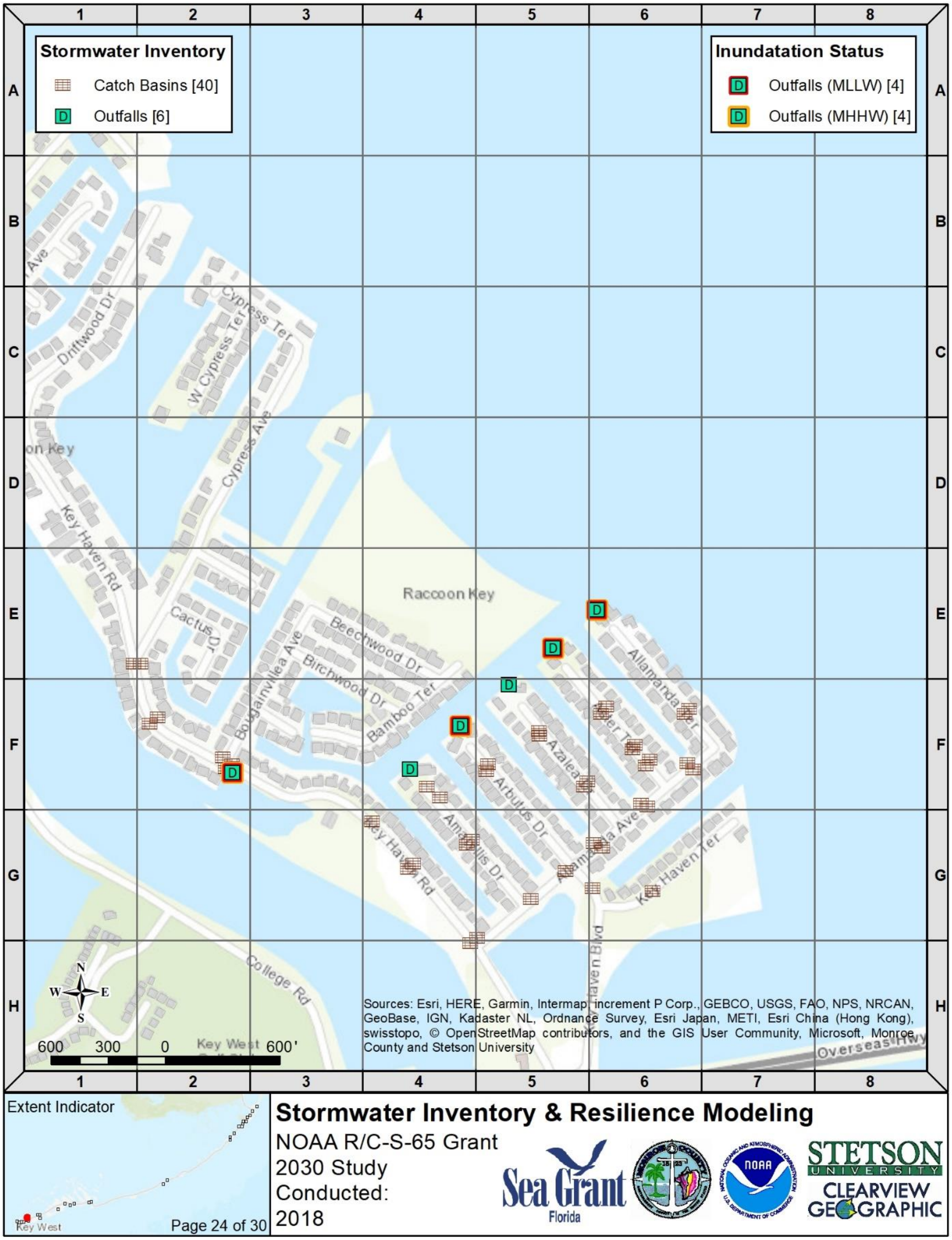

Stormwater Inventory & Resilience Modeling

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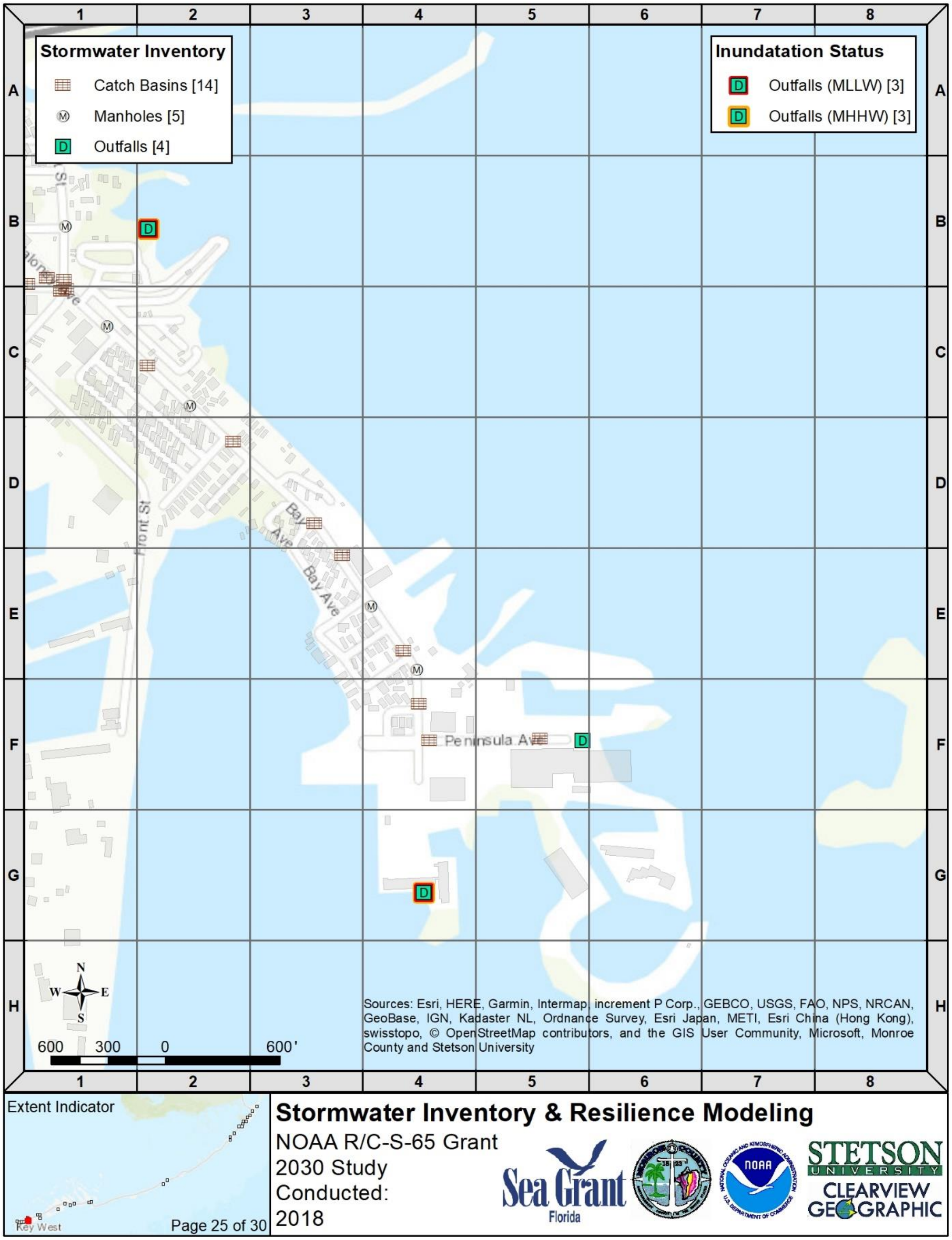

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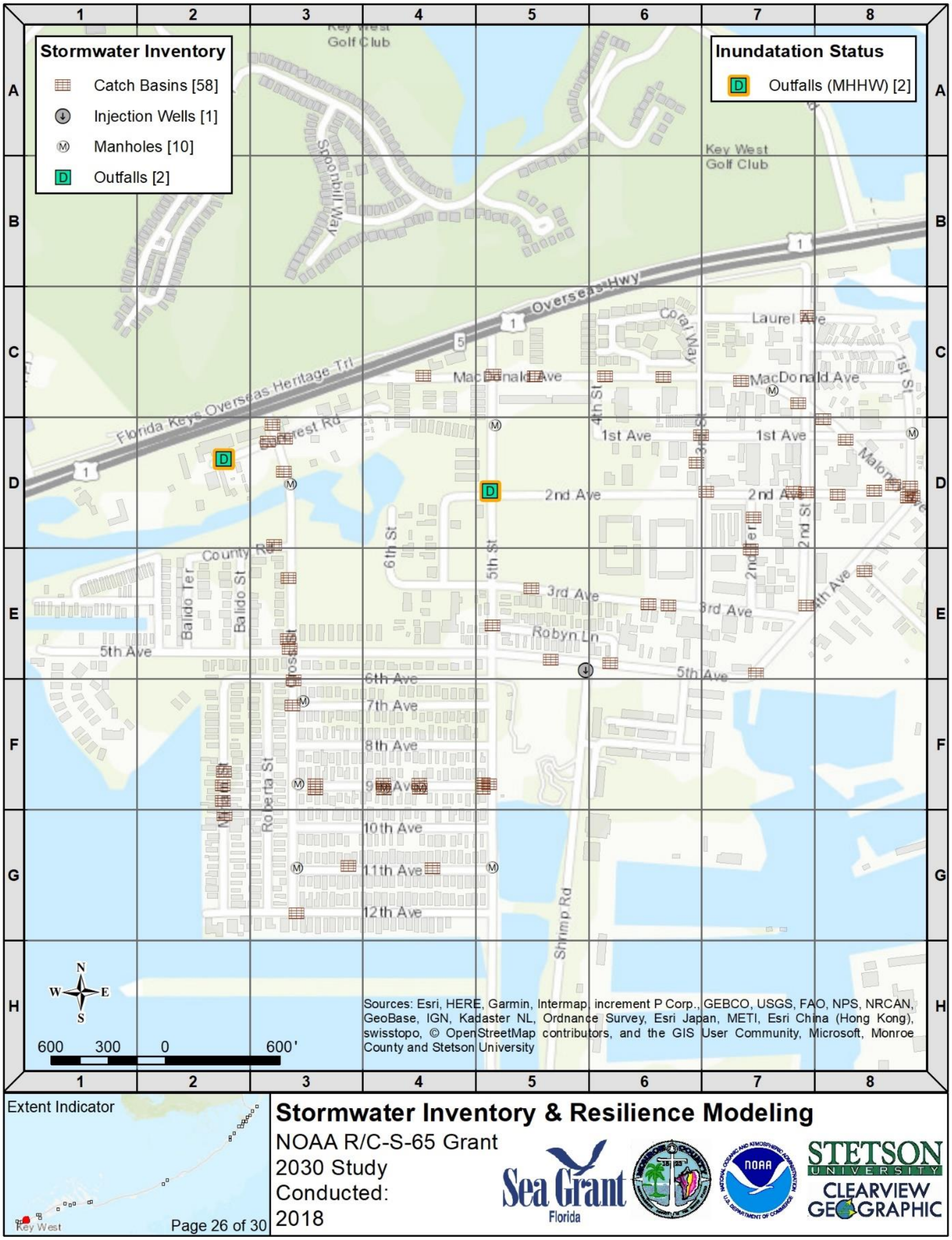

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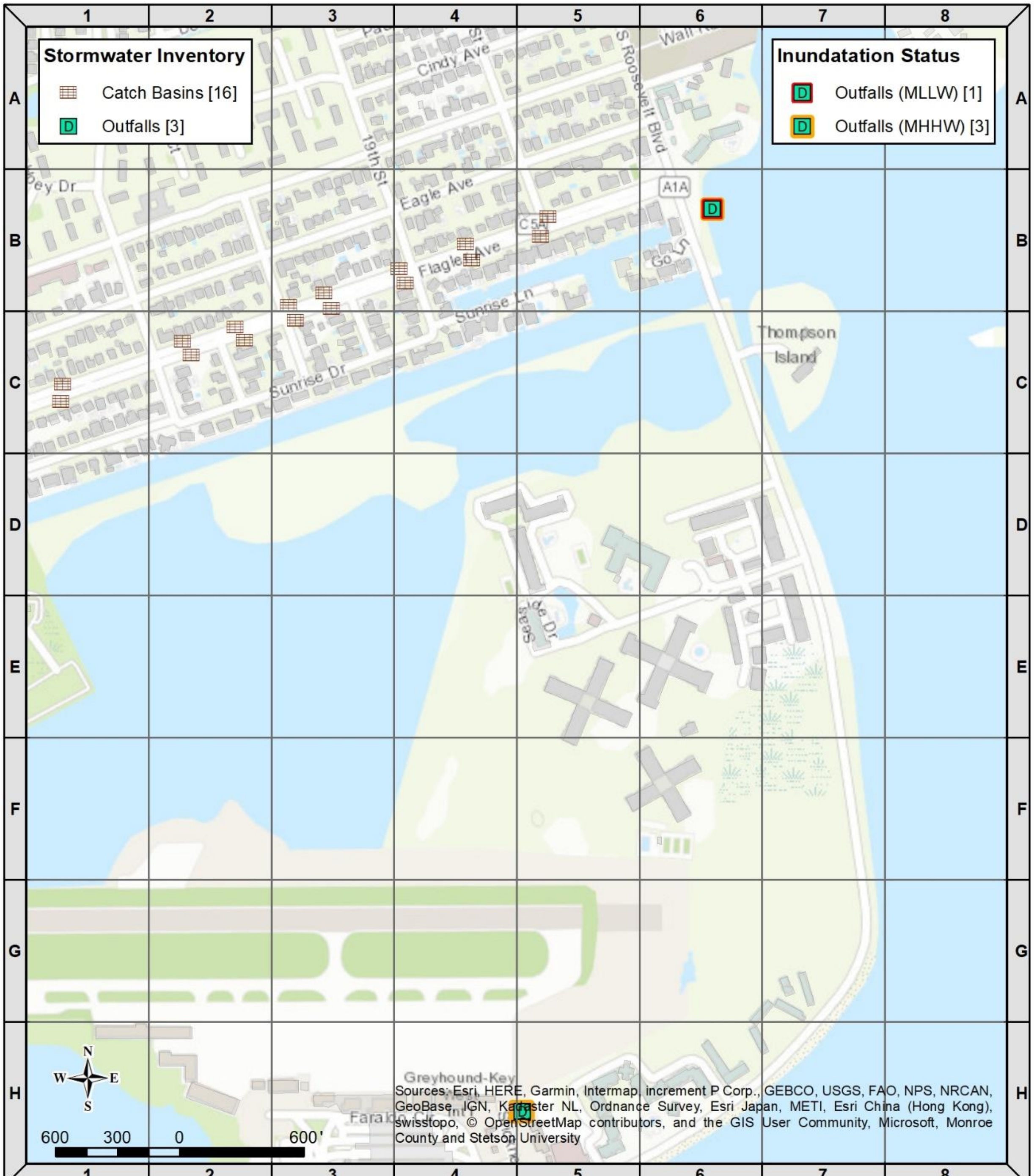

Stormwater Inventory & Resilience Modeling

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2018

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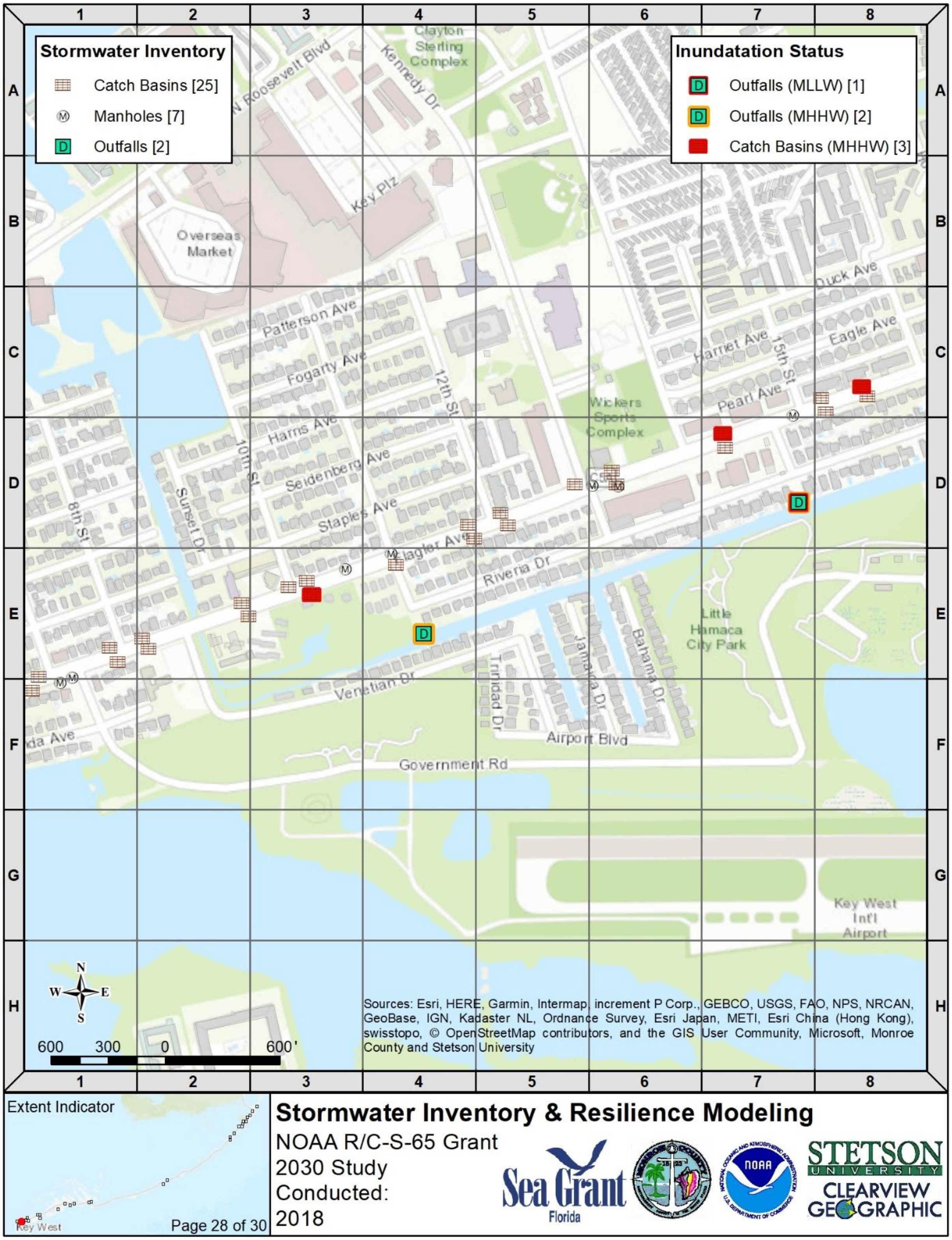

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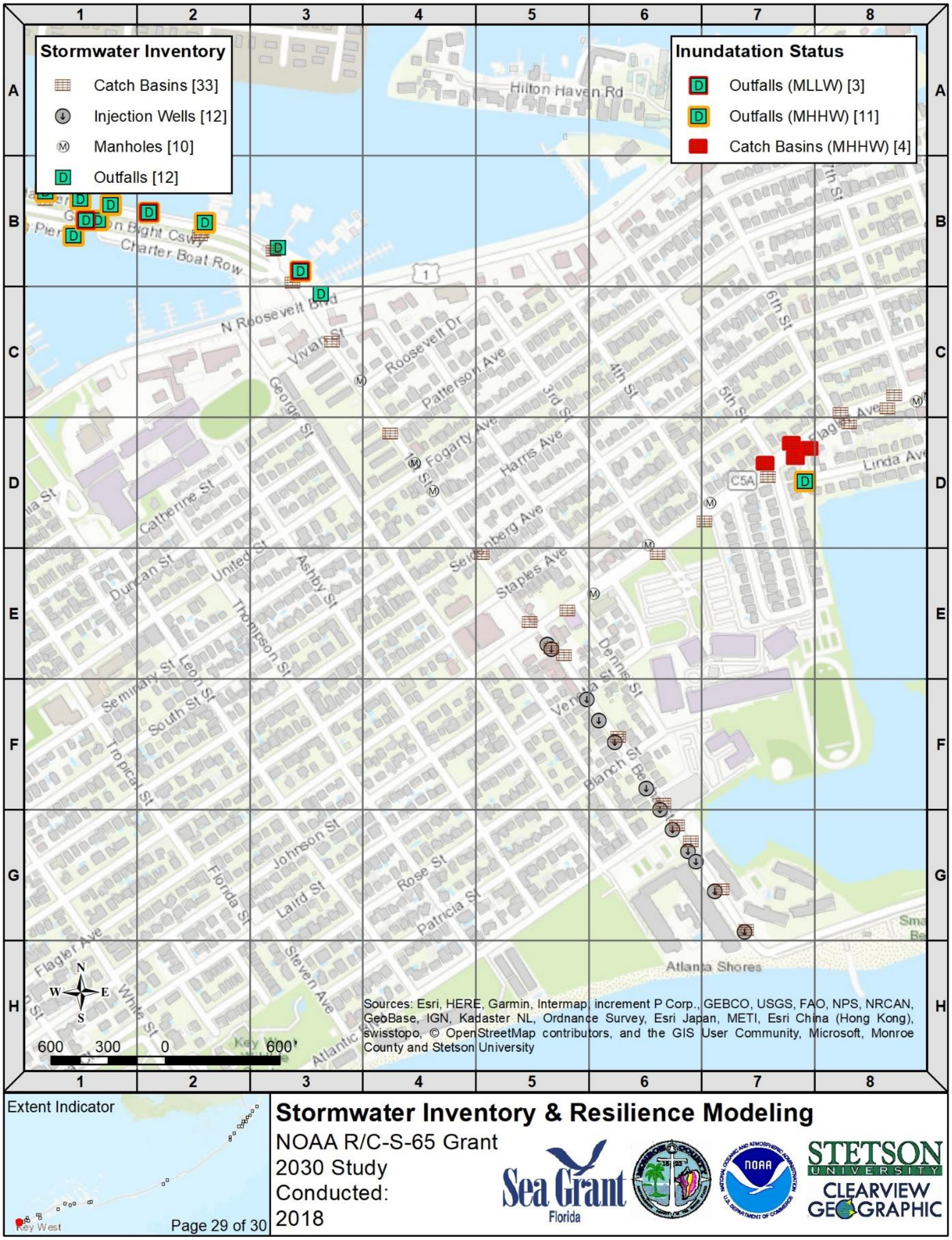

Stormwater Inventory & Resilience Modeling
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2018

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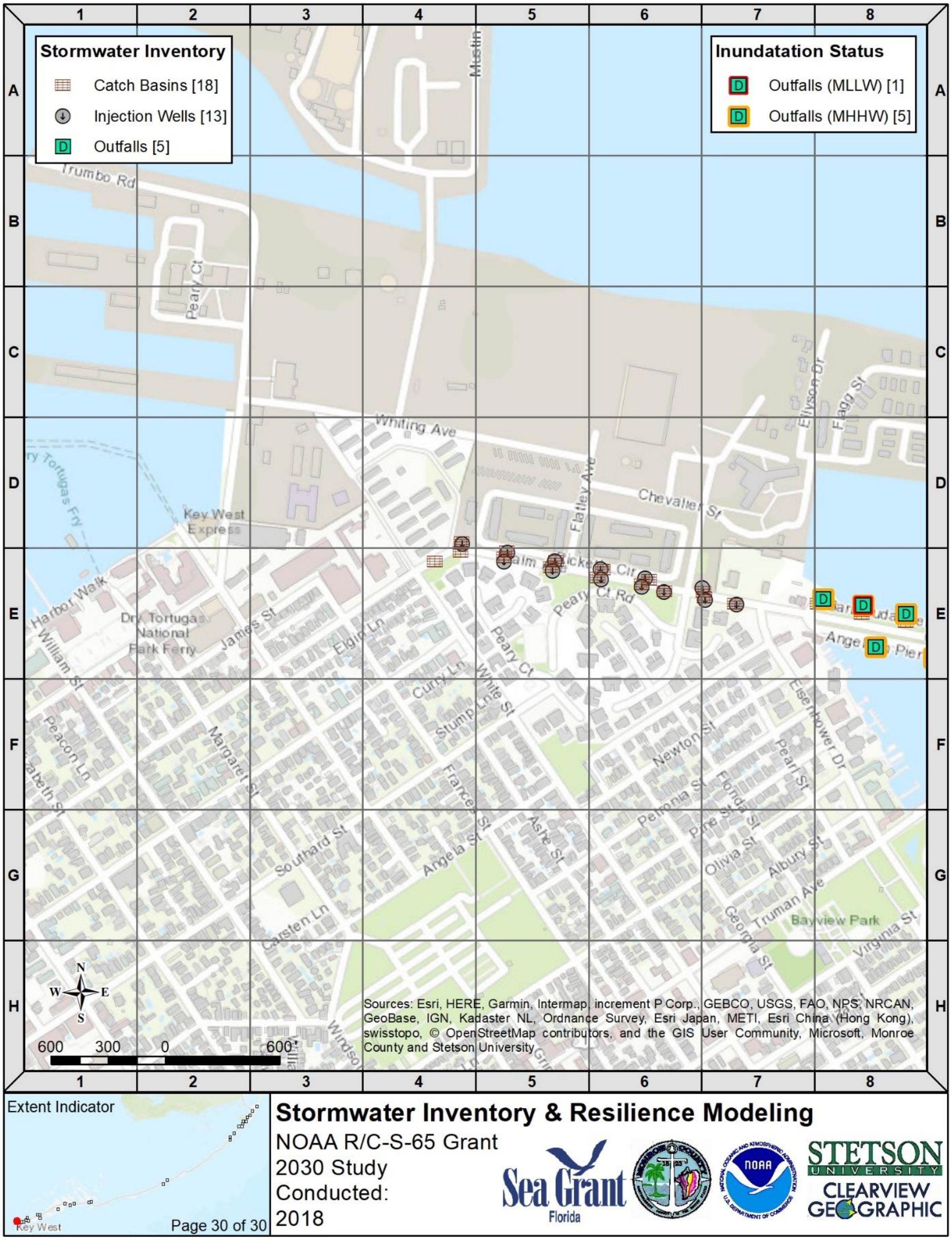
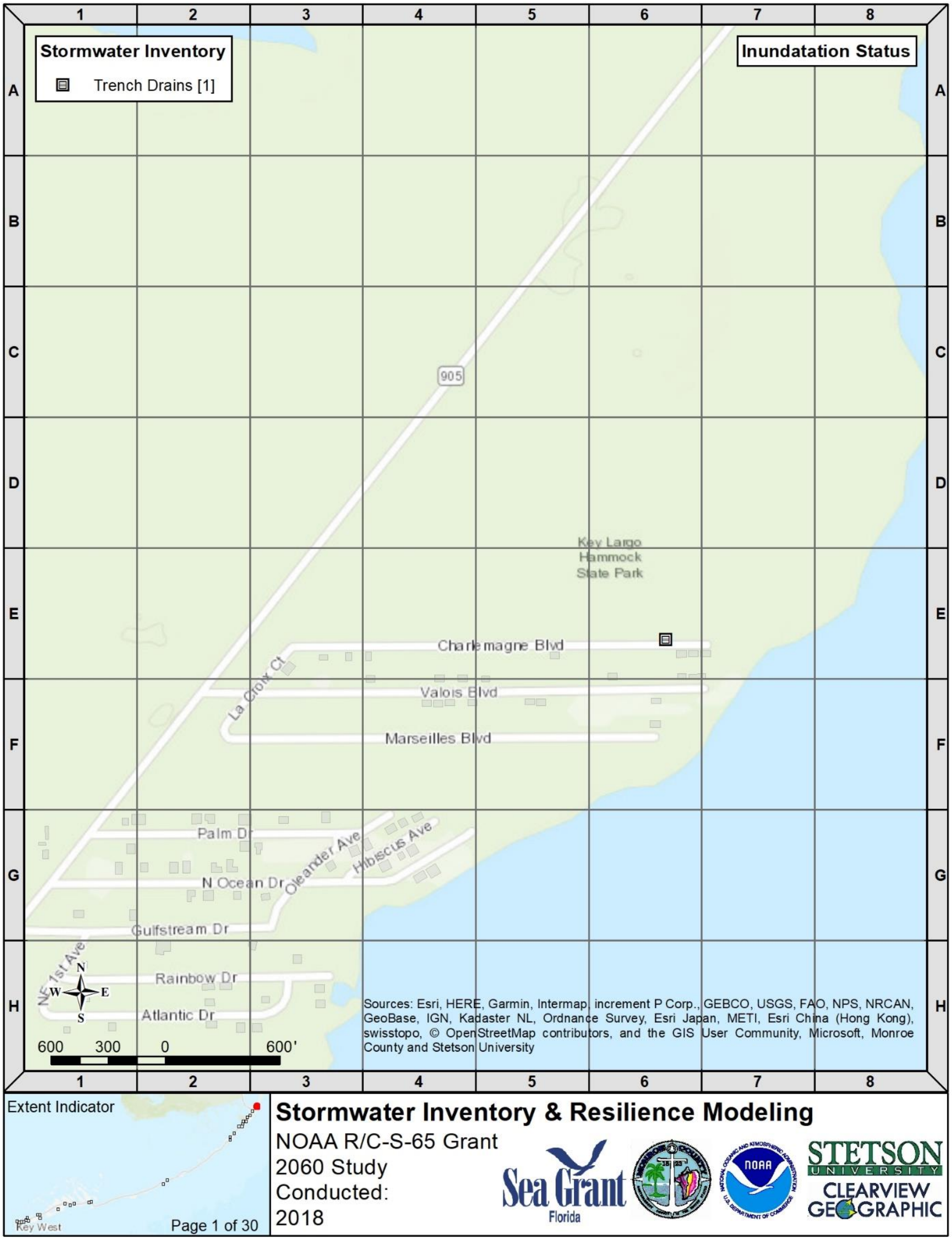


Map Series 3: Monroe County Stormwater Infrastructure Inventory with
Potential Future Vulnerability to Tidal Flooding, 2060 Low (14”) and 2060 High (26") Sea-Level Rise



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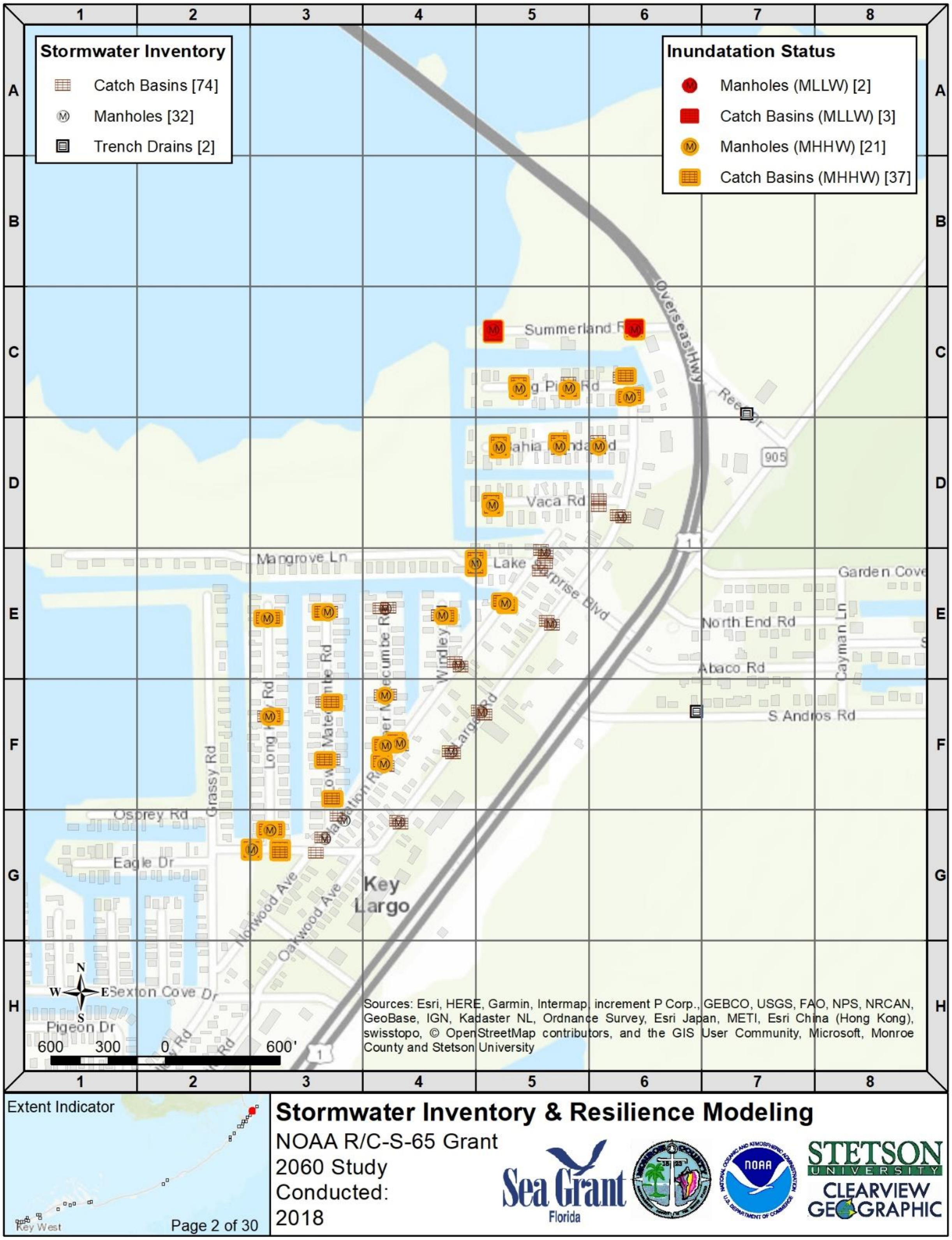

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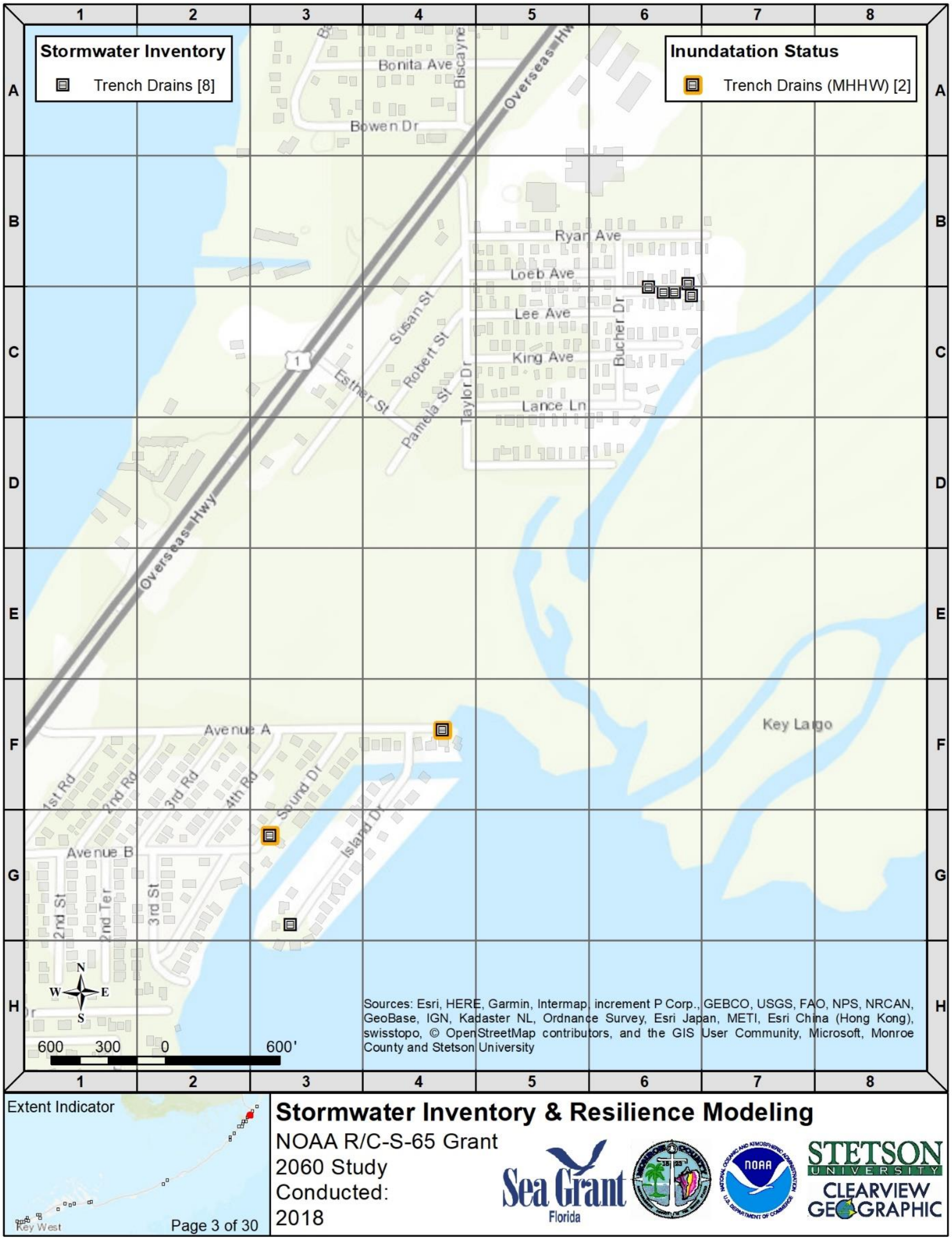

Stormwater Inventory & Resilience Modeling

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2018

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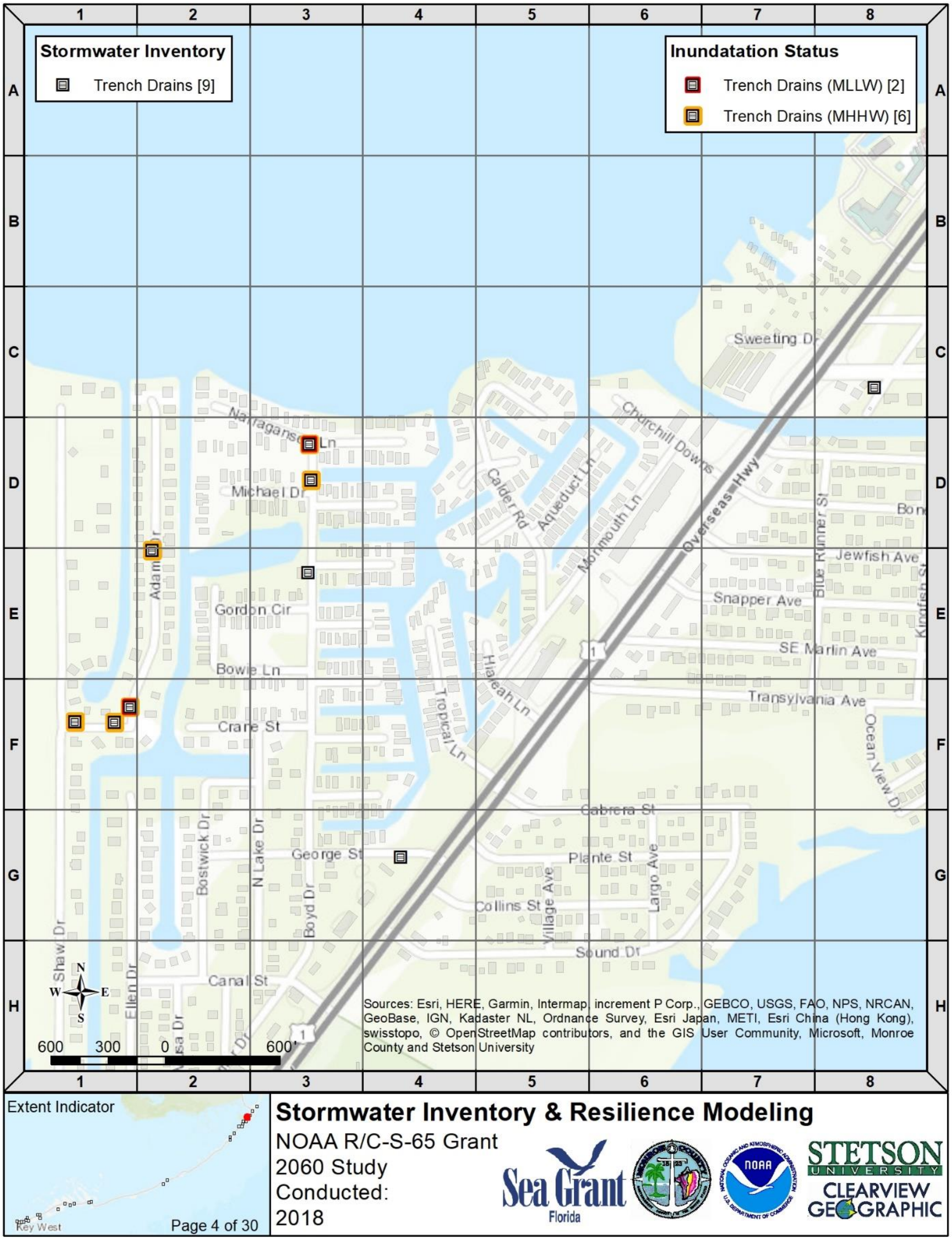

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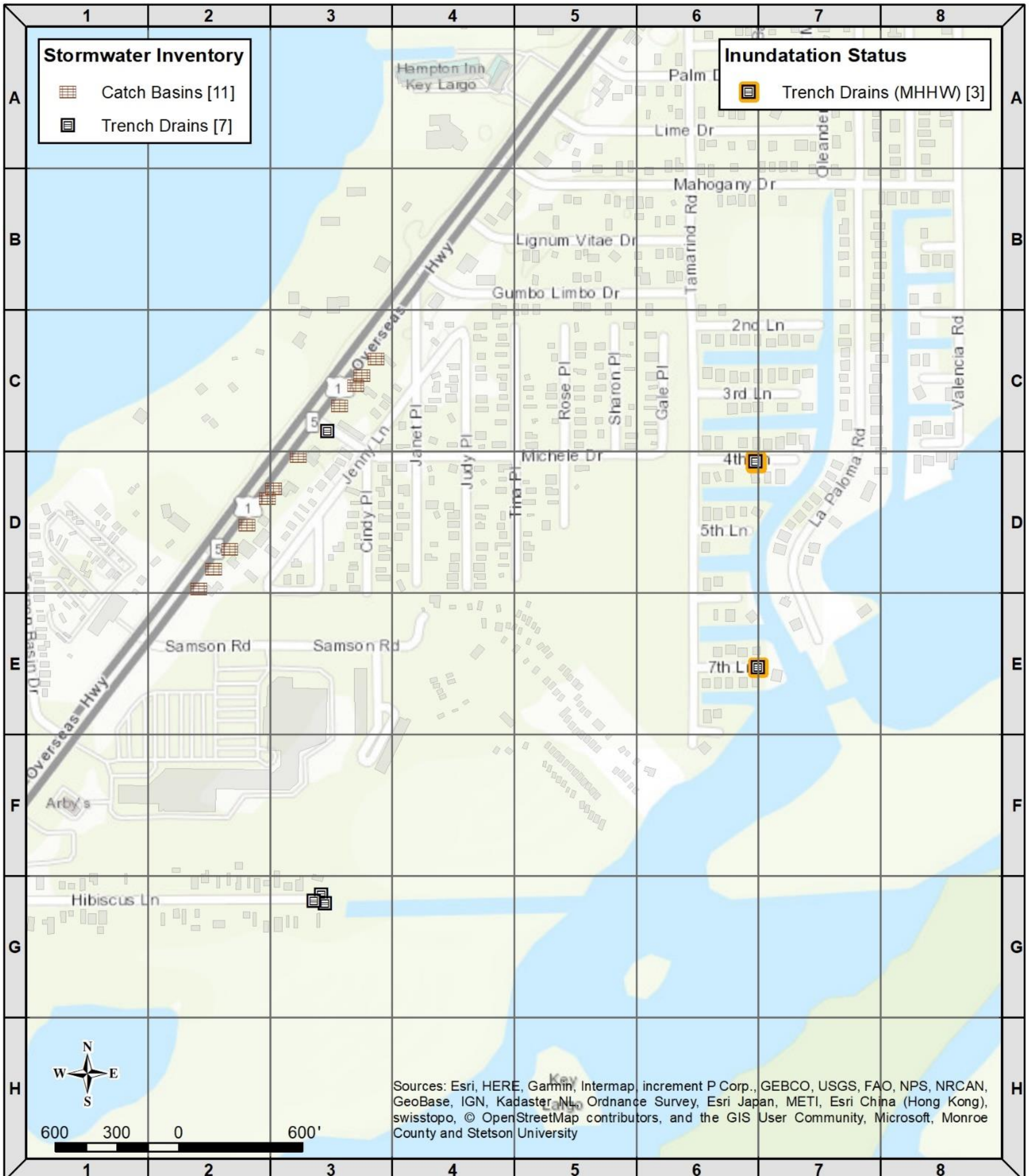

Stormwater Inventory & Resilience Modeling

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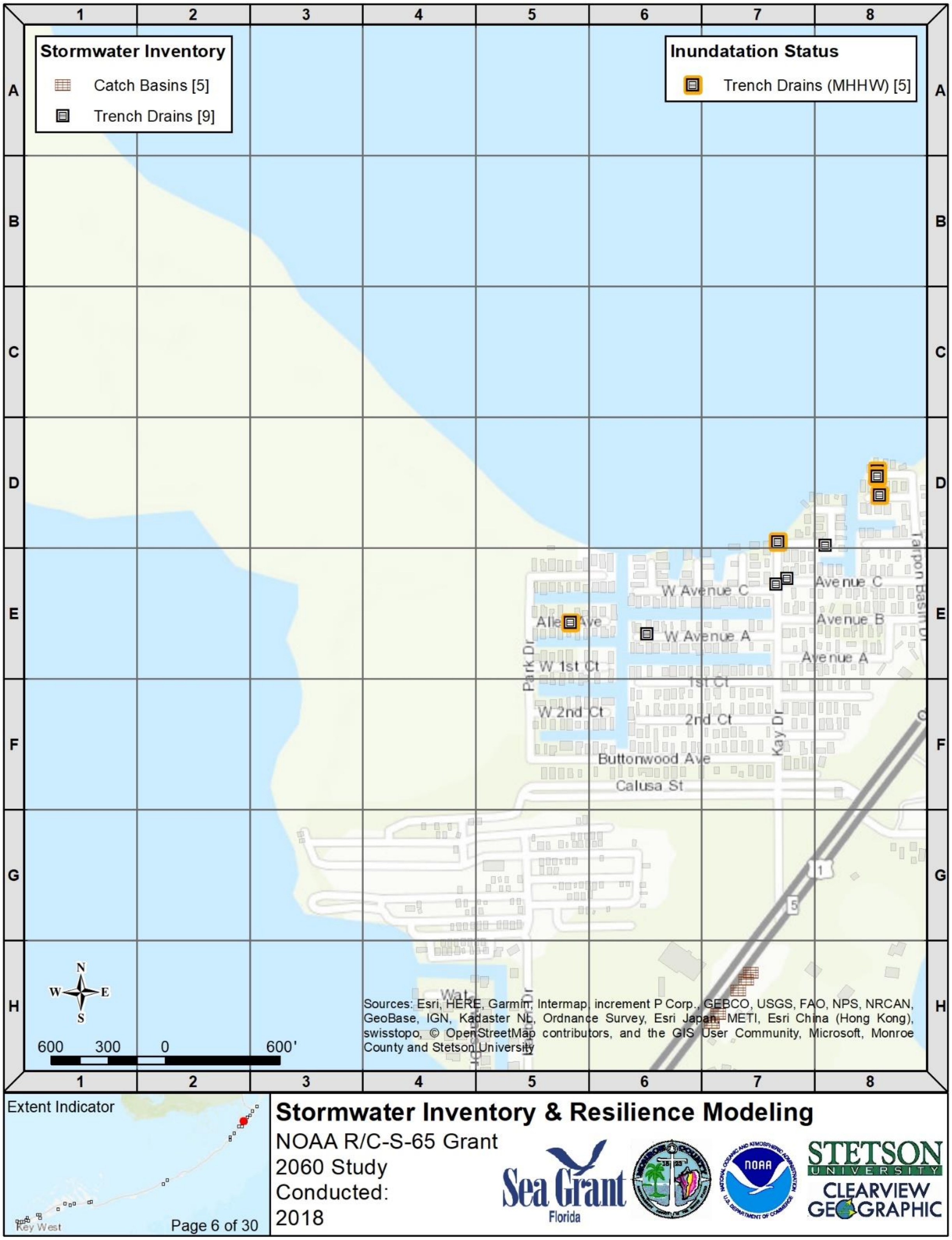
Potential Future Vulnerability to Tidal Flooding, 2060 Low (14") and 2060 High (26") Sea-Level Rise



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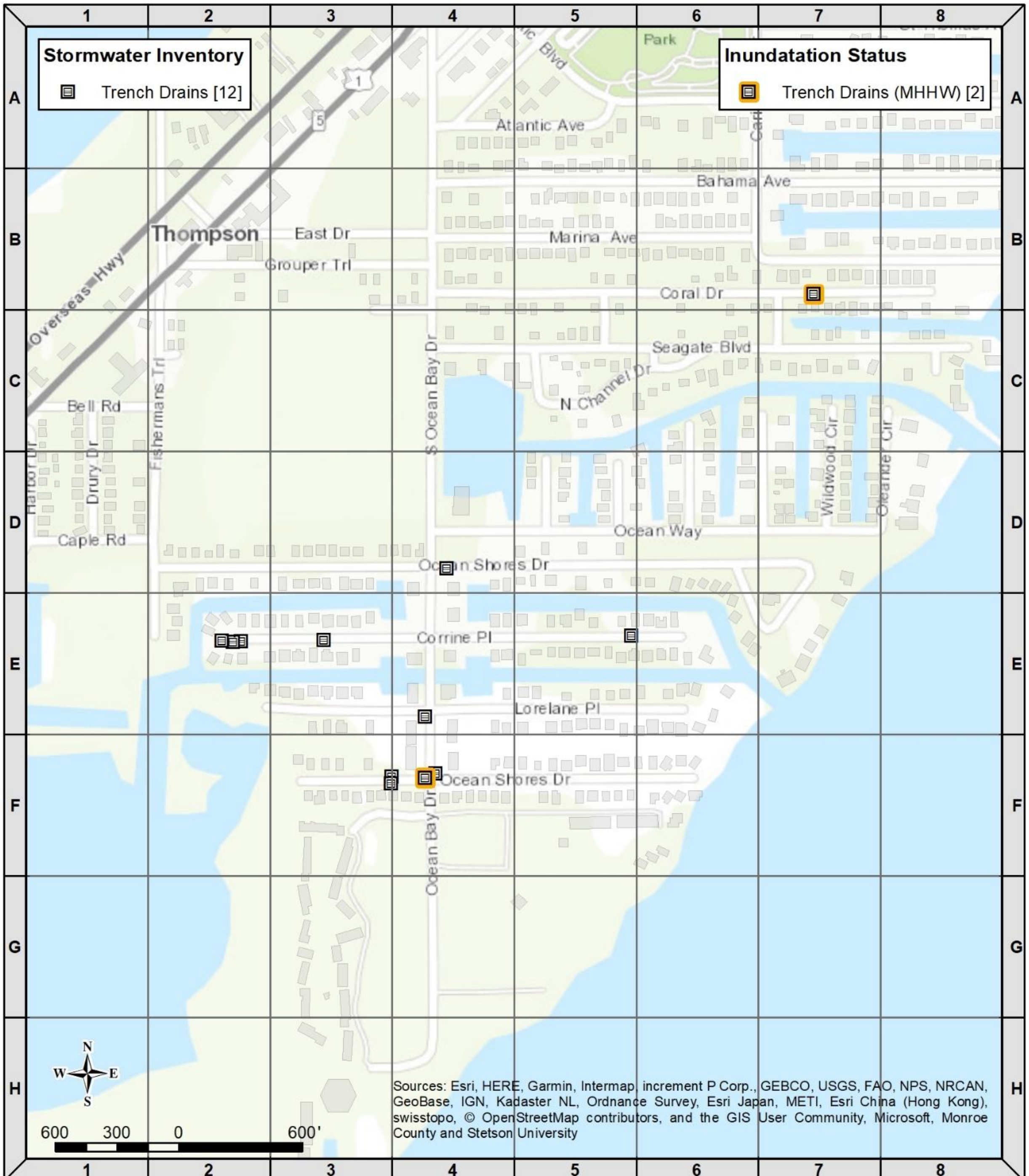

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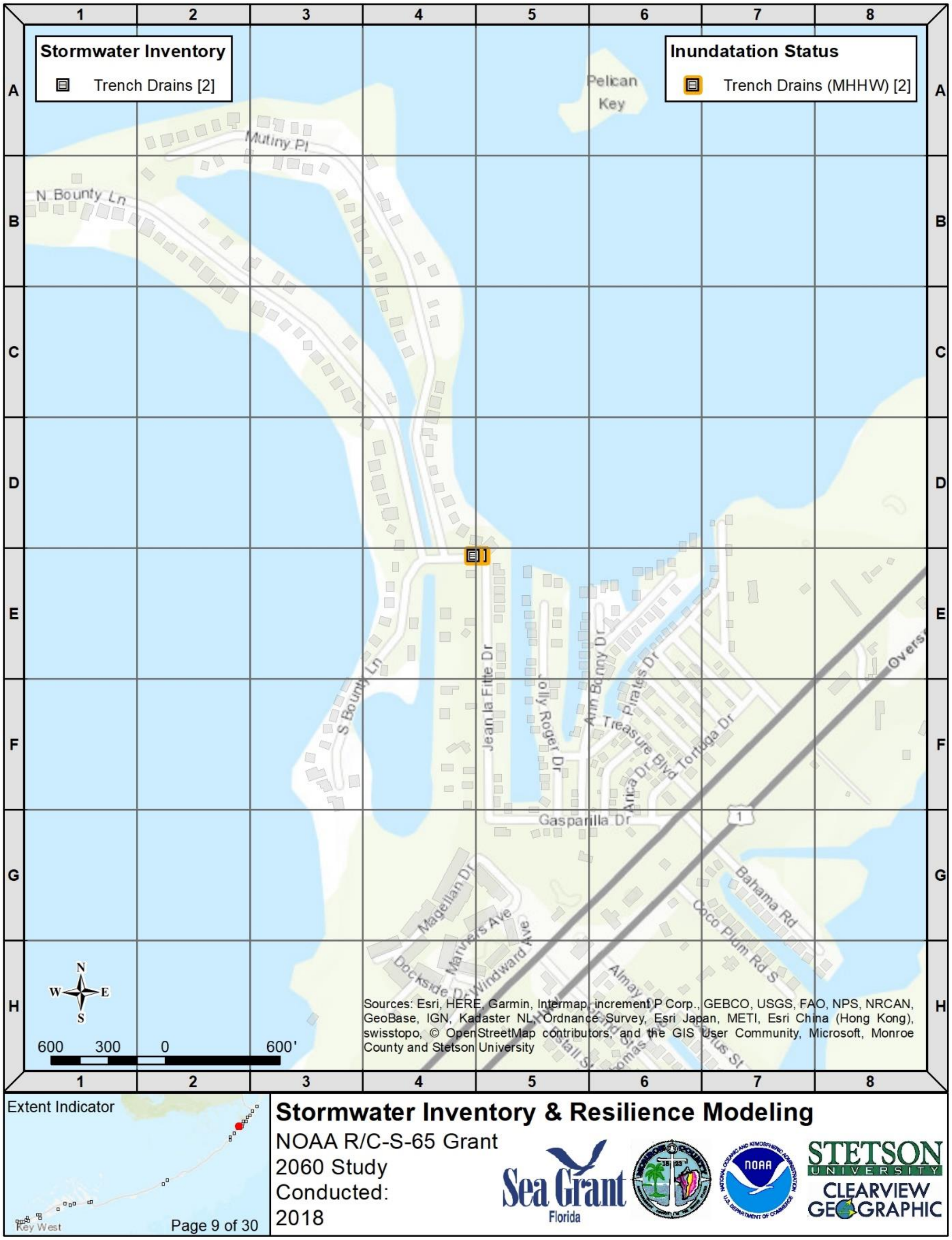

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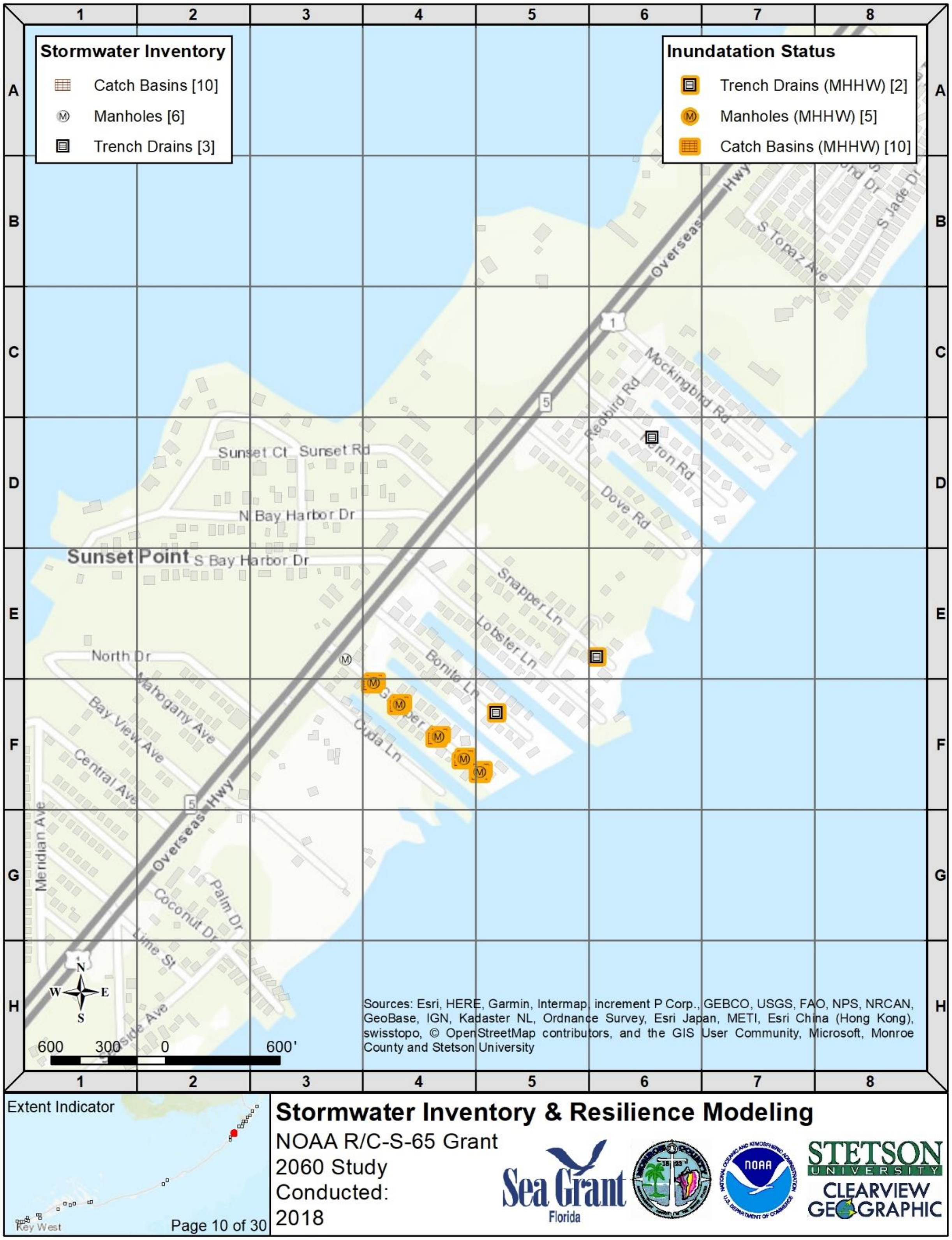

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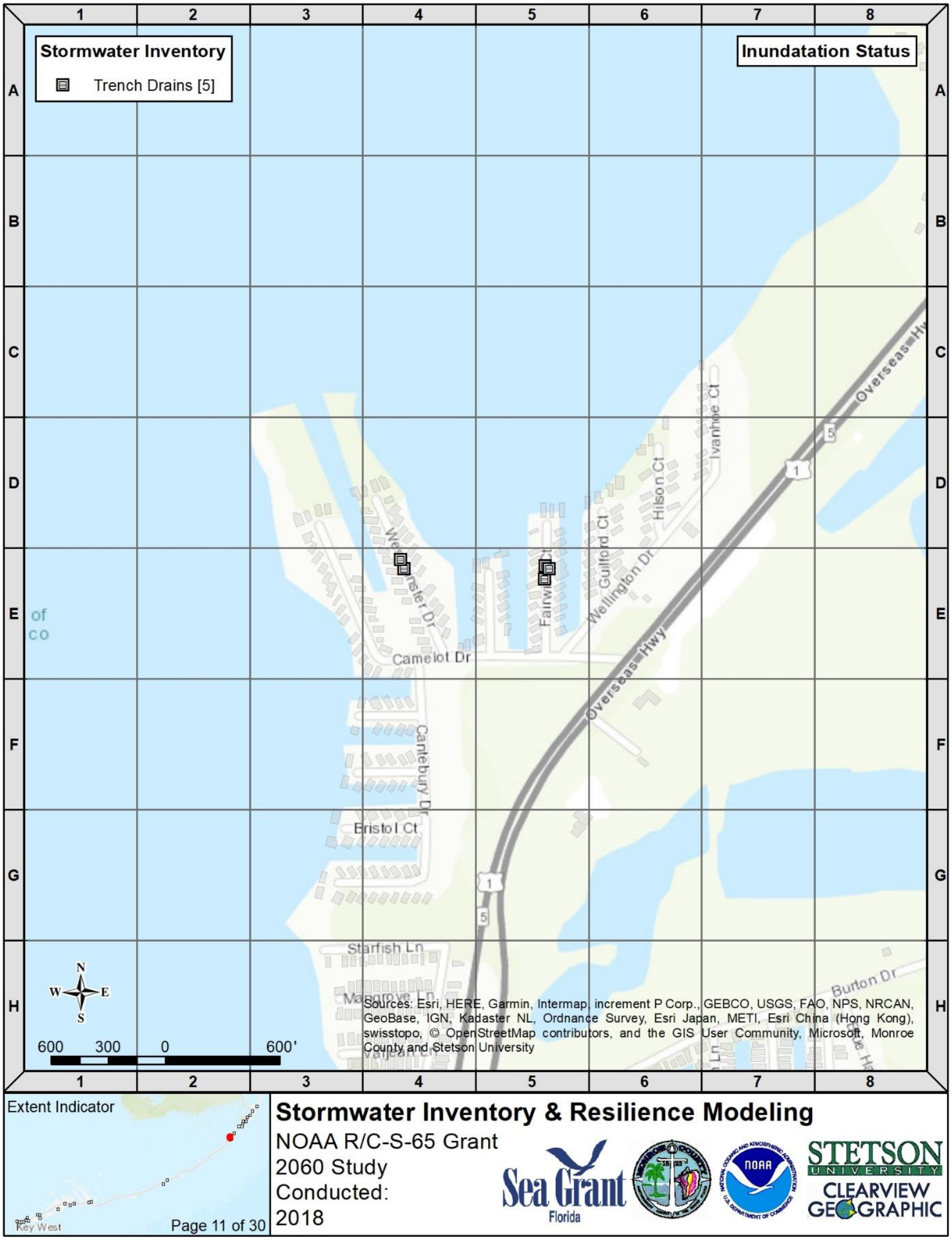

Map Series 3: Monroe County Stormwater Infrastructure Inventory with
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Extent Indicator

Key West

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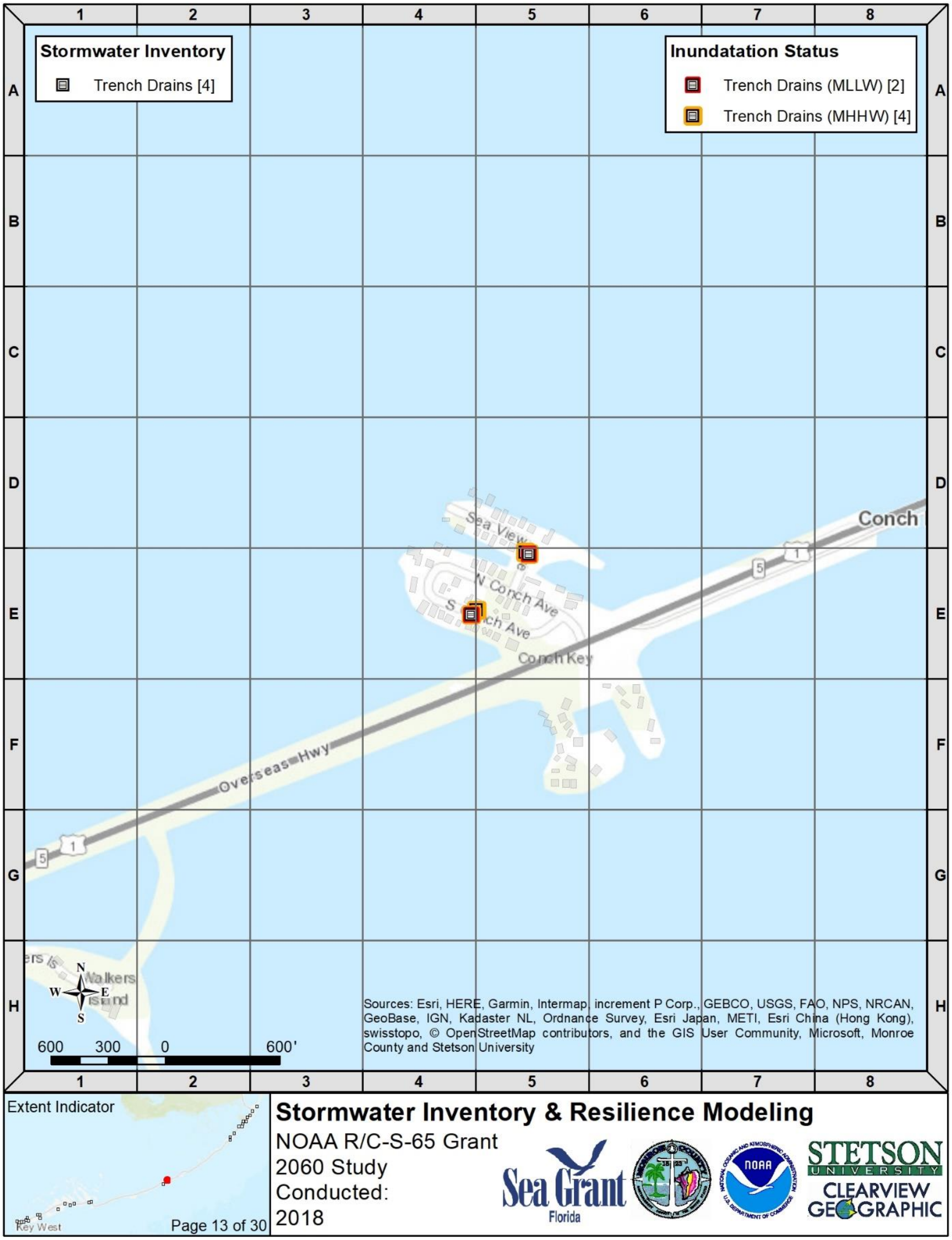

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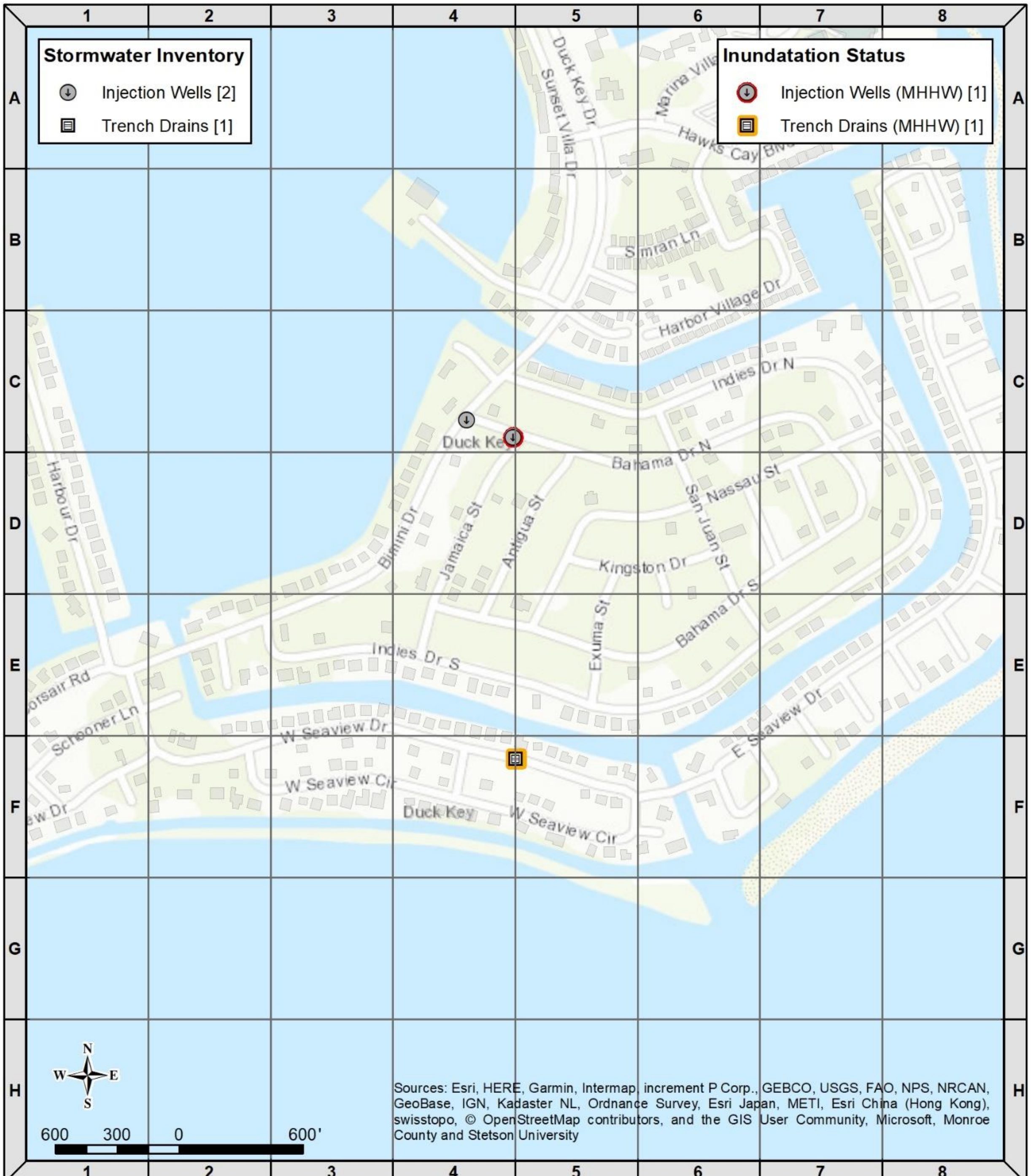

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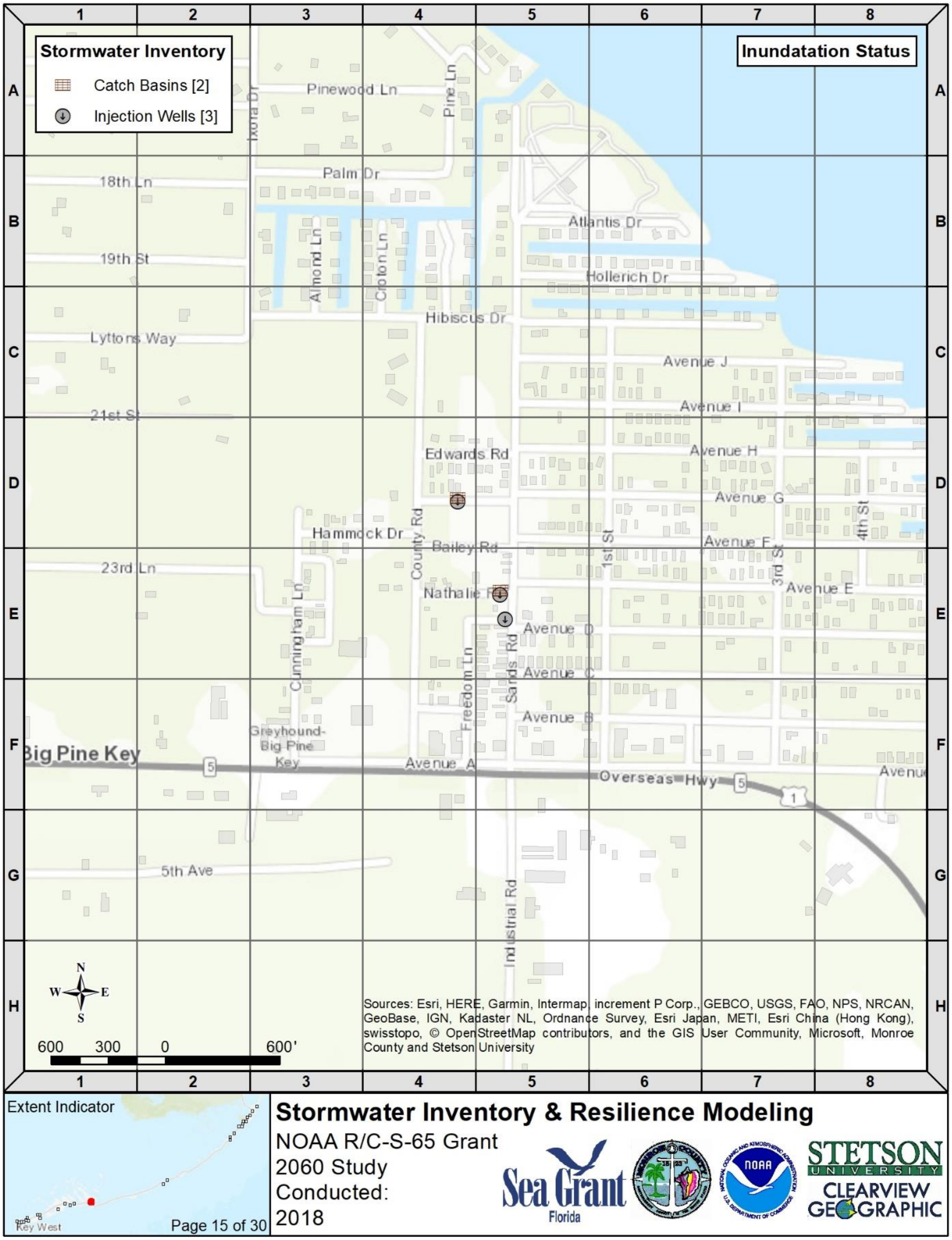

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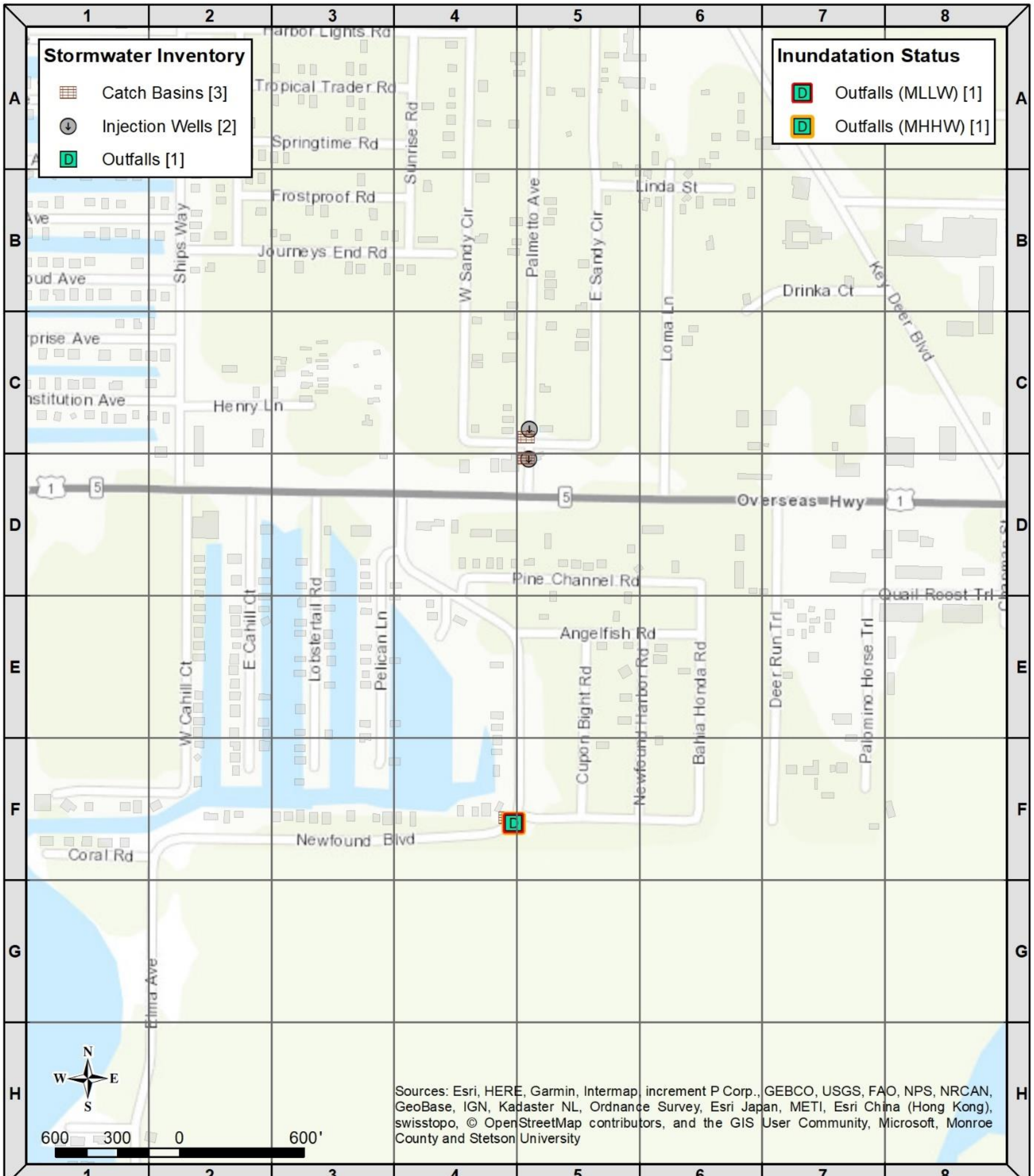

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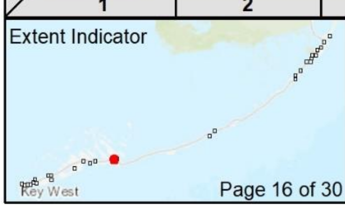

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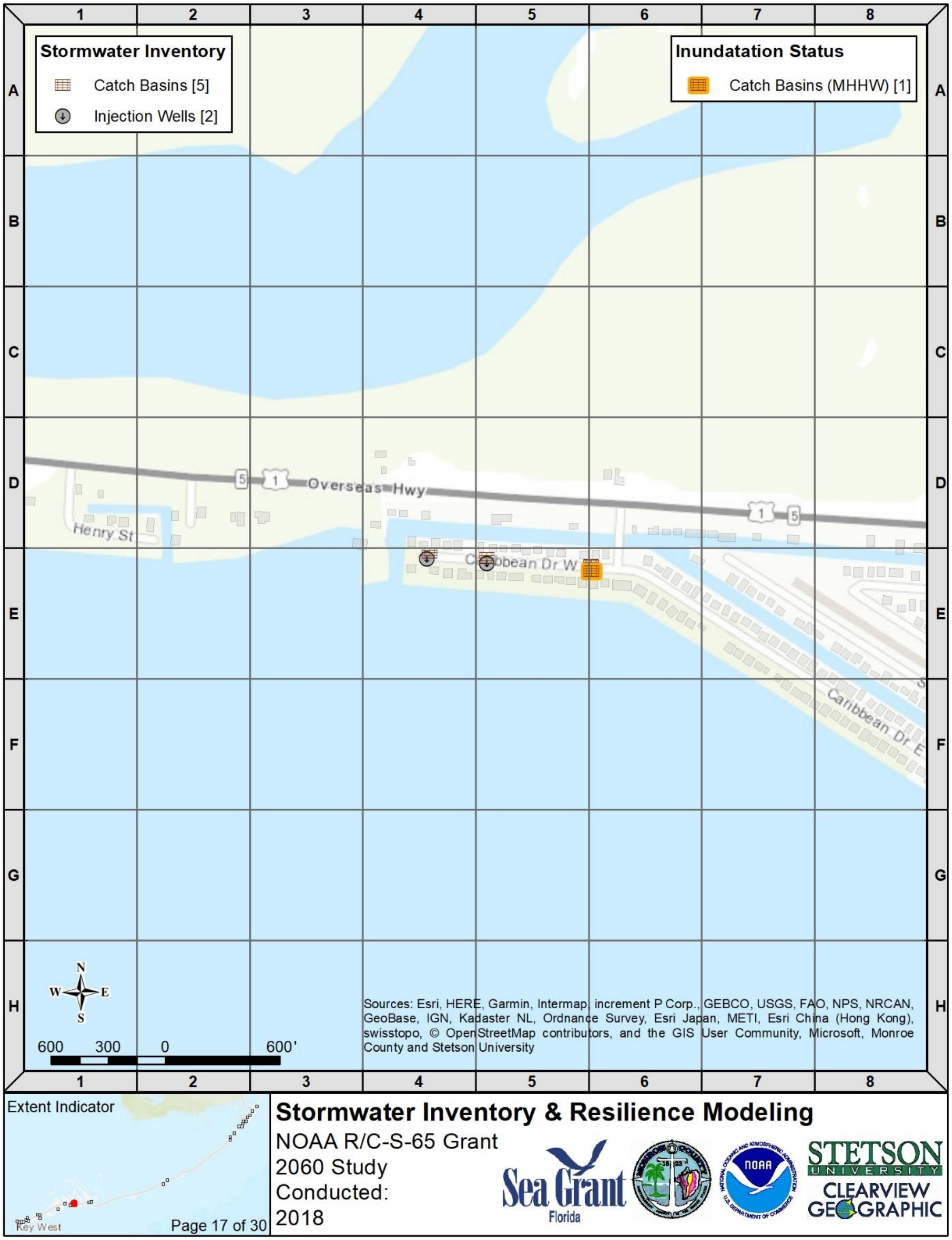

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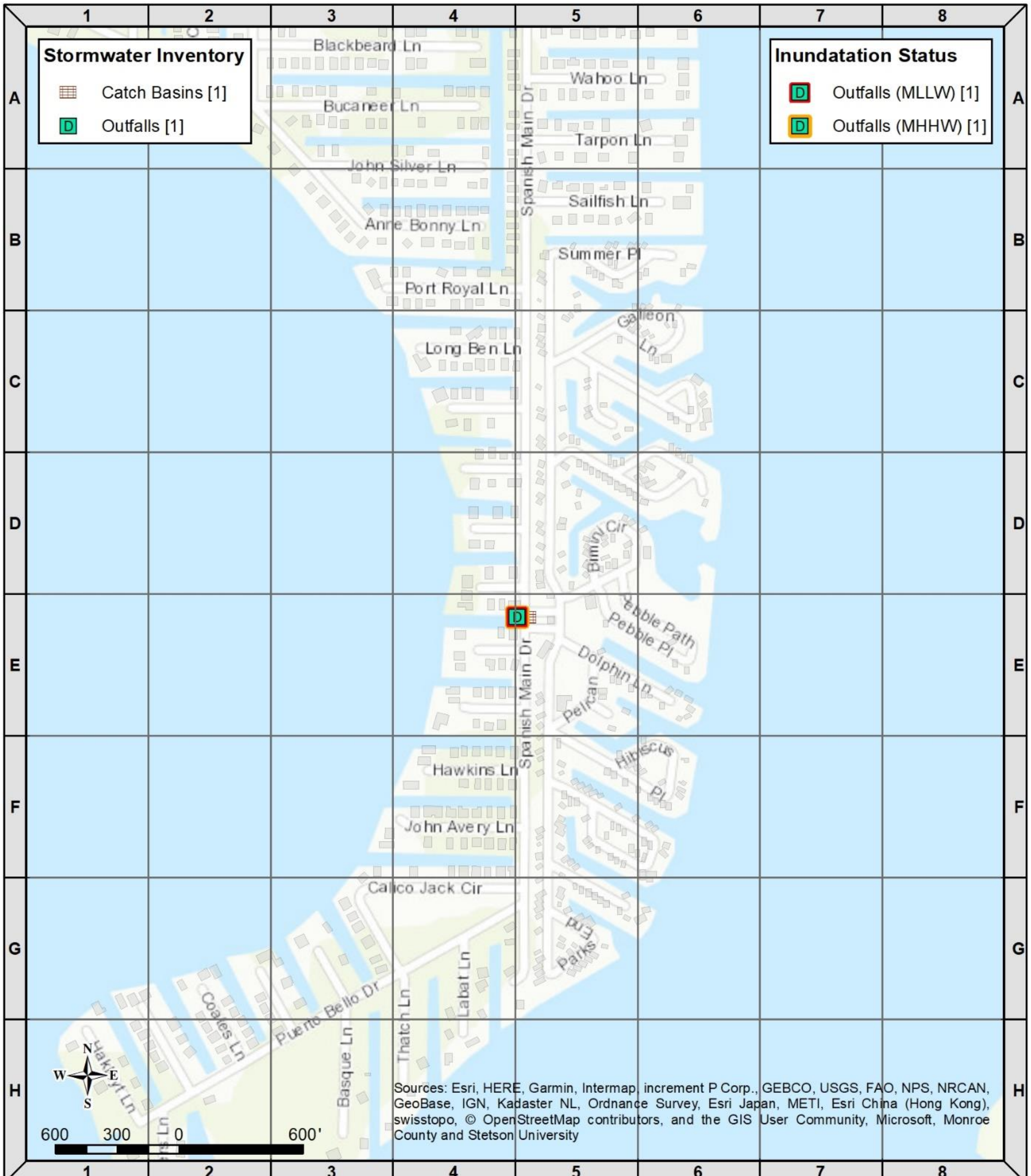

Extent Indicator

Key West

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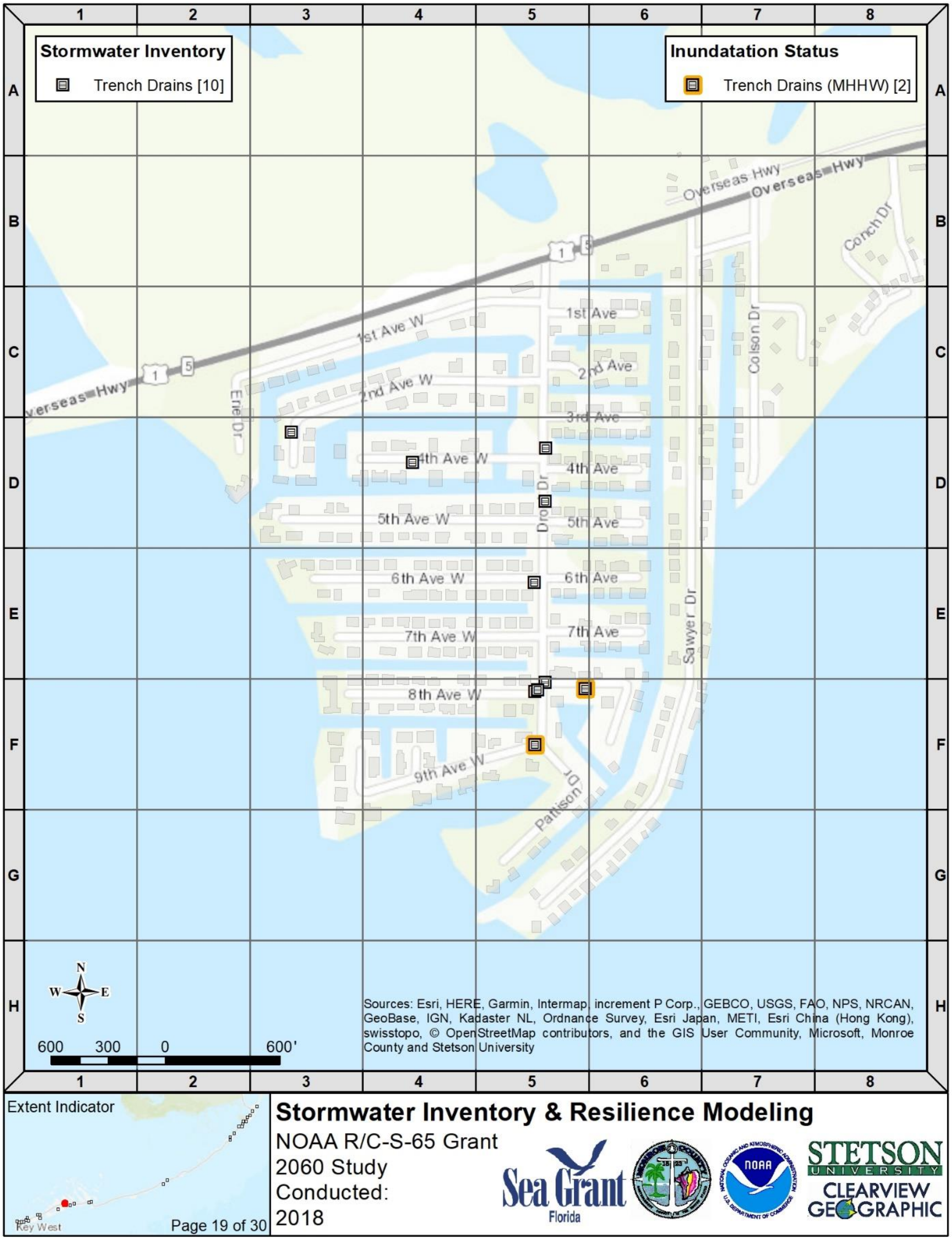

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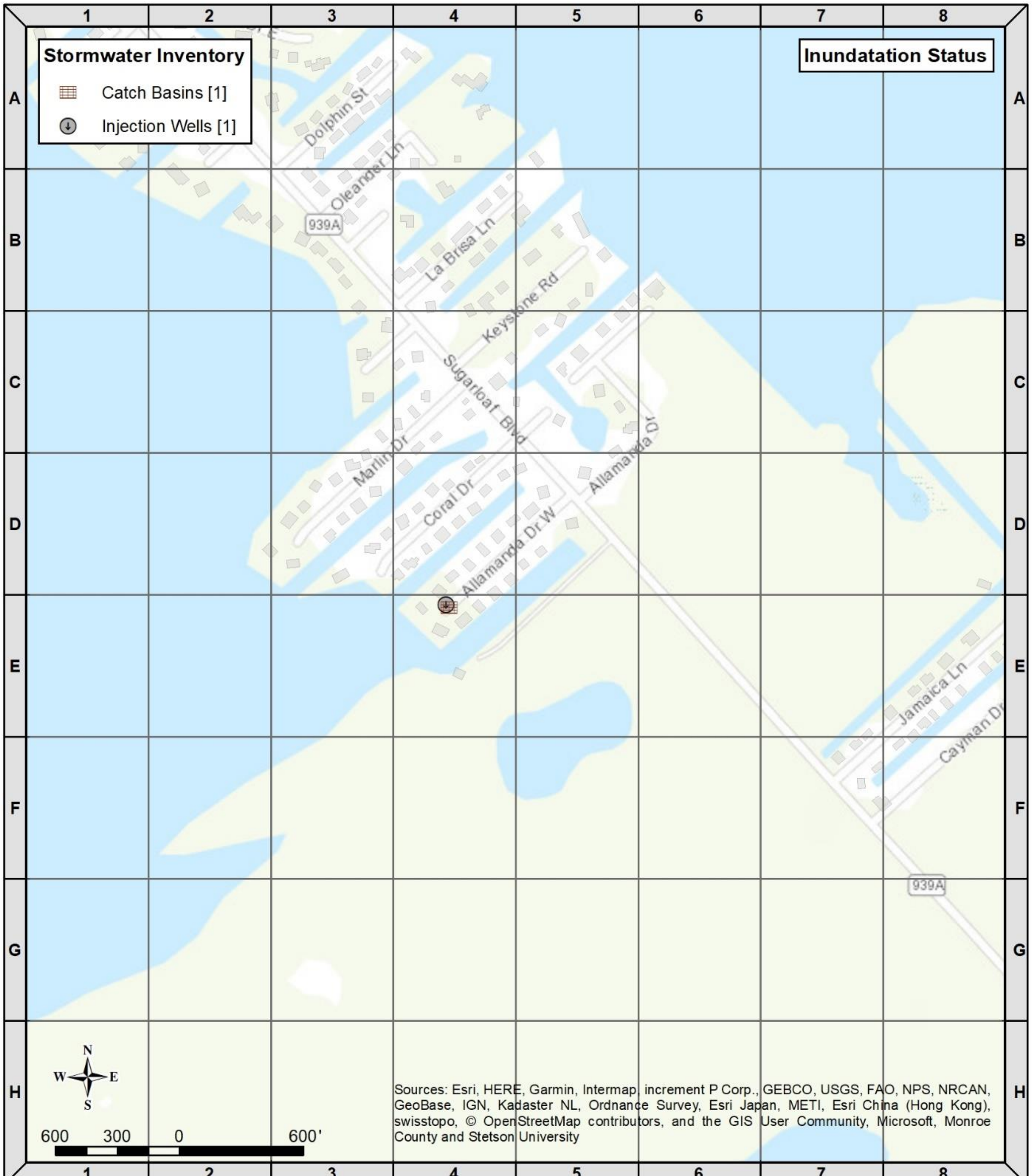

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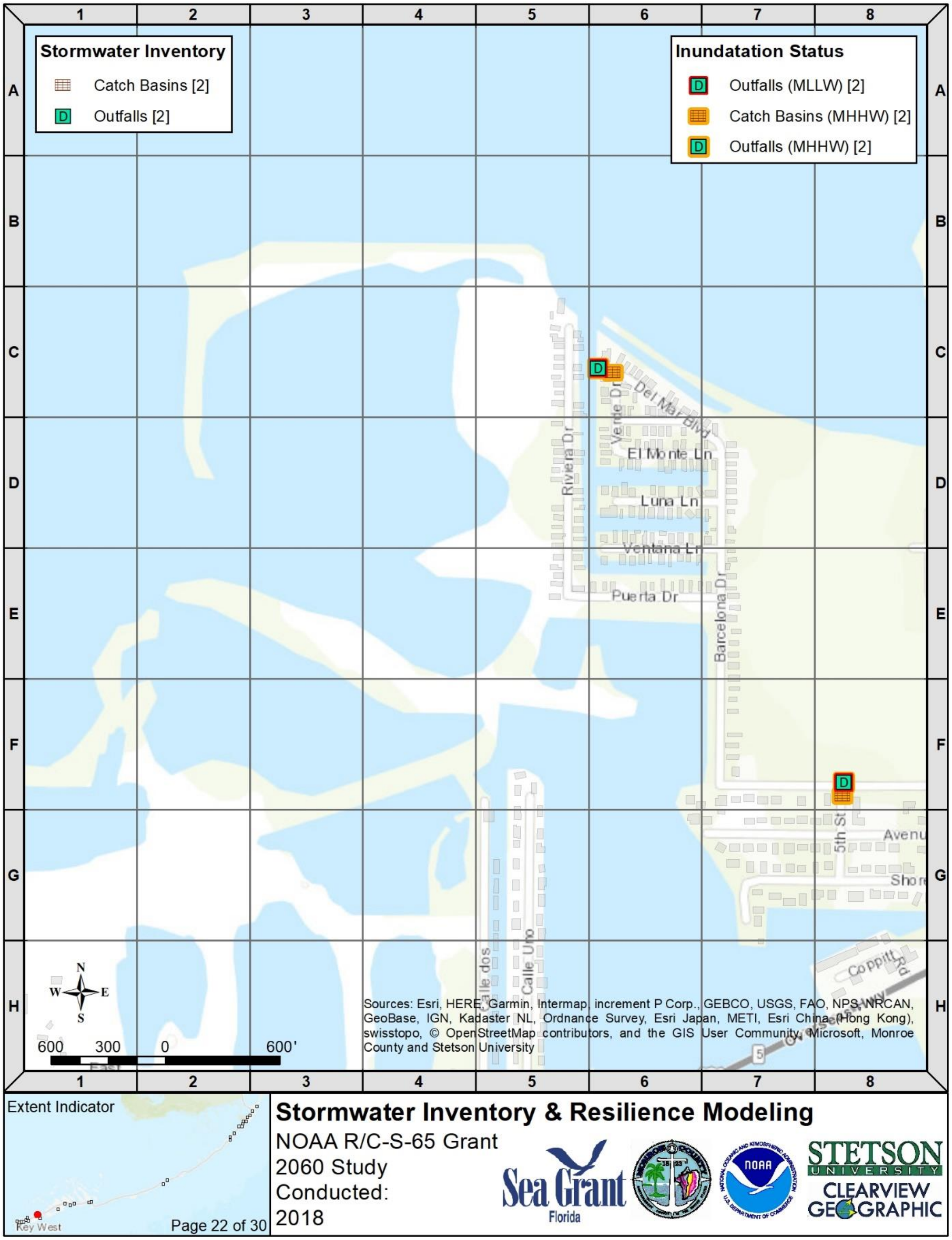

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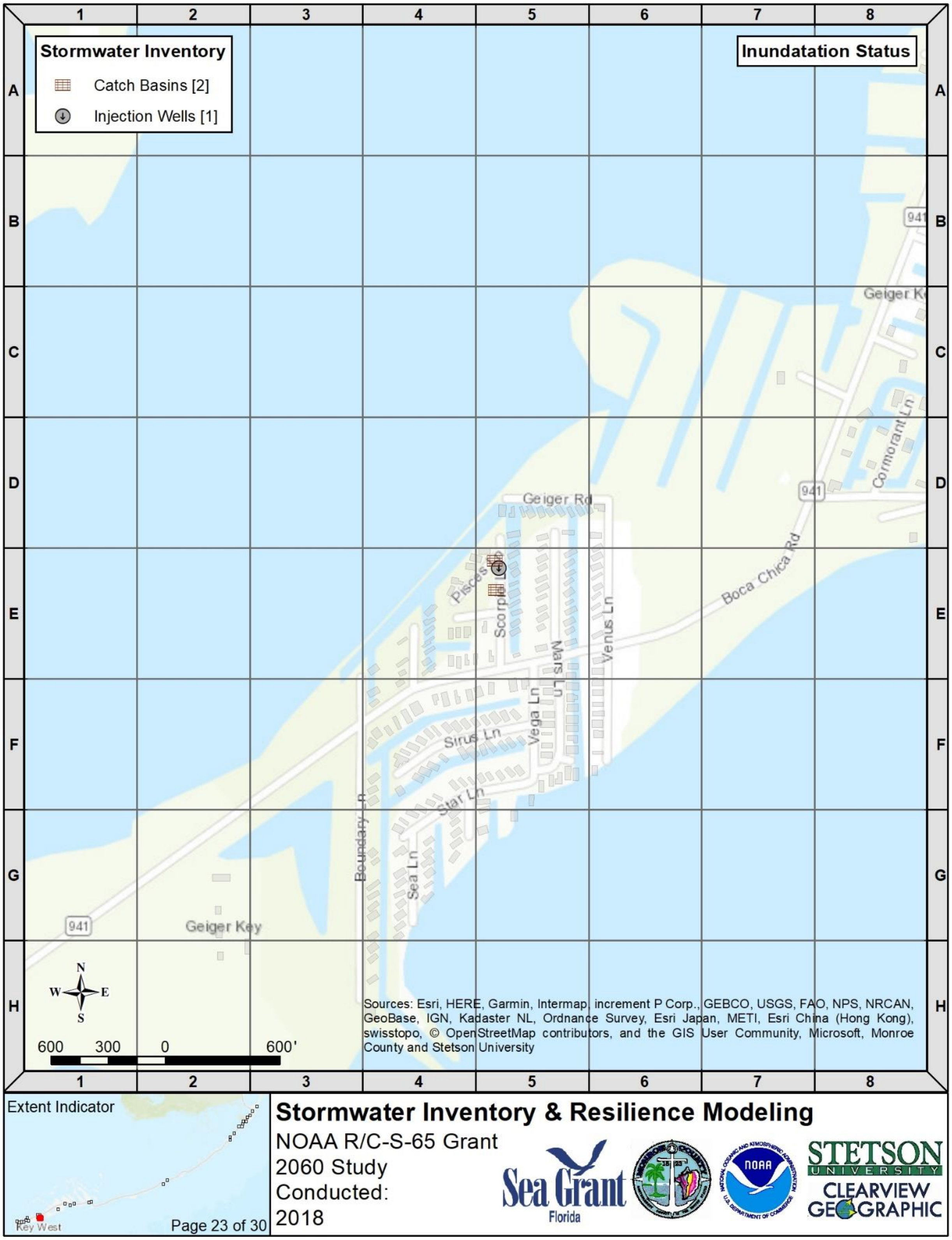

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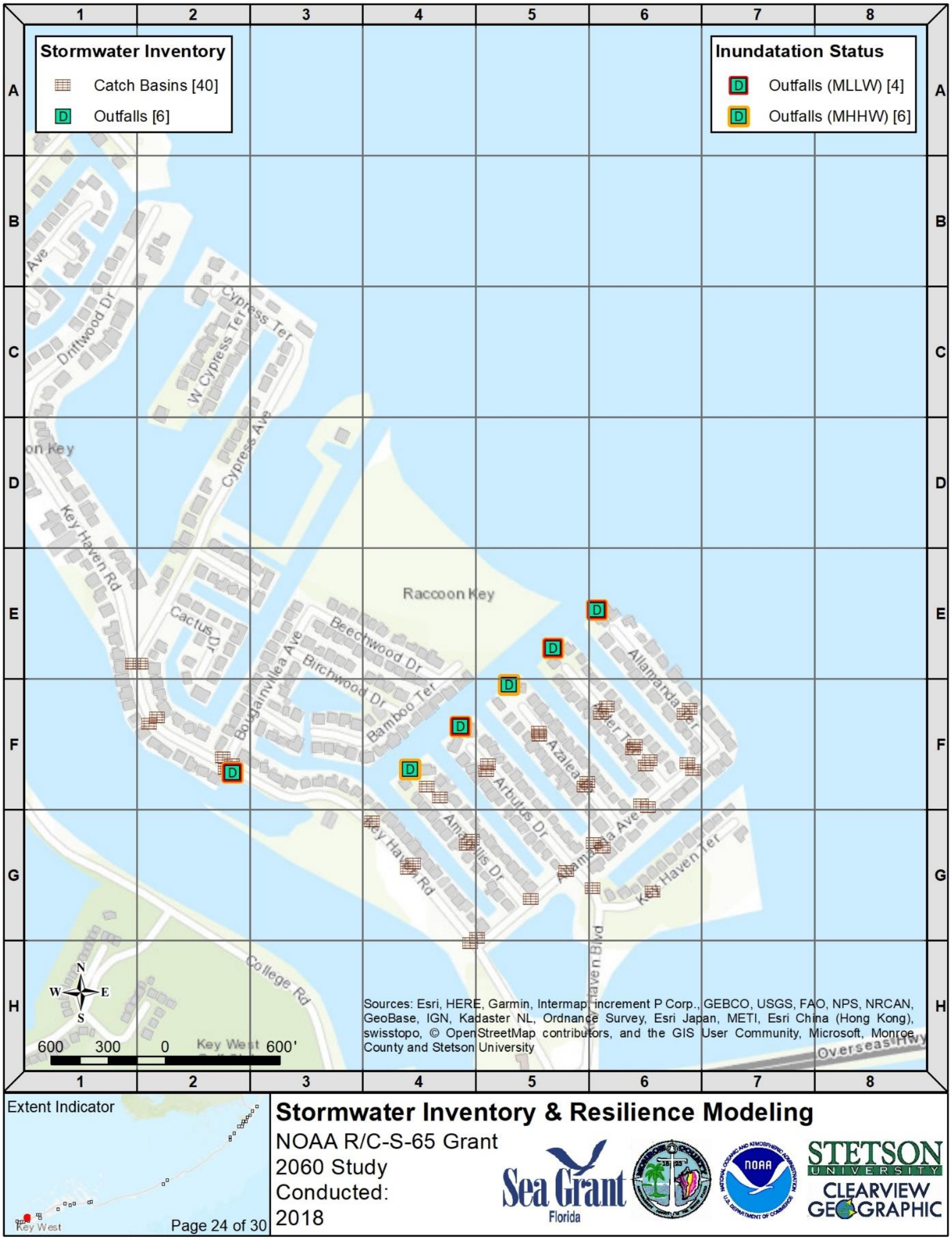

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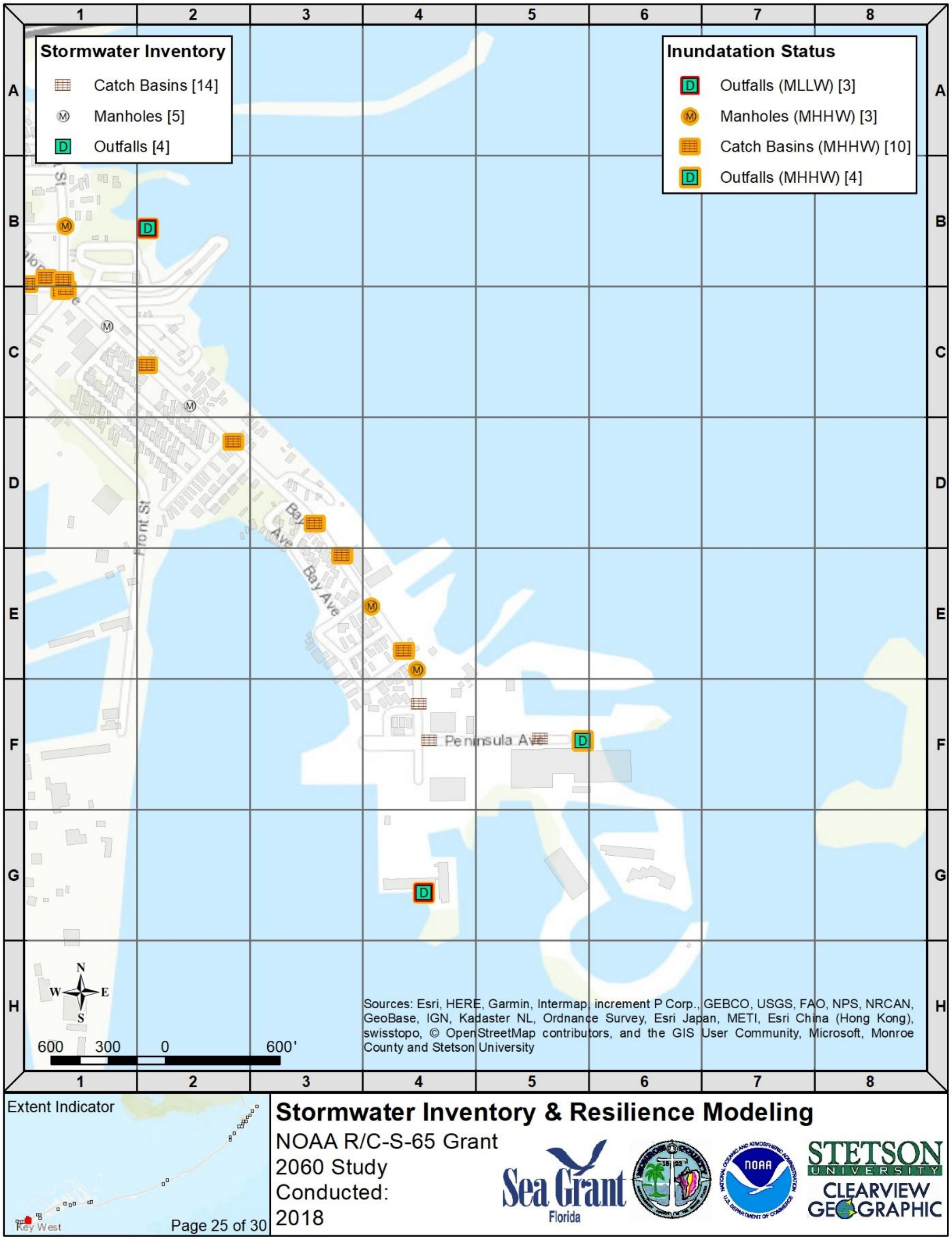

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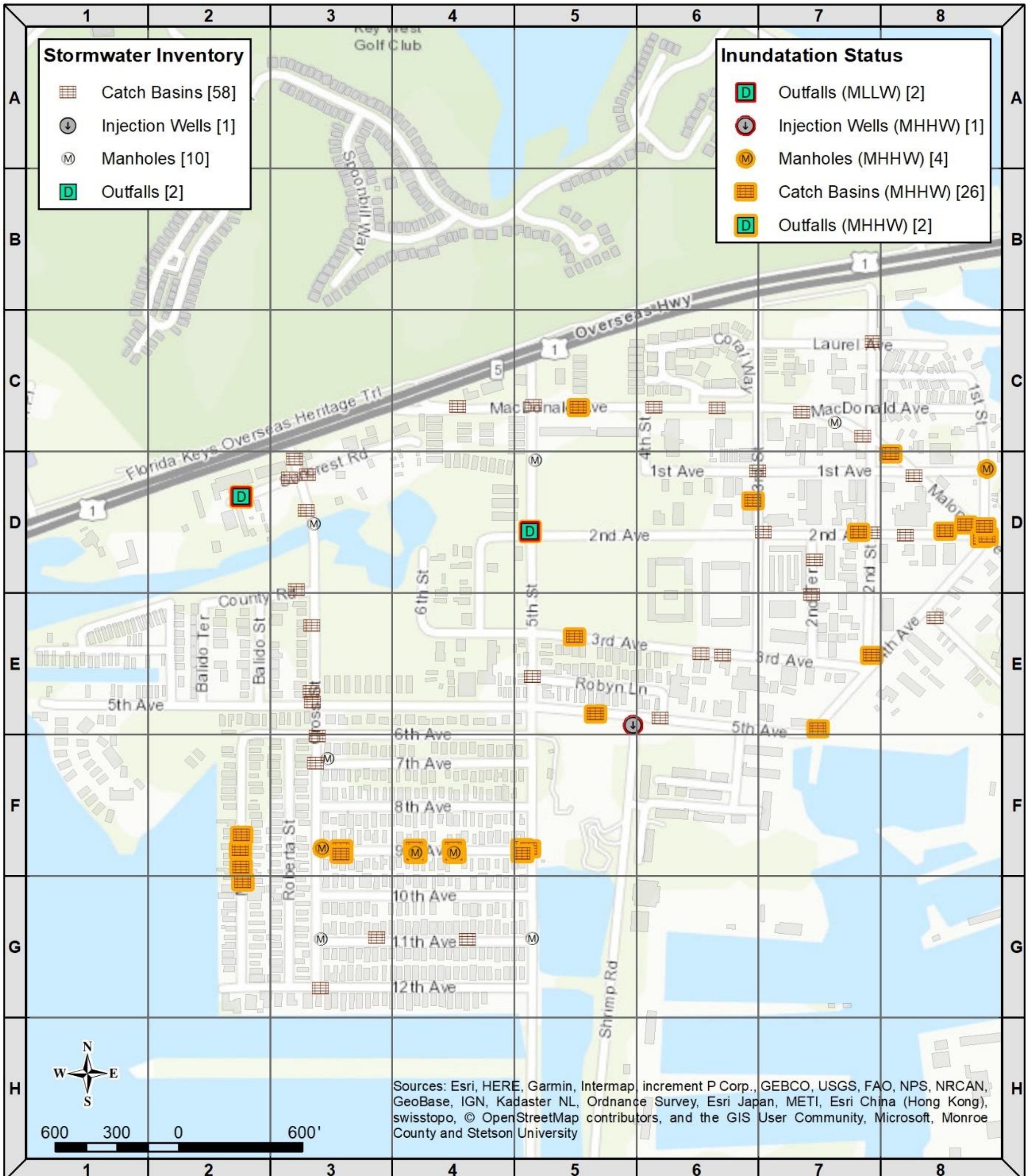

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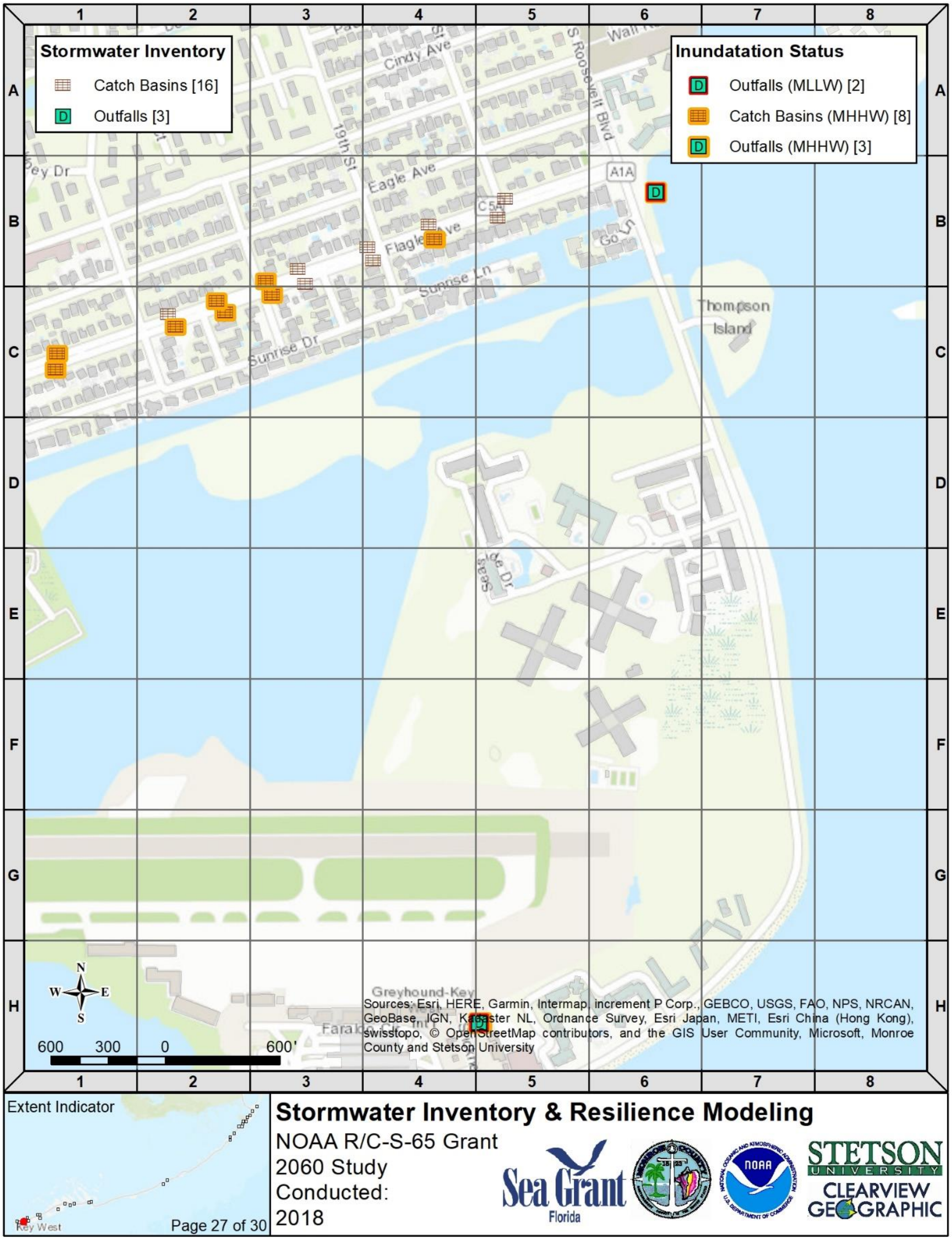

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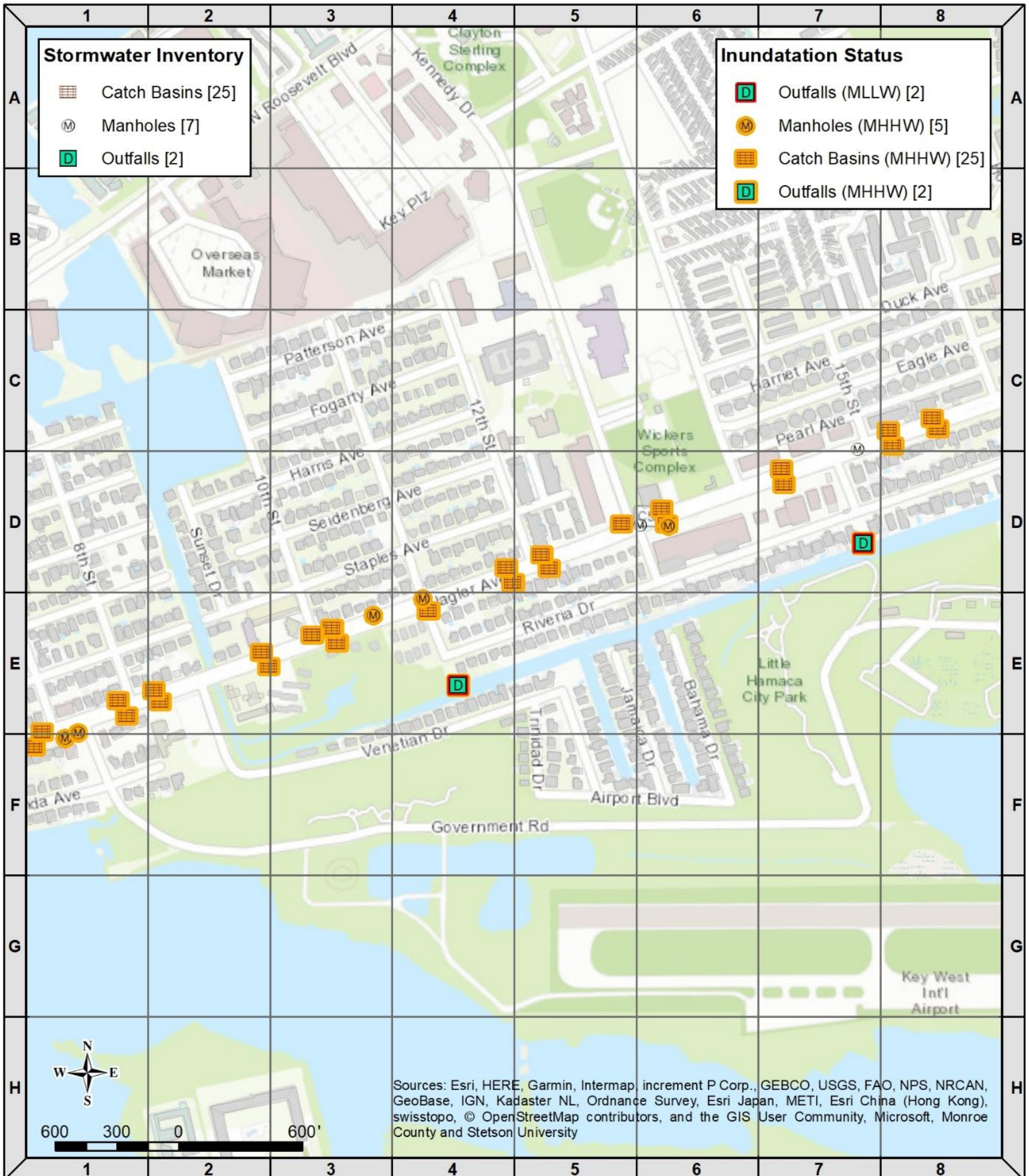

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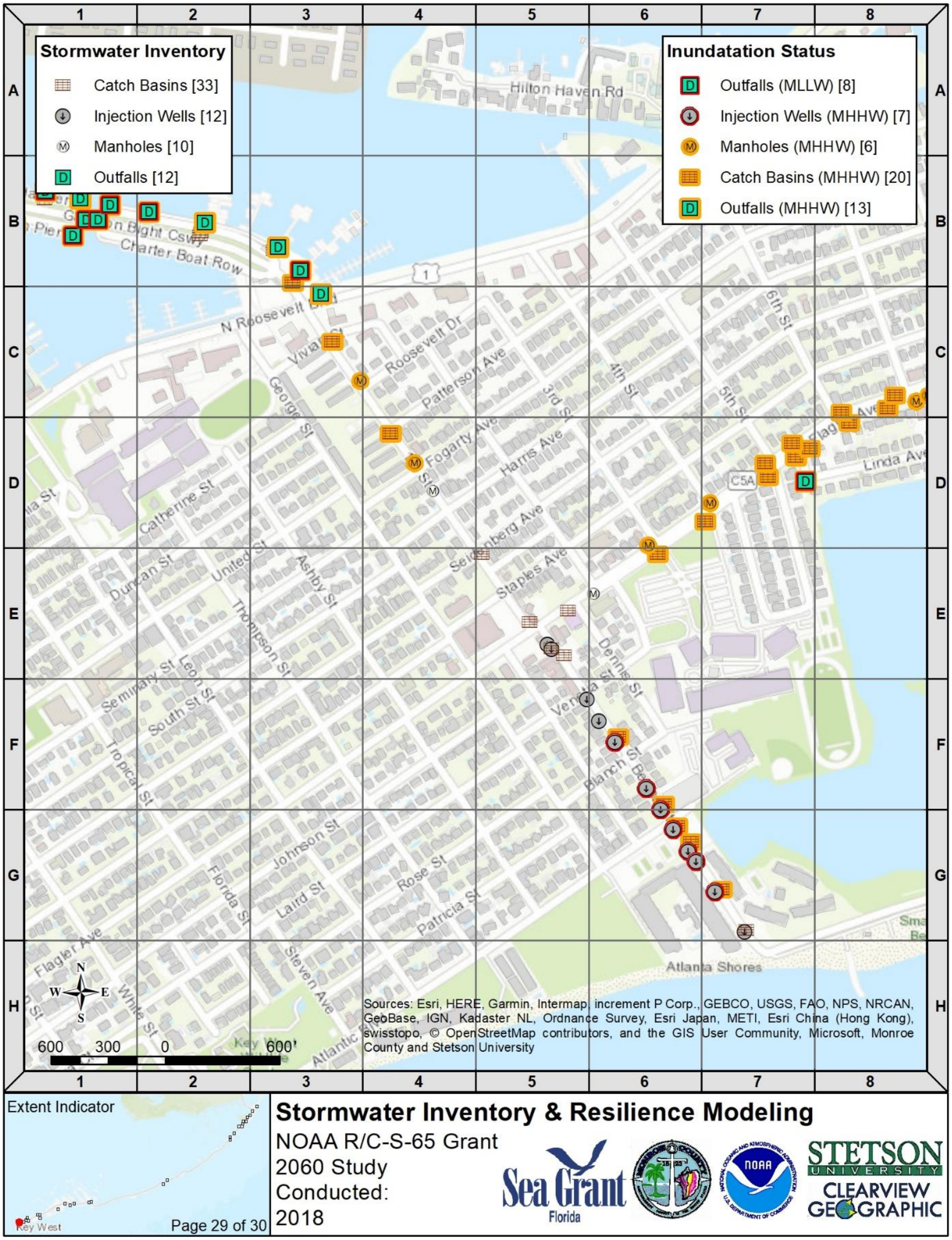

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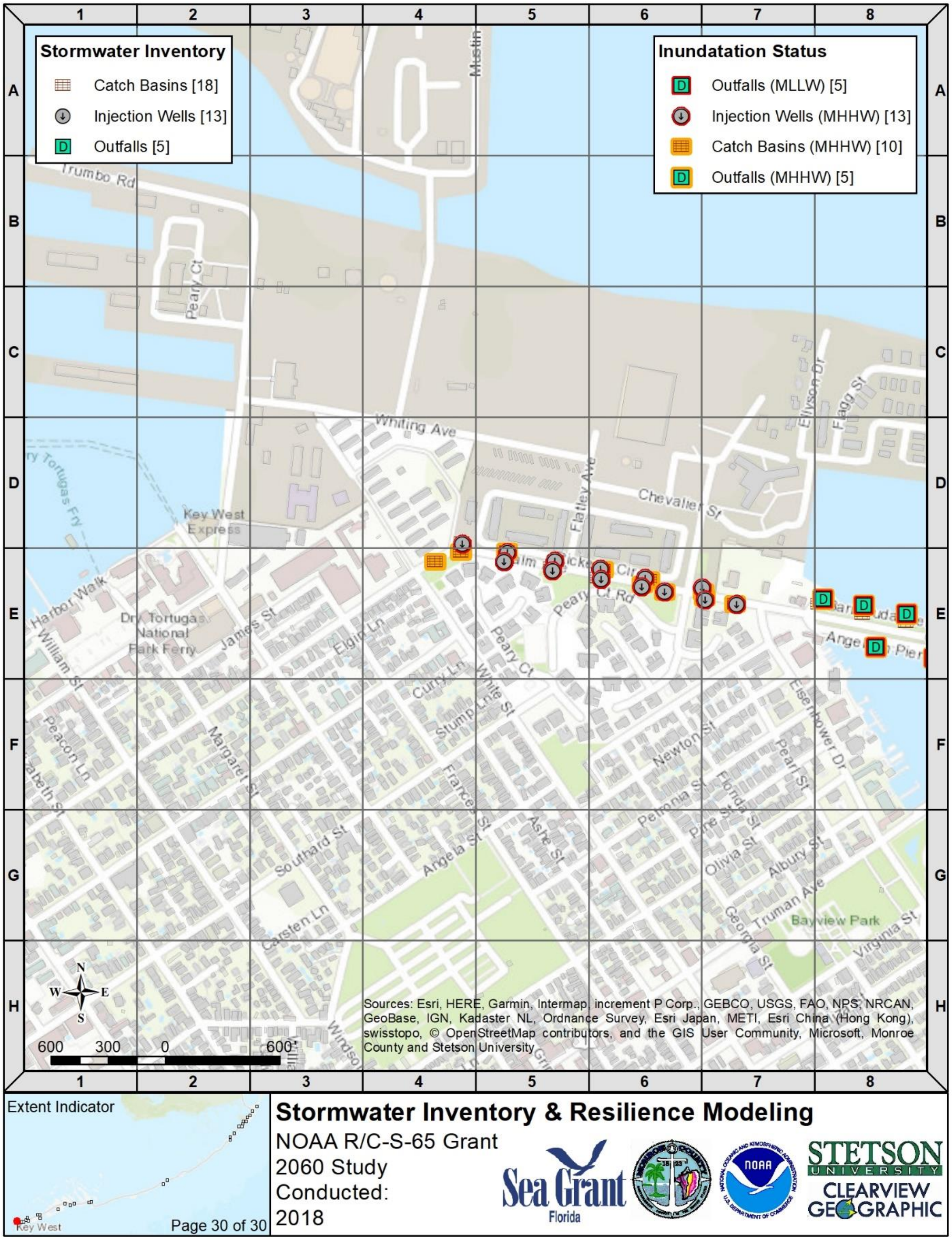
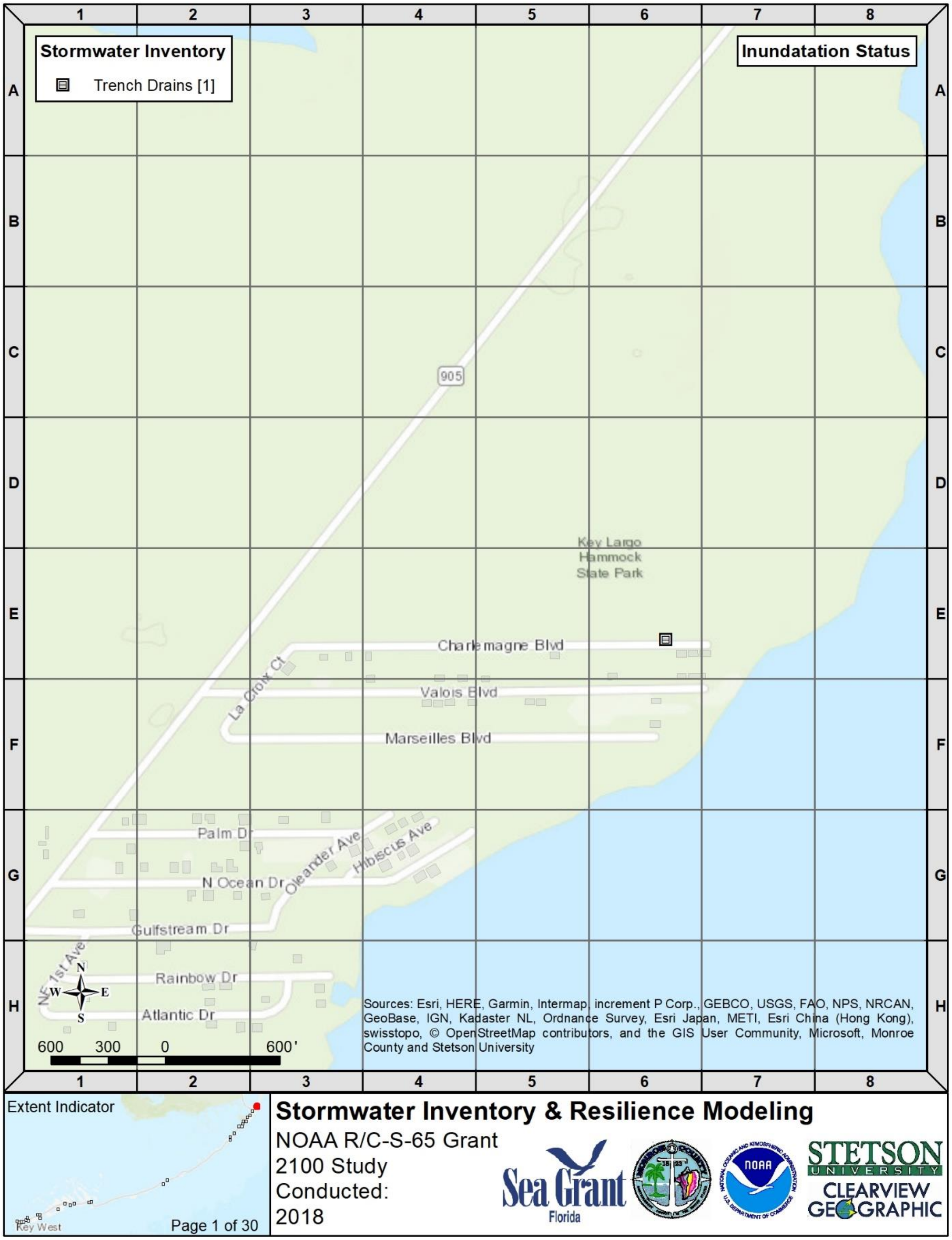


Map Series 4: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Tidal Flooding, 2100 Intermediate-High Sea-Level Rise



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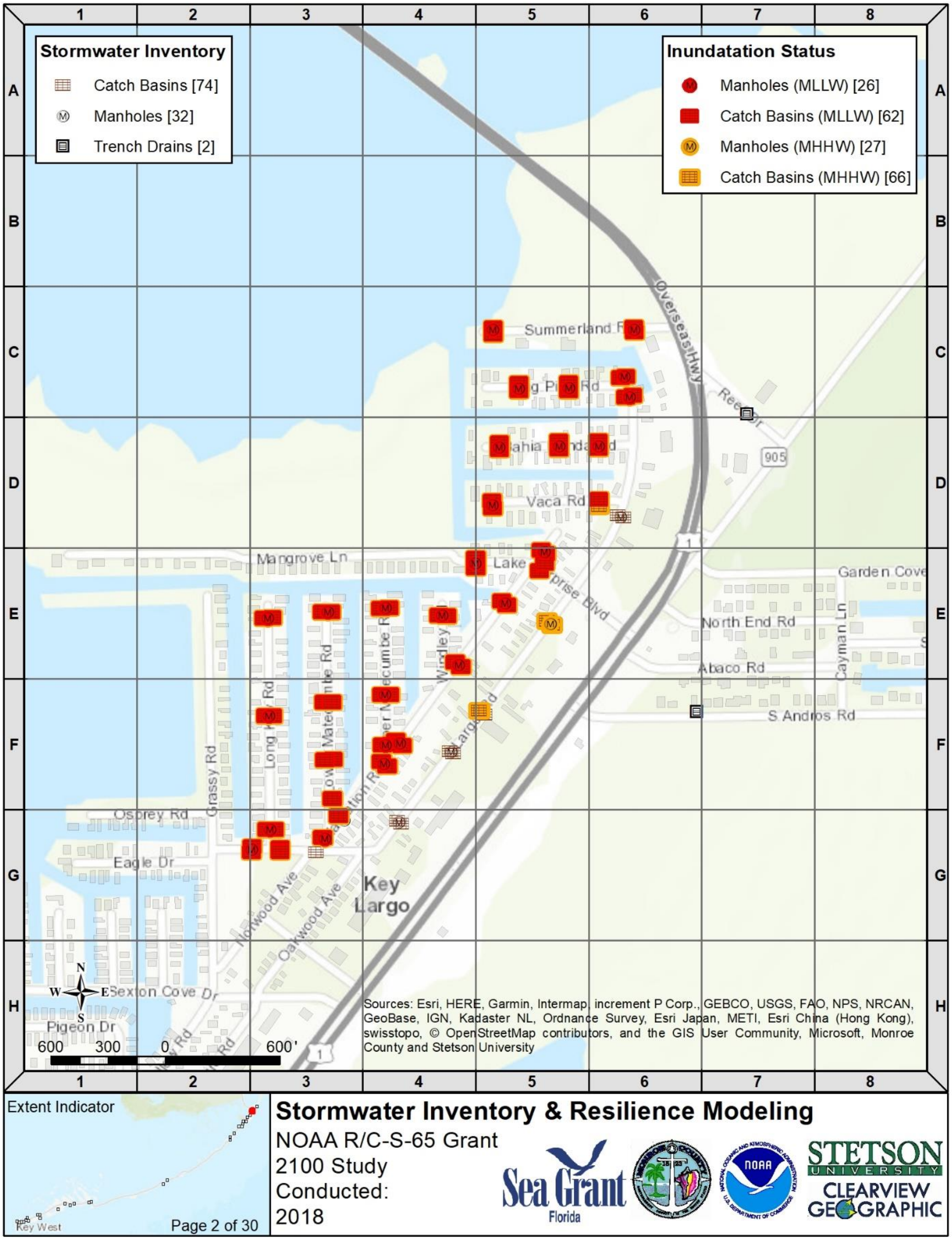

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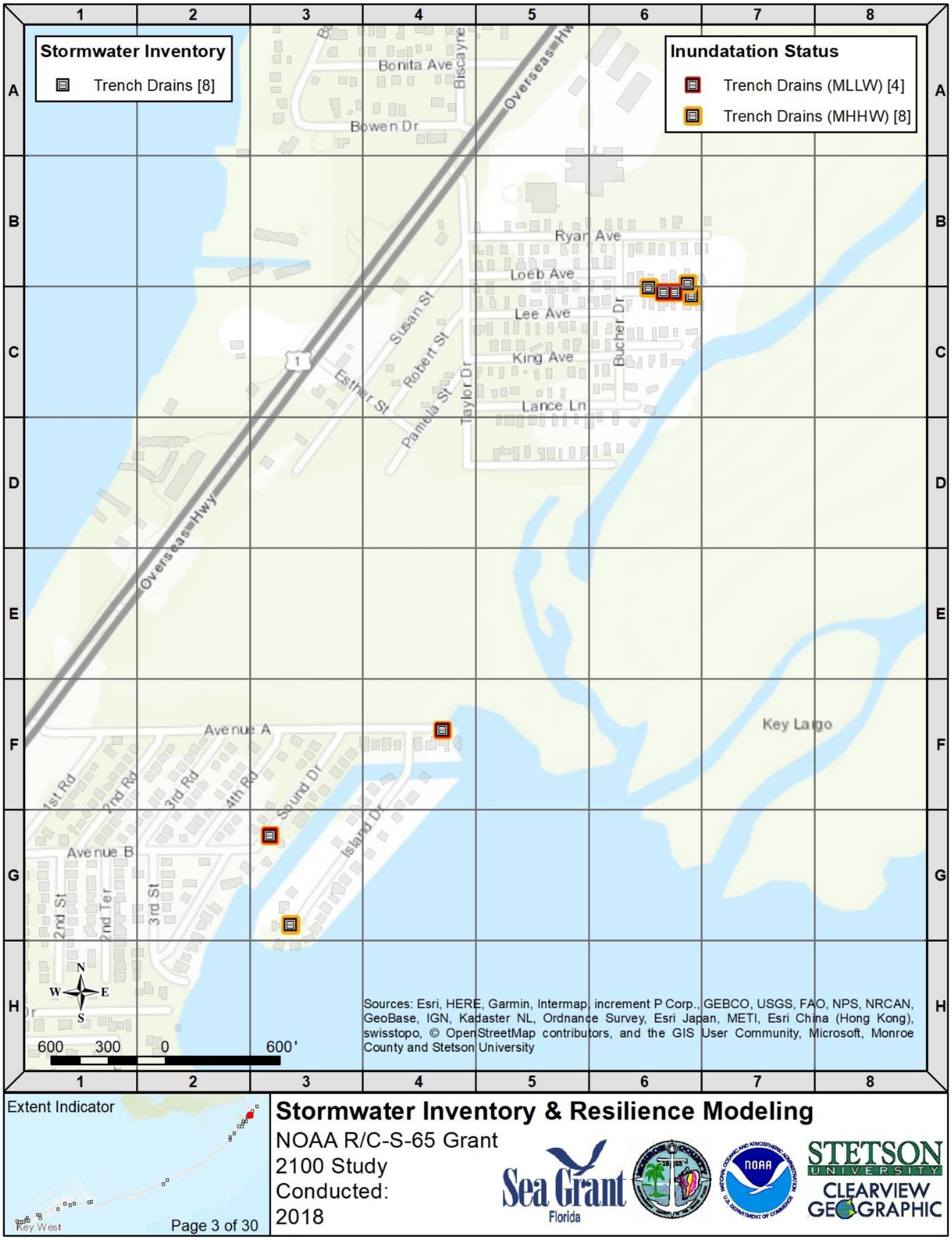

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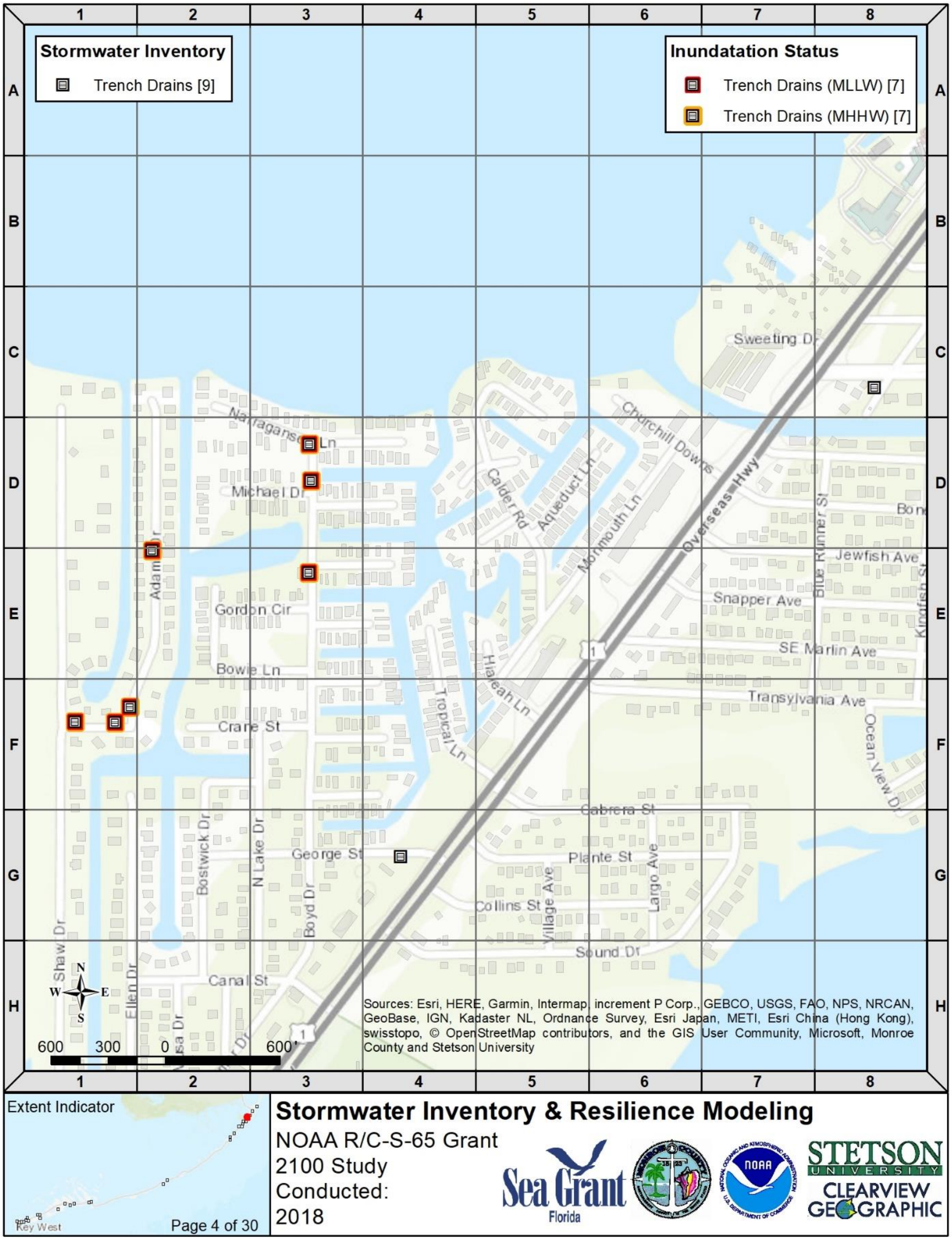

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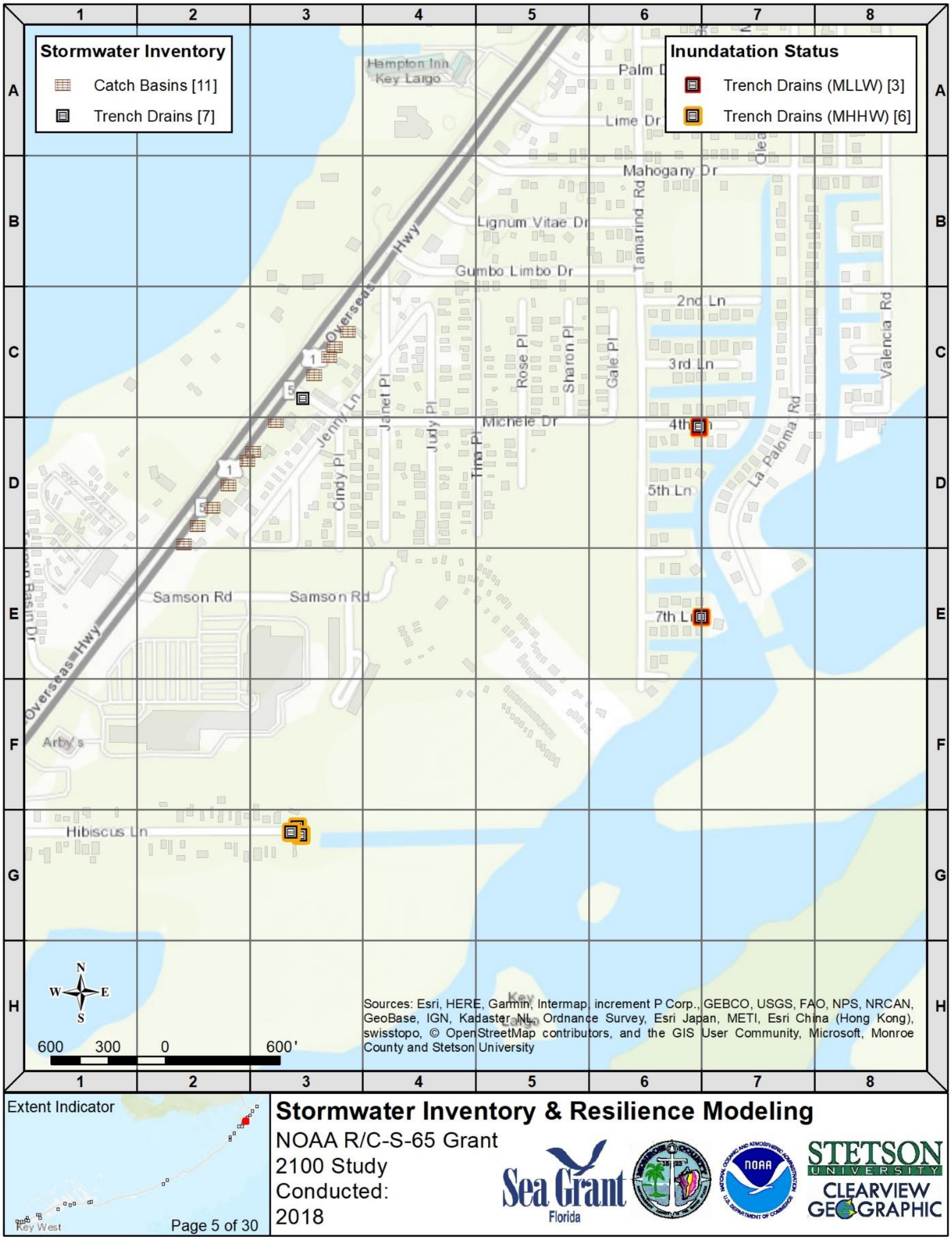

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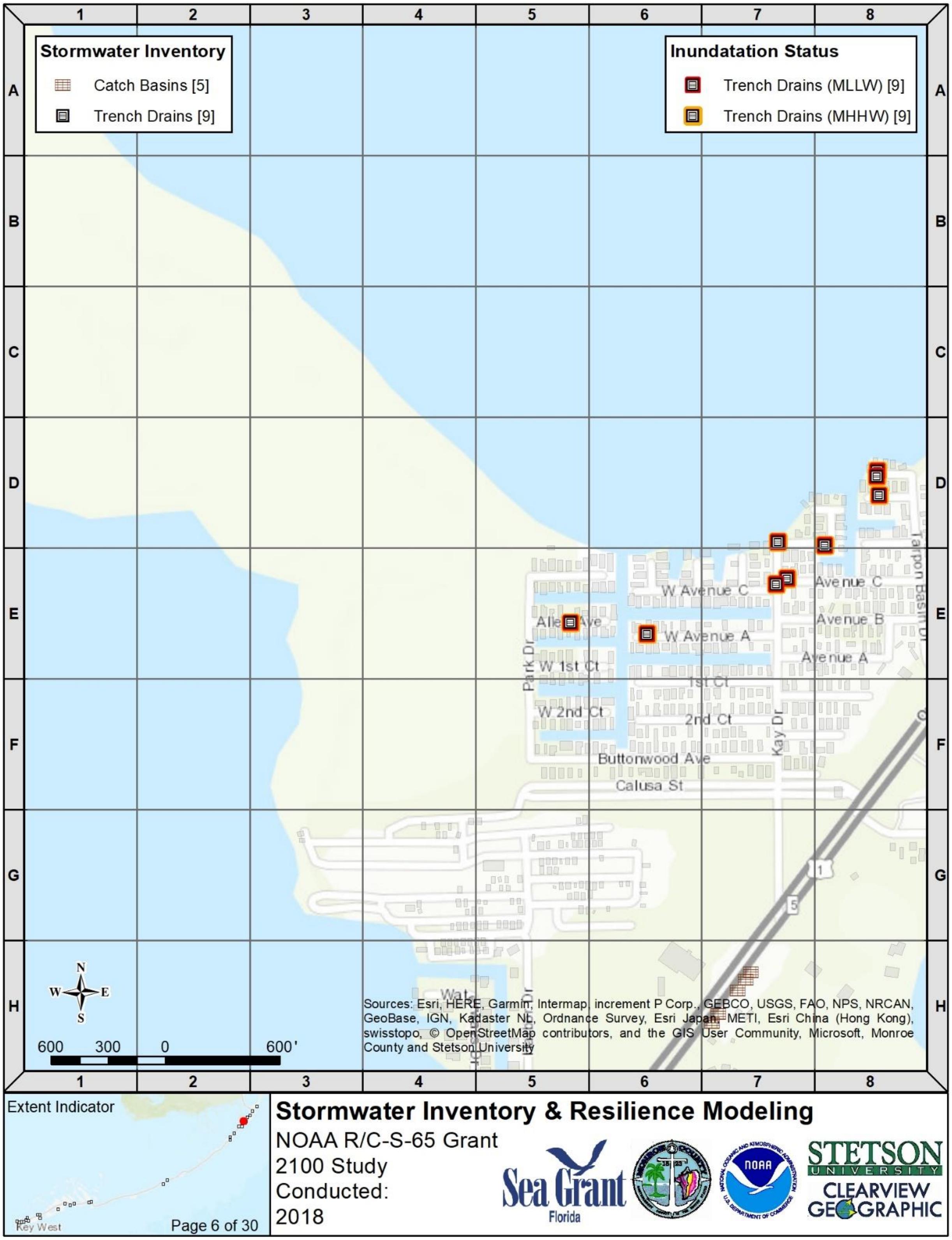

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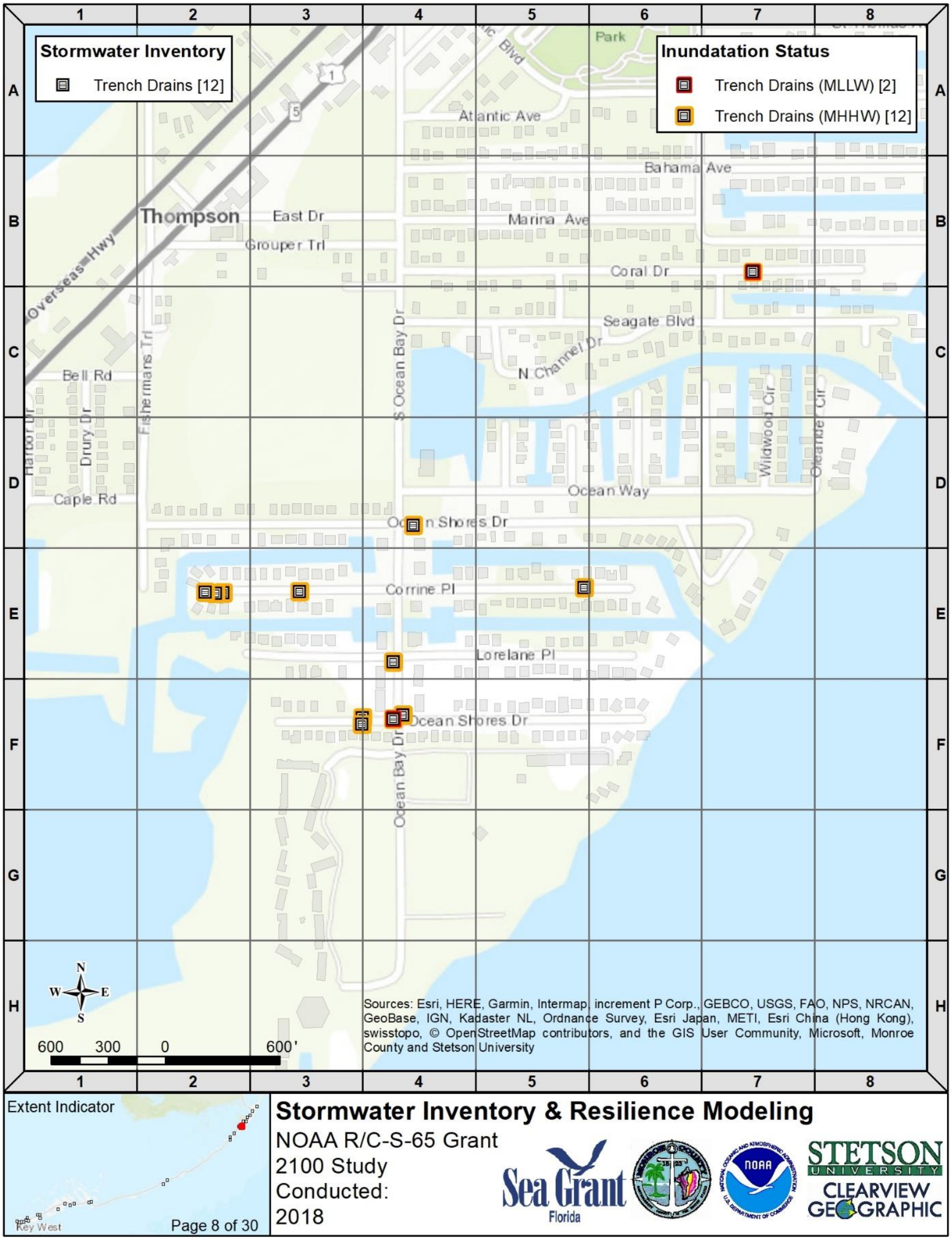

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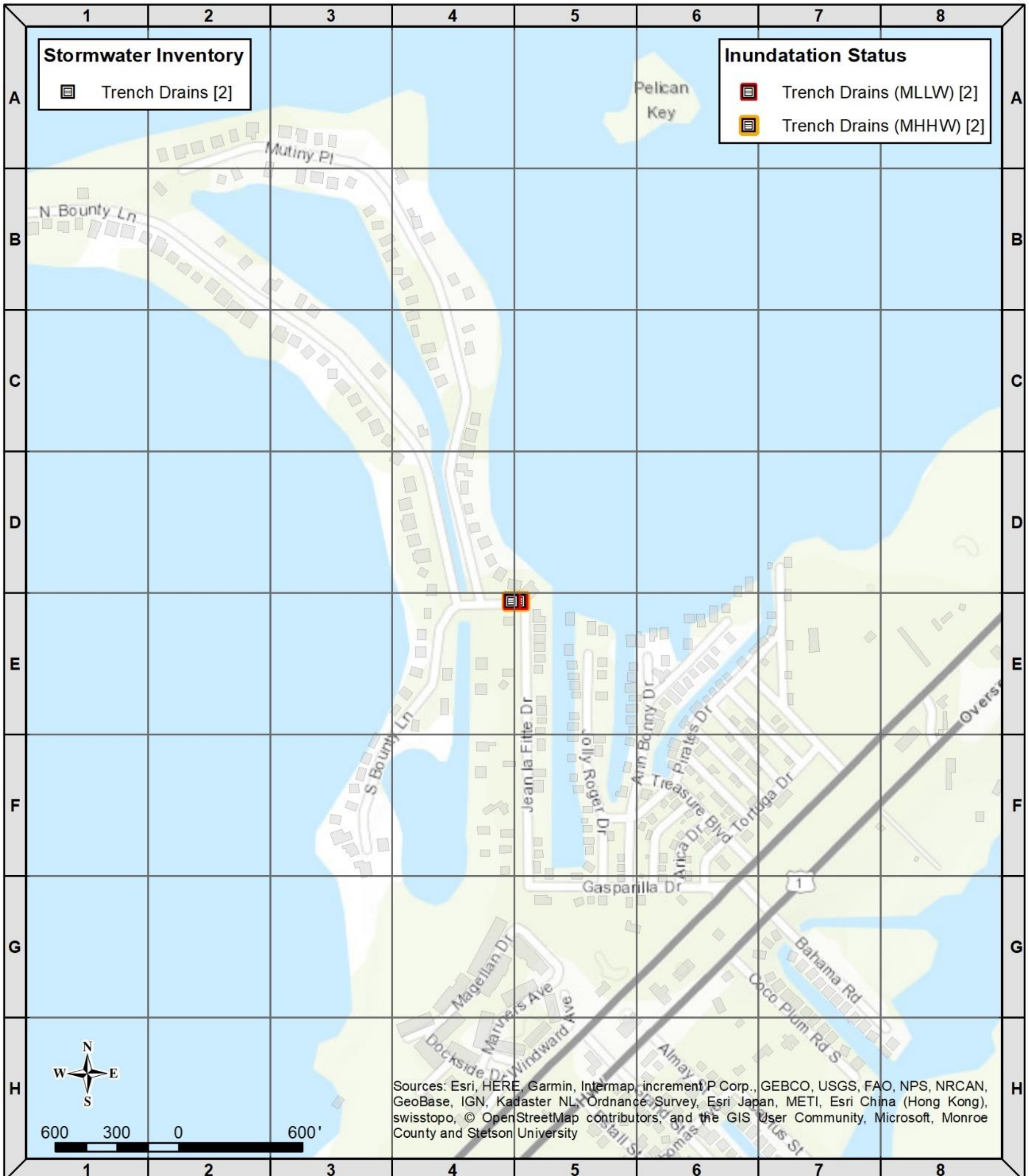

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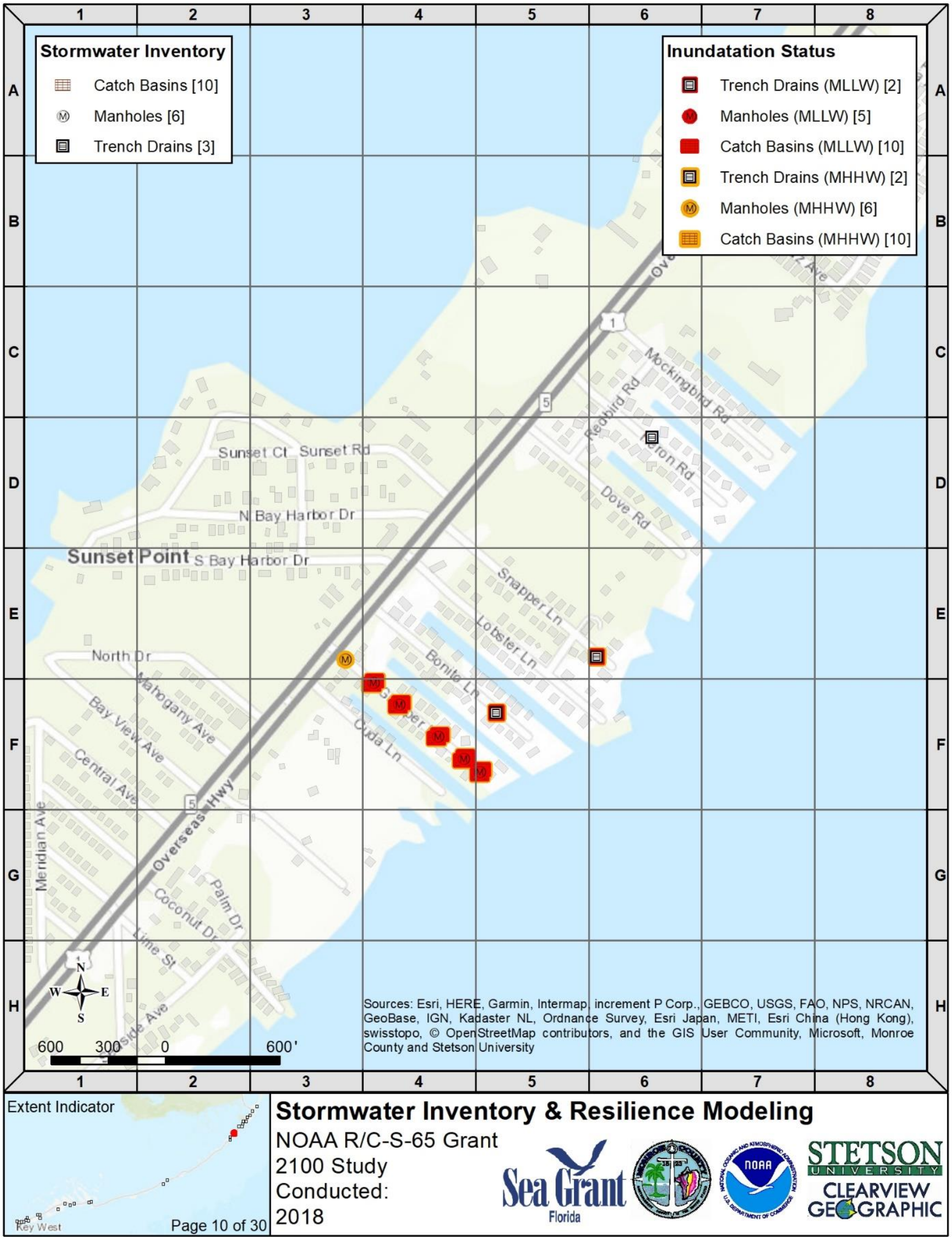

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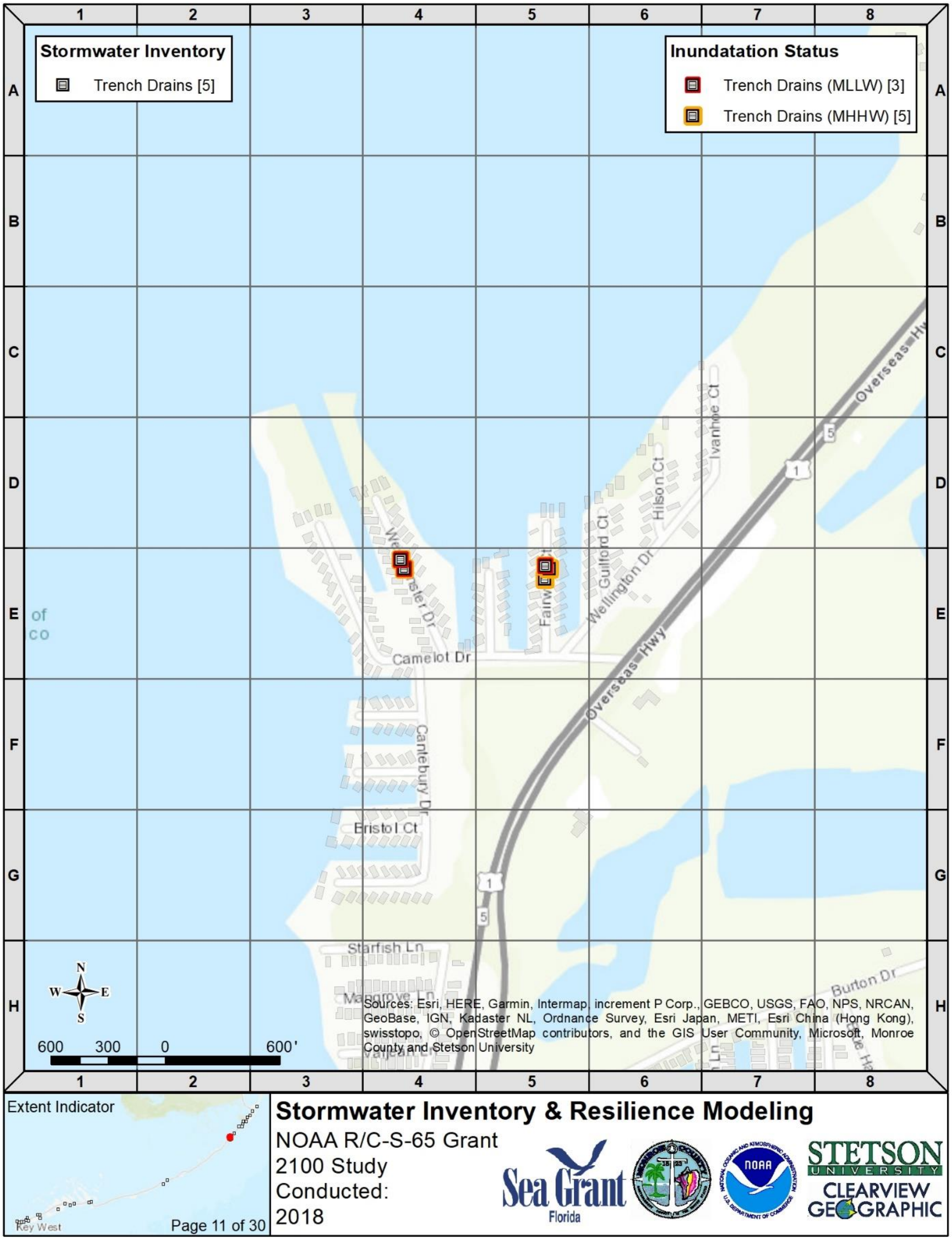

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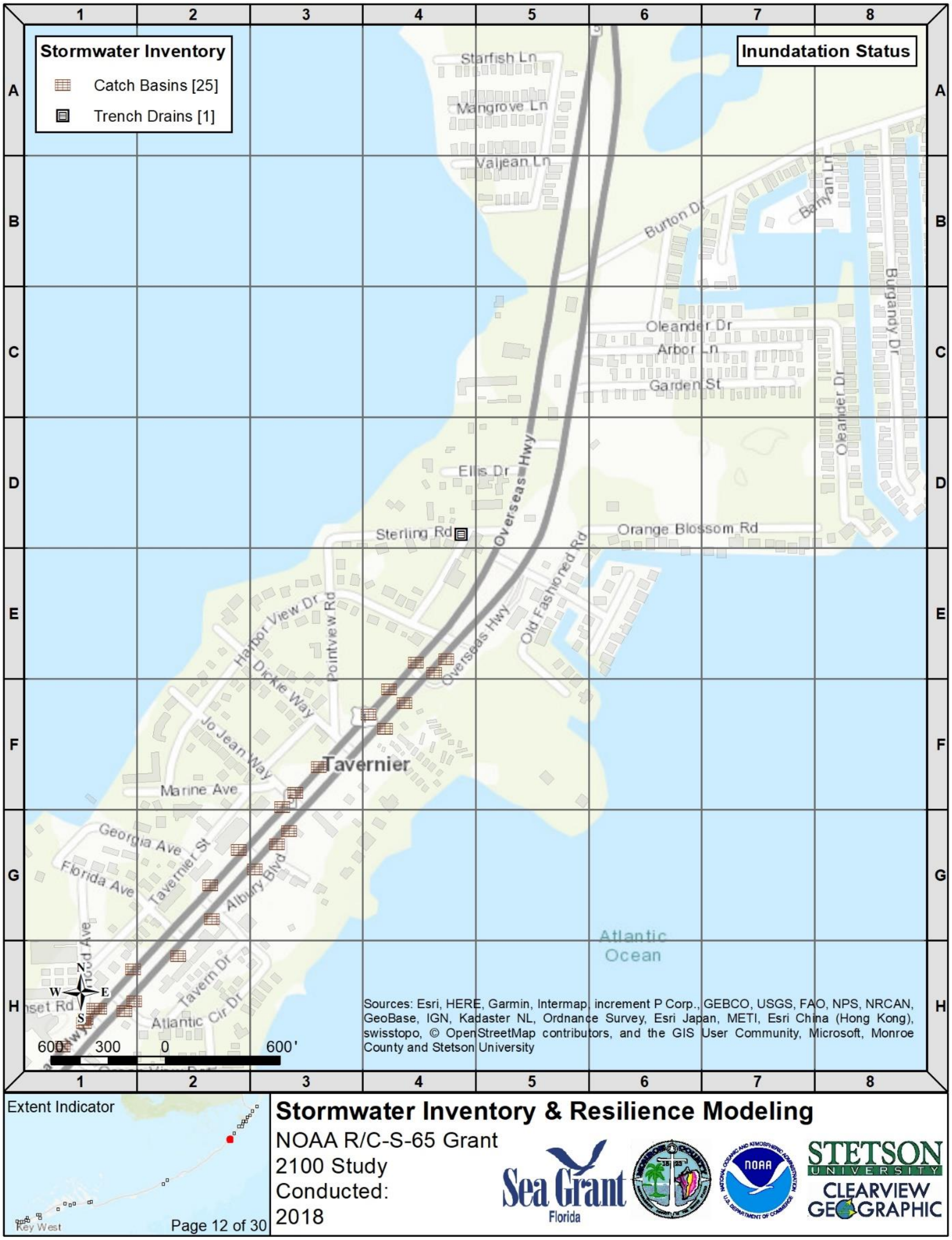

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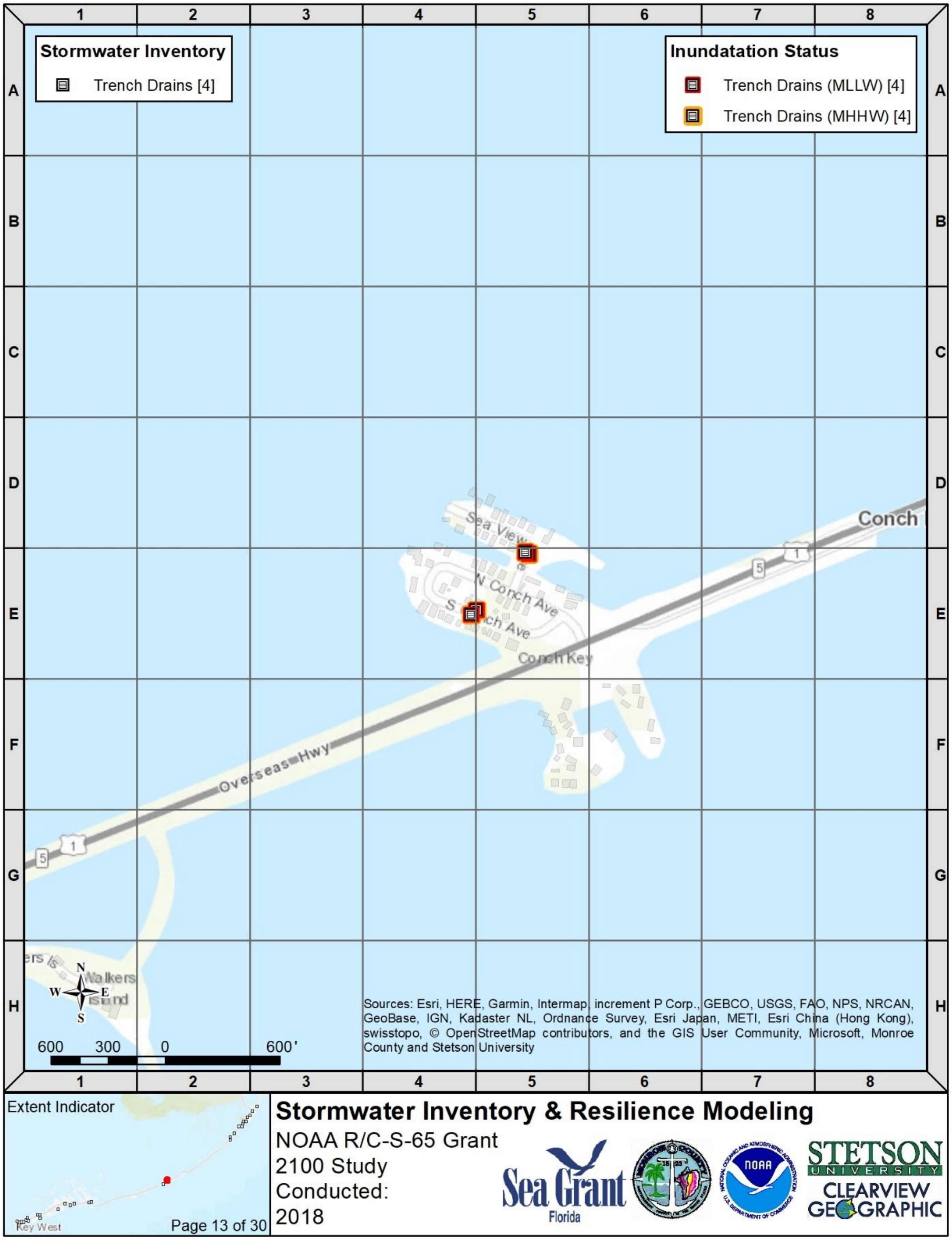

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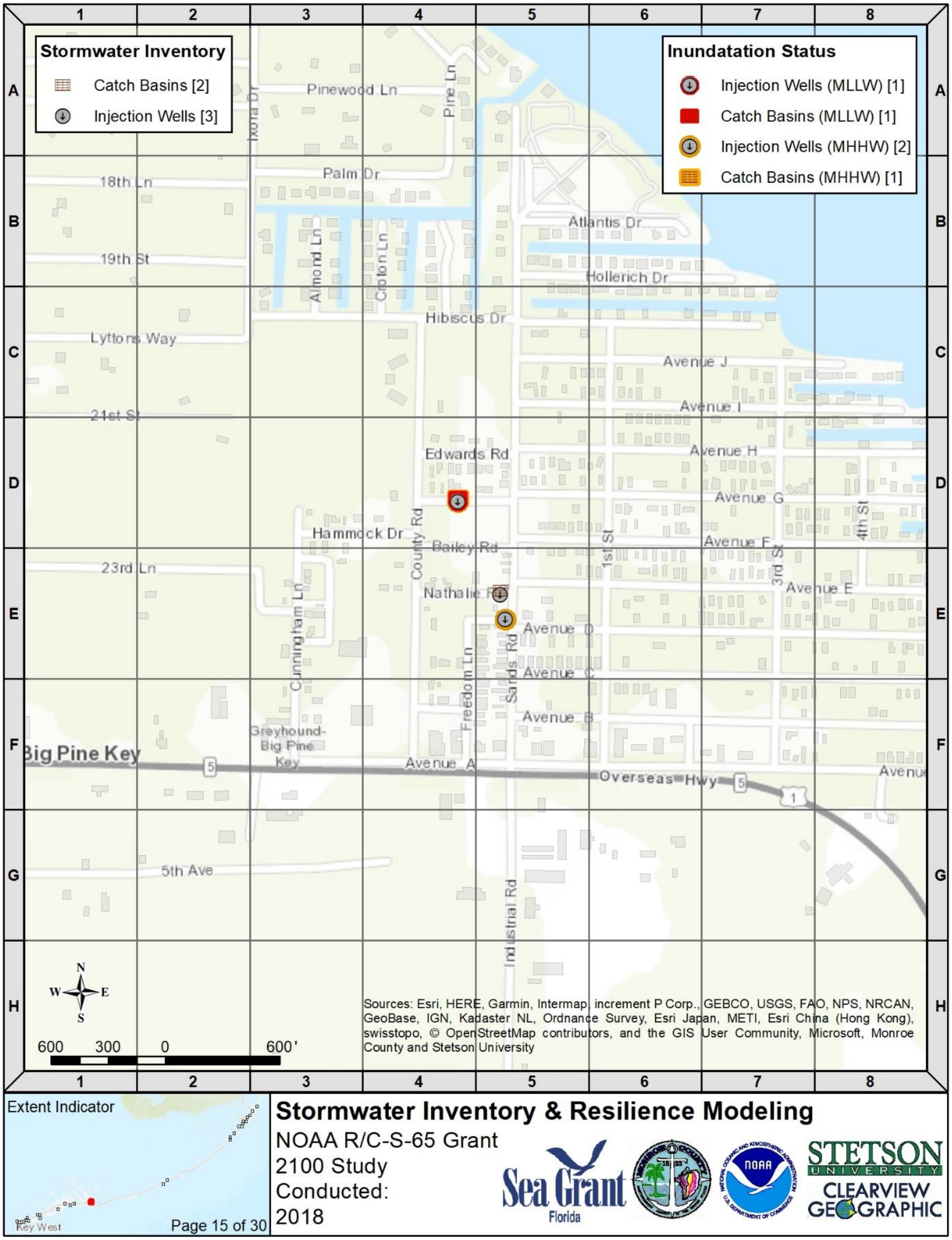

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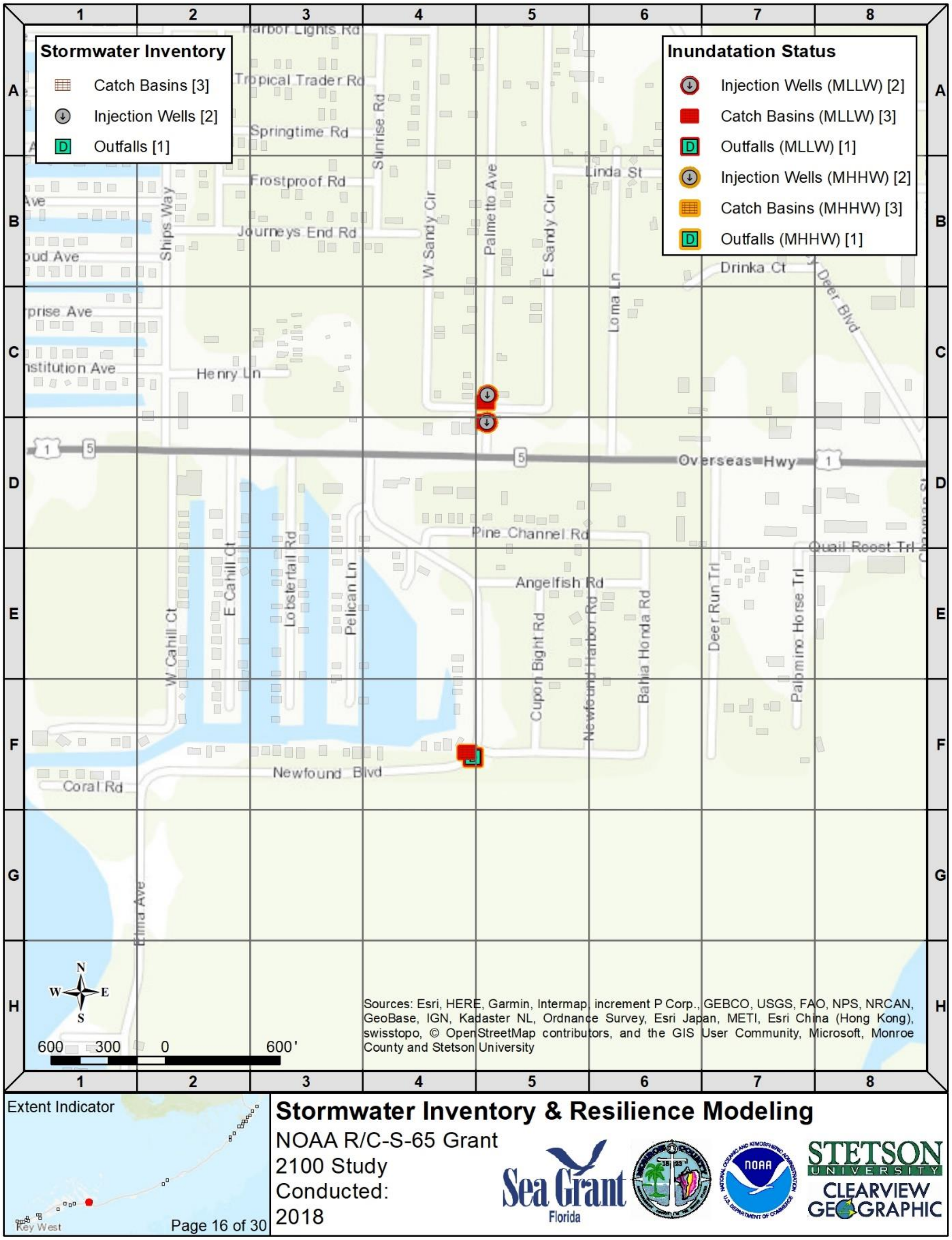

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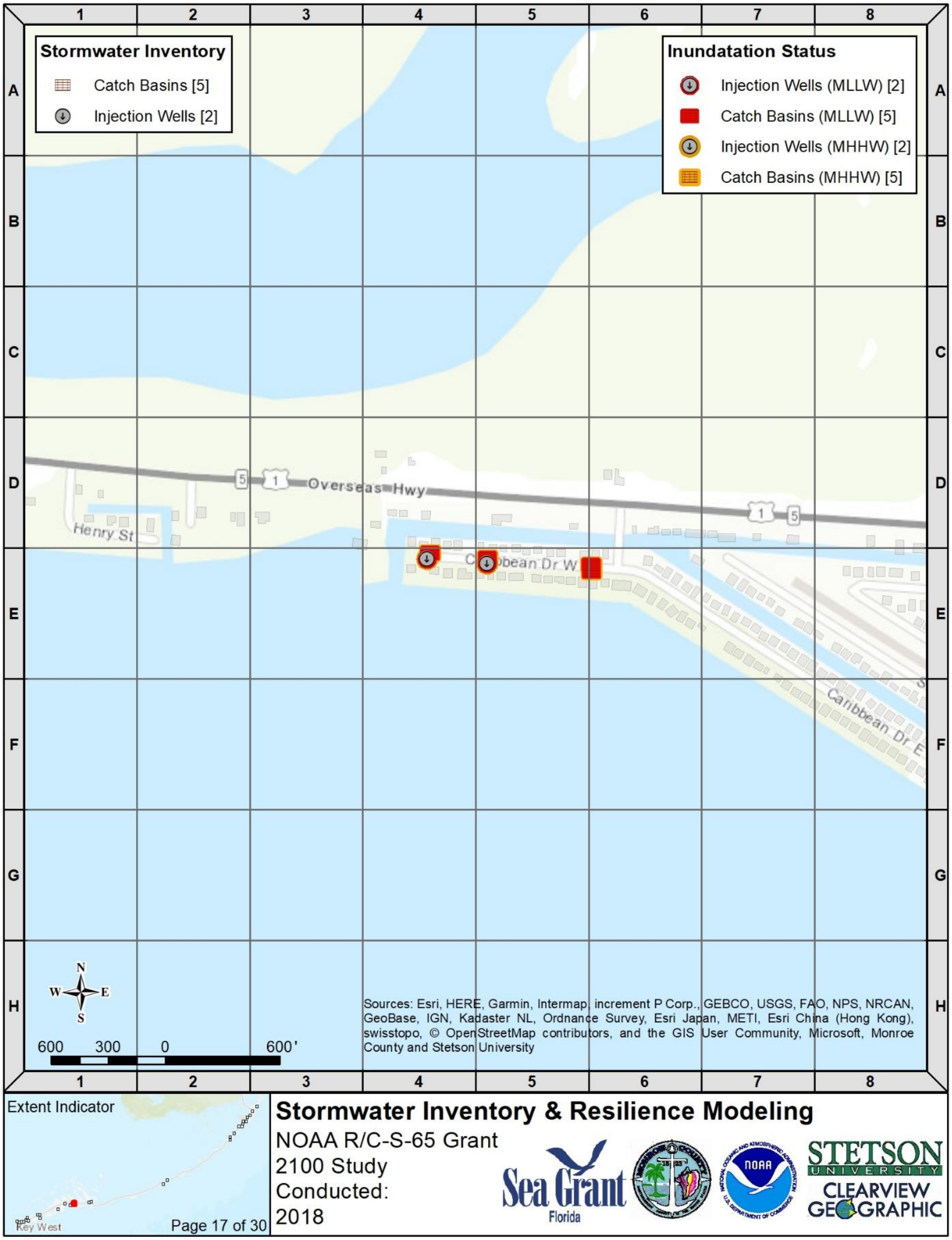

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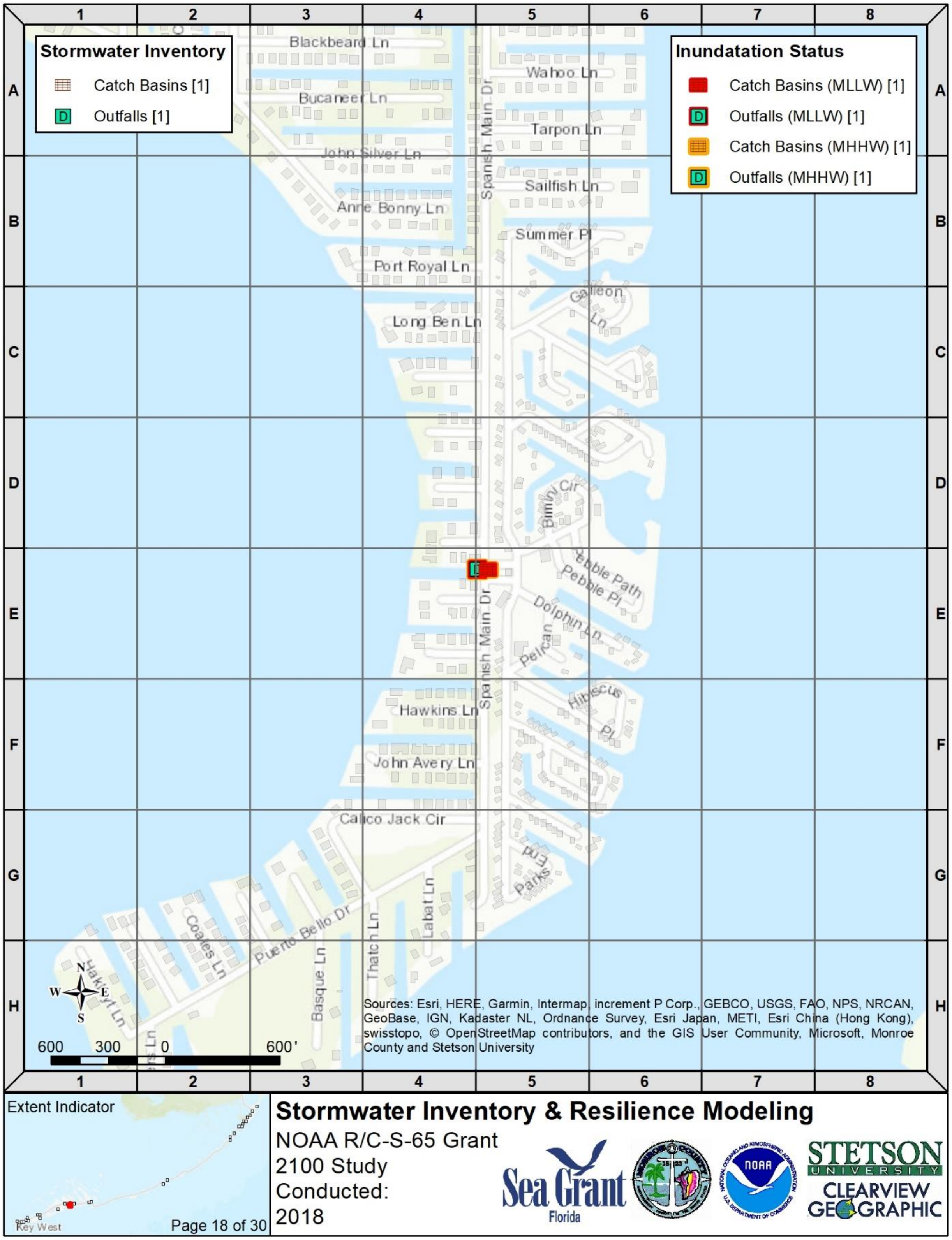

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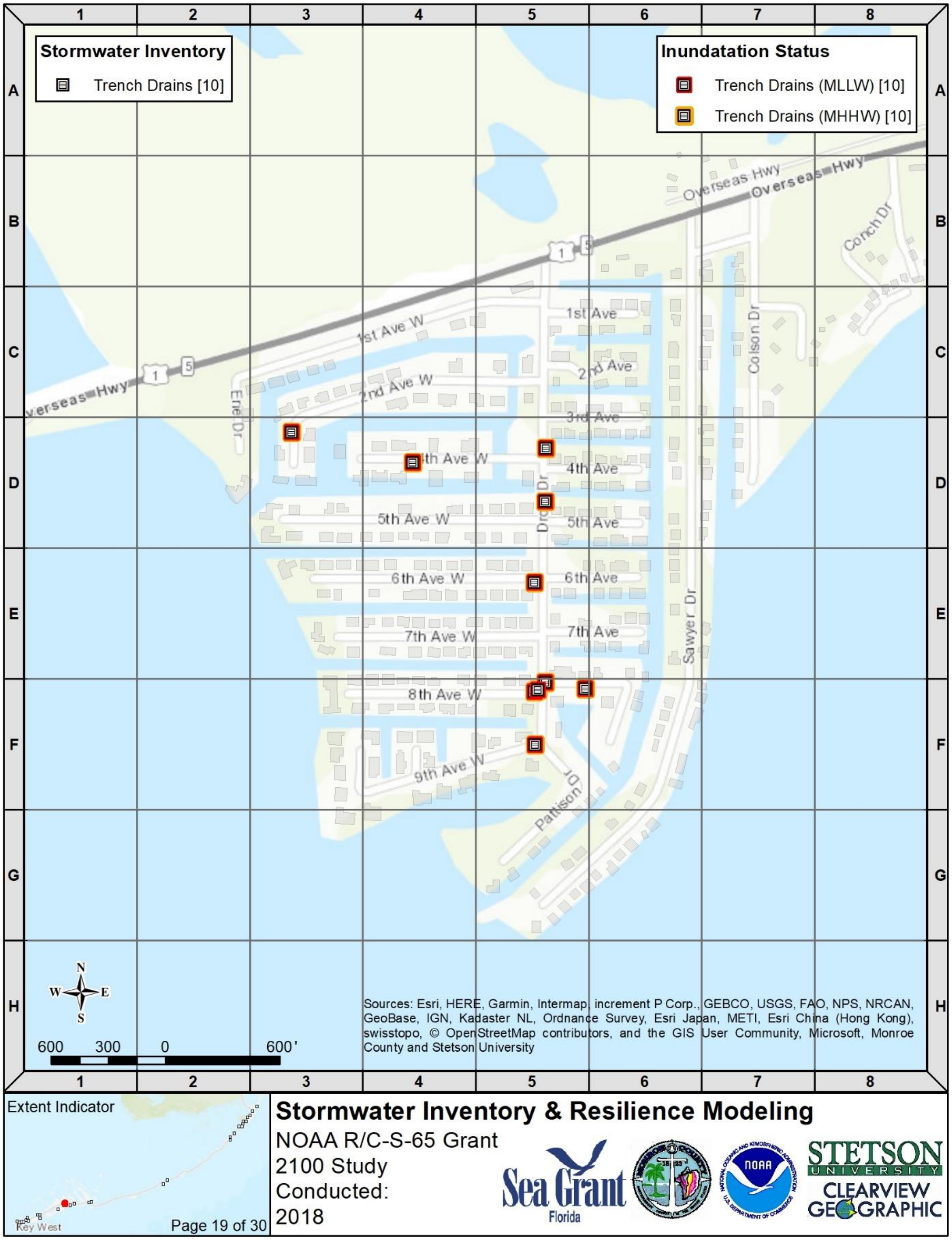

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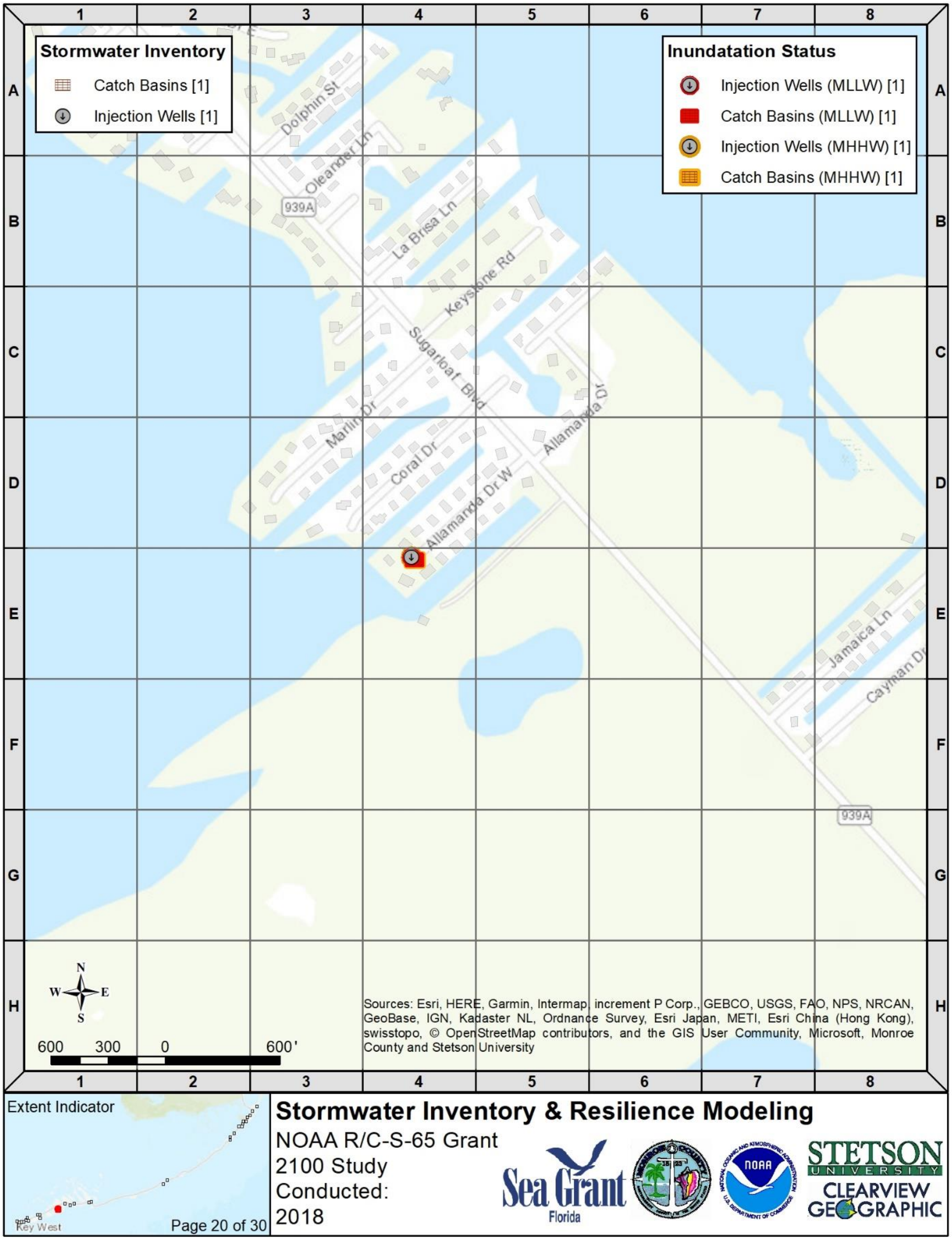

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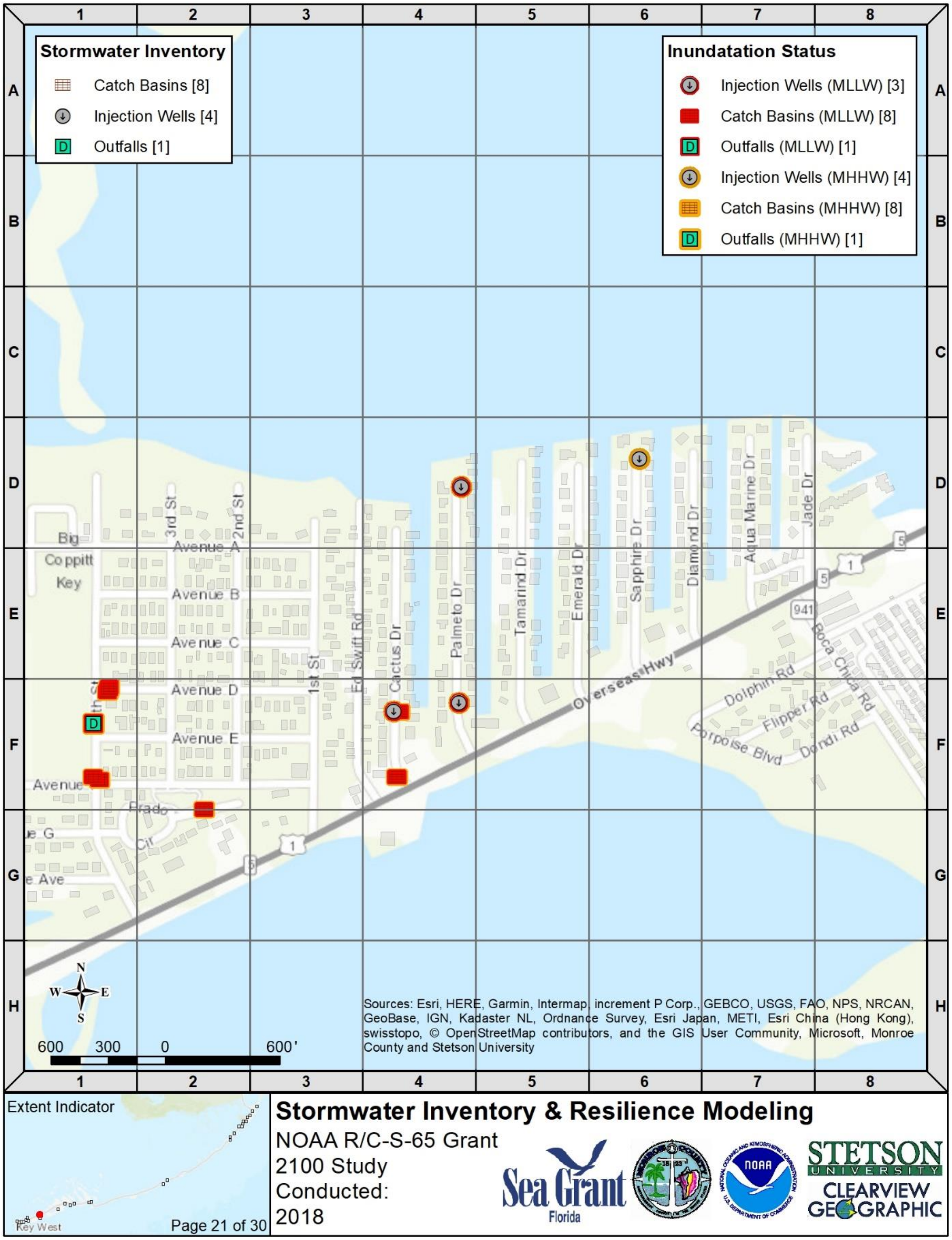

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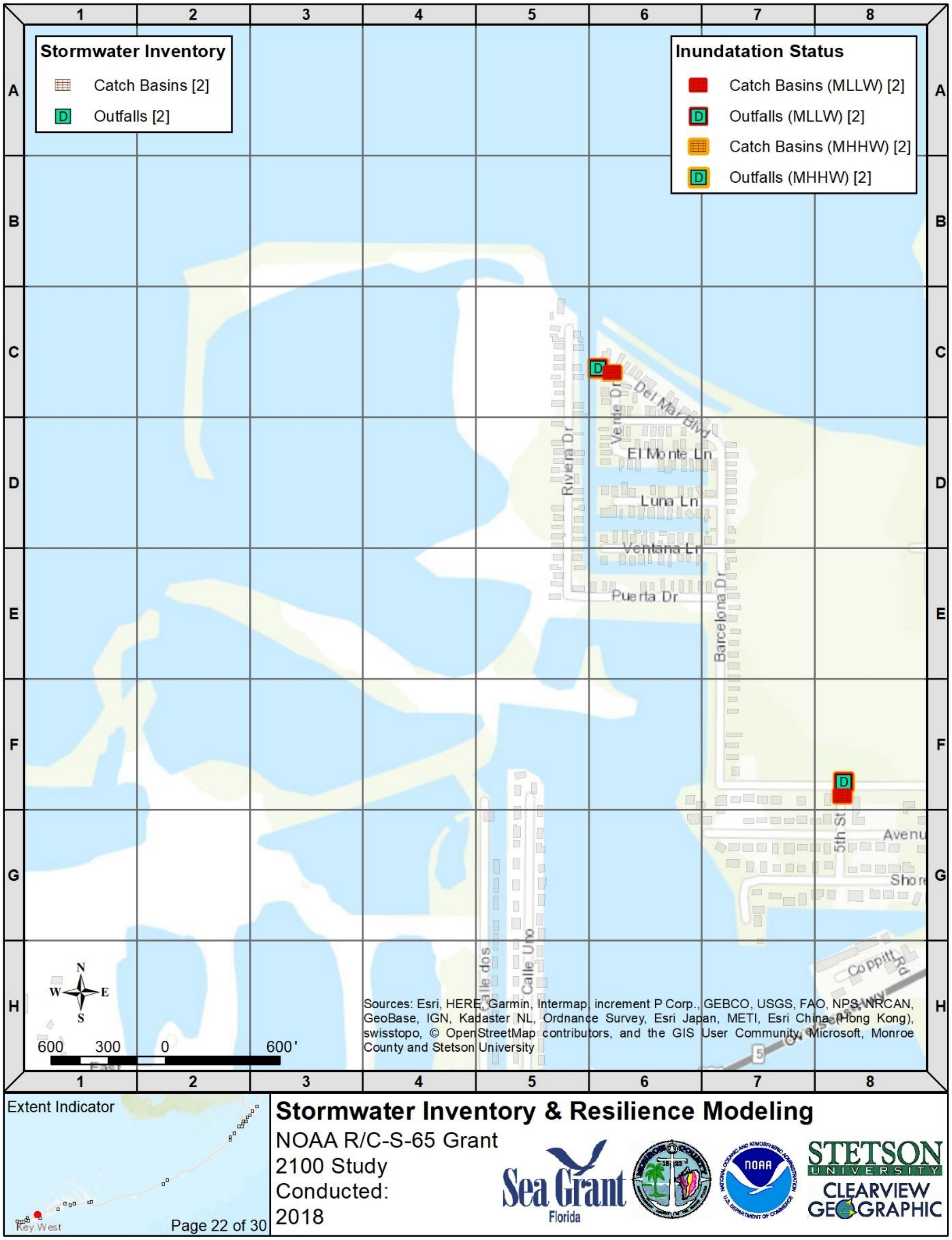

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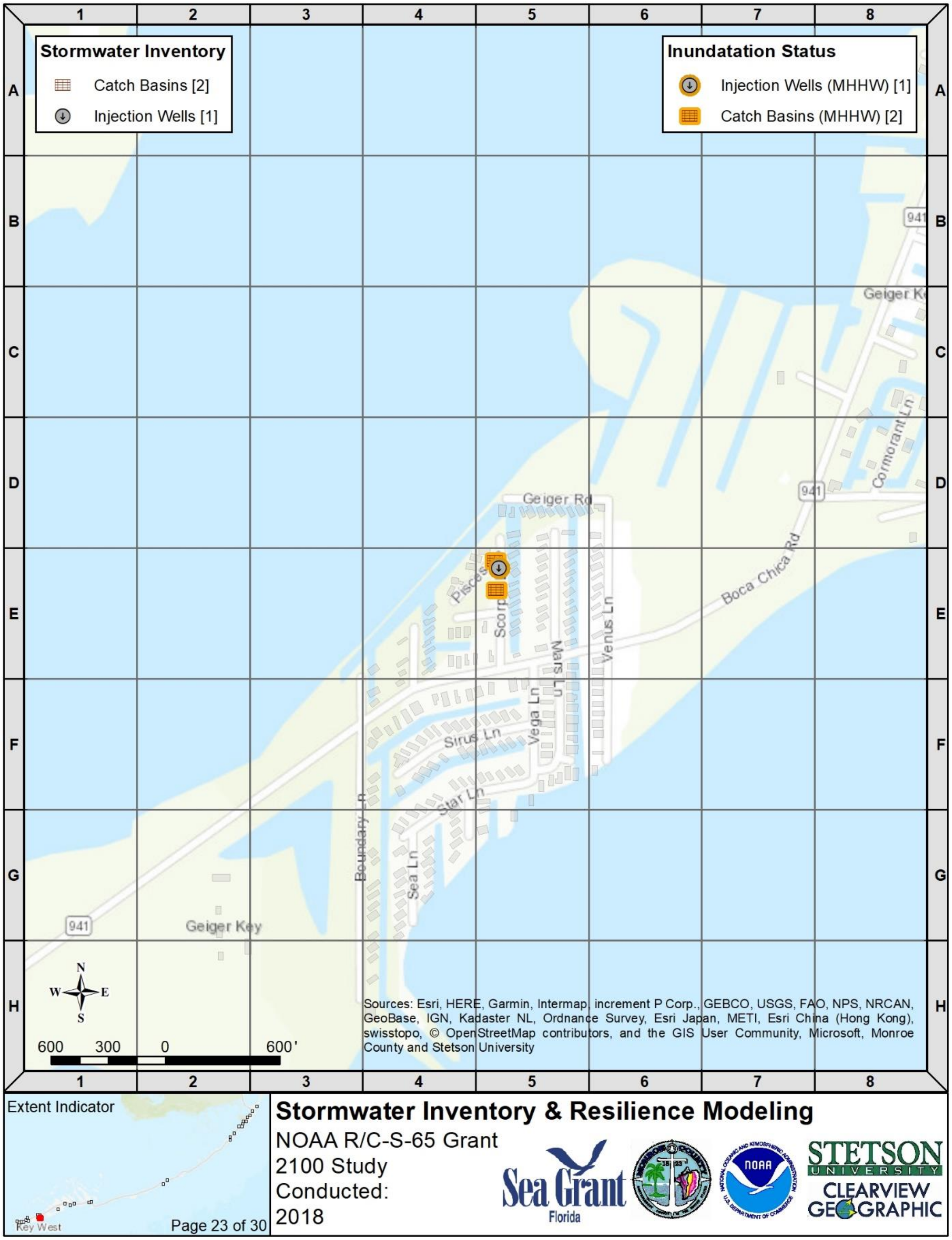

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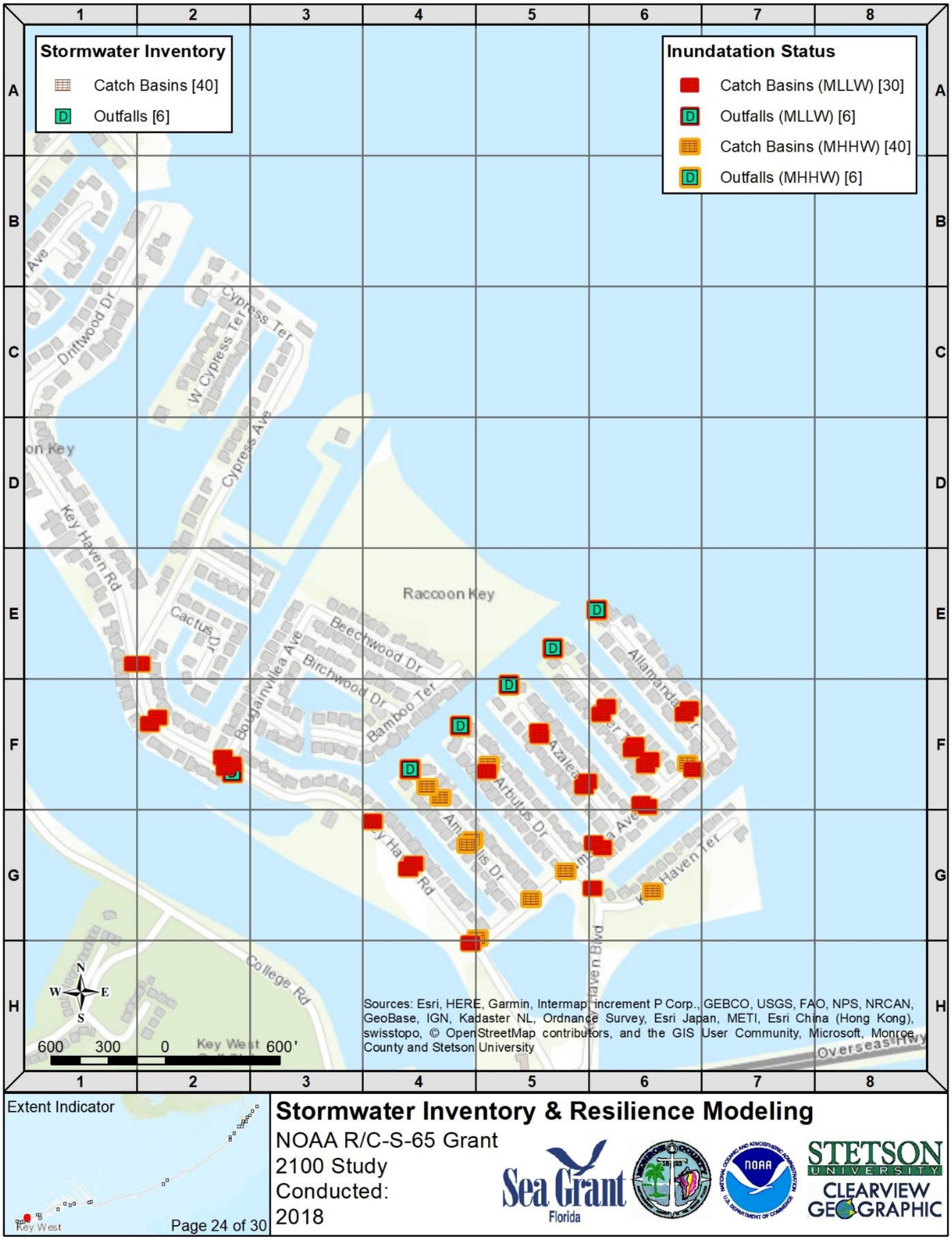

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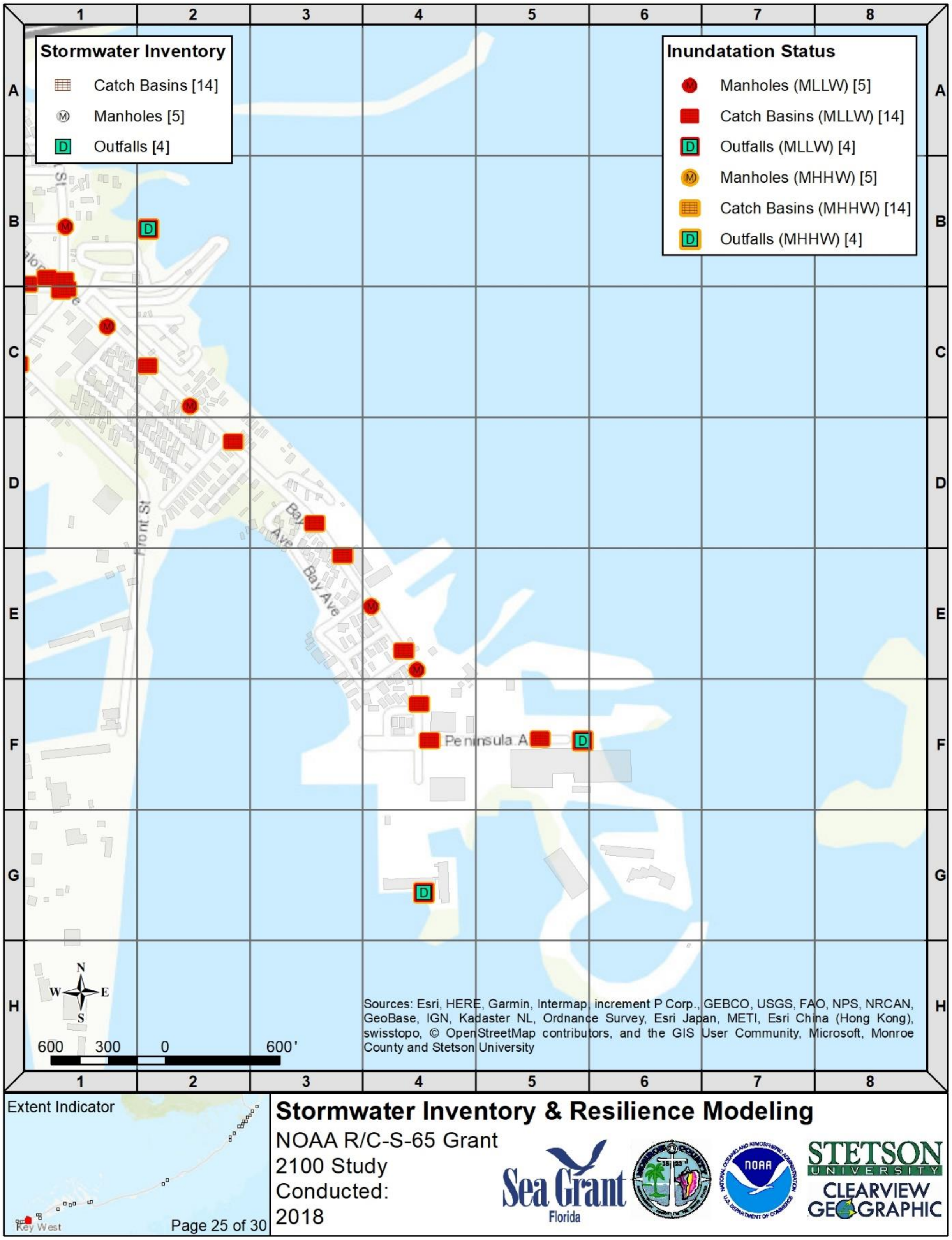

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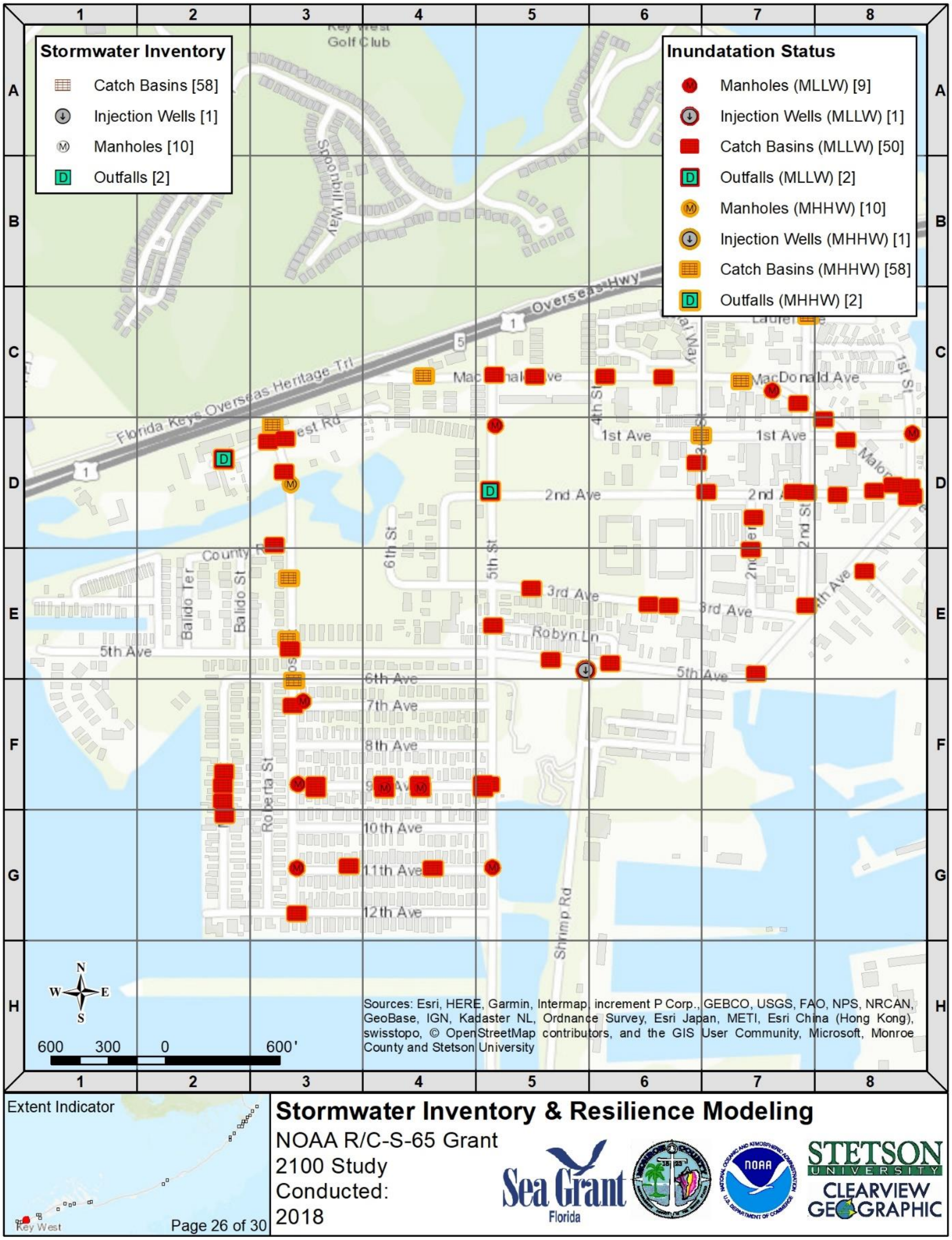

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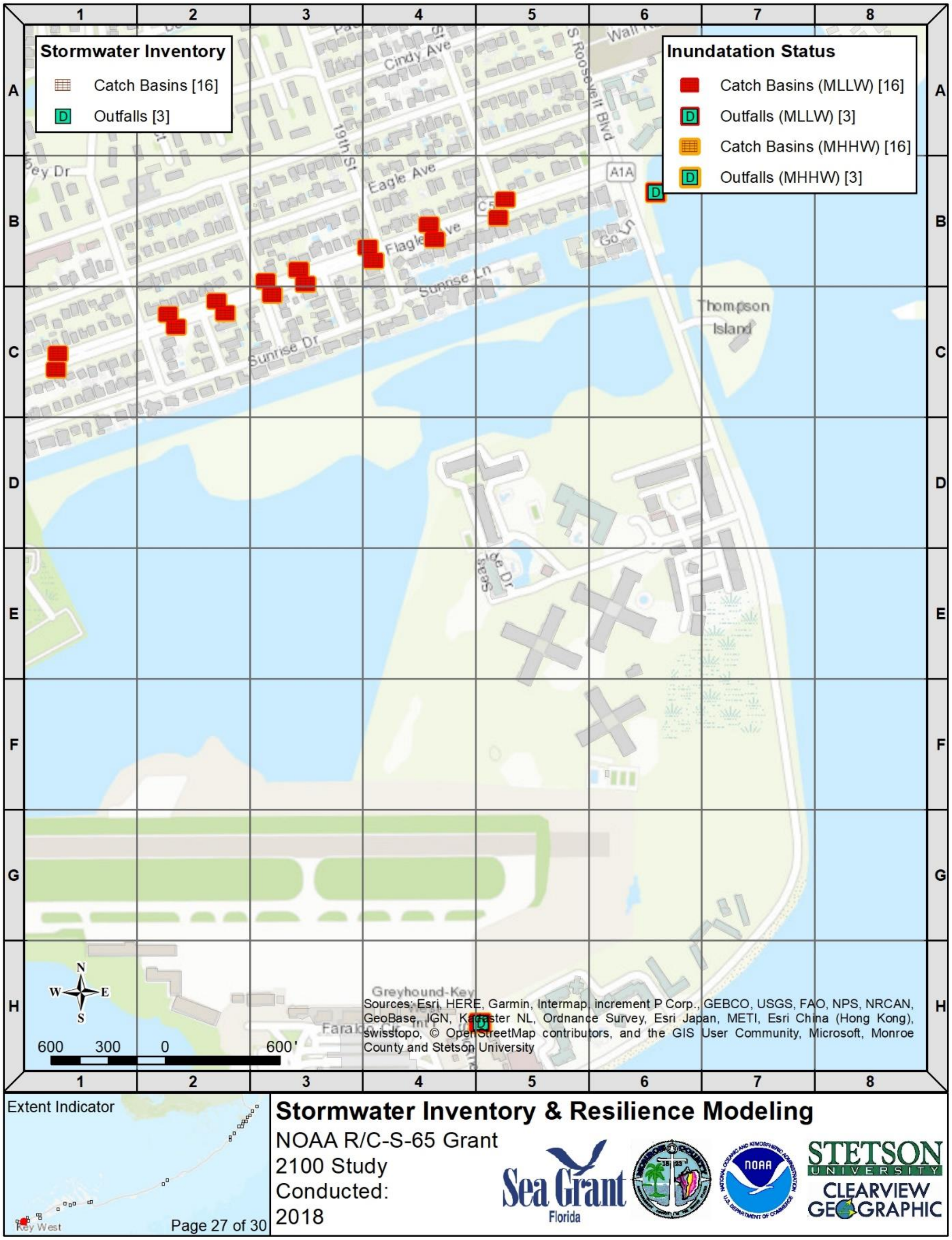

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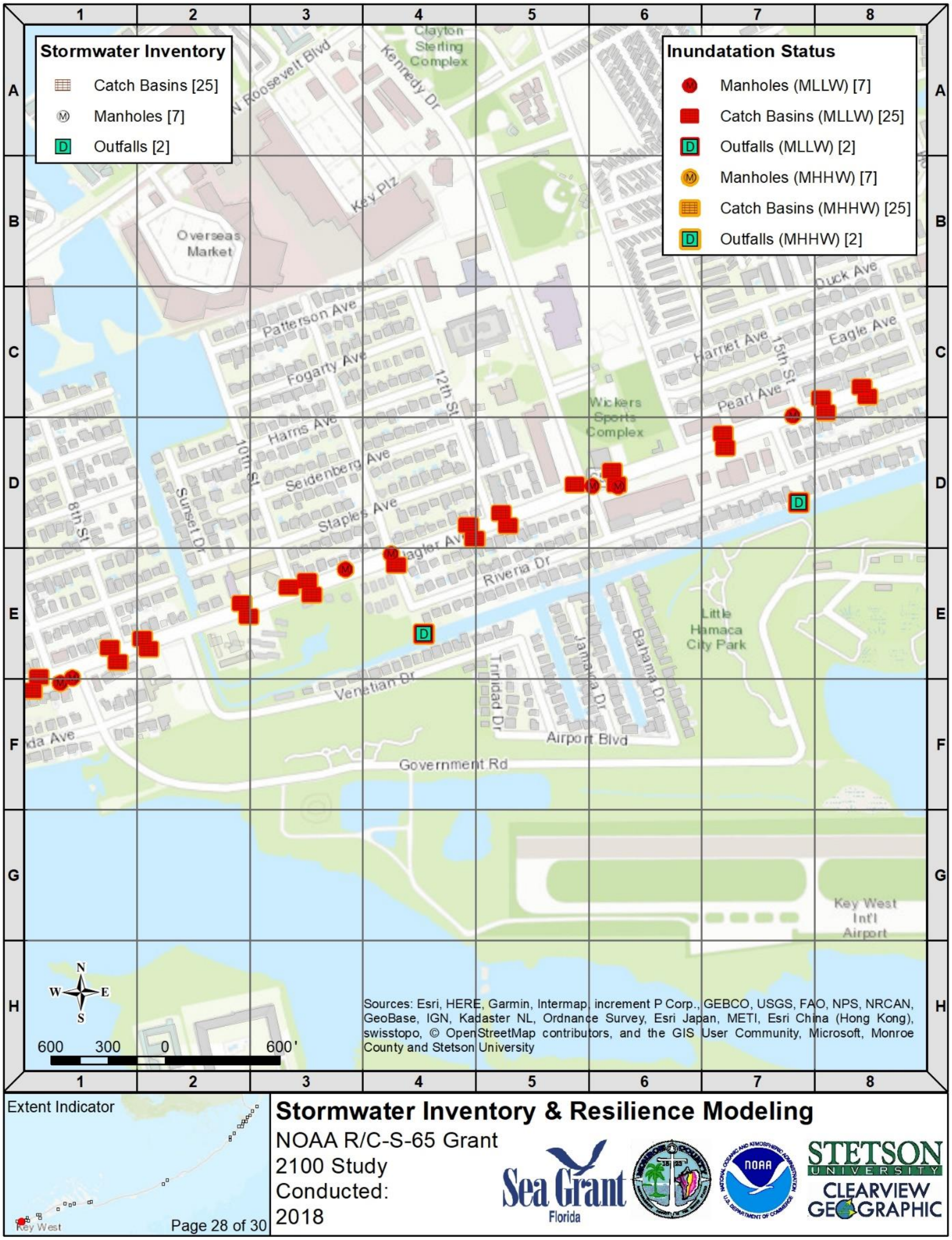

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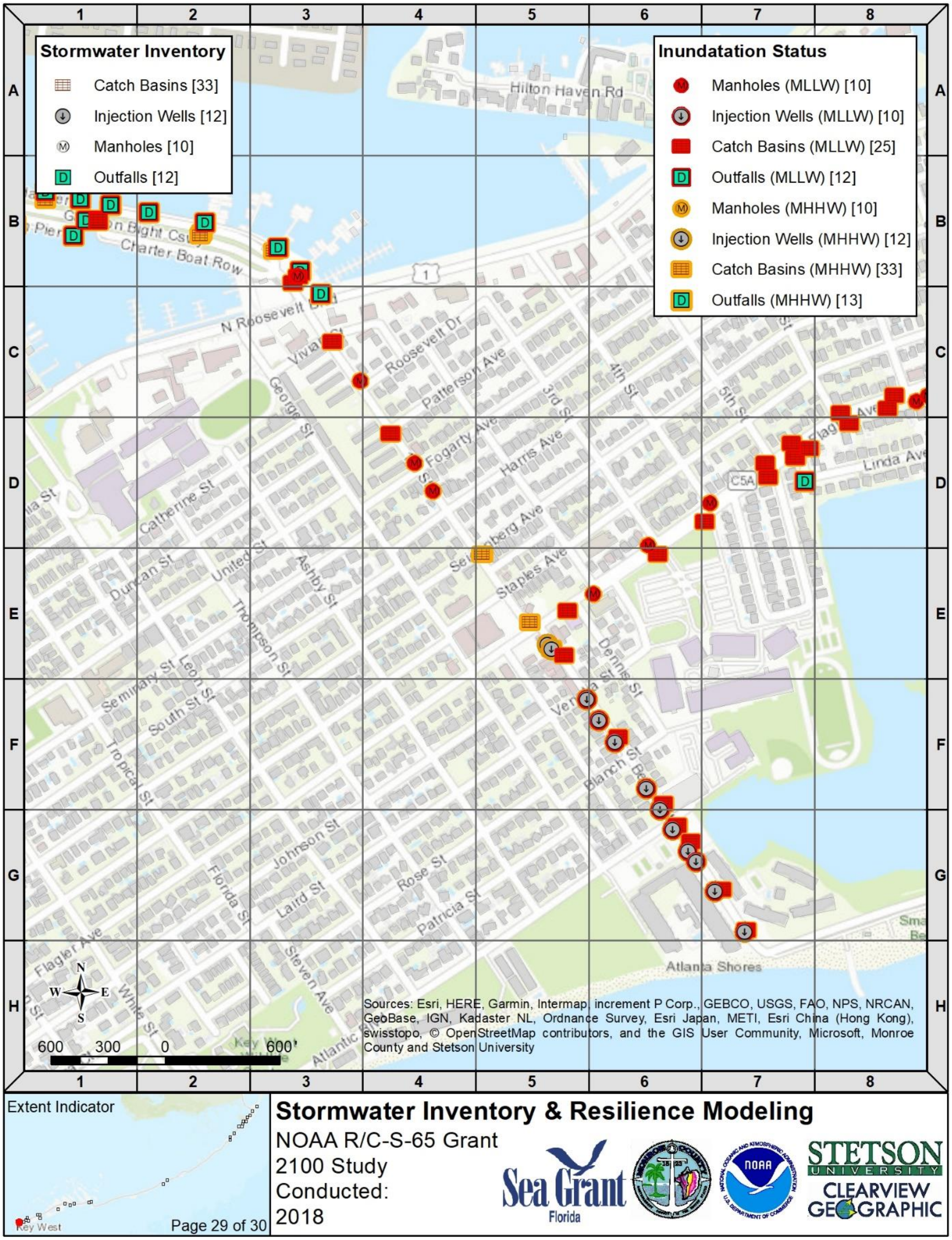
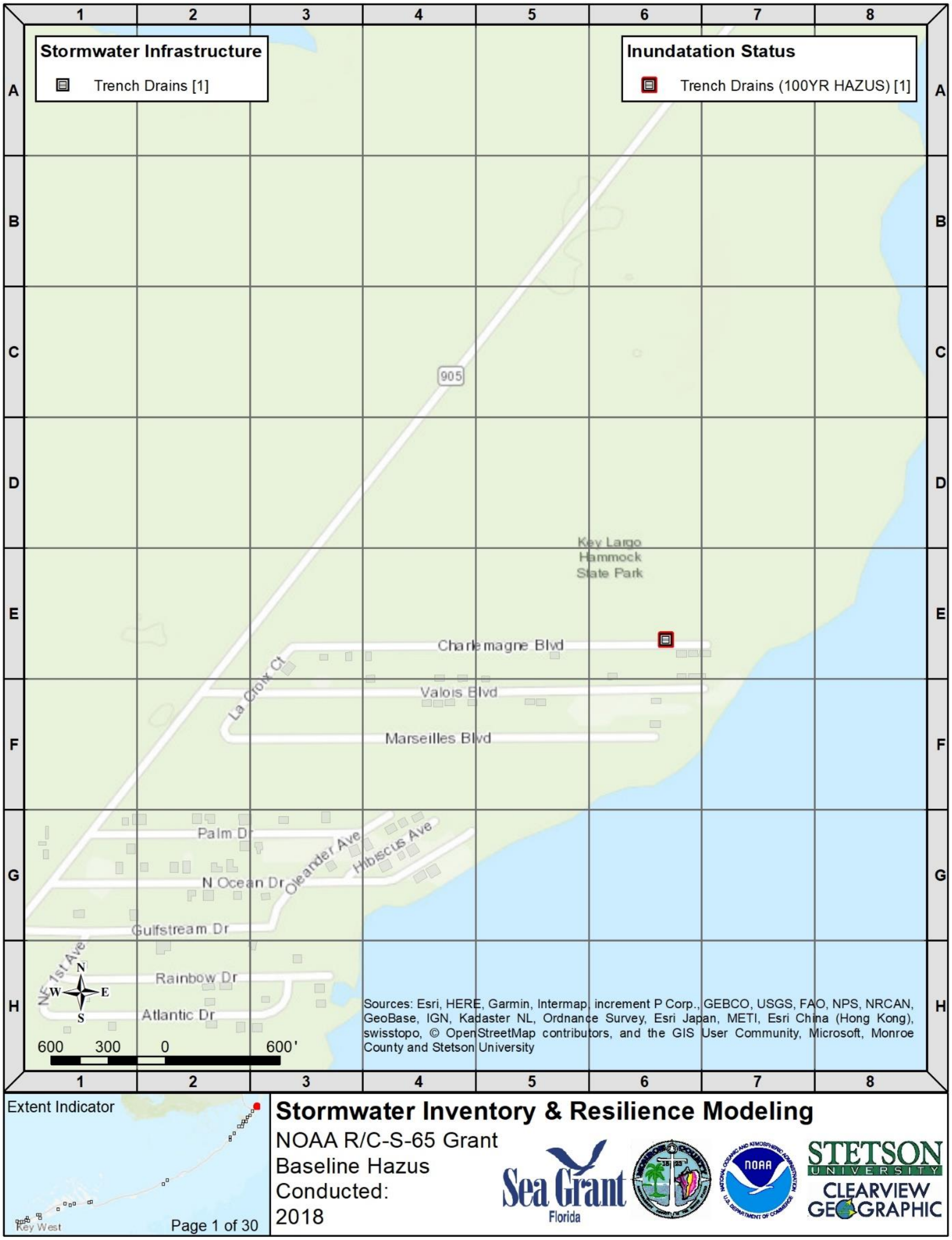
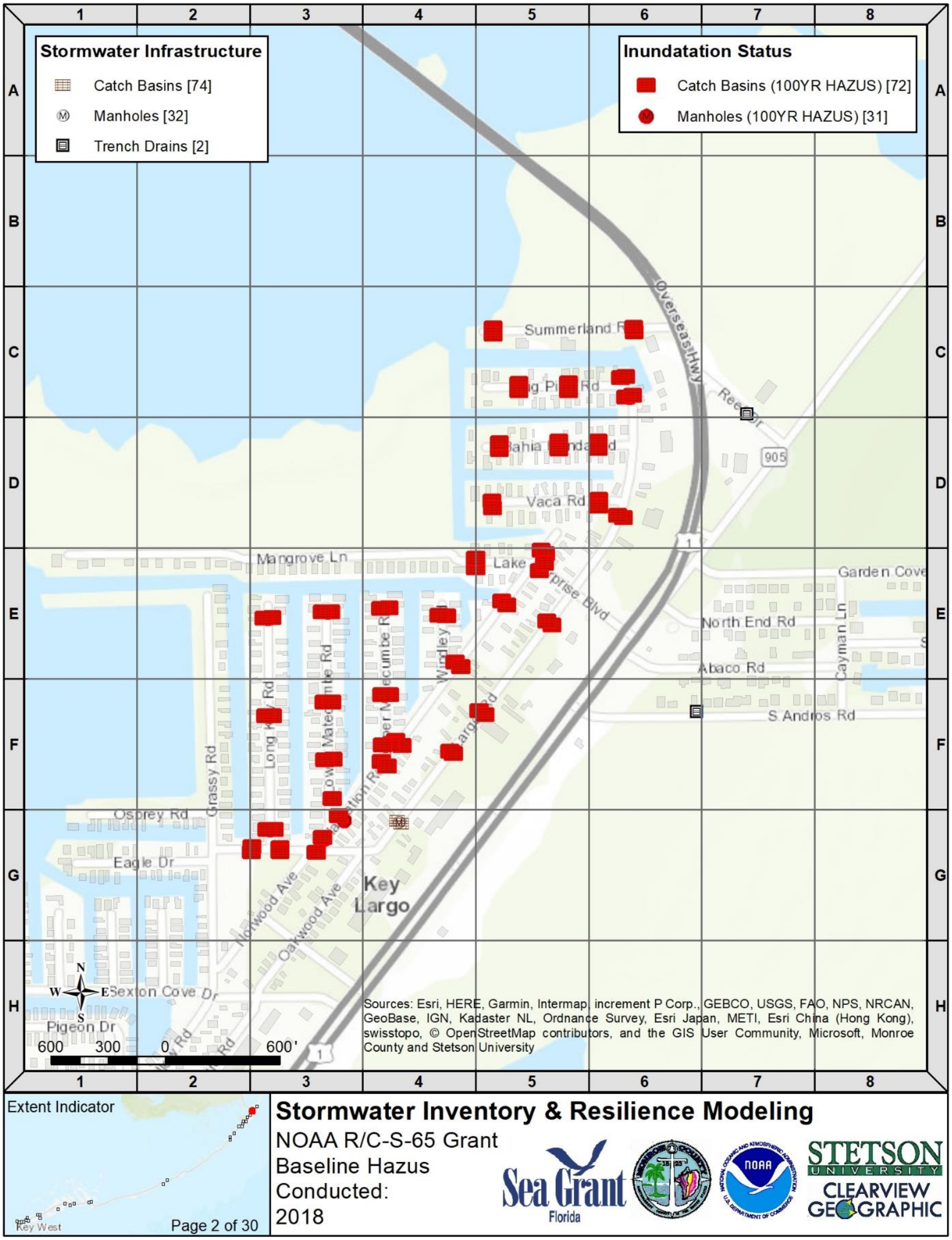


Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)



Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)



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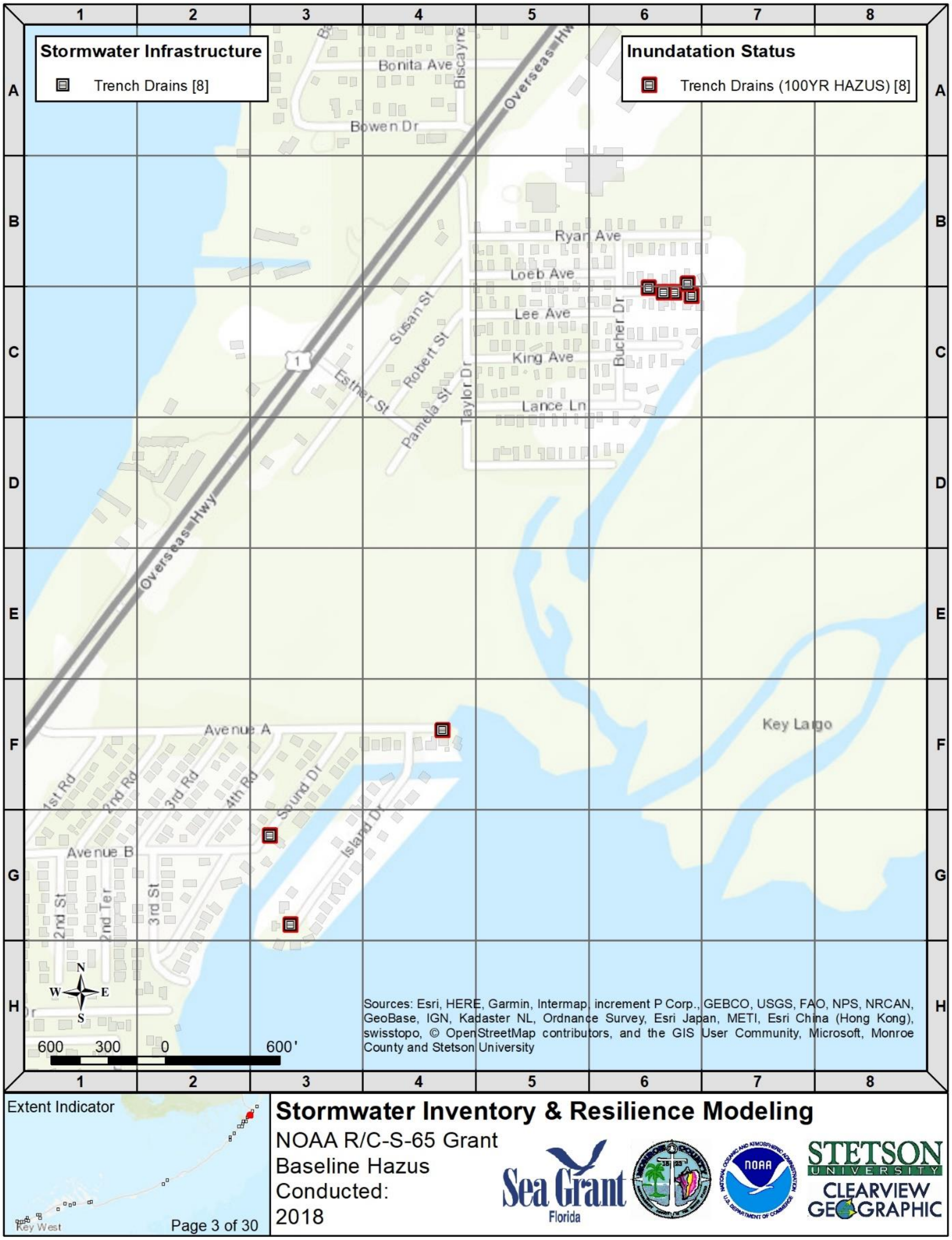

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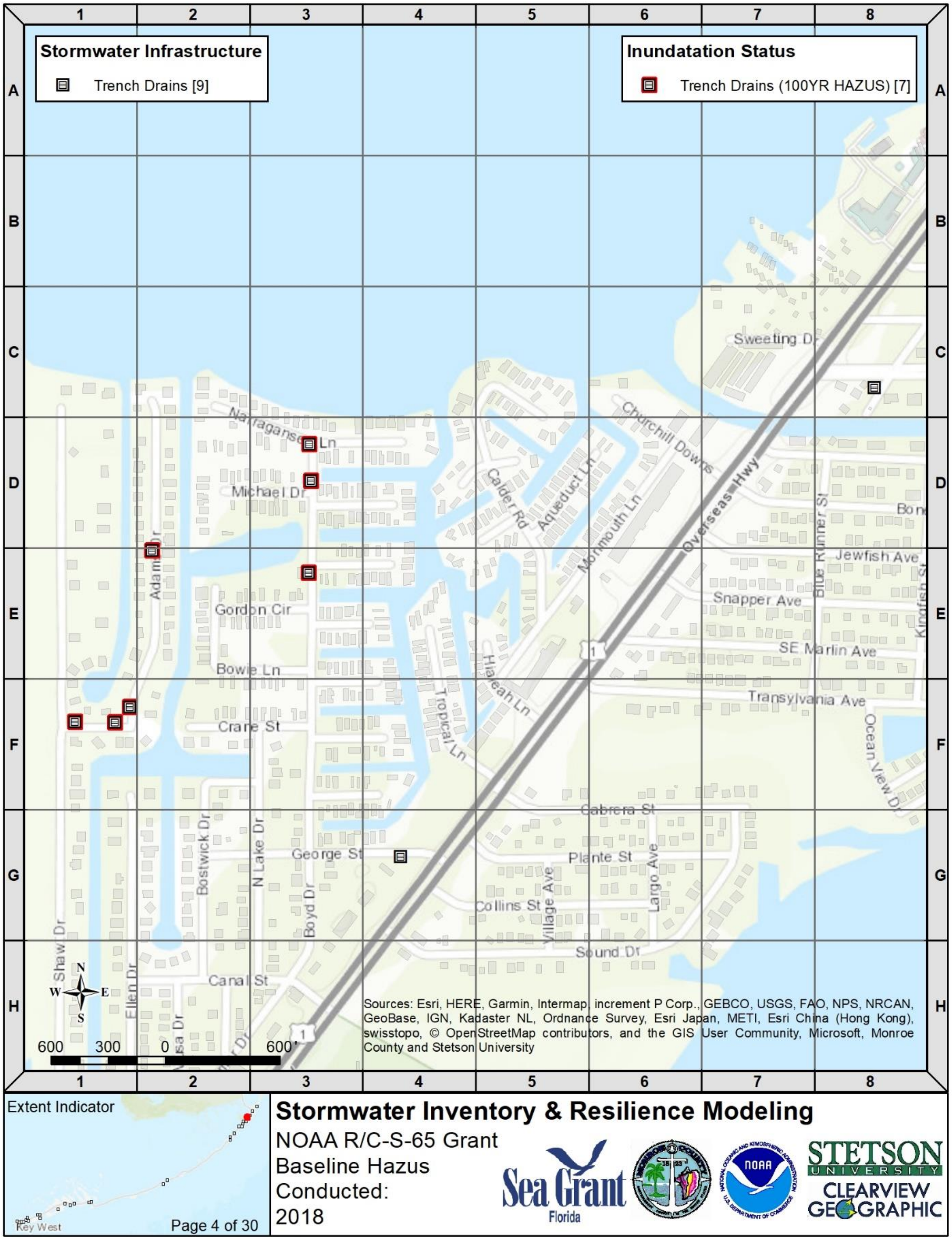

Stormwater Inventory & Resilience Modeling

NOAA R/C-S-65 Grant
Baseline Hazus
Conducted:
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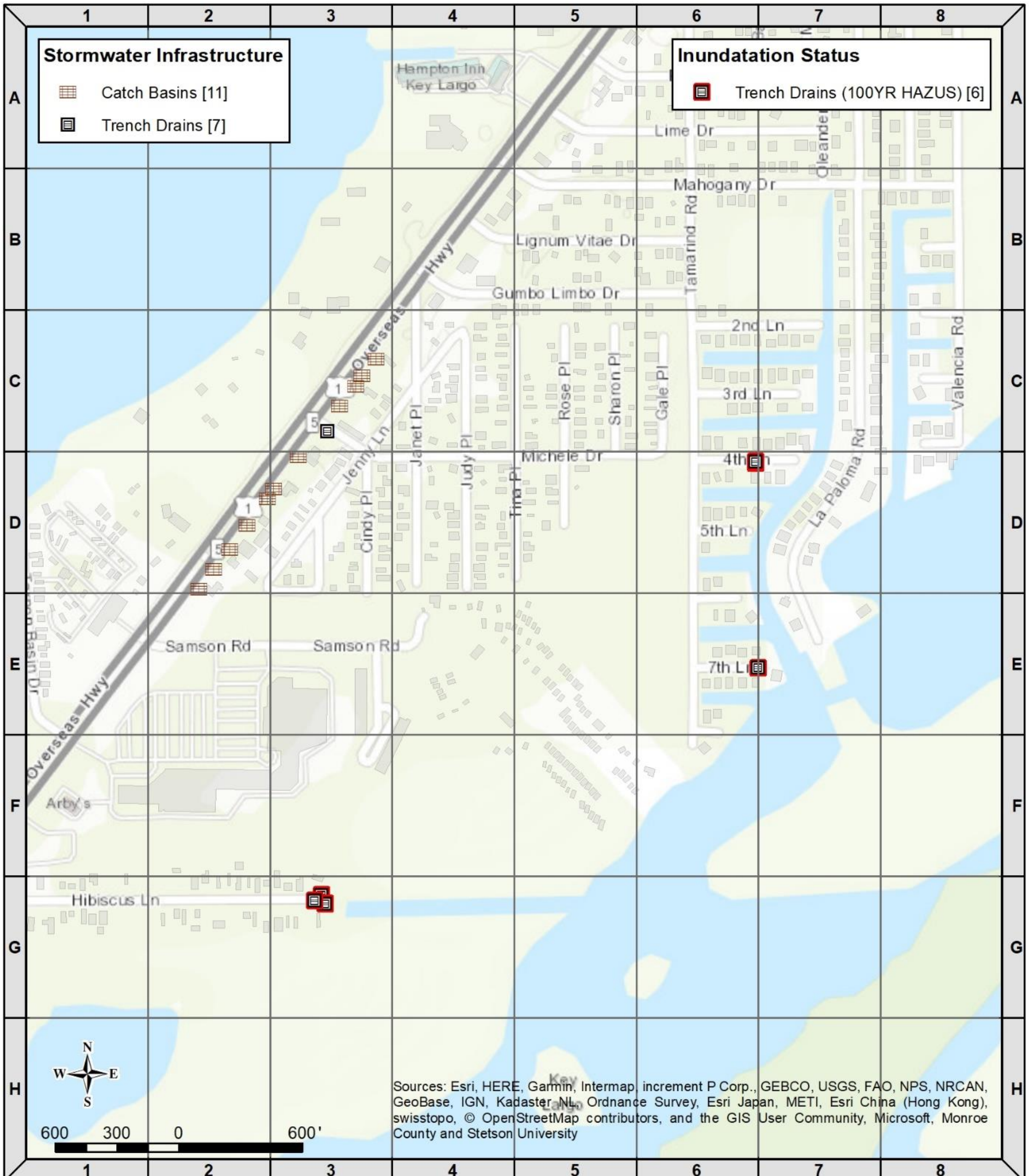
Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)



Extent Indicator

Stormwater Inventory & Resilience Modeling

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2018

Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)

Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)

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Stormwater Inventory & Resilience Modeling

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Baseline Hazus

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2018

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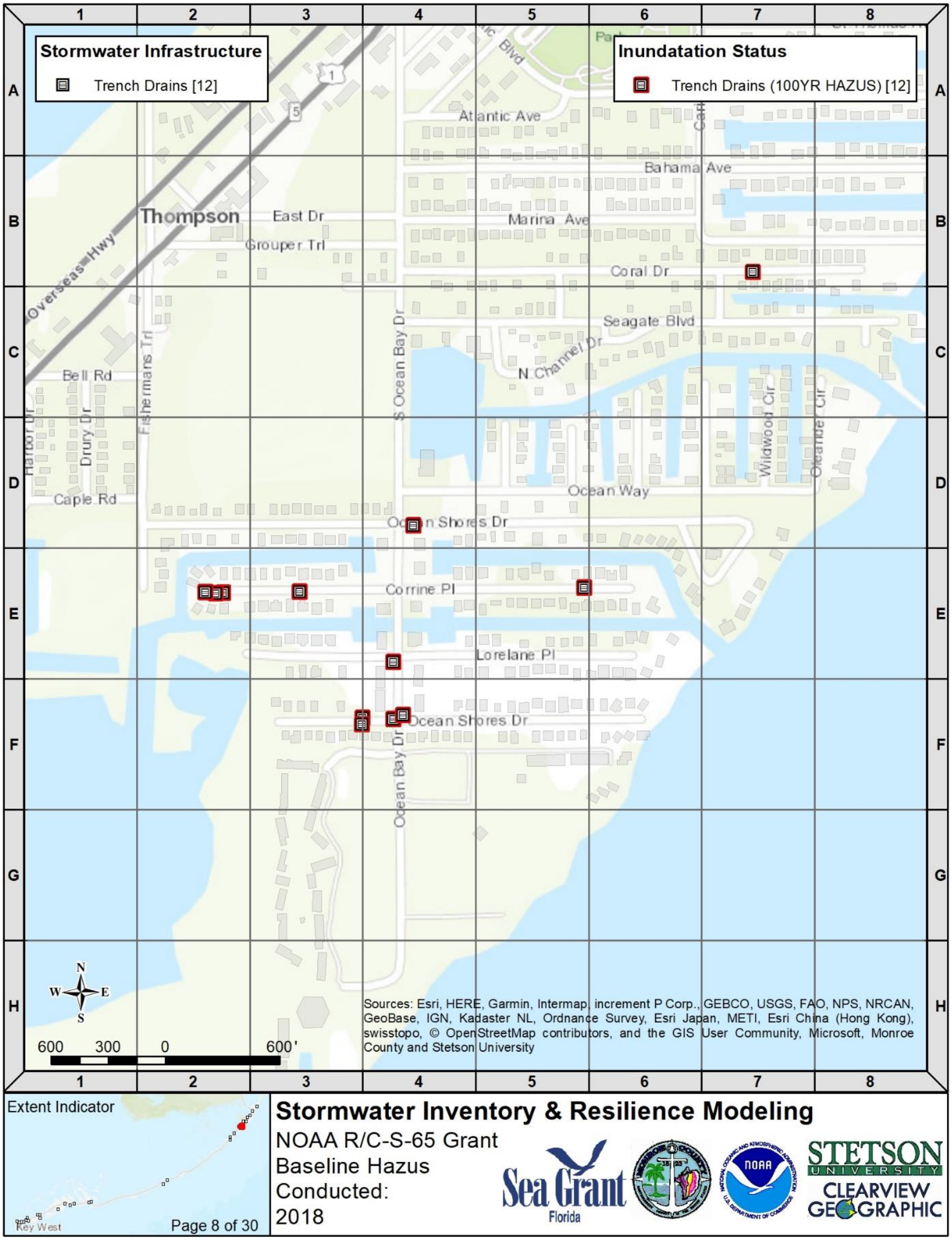

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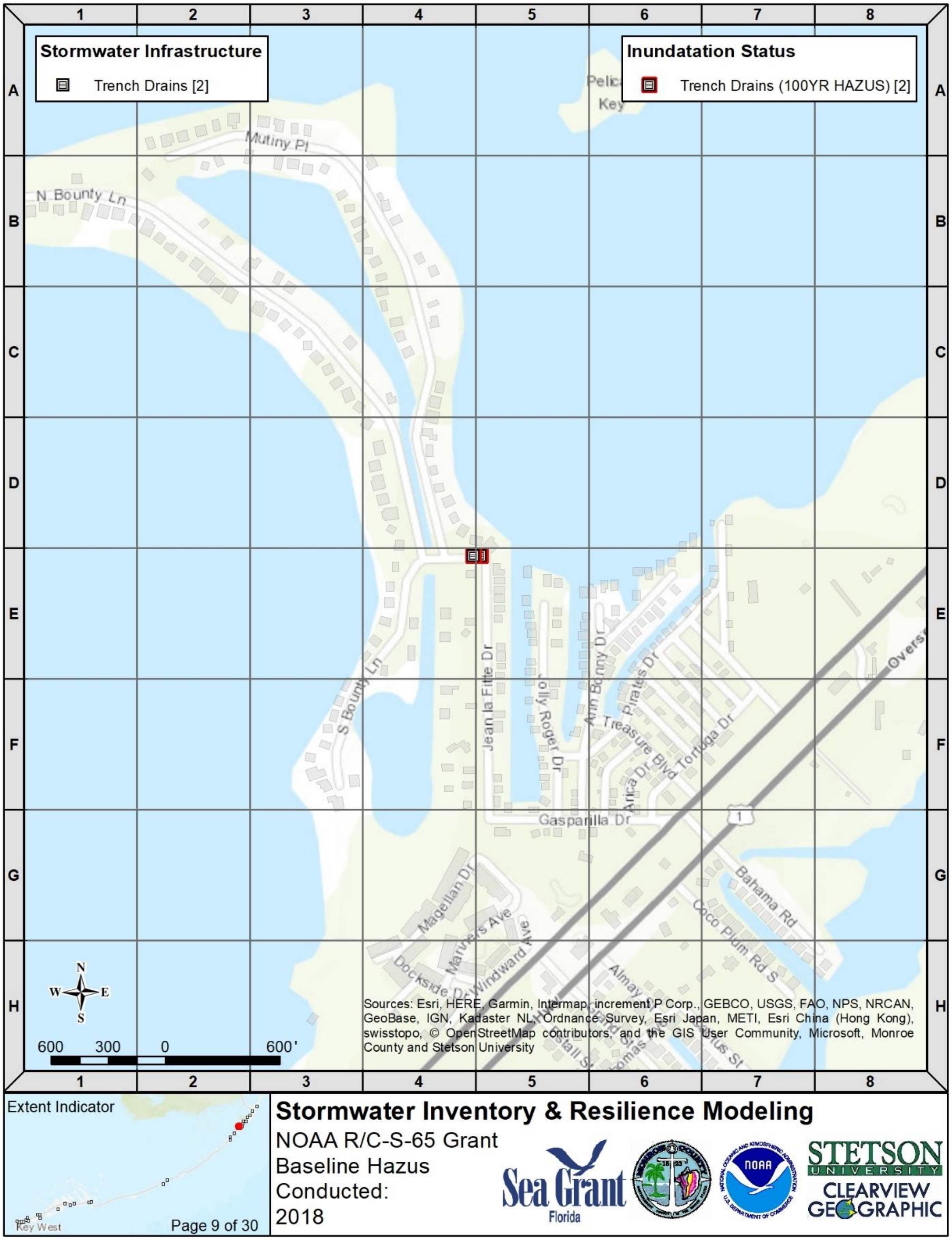
Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)



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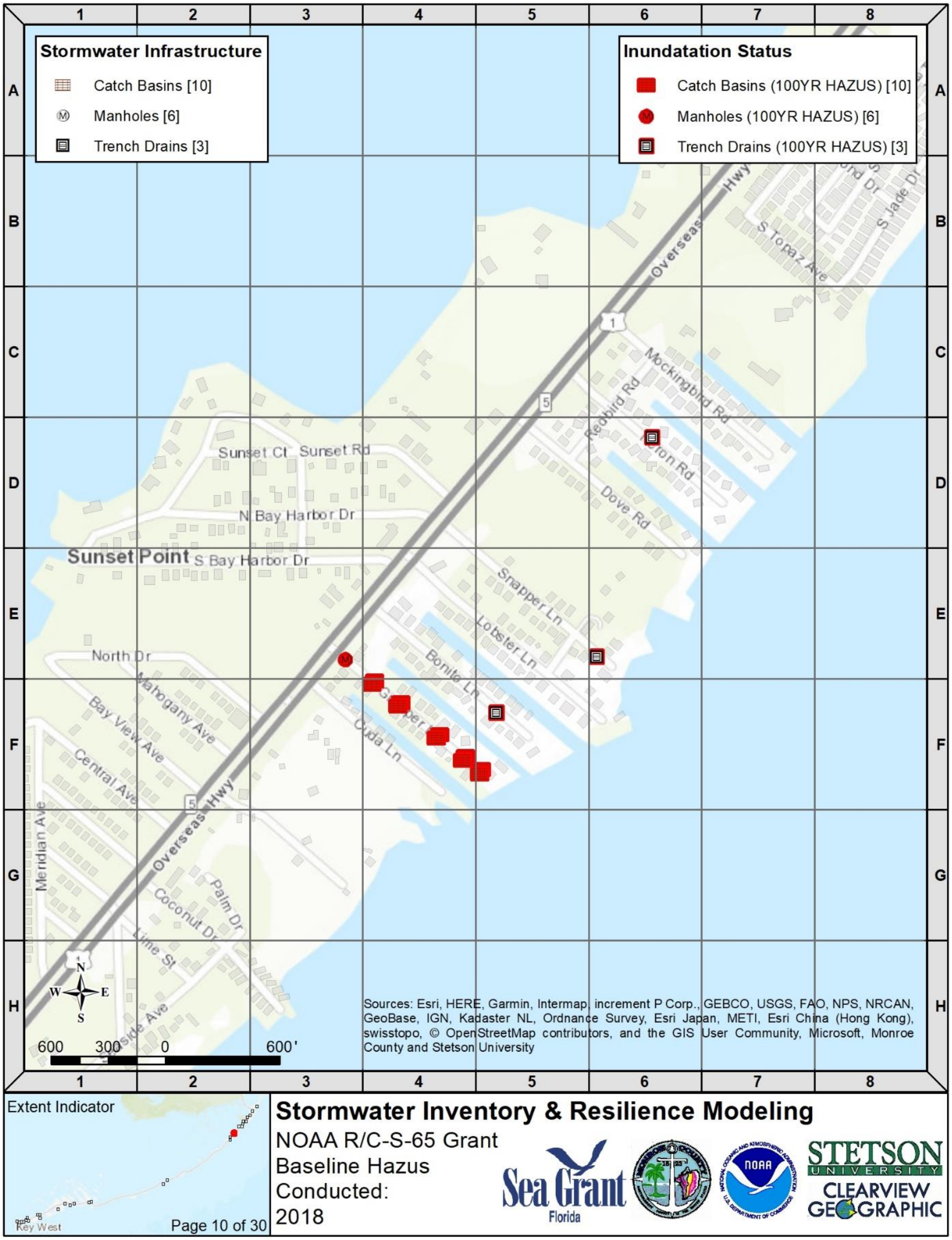

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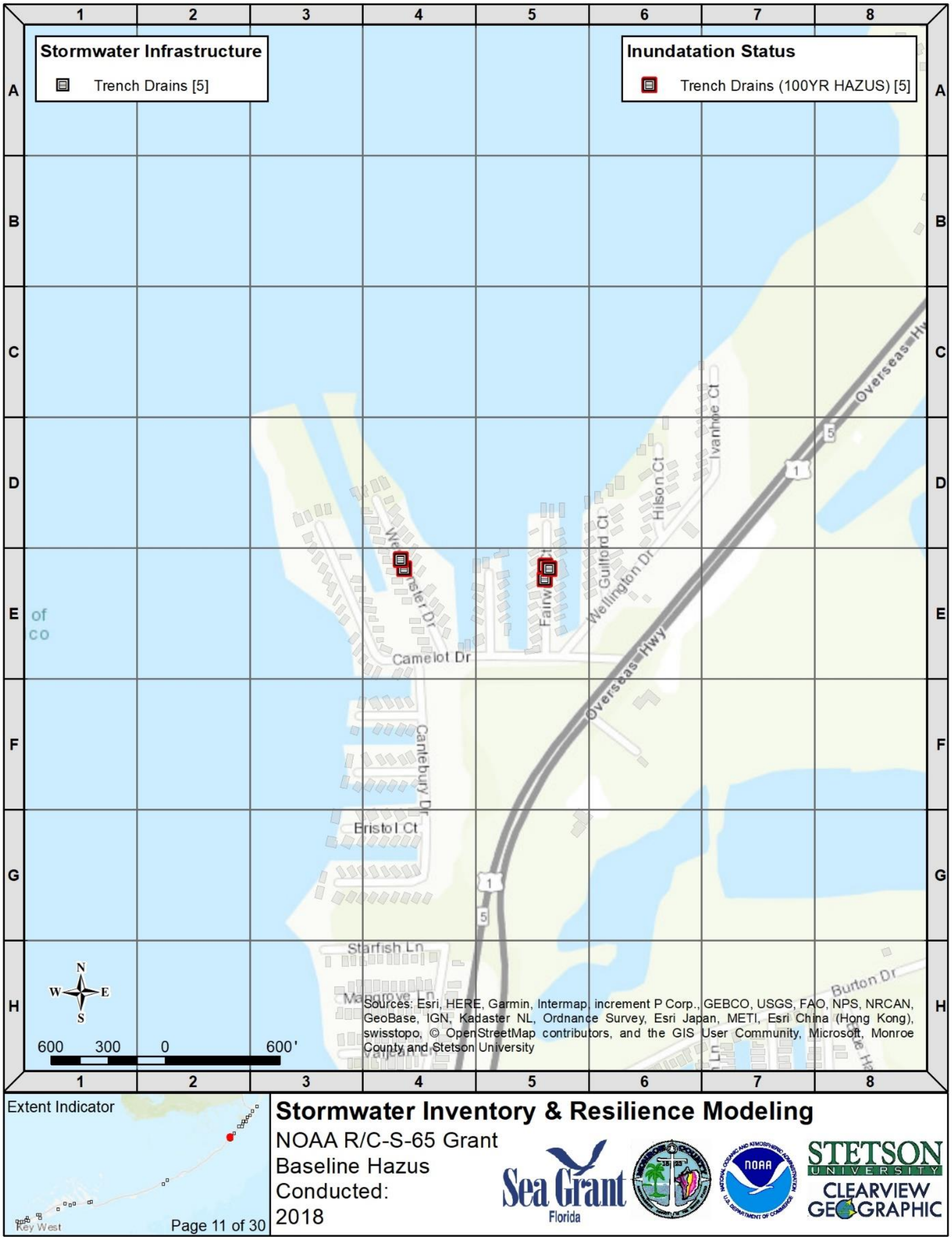

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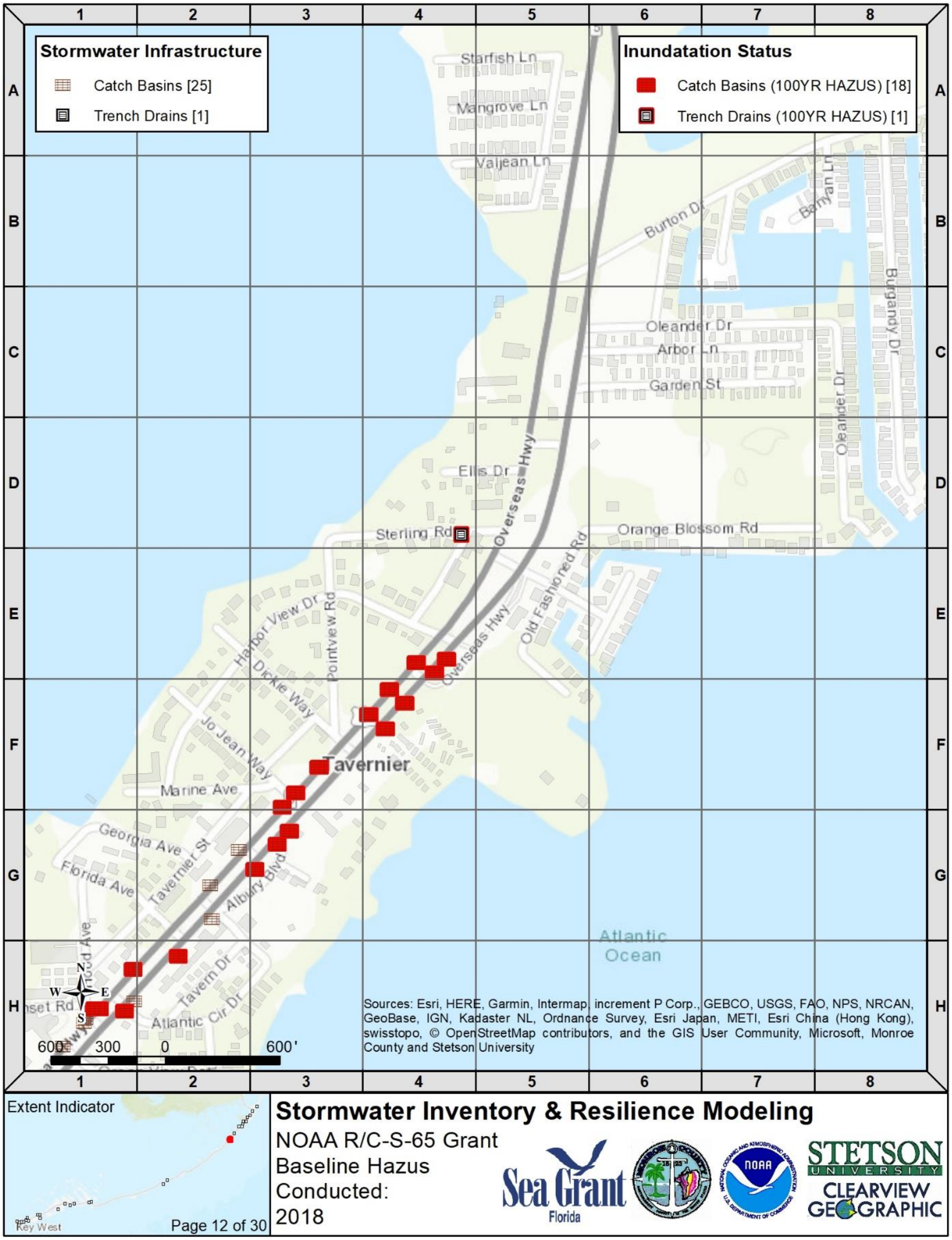

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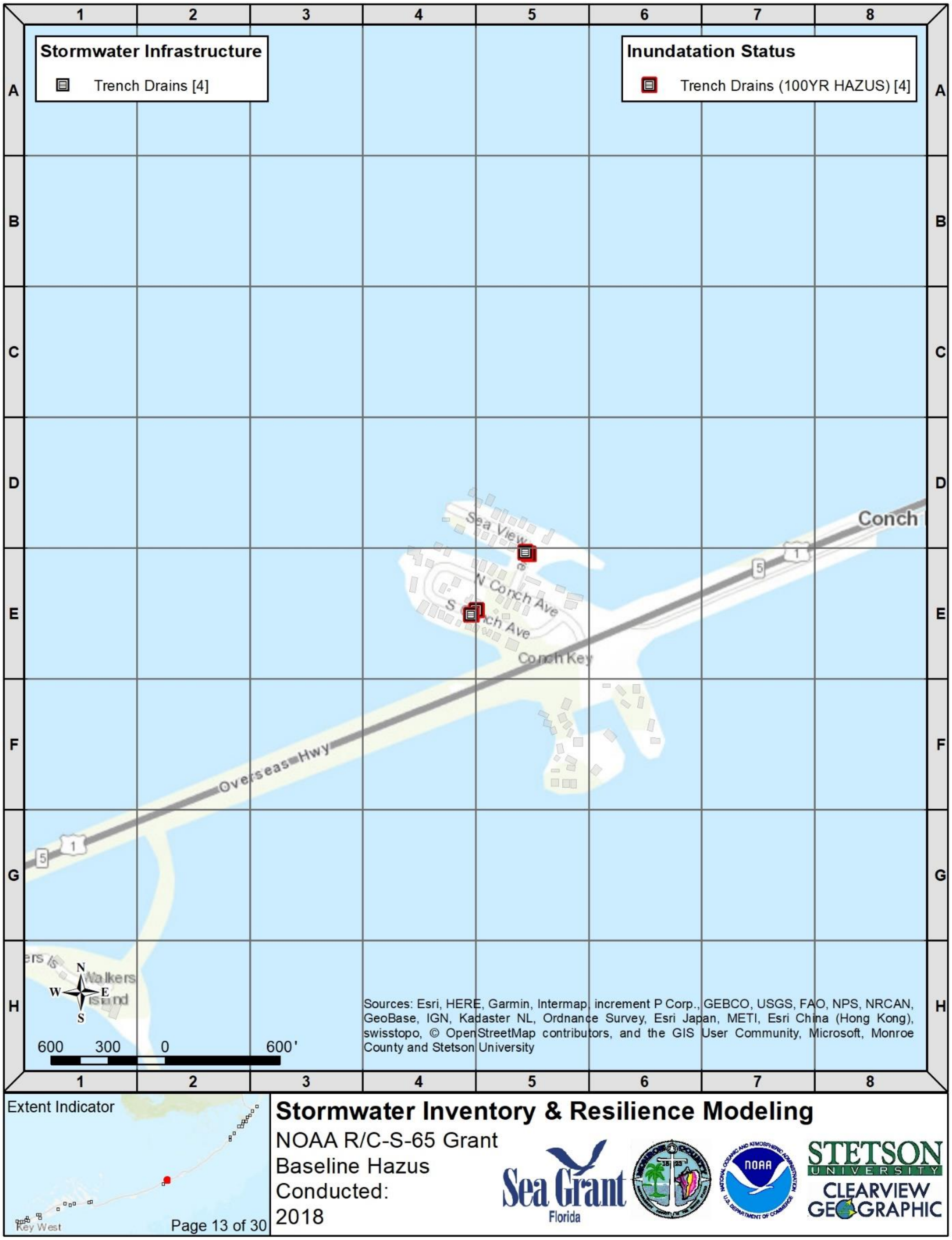

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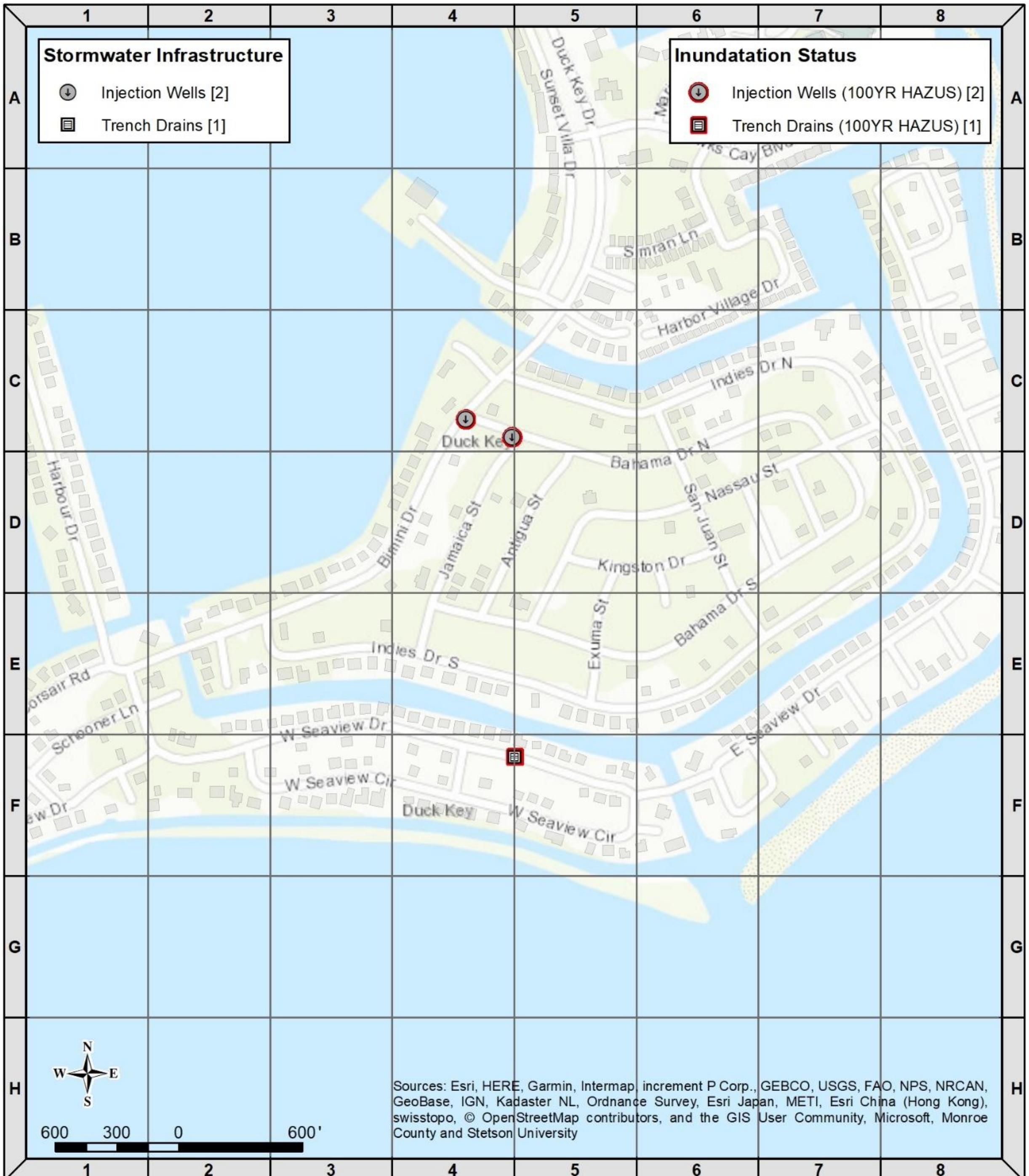

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Stormwater Inventory & Resilience Modeling

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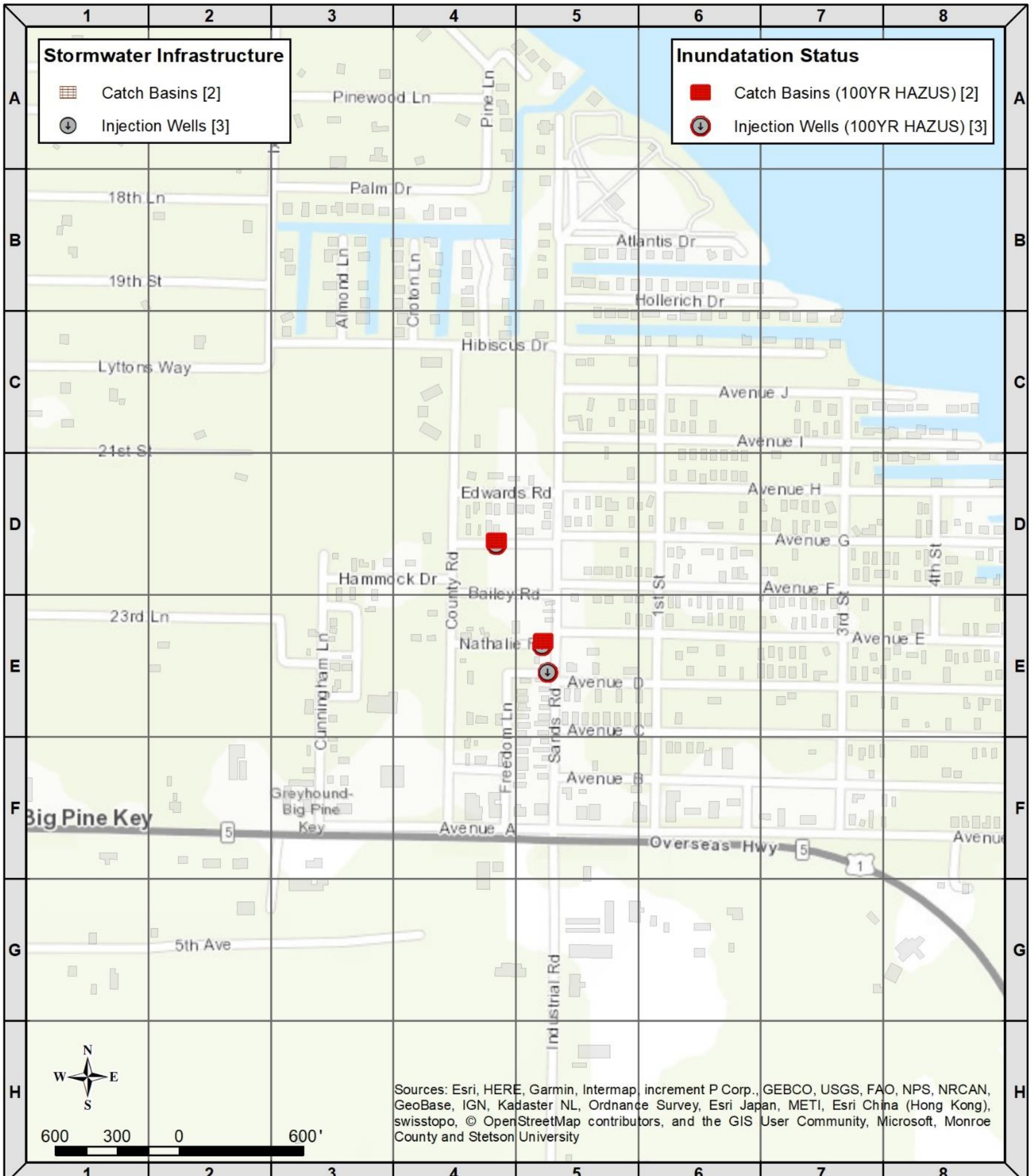

Extent Indicator

Key West

Stormwater Inventory & Resilience Modeling

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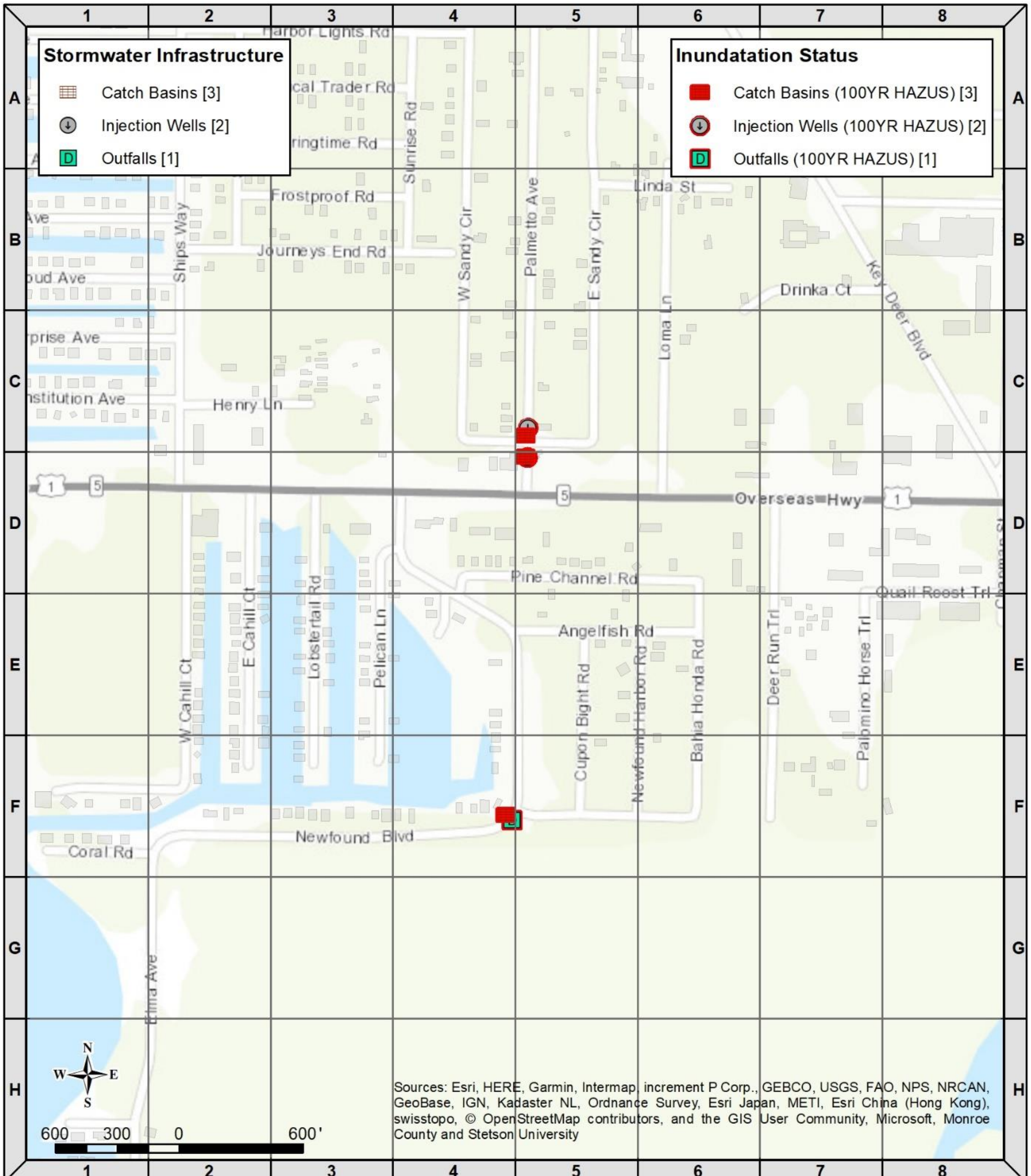
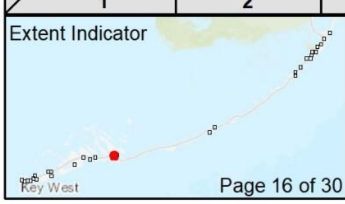
Map Series 5: Monroe County Stormwater Infrastructure Inventory with
Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)





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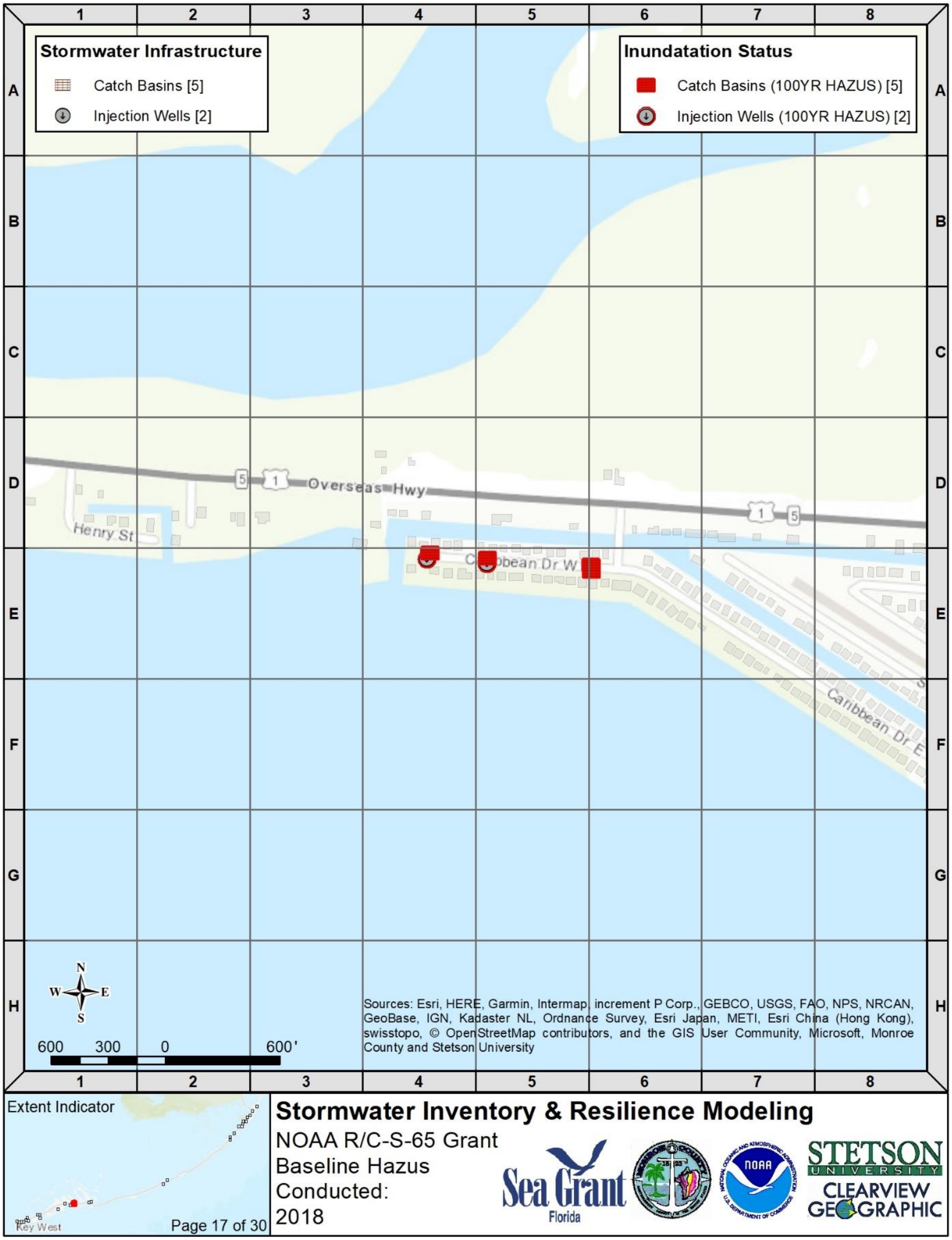
Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)



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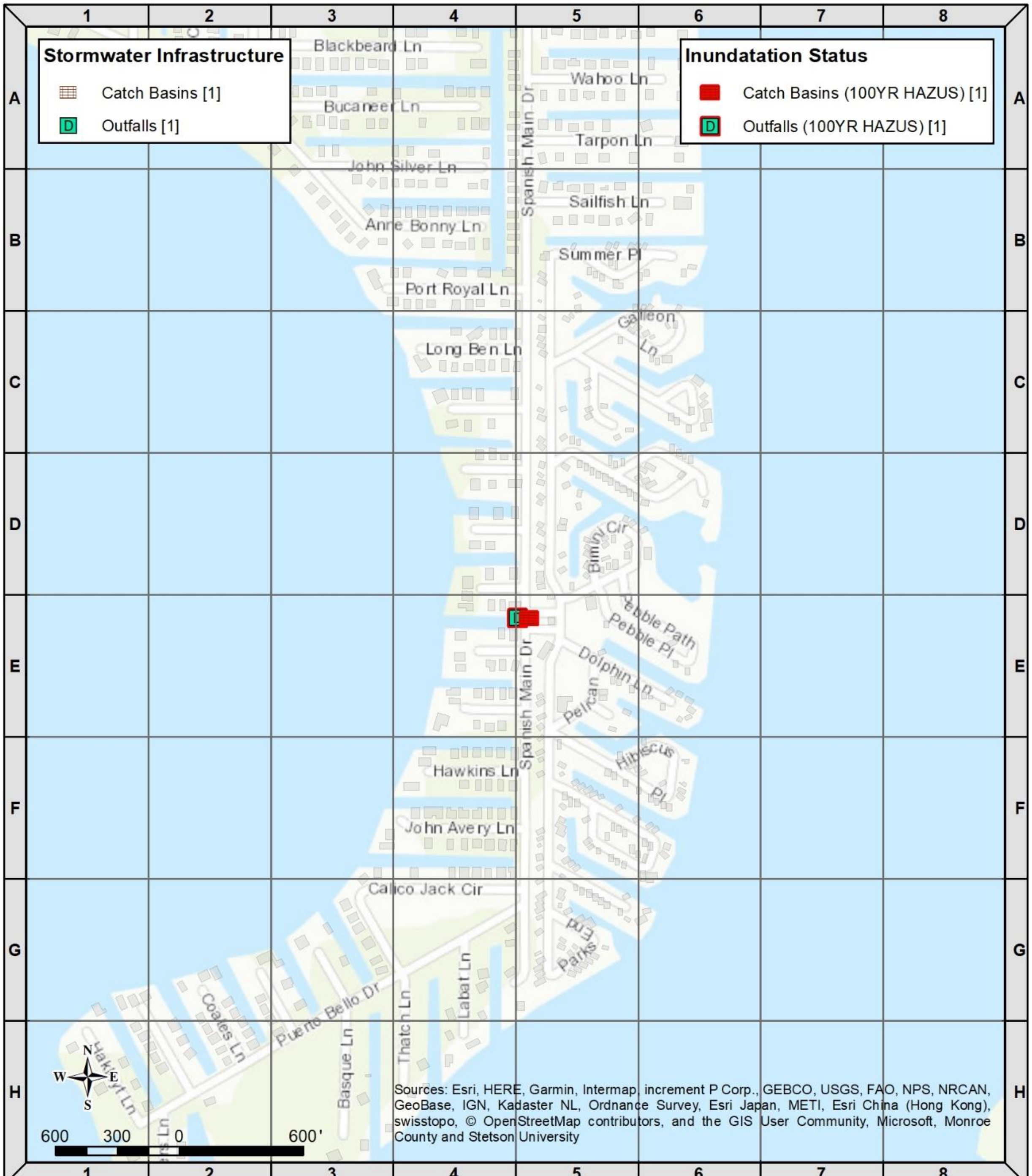

Stormwater Inventory & Resilience Modeling
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Baseline Hazus
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2018

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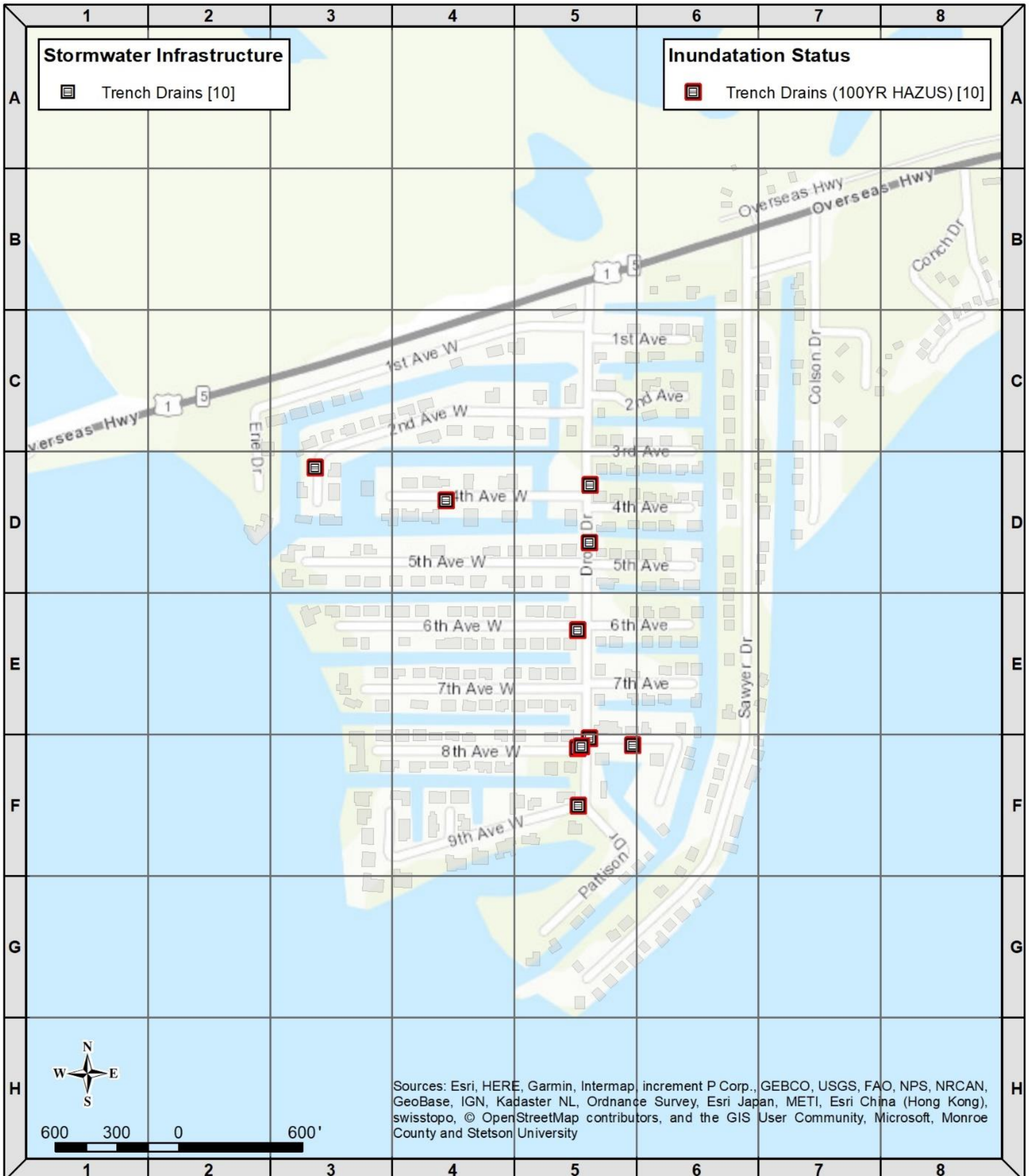

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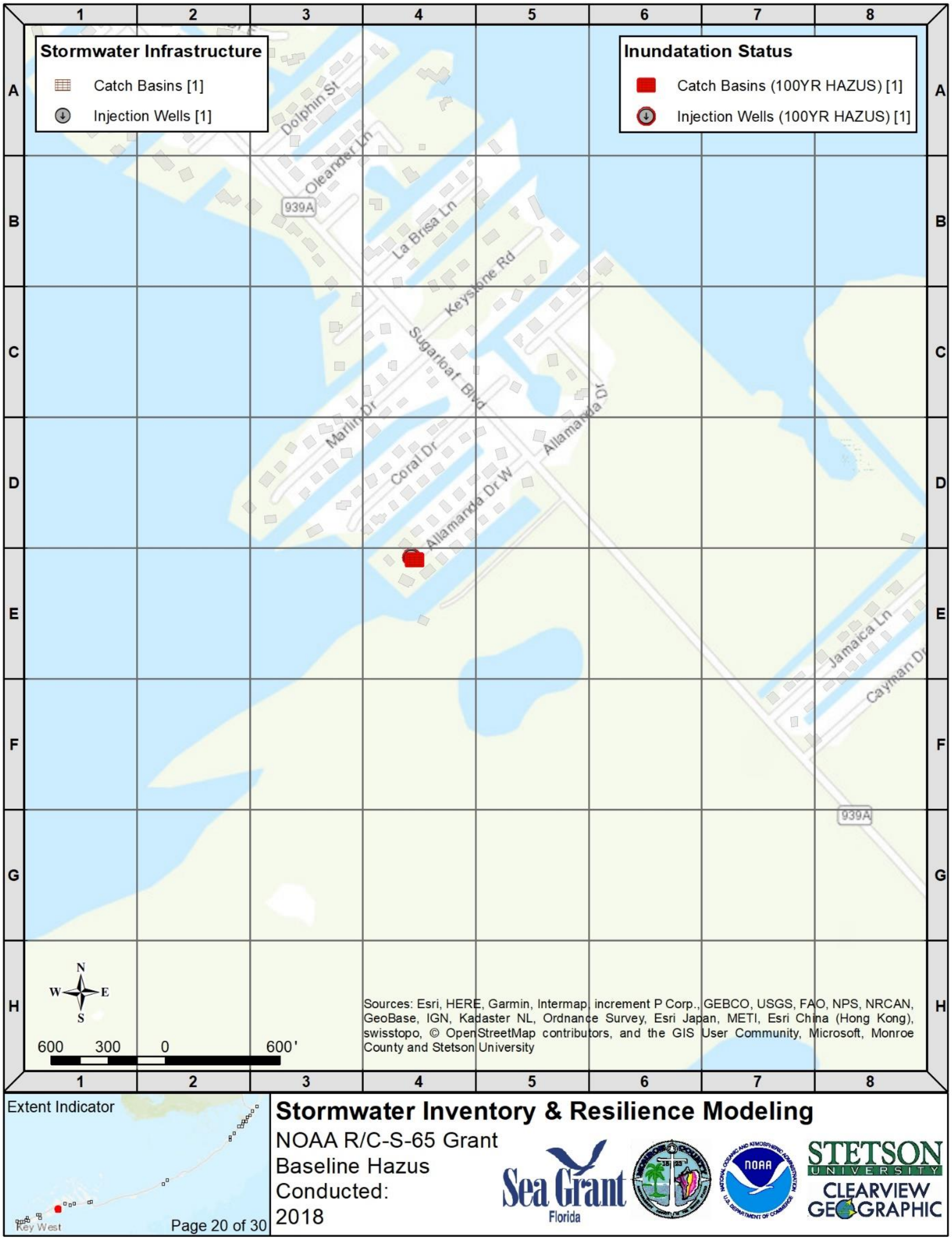
Map Series 5: Monroe County Stormwater Infrastructure Inventory with
Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)



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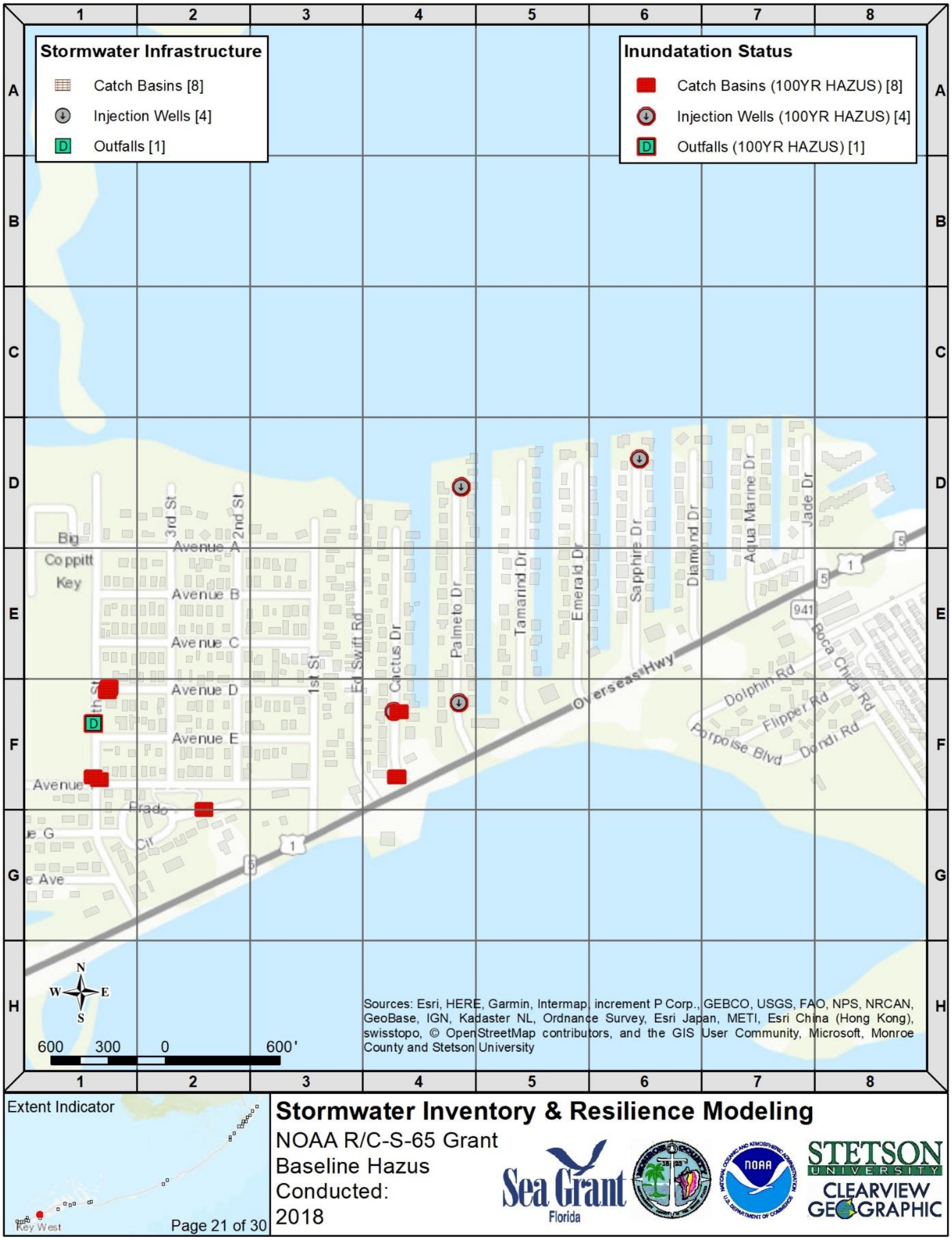

Stormwater Inventory & Resilience Modeling

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2018

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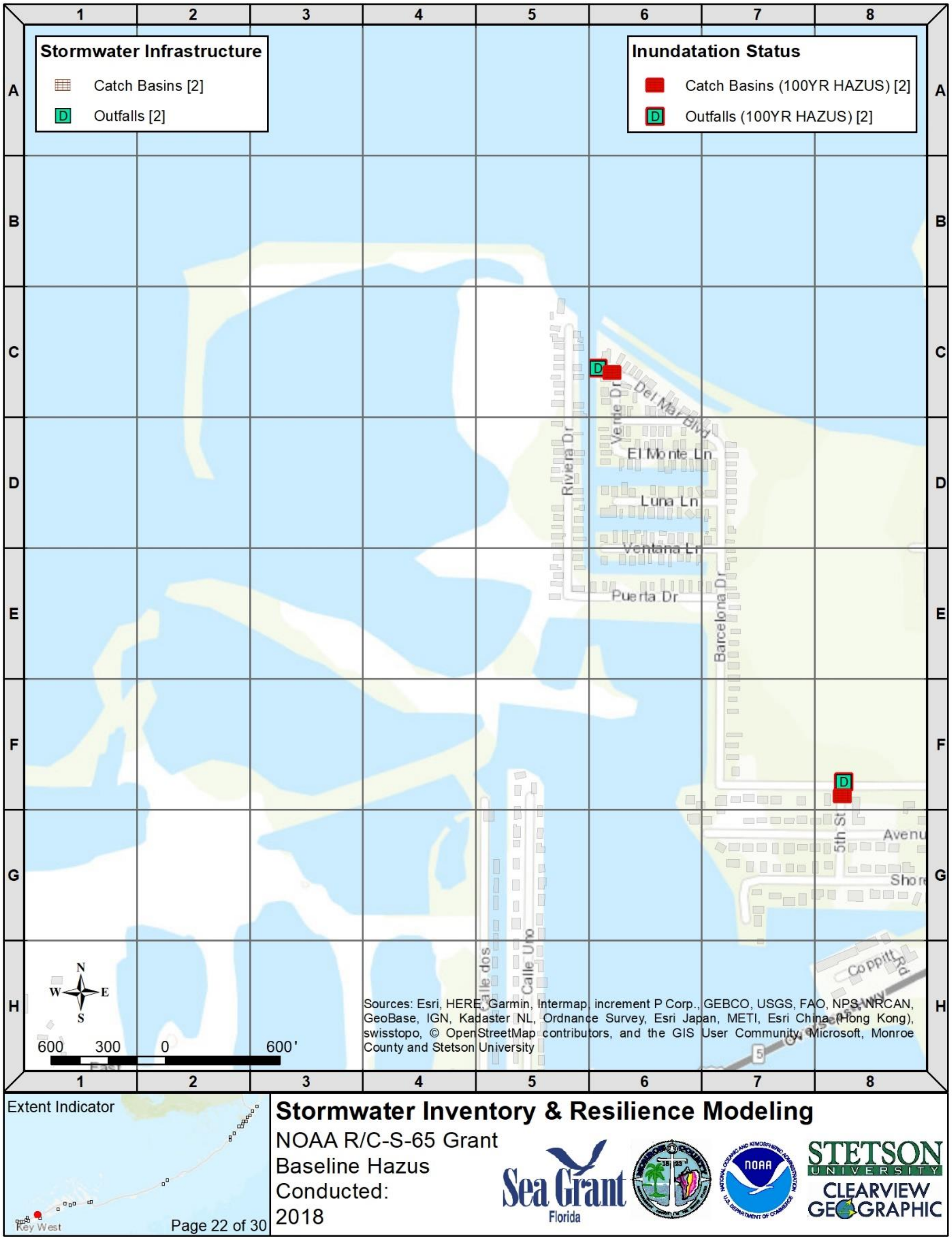

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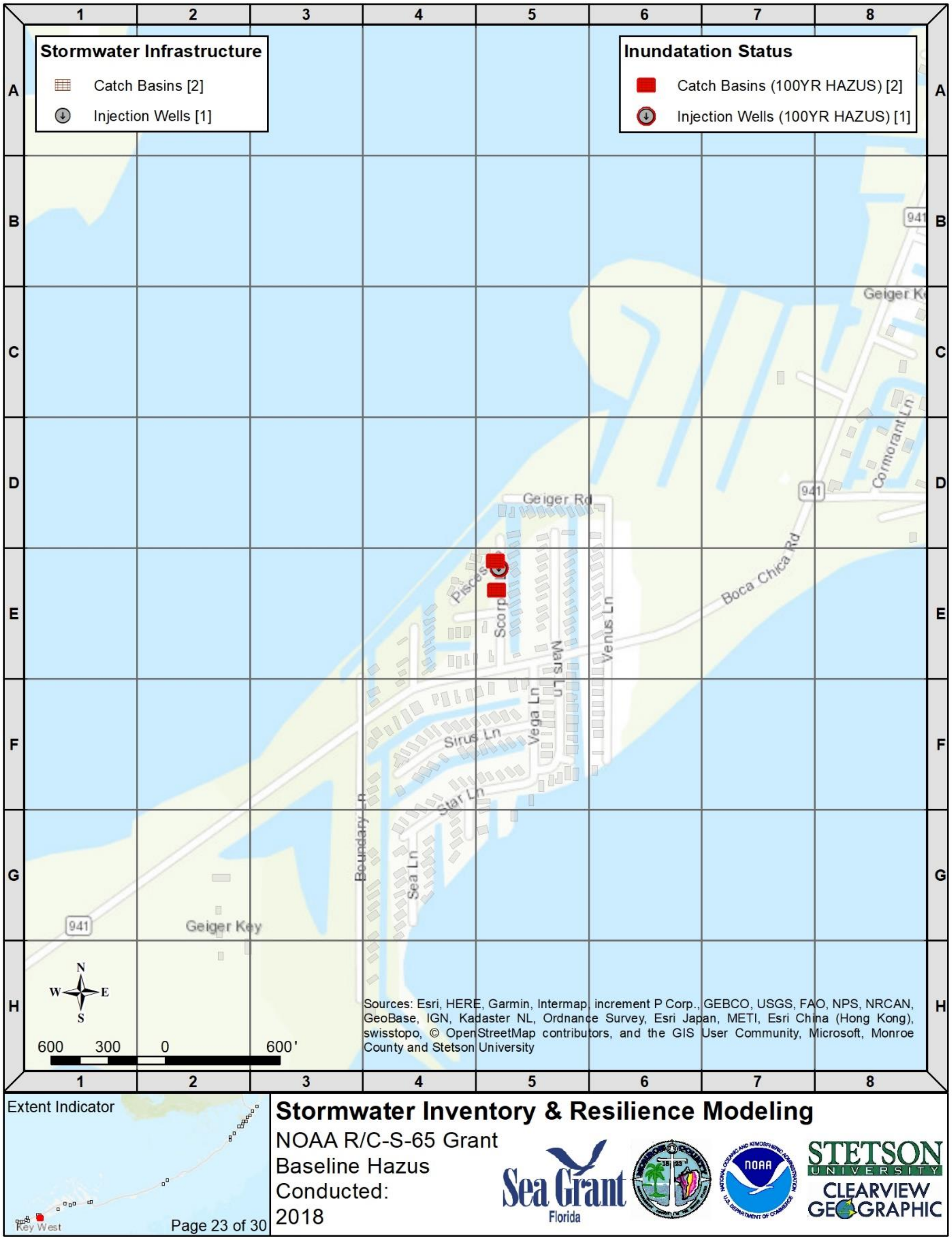
Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)



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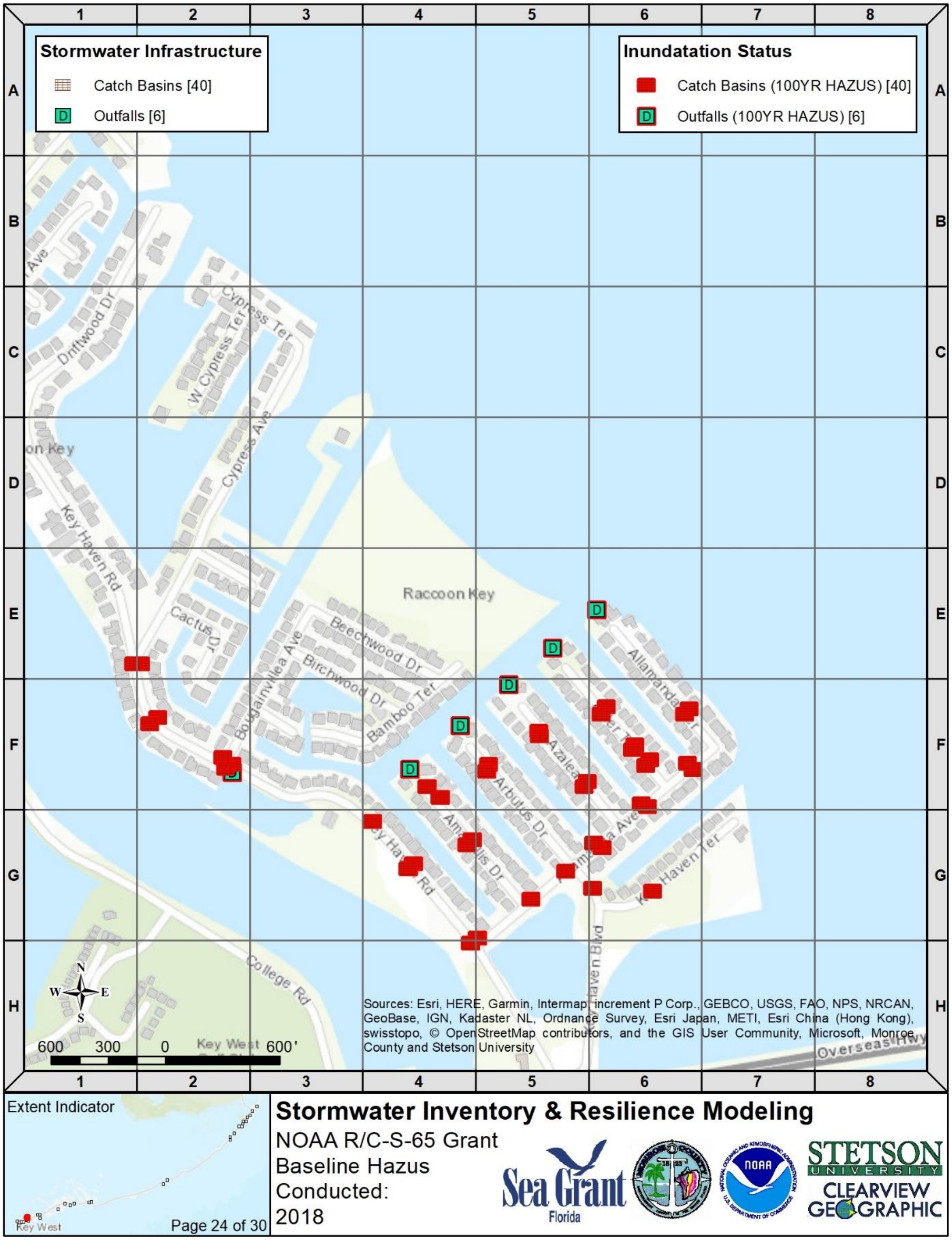

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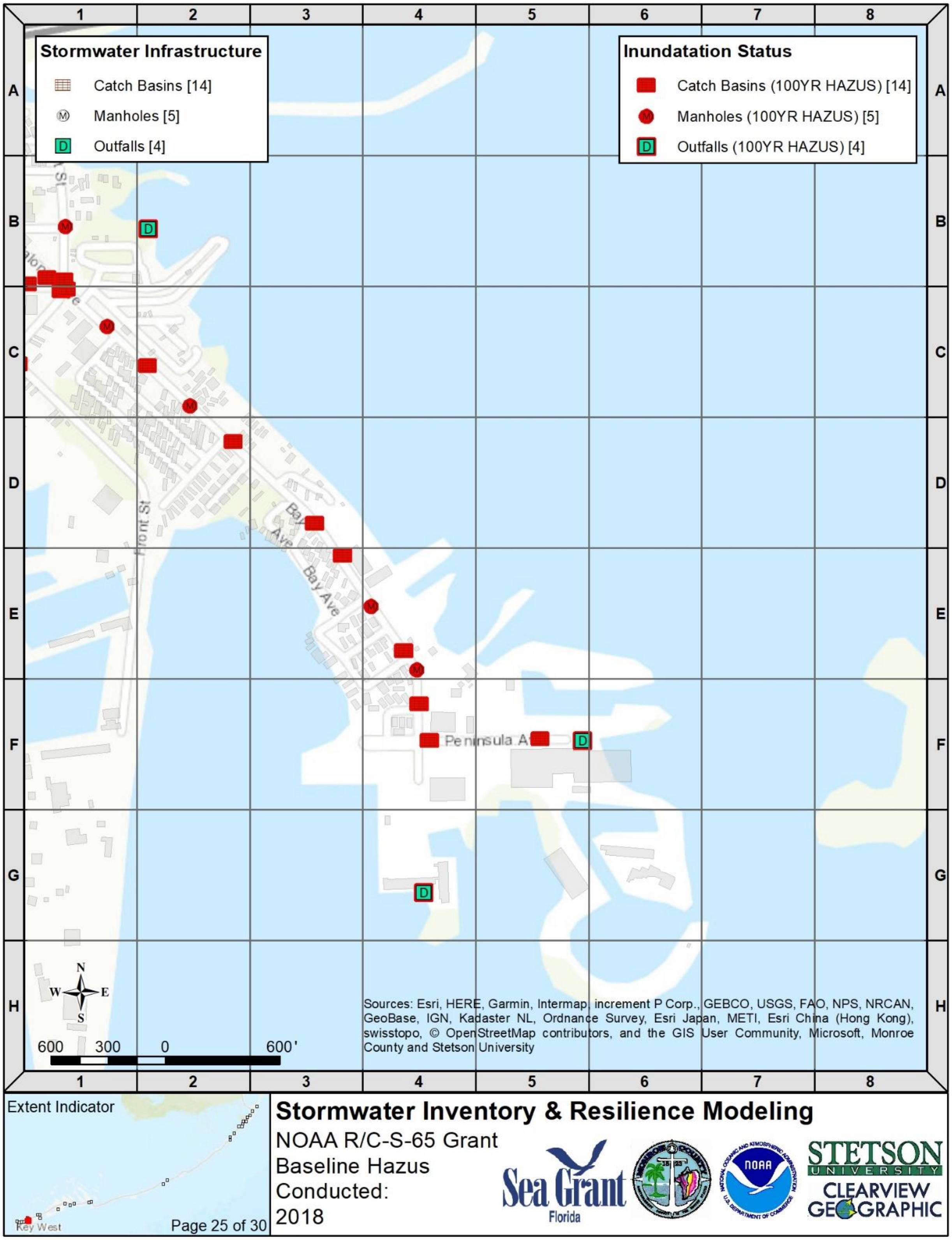

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Baseline Hazus

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2018

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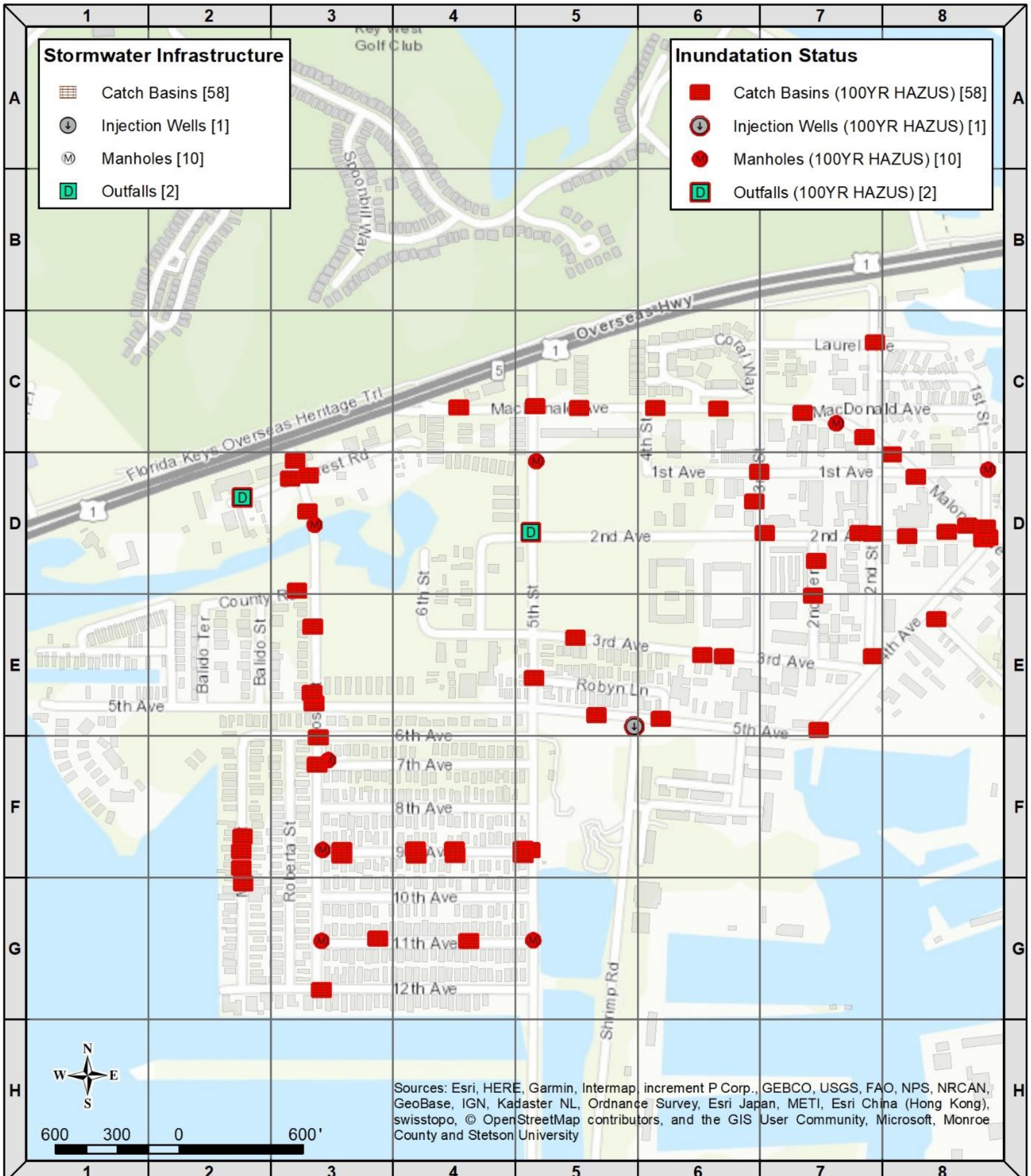

Stormwater Inventory & Resilience Modeling

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2018

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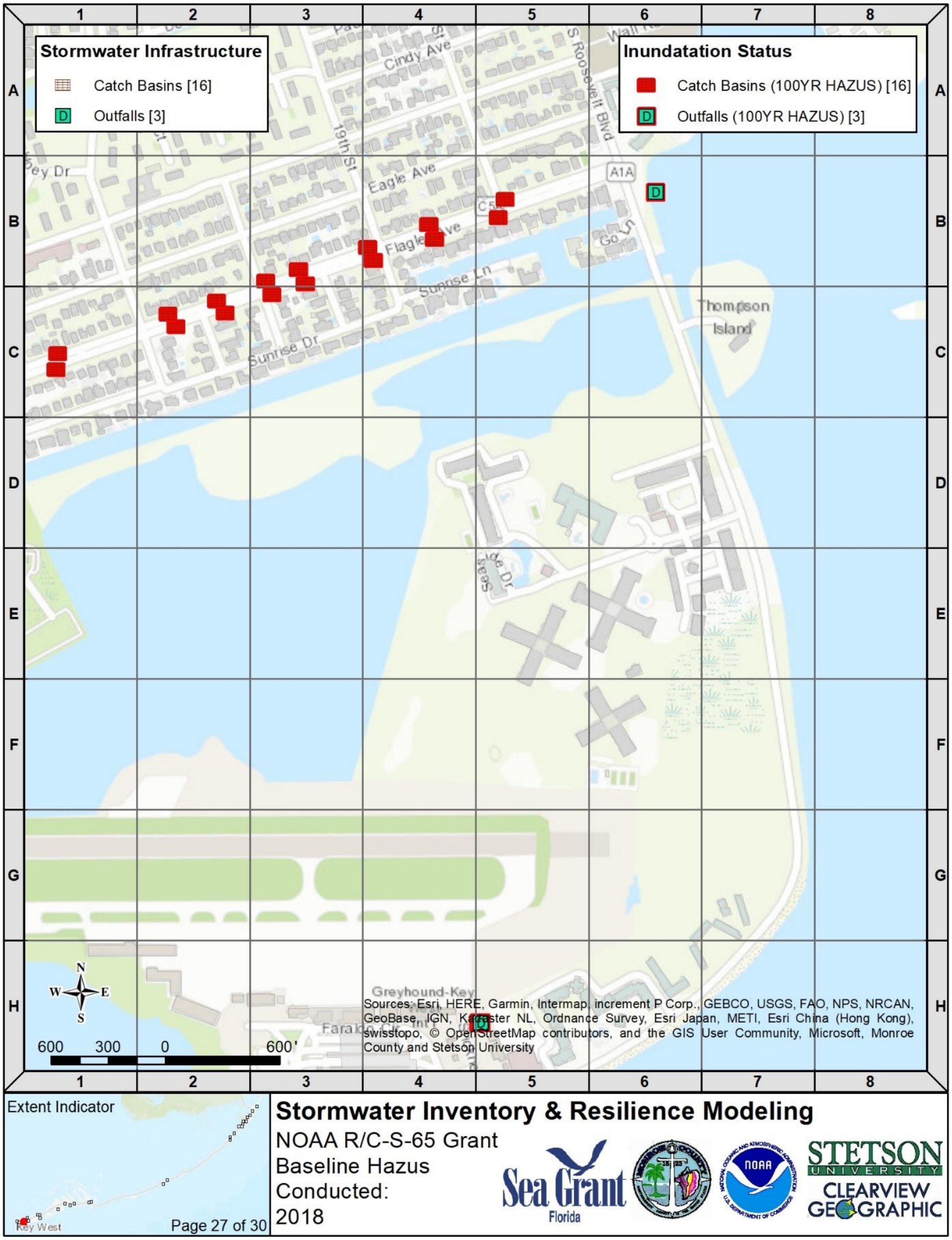

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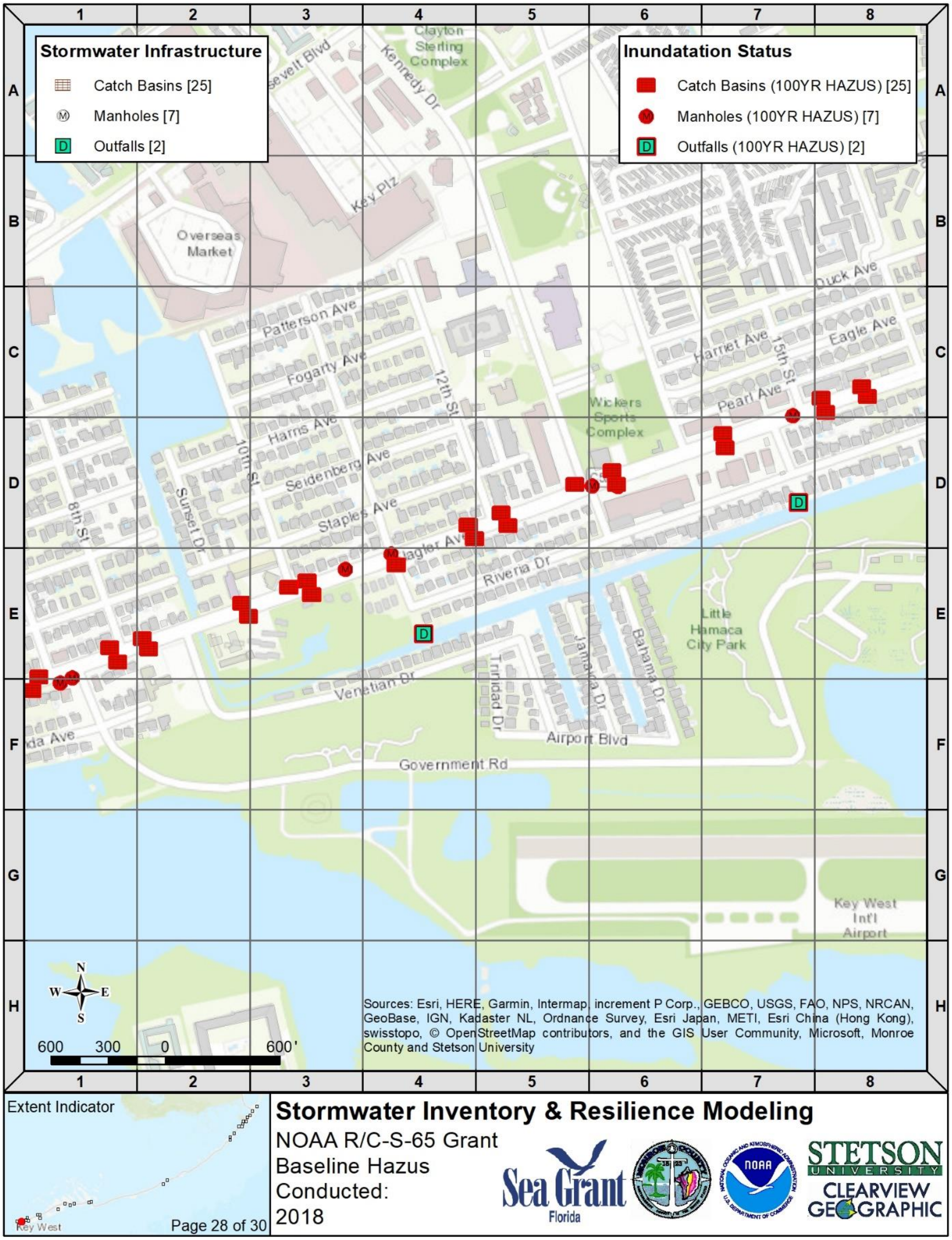

Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)

Extent Indicator

Key West

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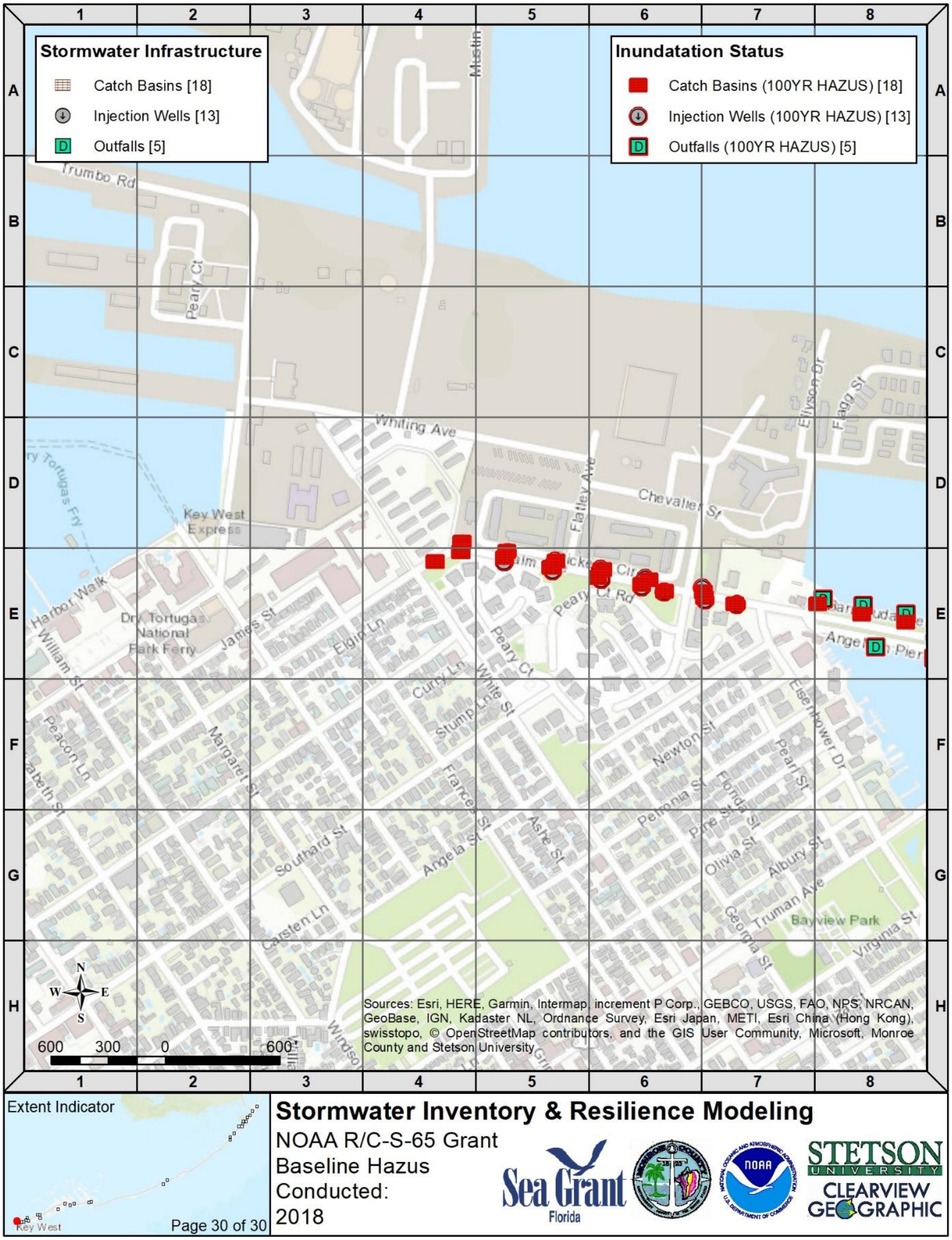
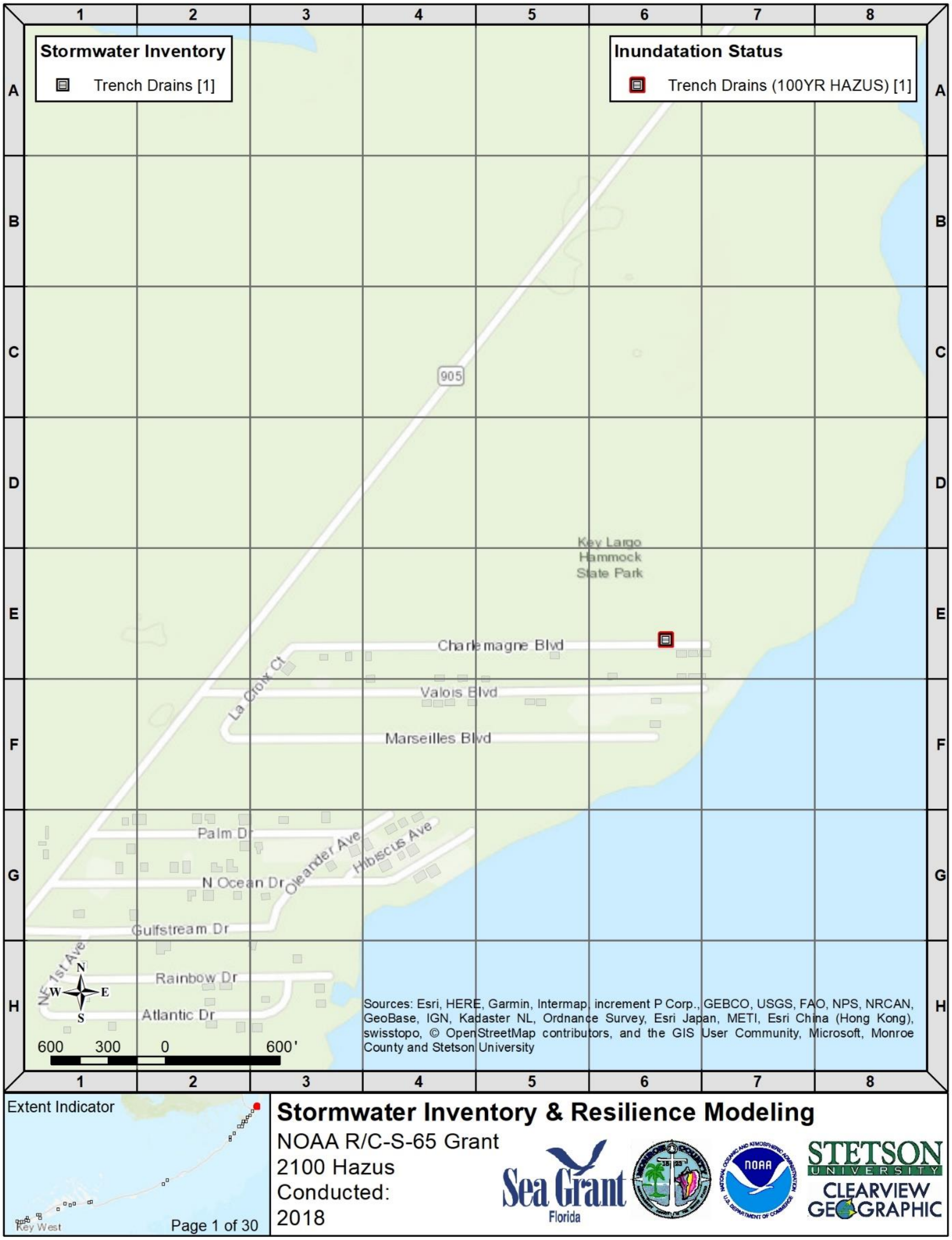
Map Series 5: Monroe County Stormwater Infrastructure Inventory with Vulnerability to Hazus-MH 100-Year Coastal Flood, Baseline Condition (1992 Sea Level)



Map Series 6: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Hazus-MH 100-Year Coastal Flood, 2100 Intermediate-High (4.13') Sea-Level Rise



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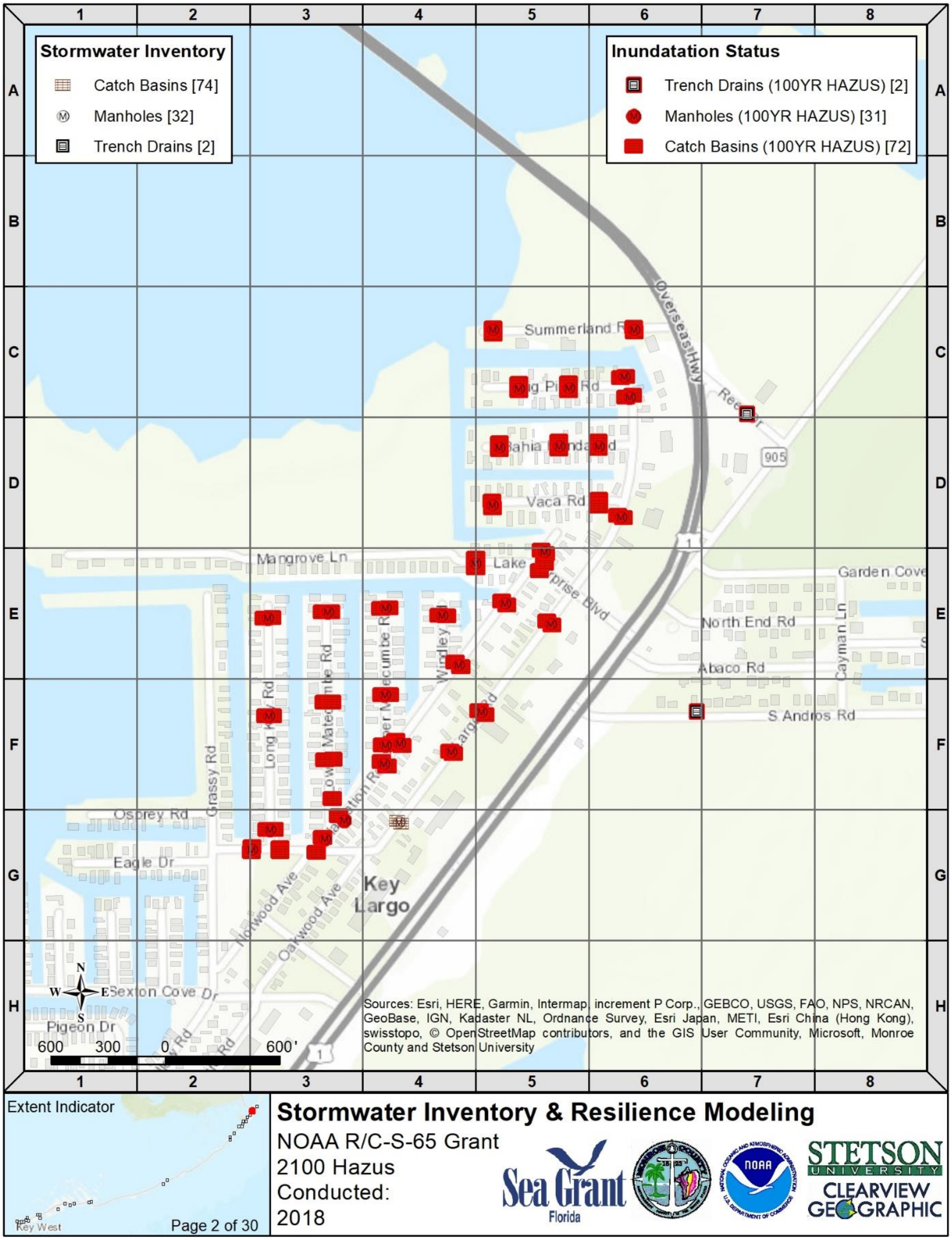

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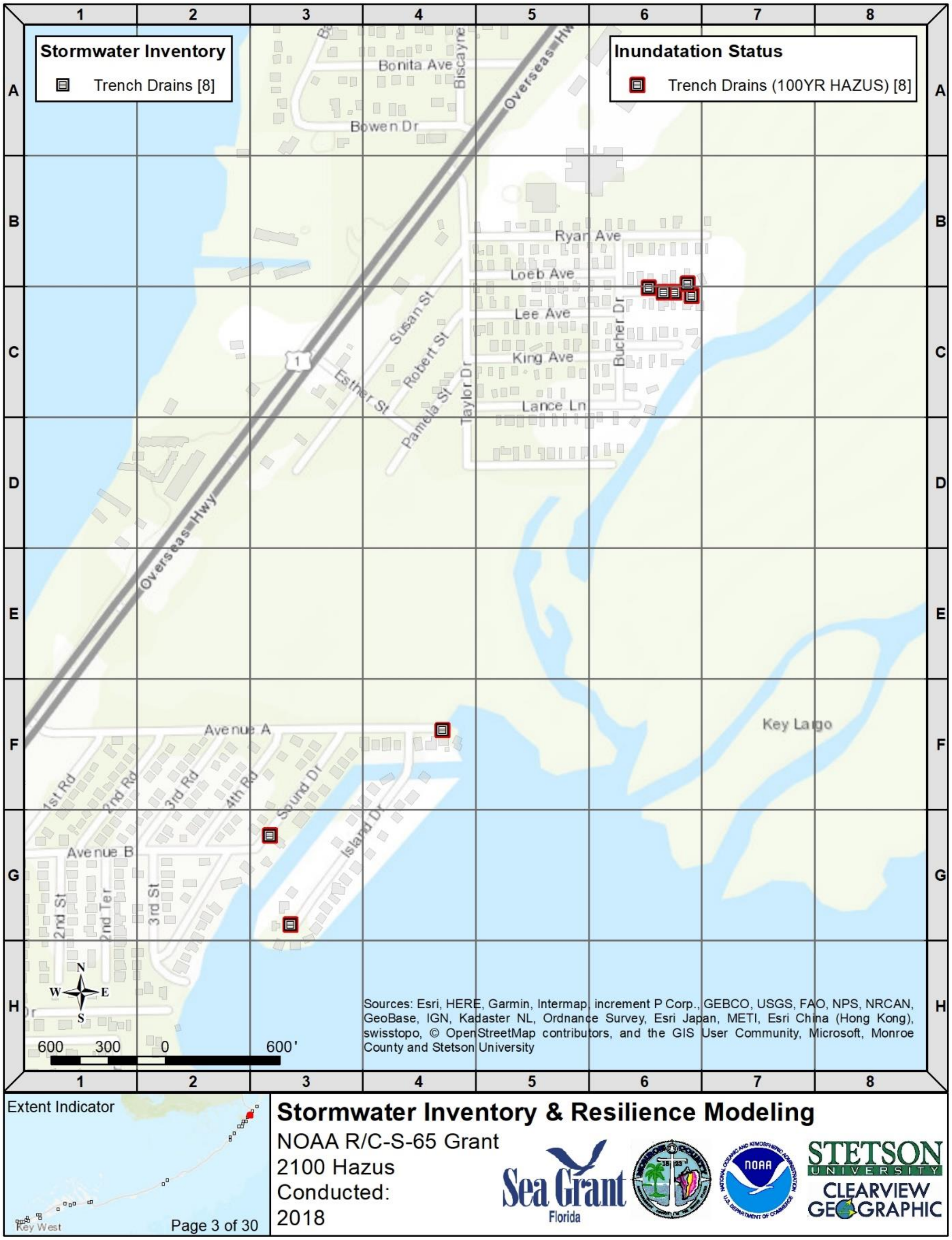

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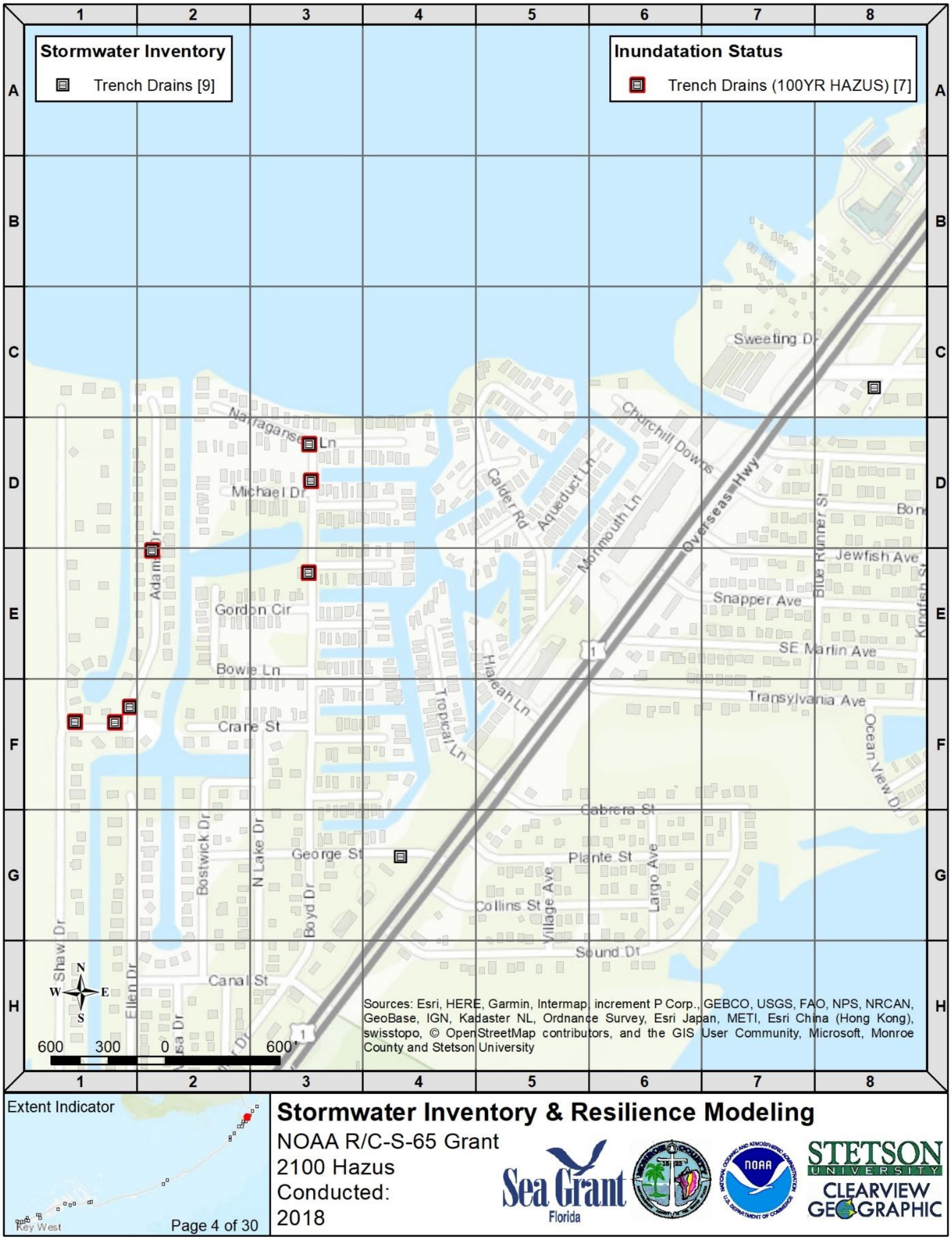

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Stormwater Inventory & Resilience Modeling

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Map Series 6: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Hazus-MH 100-Year Coastal Flood, 2100 Intermediate-High (4.13’) Sea-Level Rise

Extent Indicator

Key West

Stormwater Inventory & Resilience Modeling

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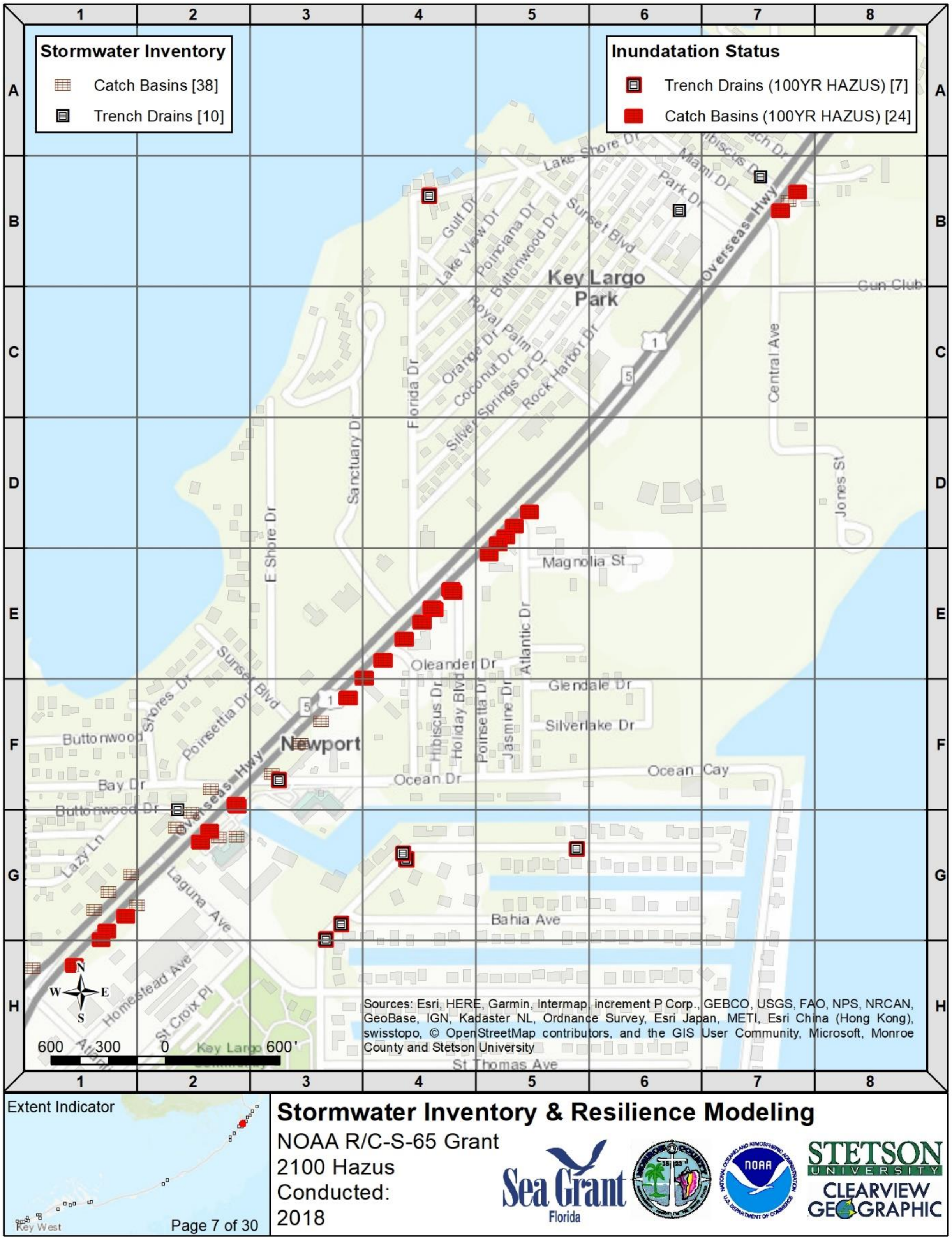

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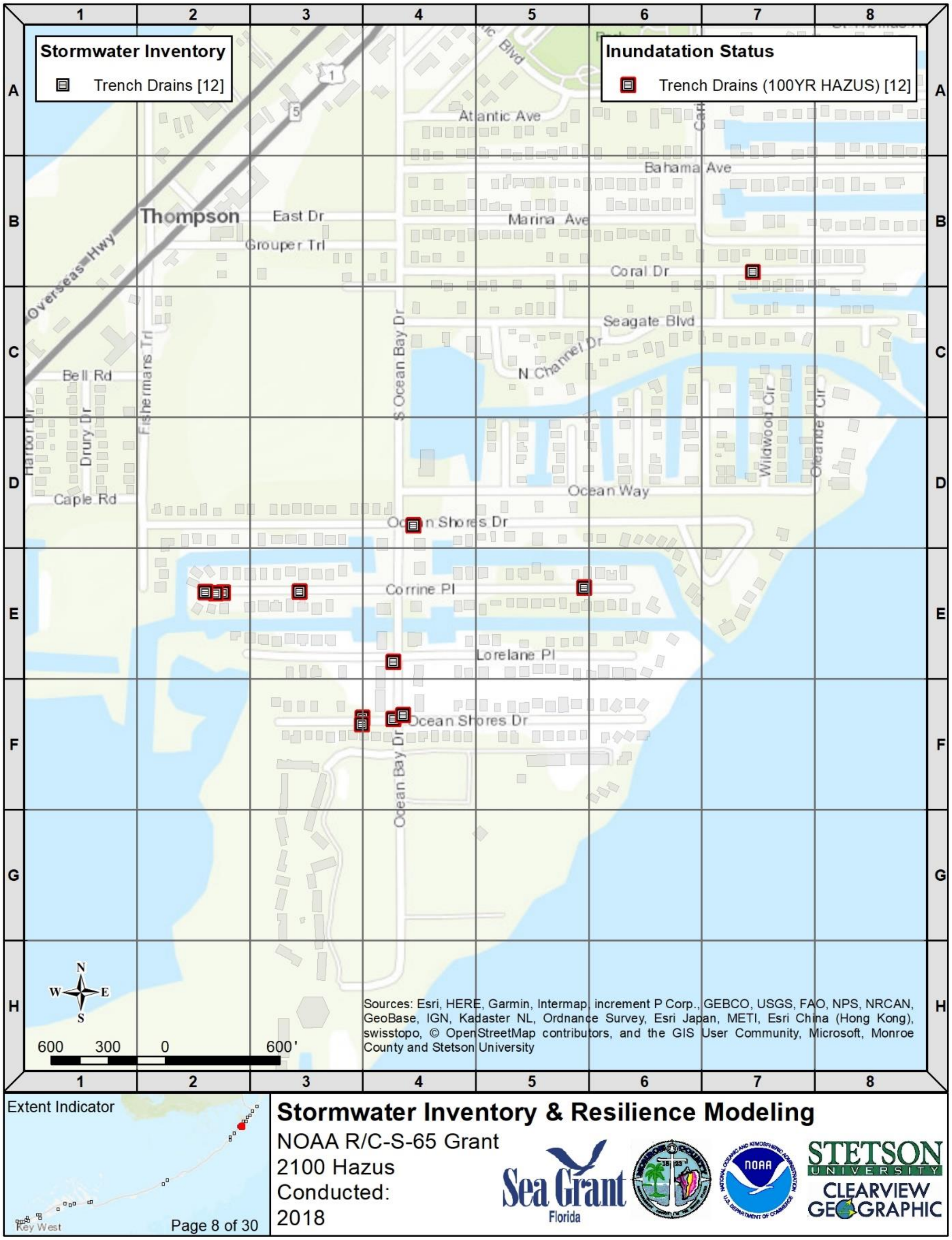

Stormwater Inventory & Resilience Modeling

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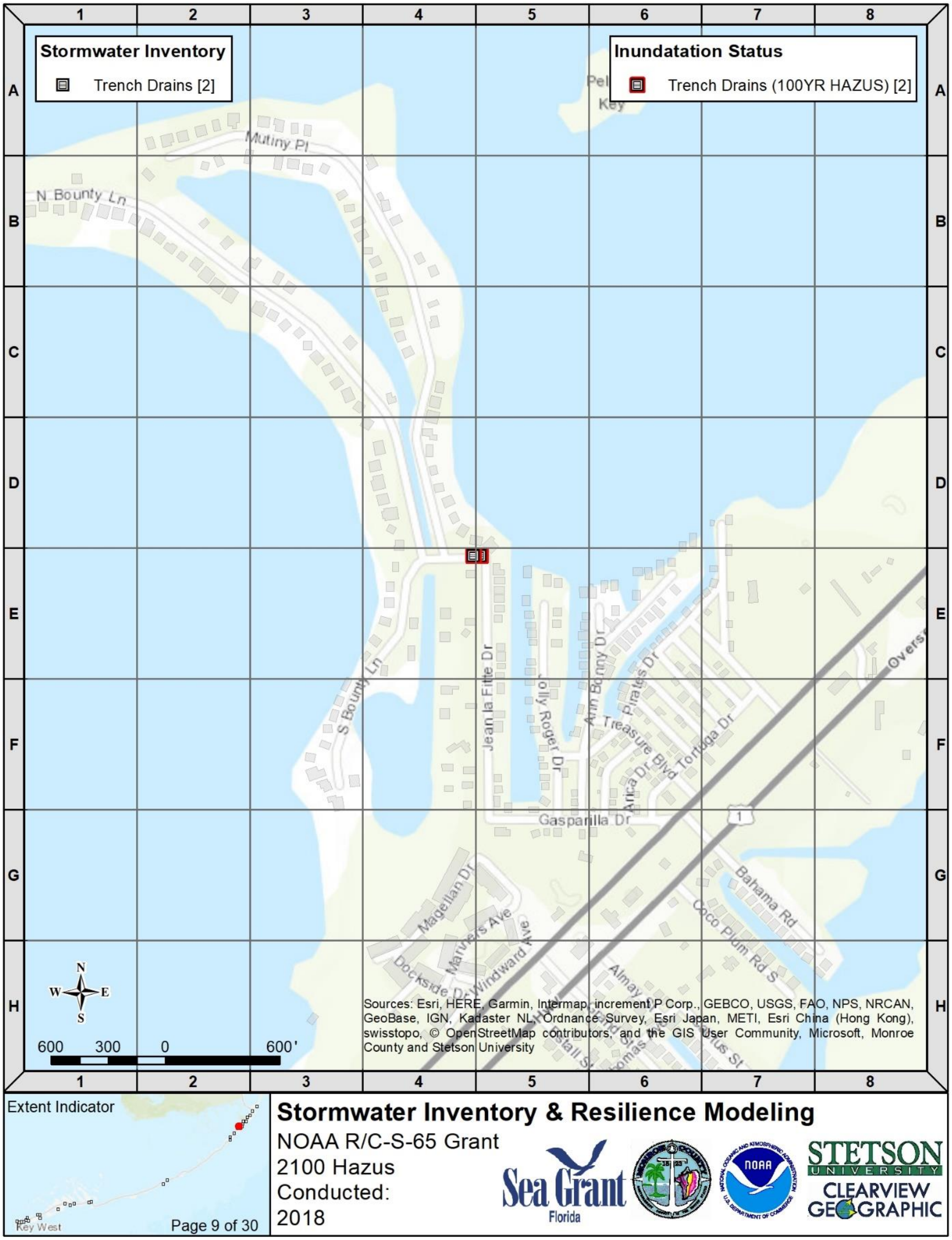

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Stormwater Inventory & Resilience Modeling

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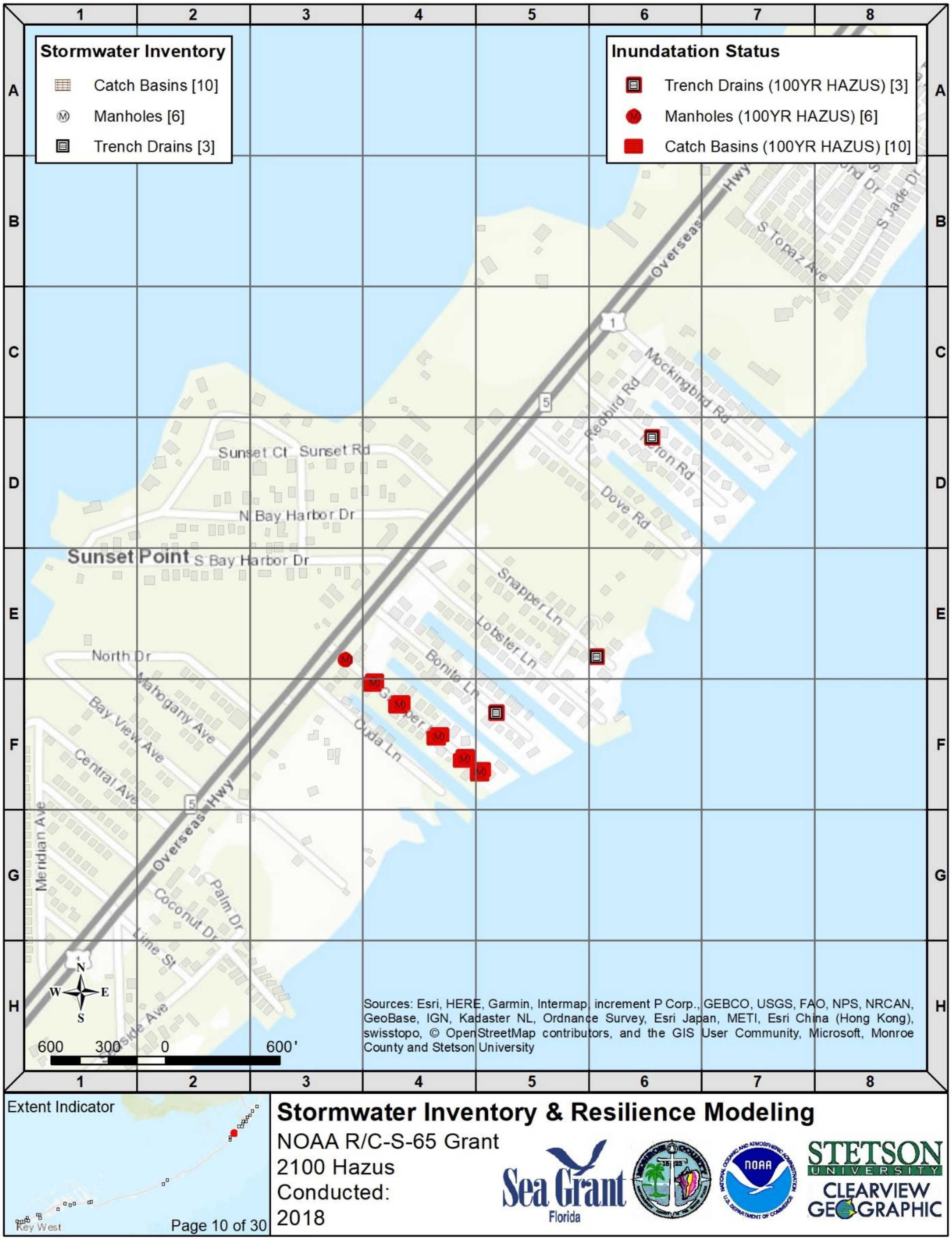

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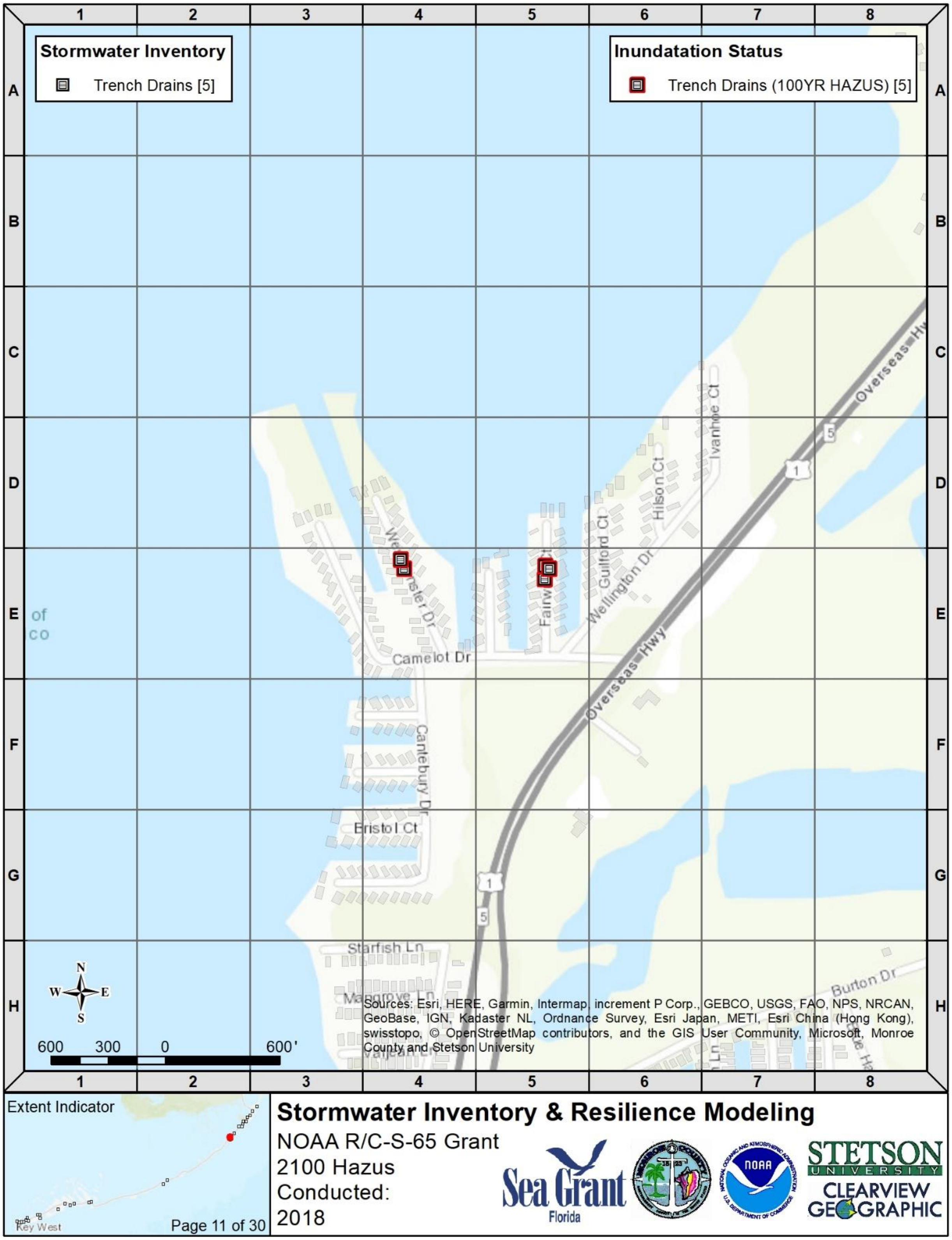

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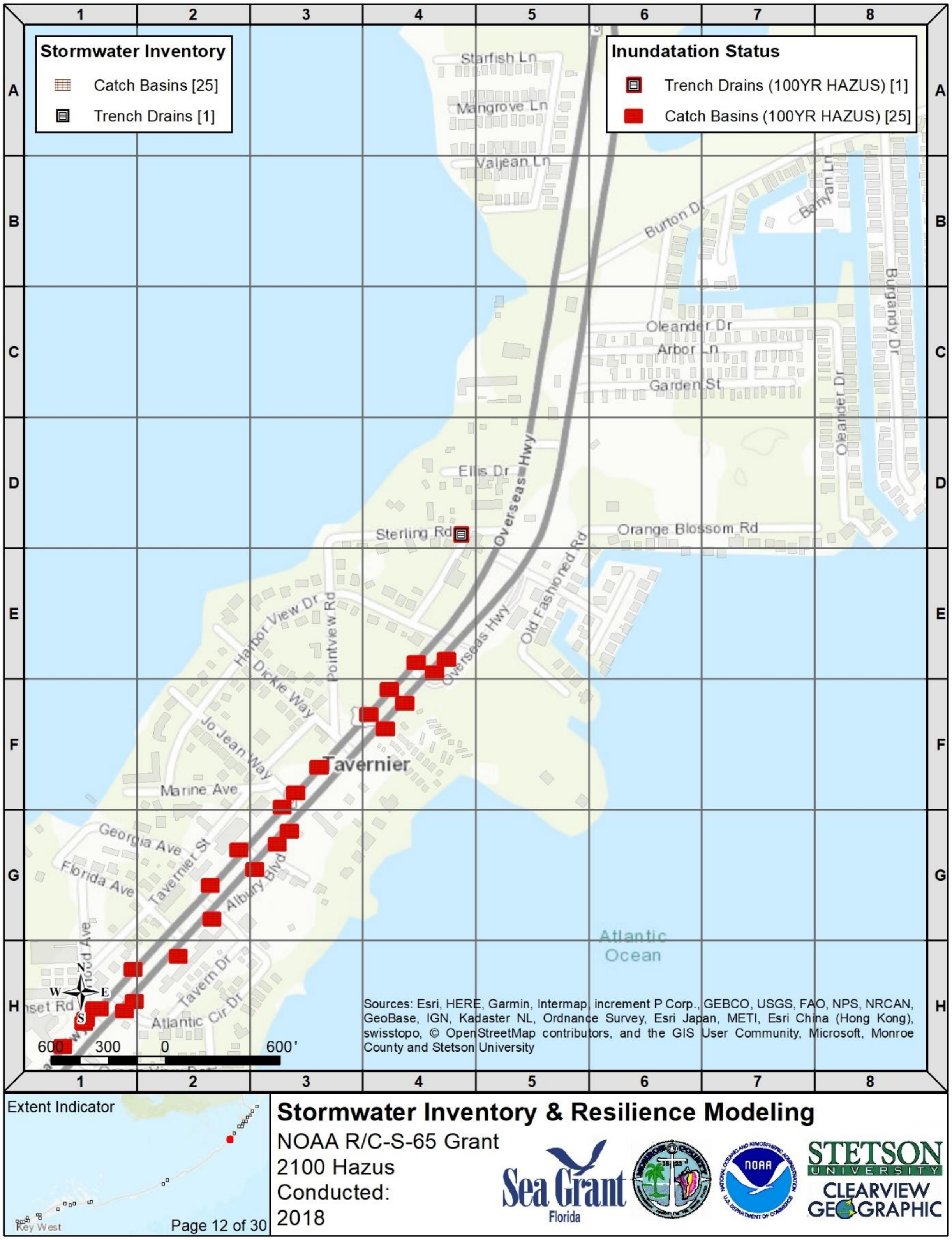

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Stormwater Inventory & Resilience Modeling

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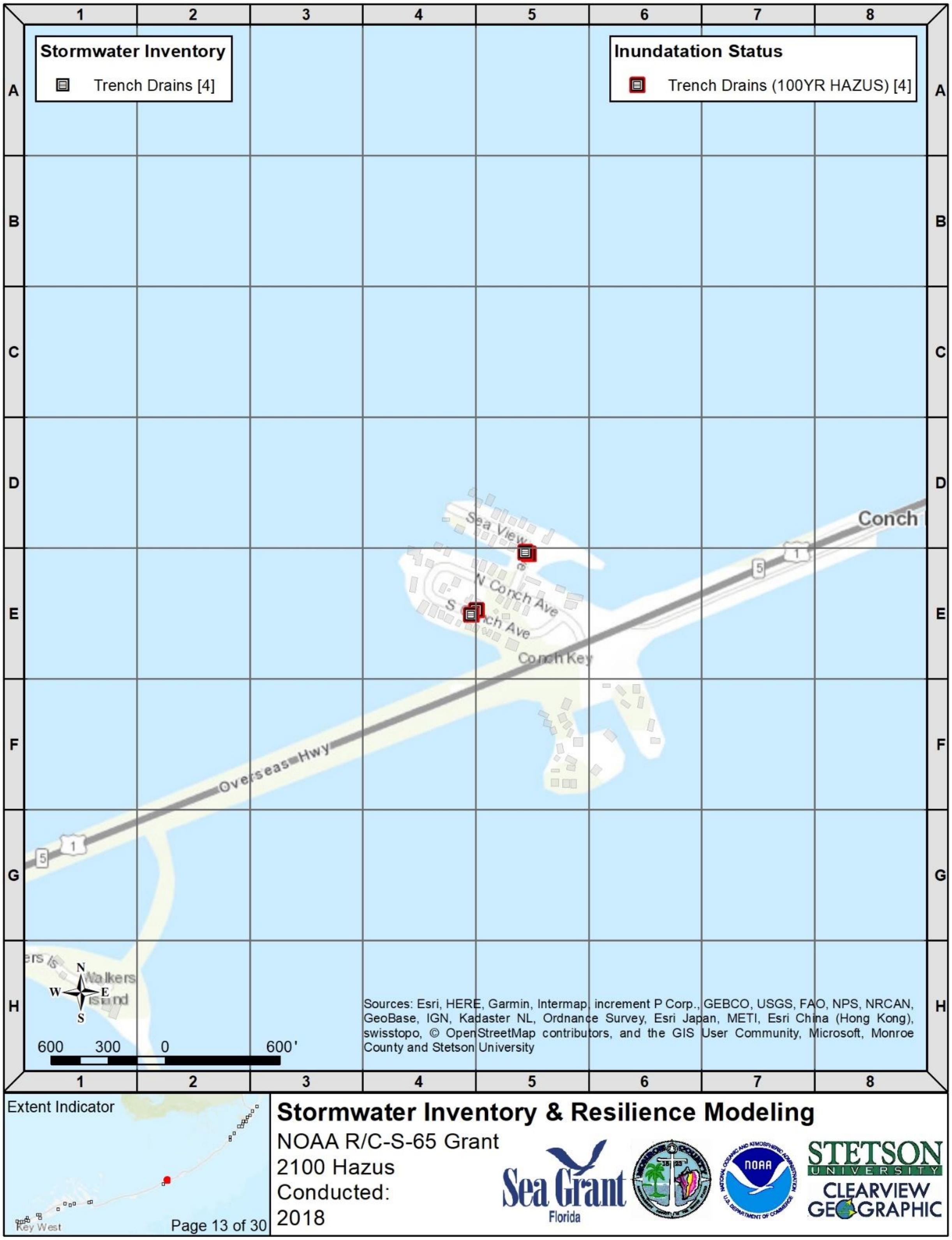
2018

Map Series 6: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Hazus-MH 100-Year Coastal Flood, 2100 Intermediate-High (4.13') Sea-Level Rise



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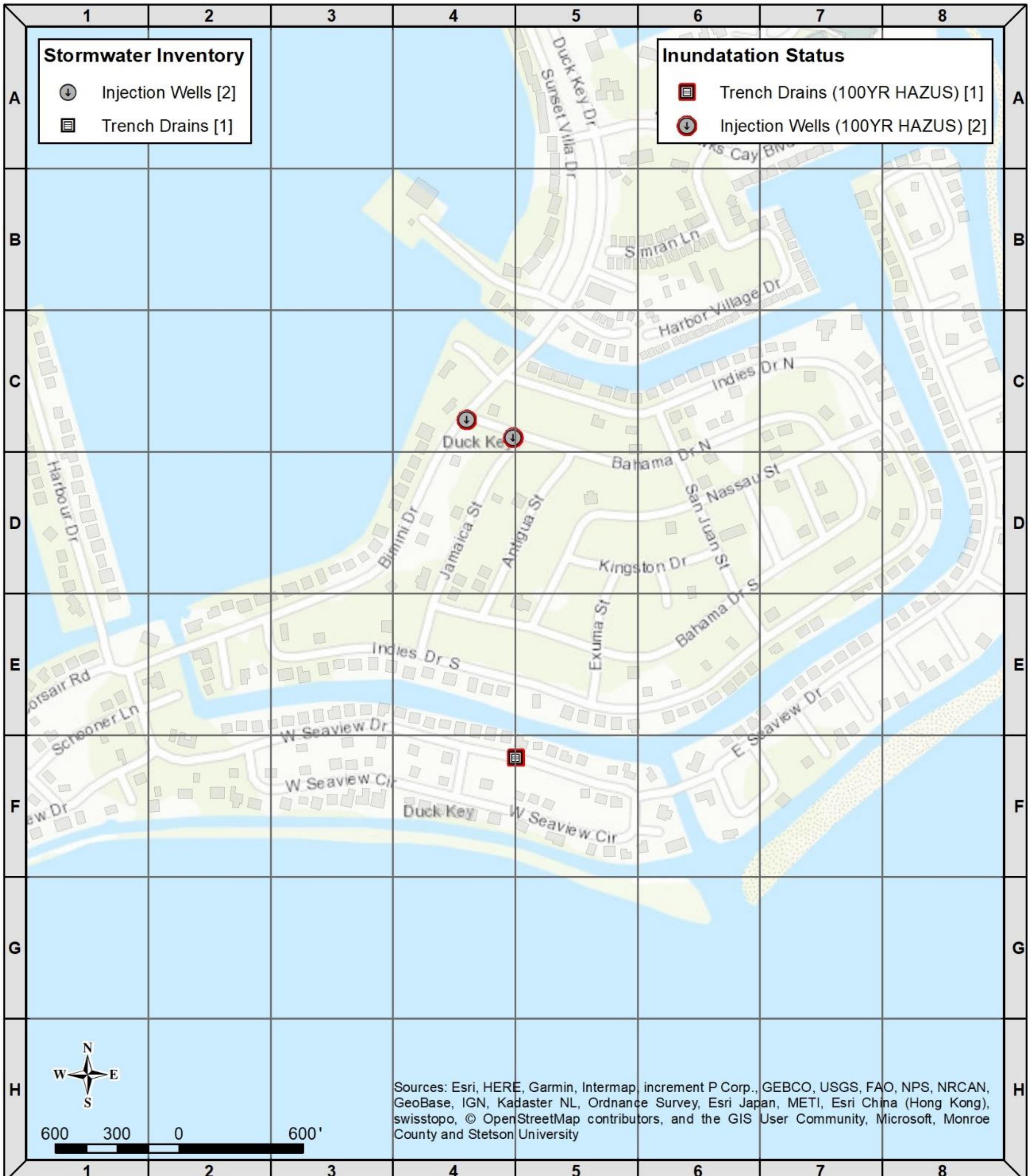

Extent Indicator

Stormwater Inventory & Resilience Modeling

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2018

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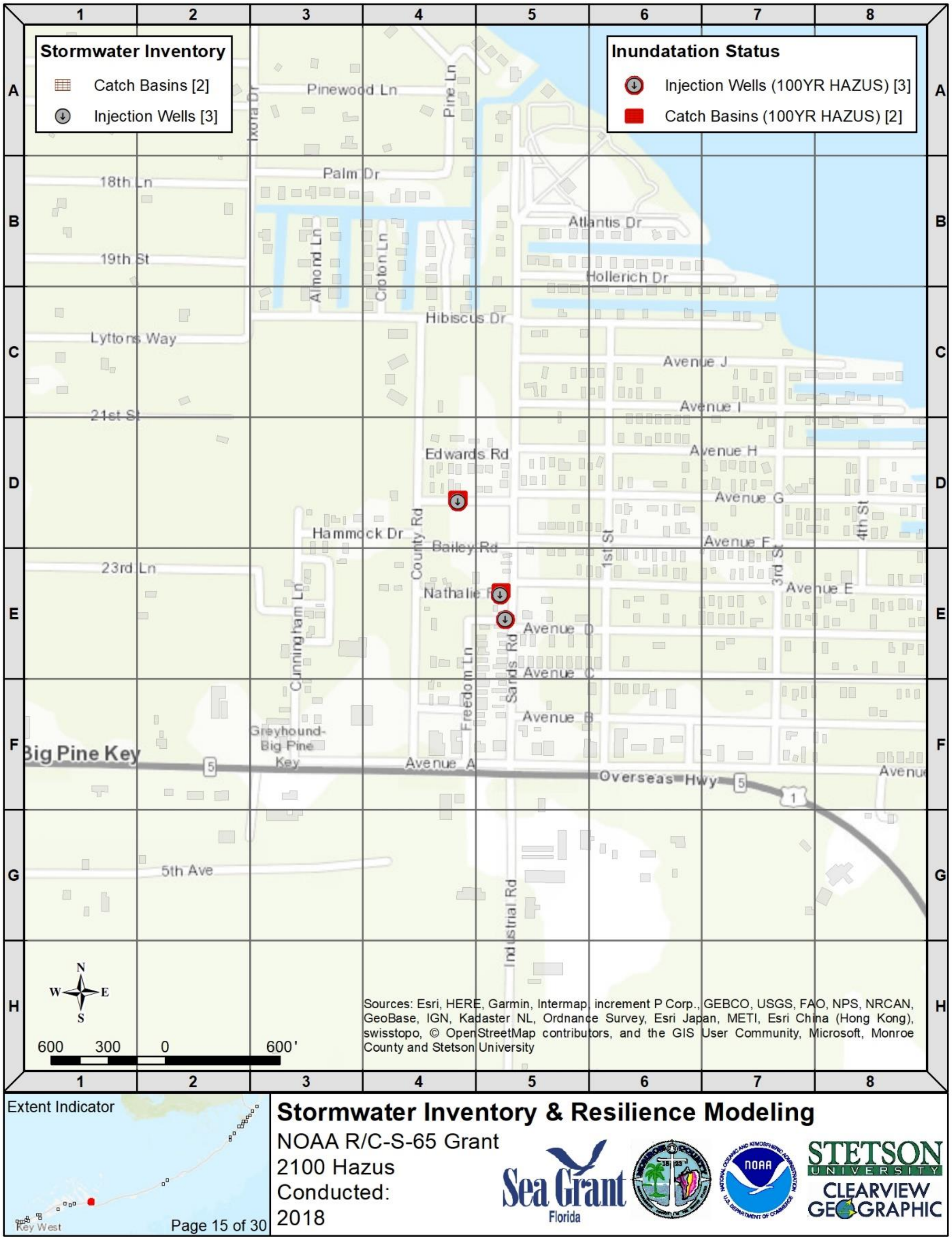

Stormwater Inventory & Resilience Modeling

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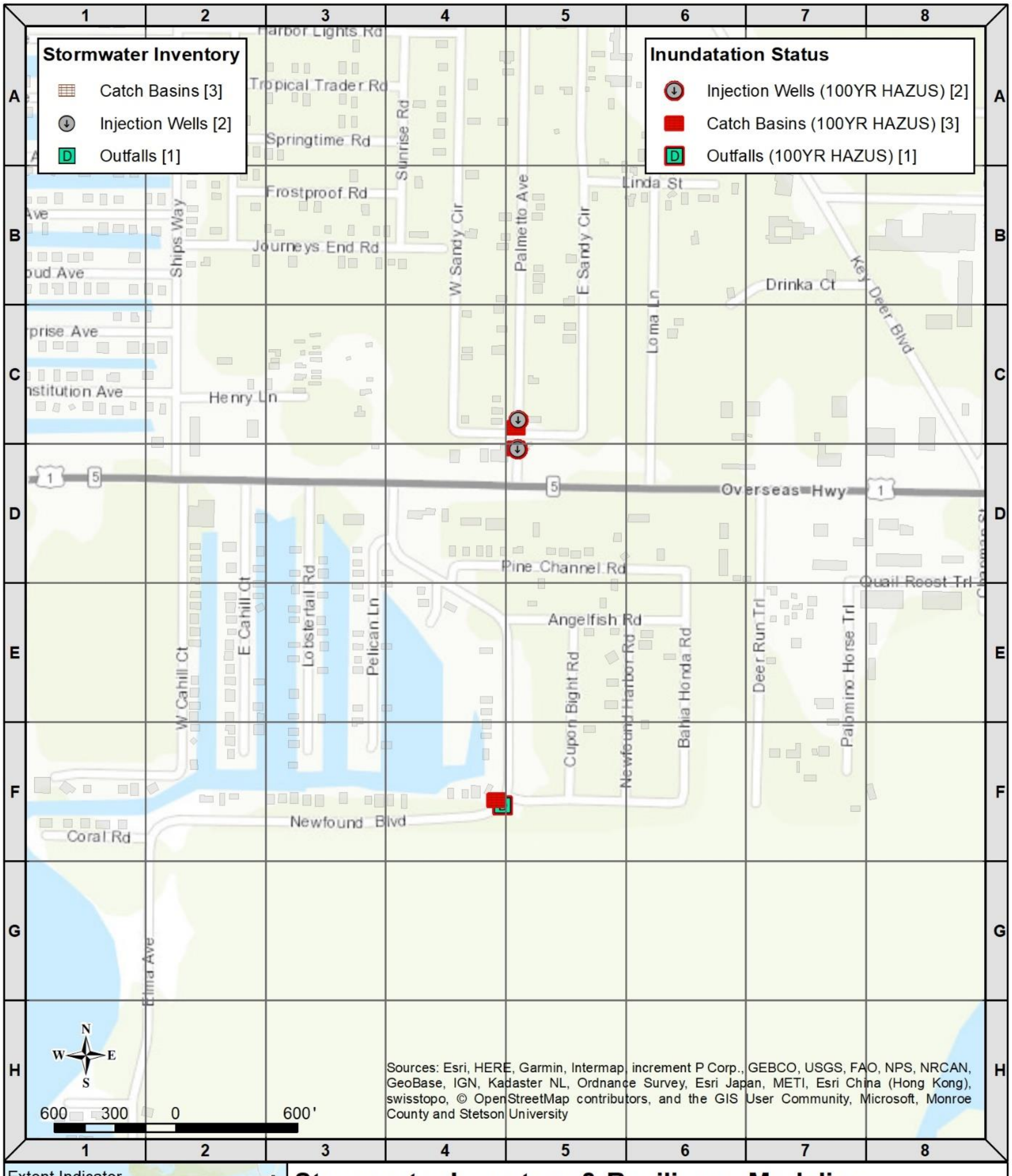
2018

Map Series 6: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Hazus-MH 100-Year Coastal Flood, 2100 Intermediate-High (4.13') Sea-Level Rise



Stormwater Inventory & Resilience Modeling
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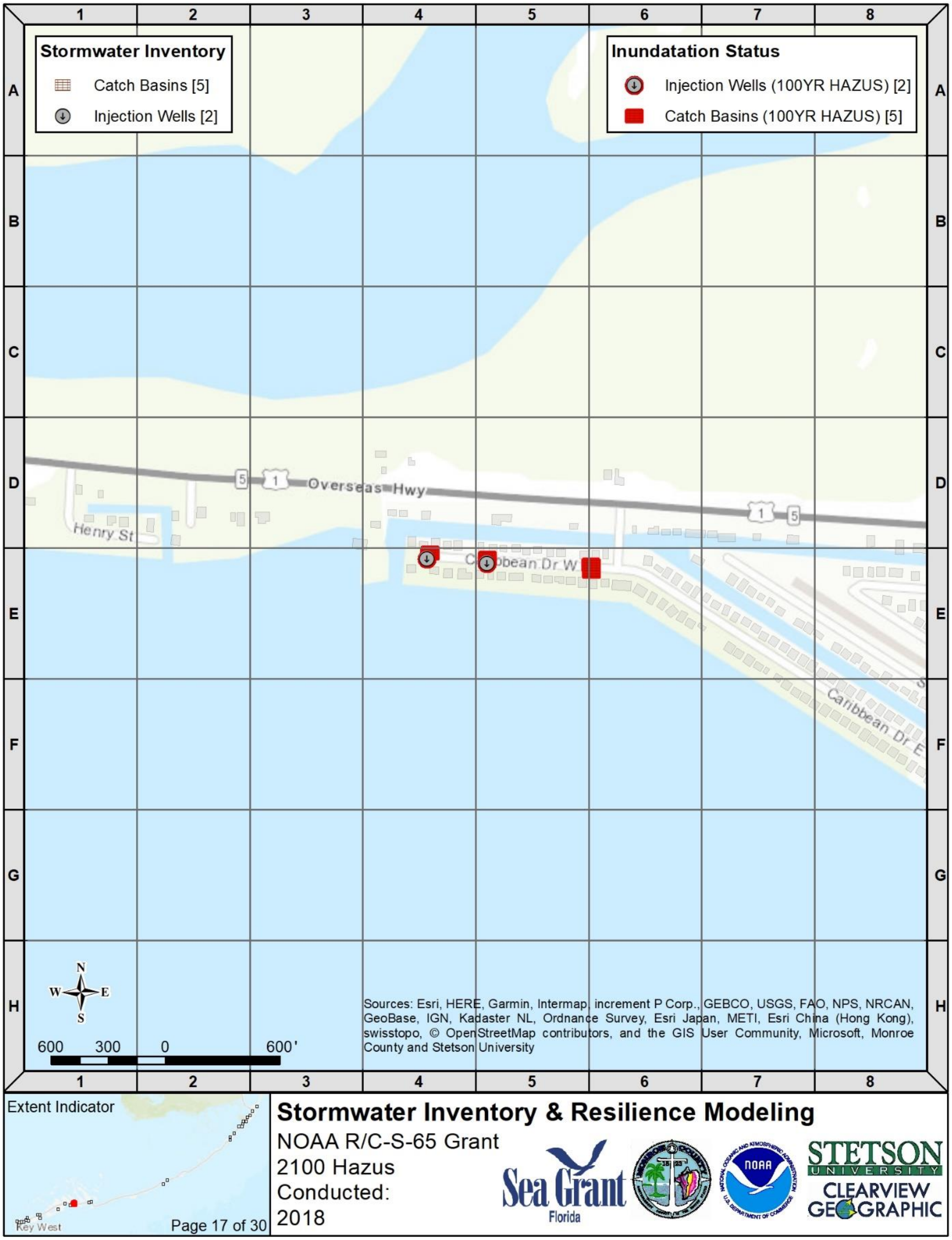

Stormwater Inventory & Resilience Modeling

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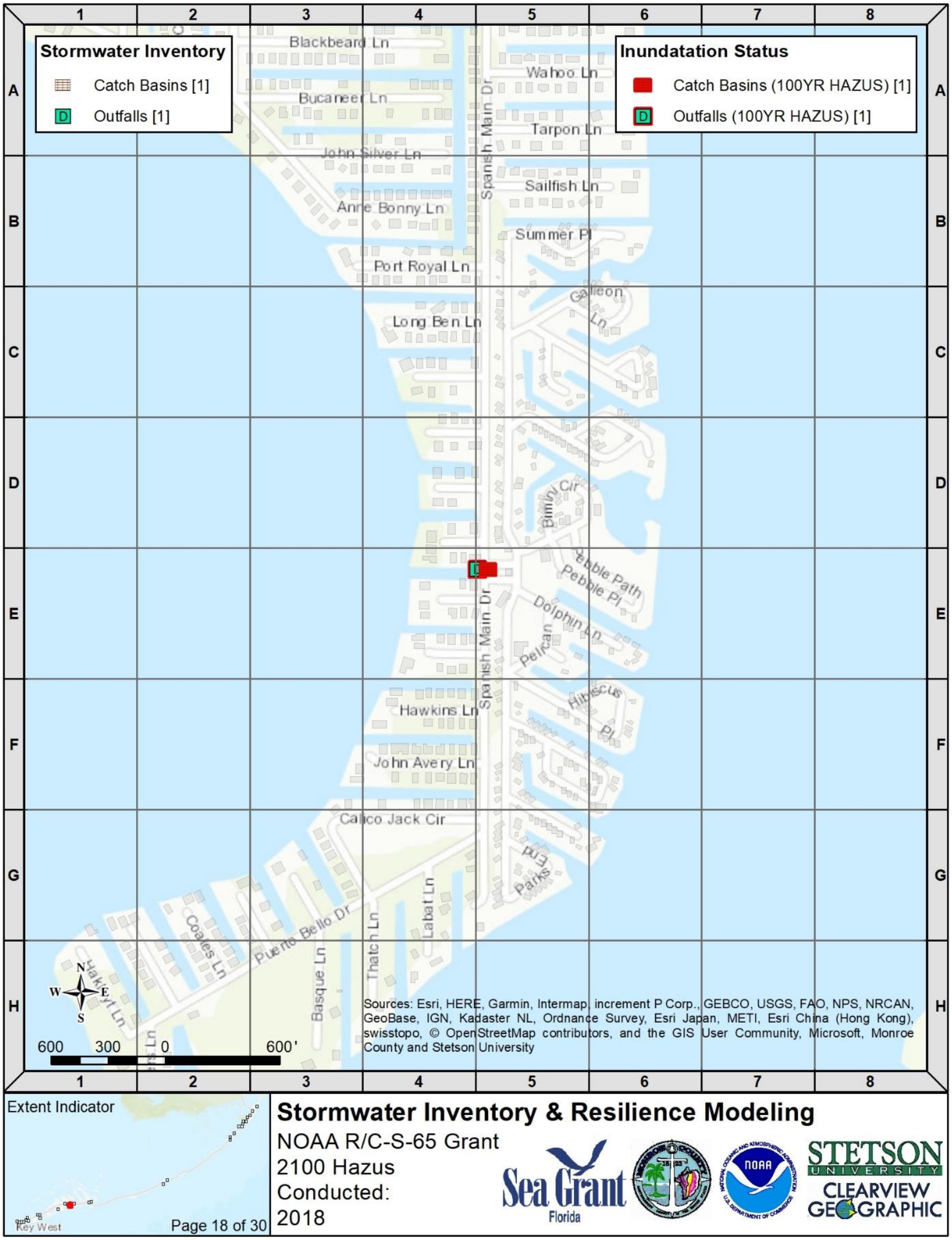

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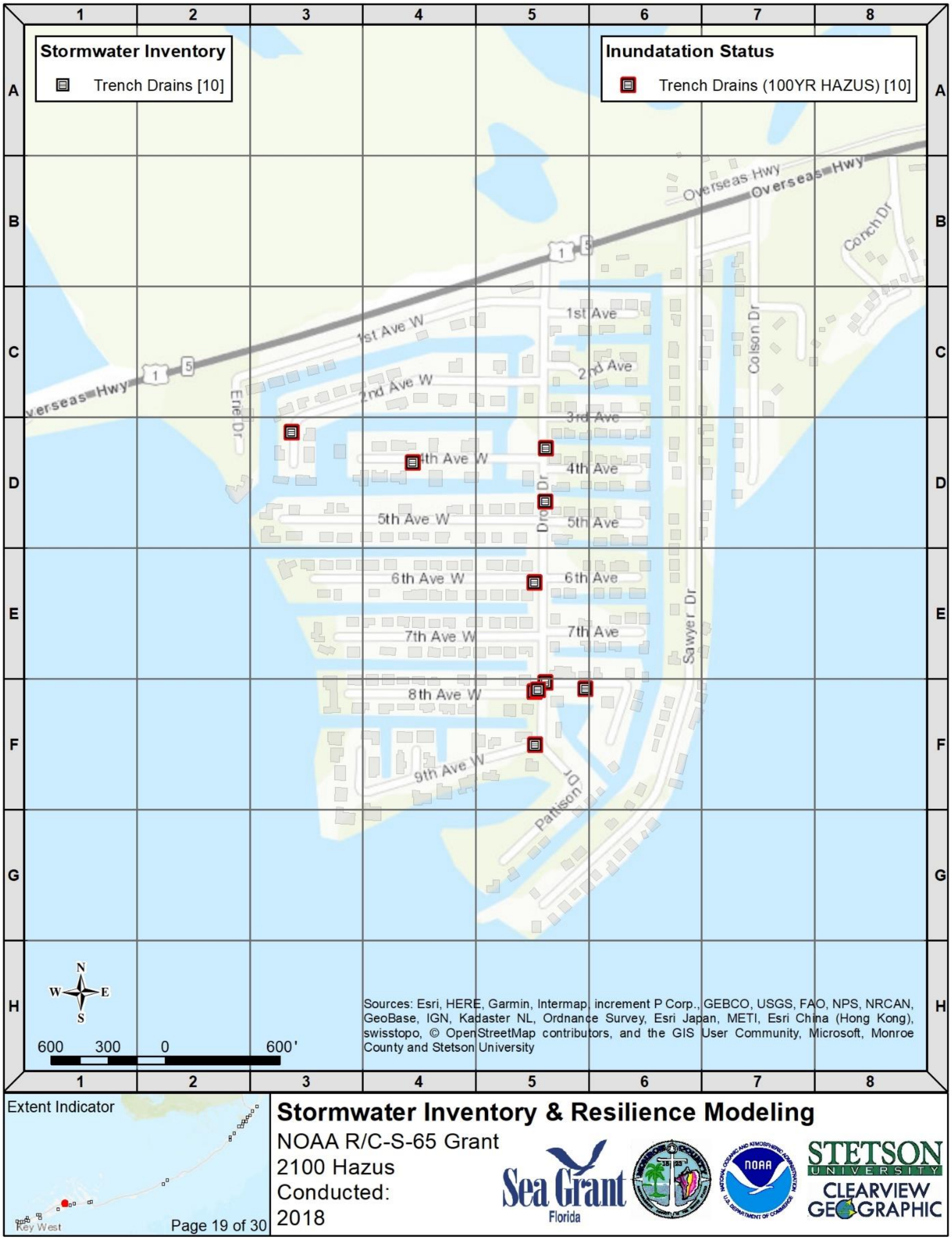

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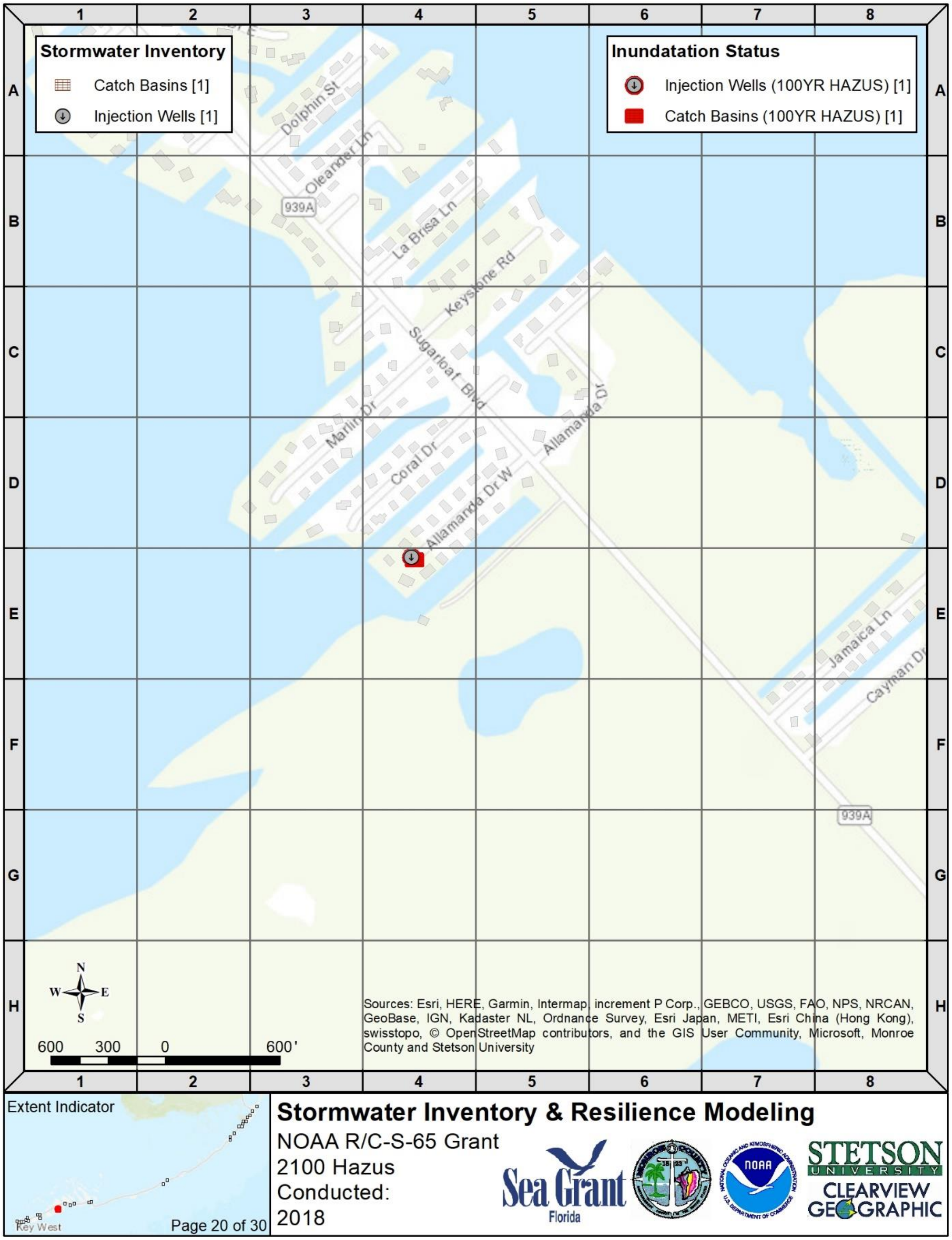

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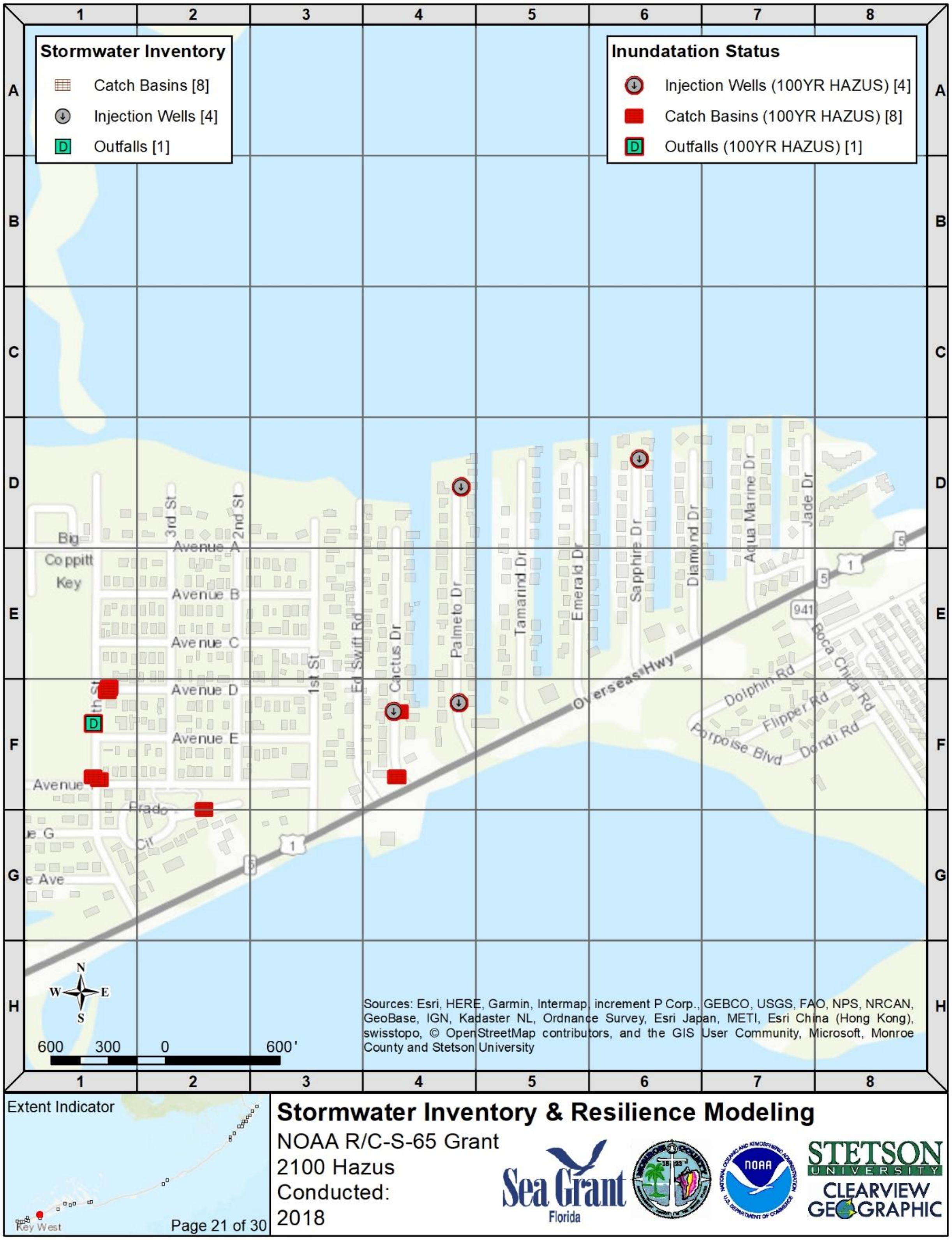

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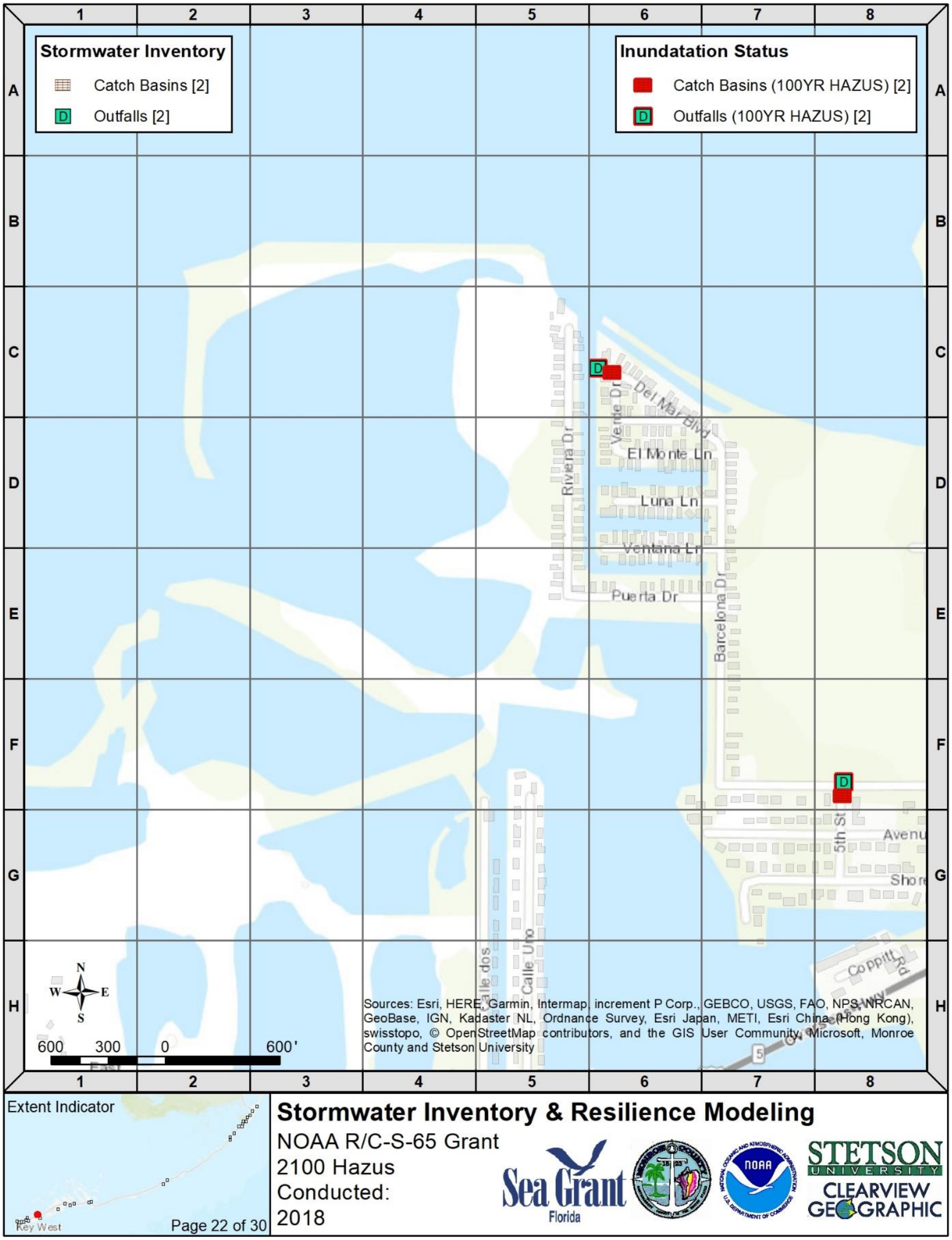

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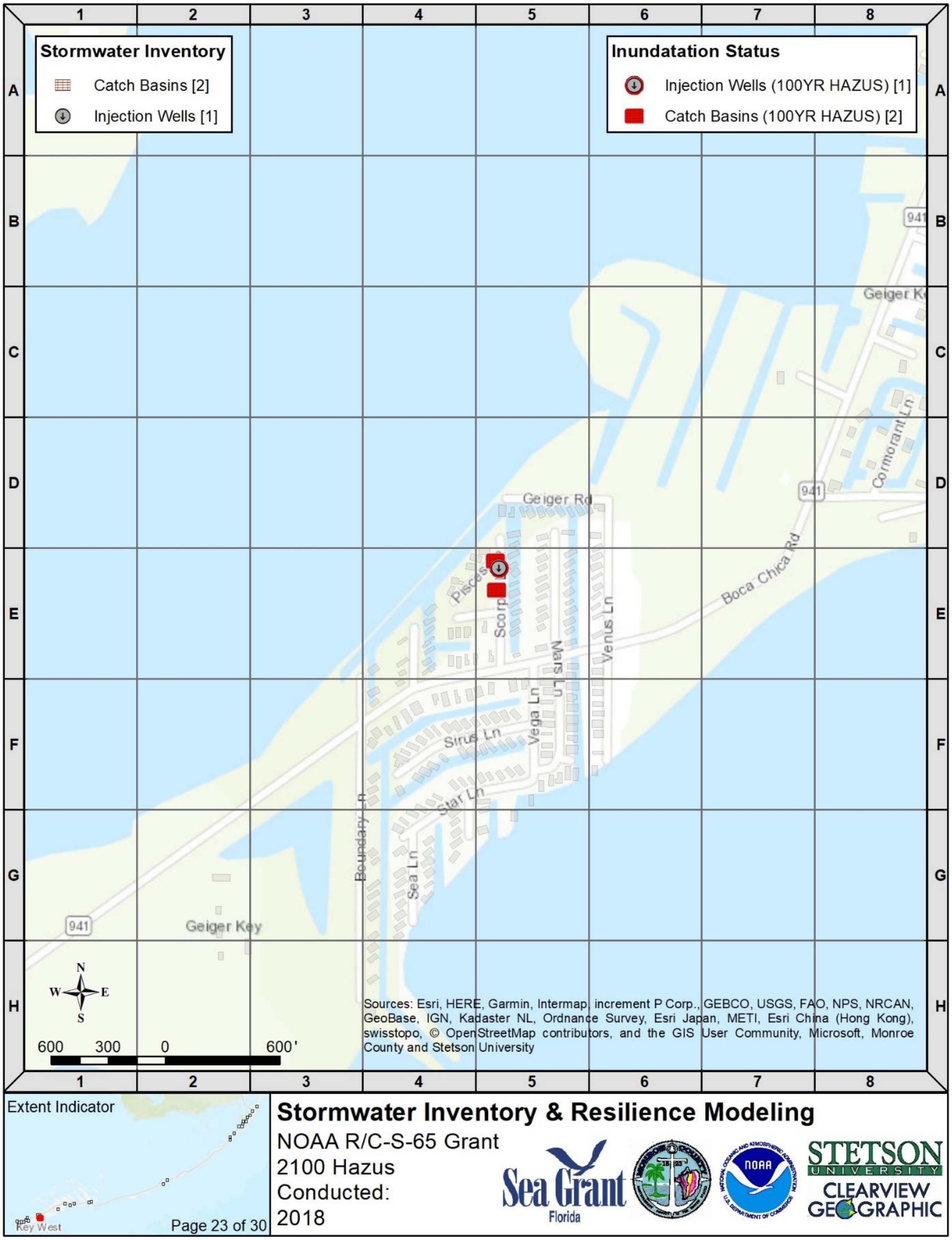
Map Series 6: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Hazus-MH 100-Year Coastal Flood, 2100 Intermediate-High (4.13') Sea-Level Rise



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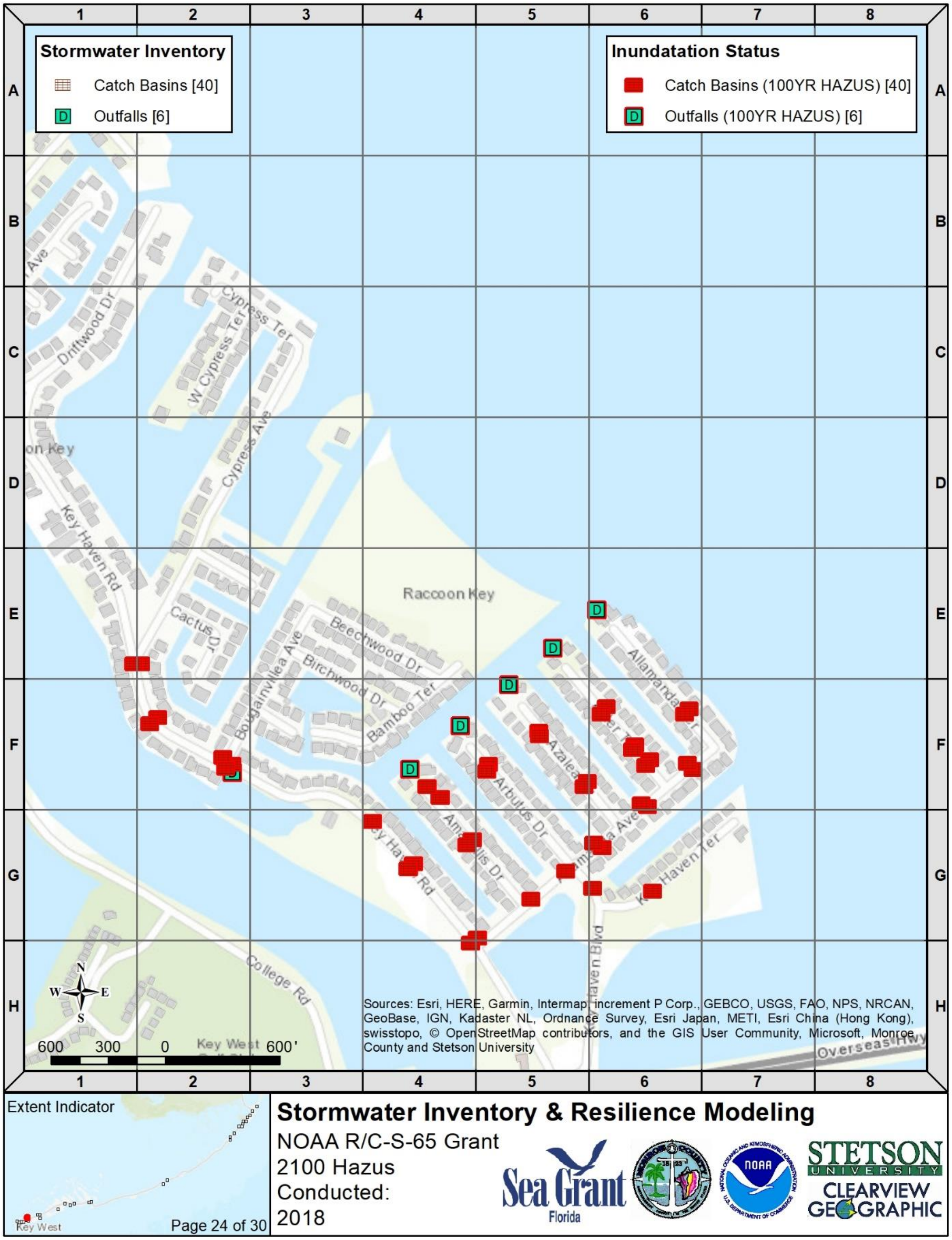

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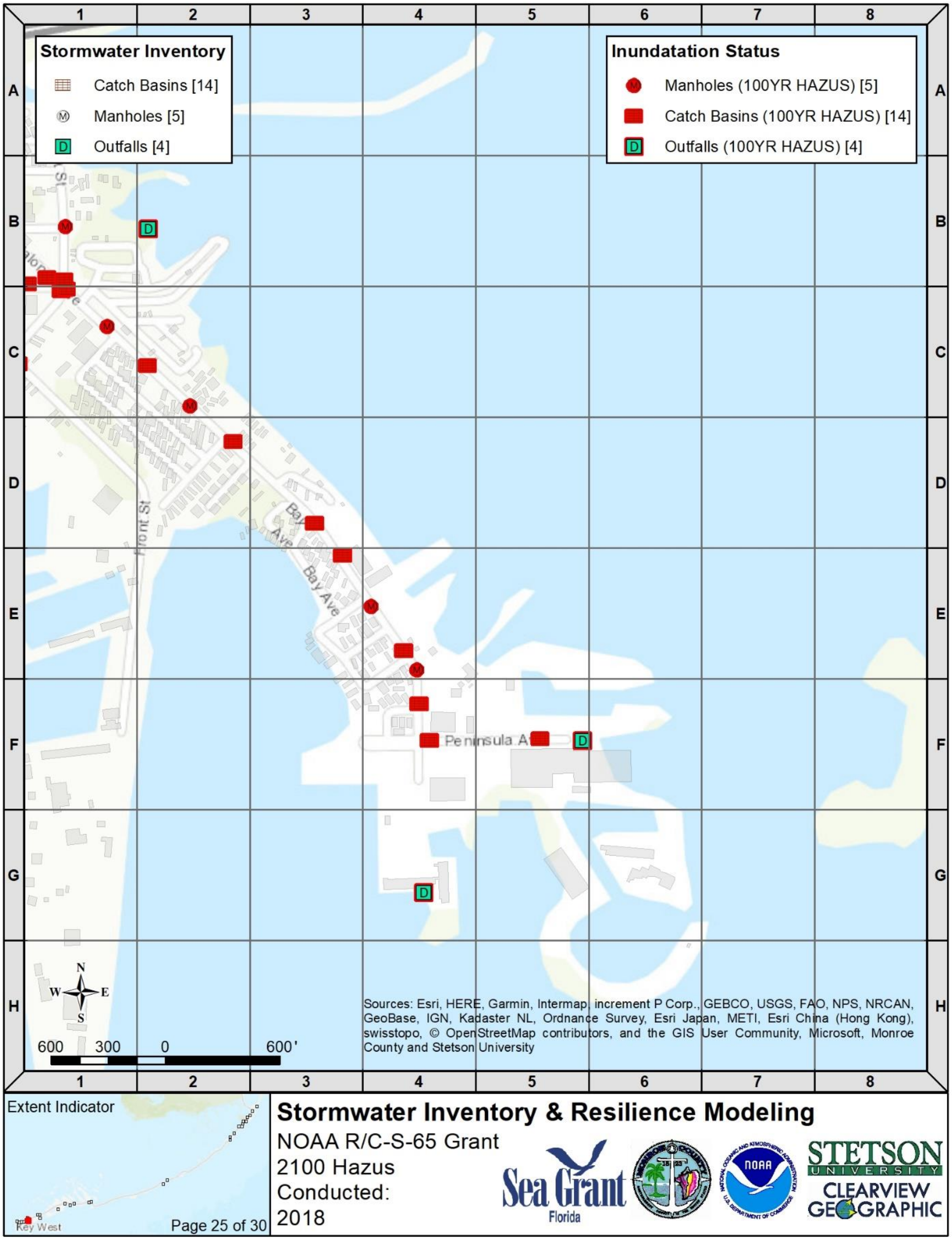
Map Series 6: Monroe County Stormwater Infrastructure Inventory with Potential Future Vulnerability to Hazus-MH 100-Year Coastal Flood, 2100 Intermediate-High (4.13') Sea-Level Rise



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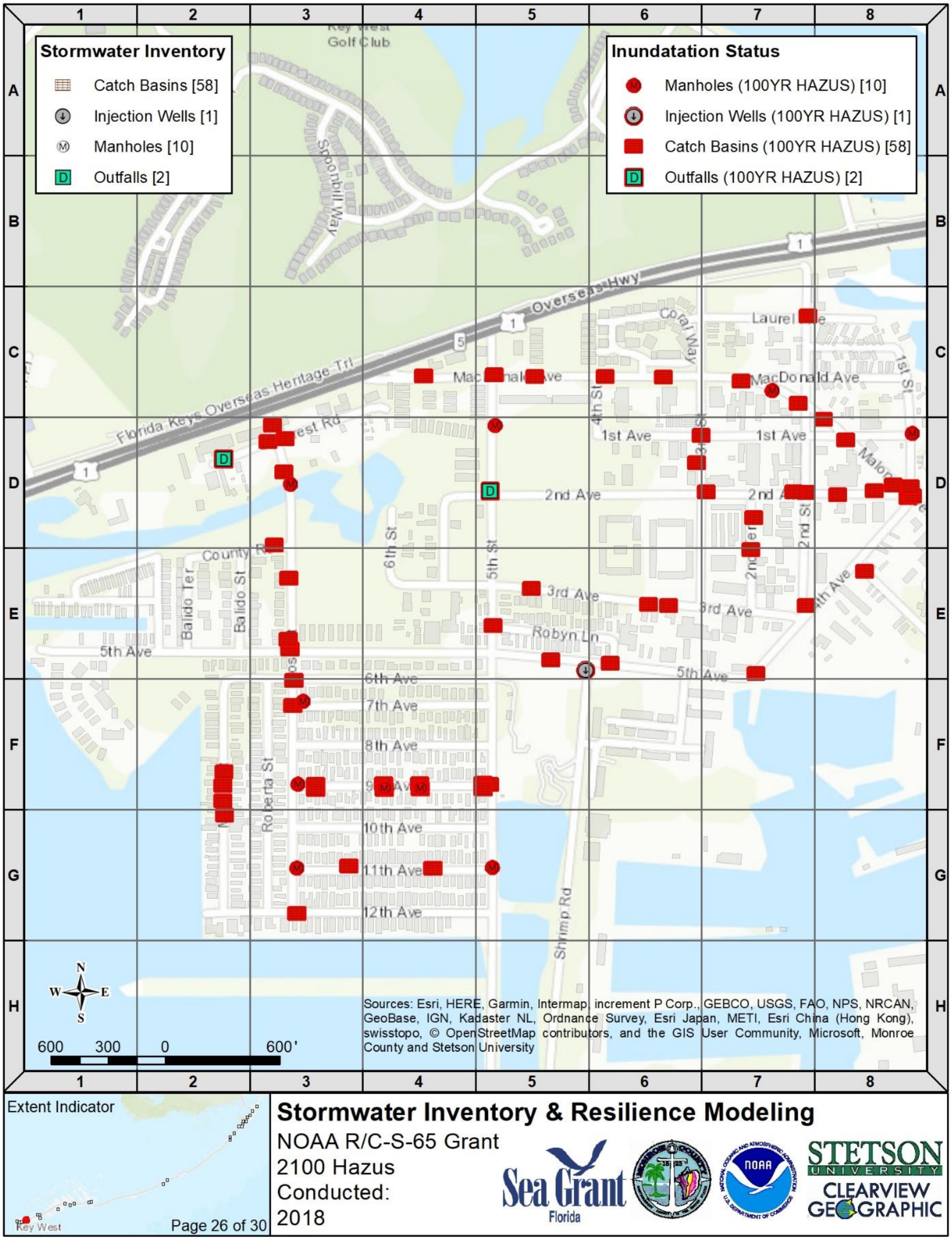

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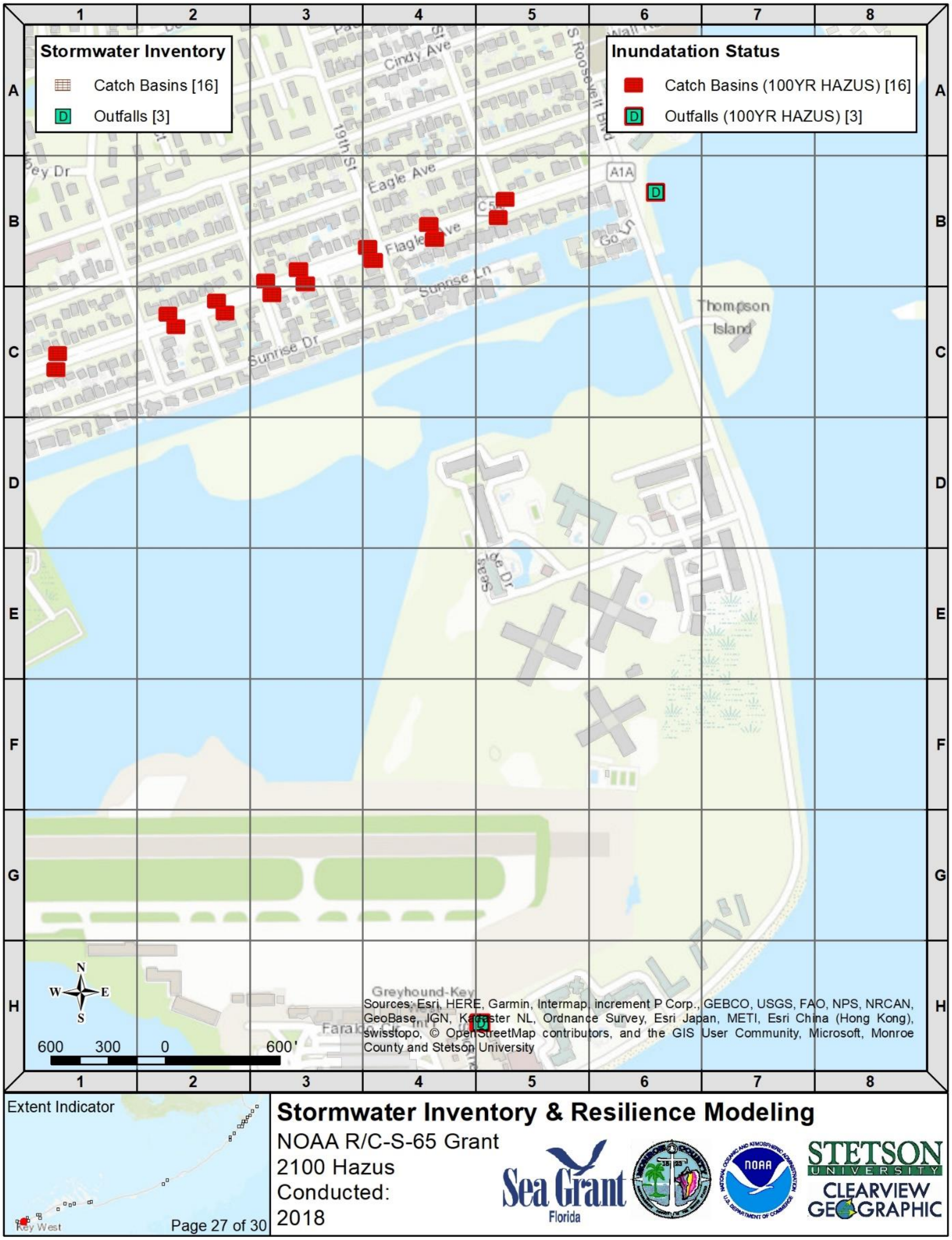

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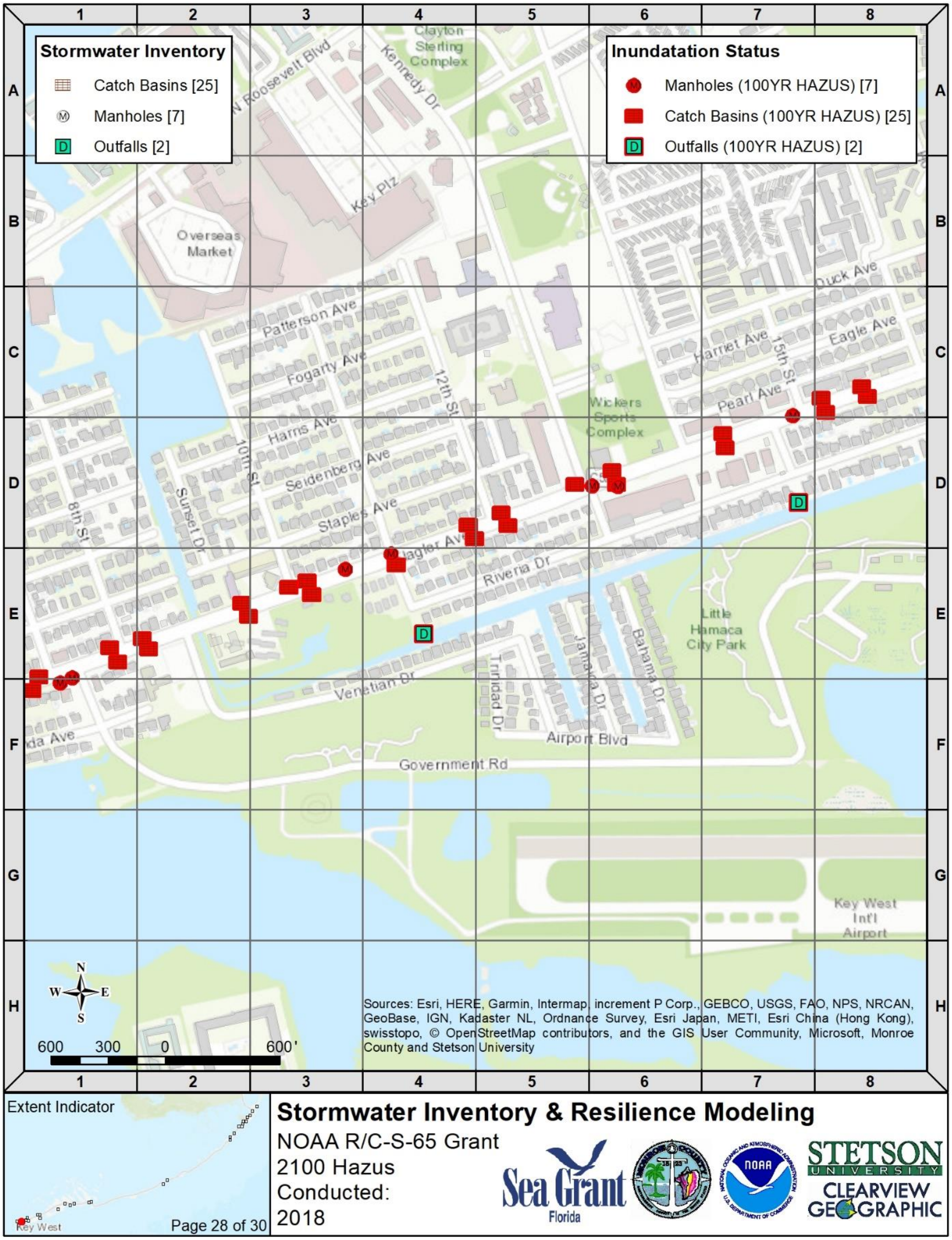

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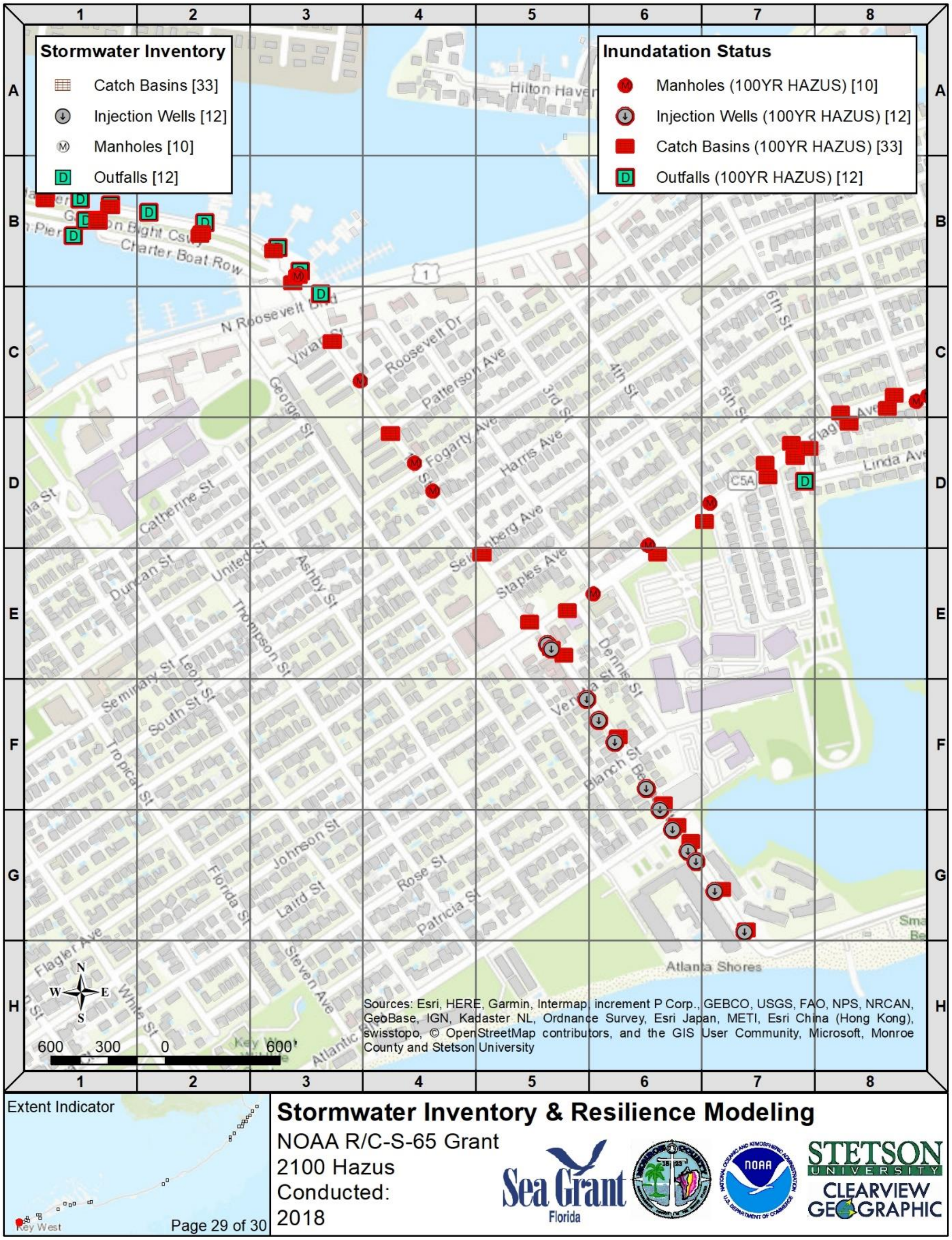

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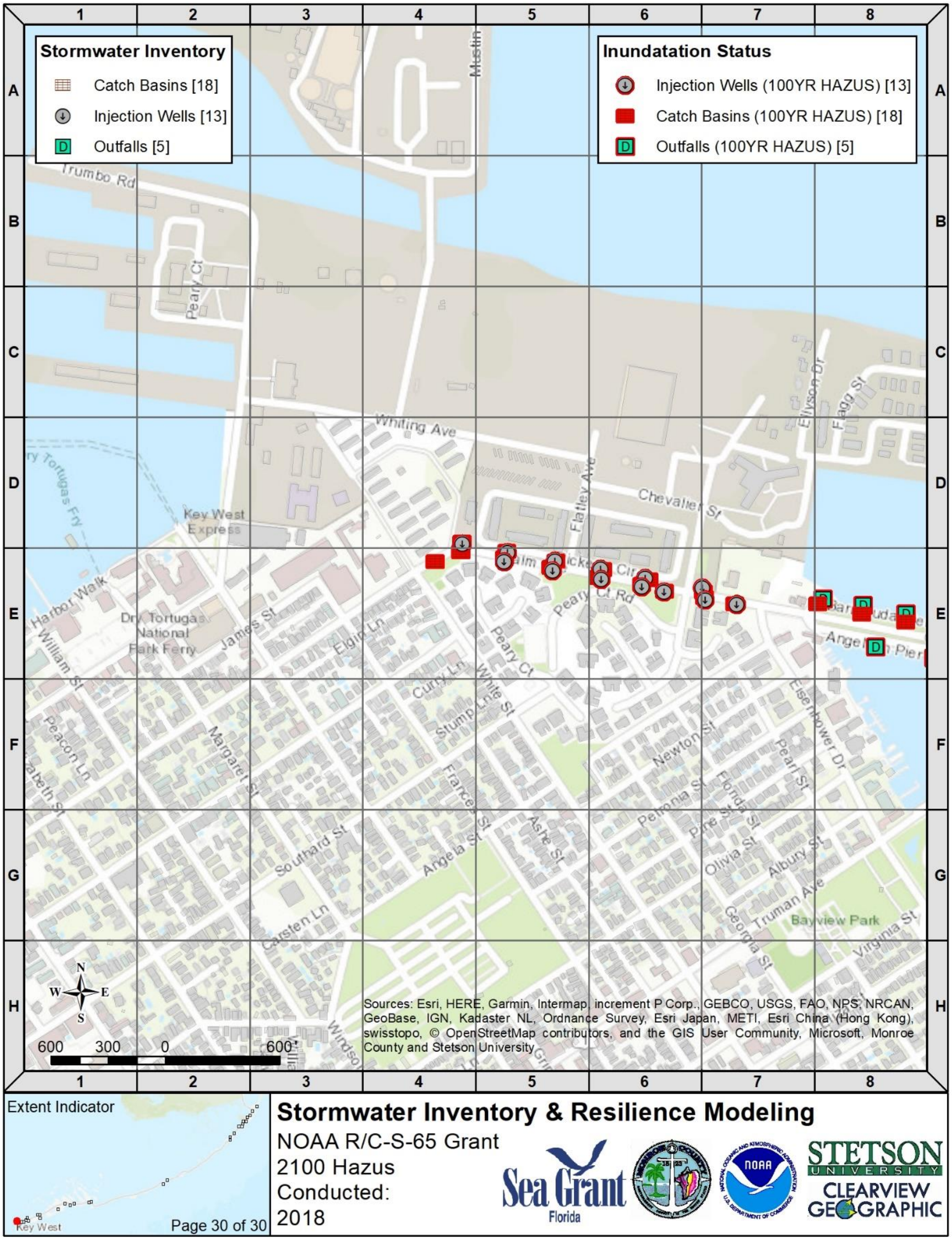
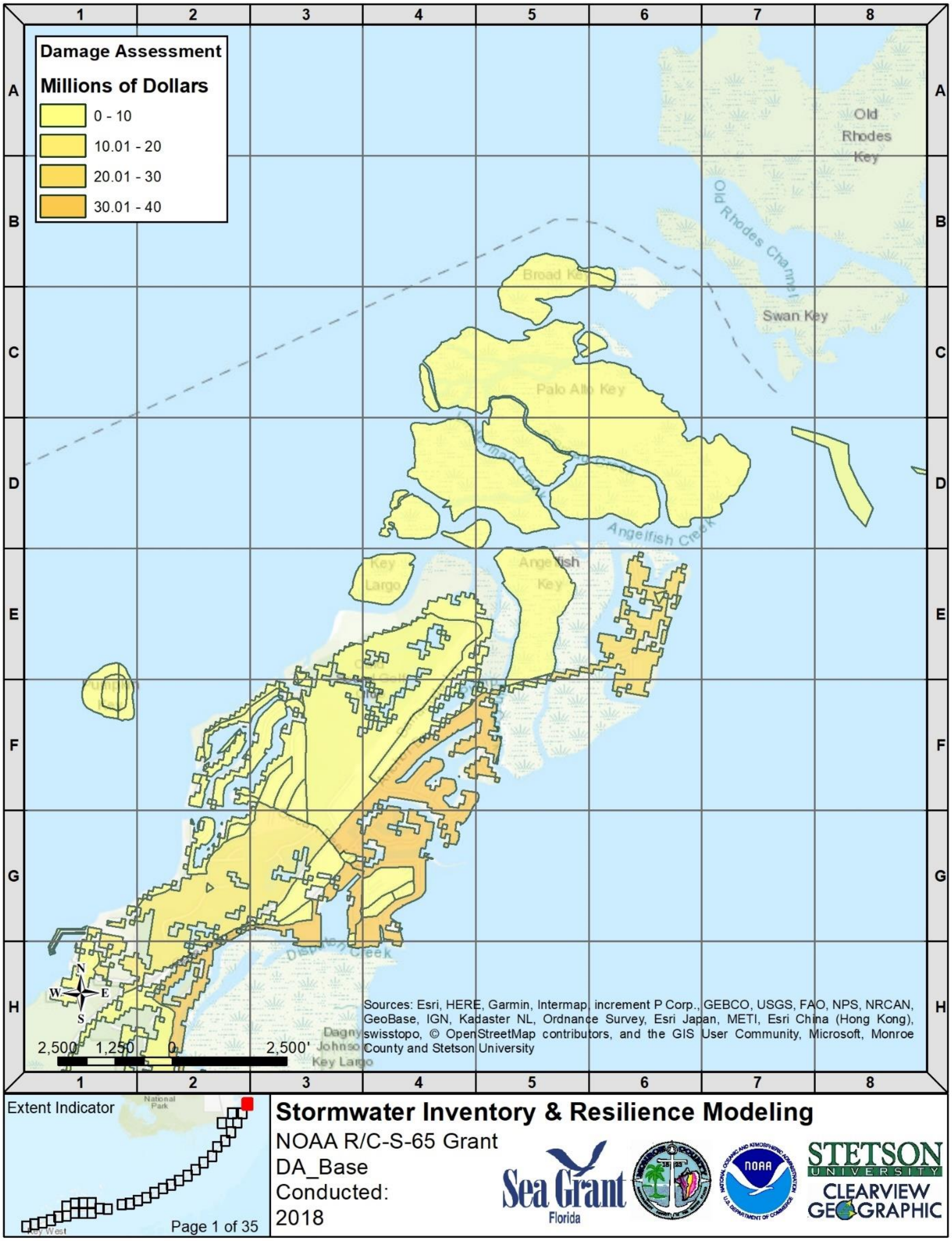


Map Series 7: Hazus-MH 100-Year Coastal Flood Model Damage Assessment for Monroe County, Baseline Scenario (1992 Sea-Level)



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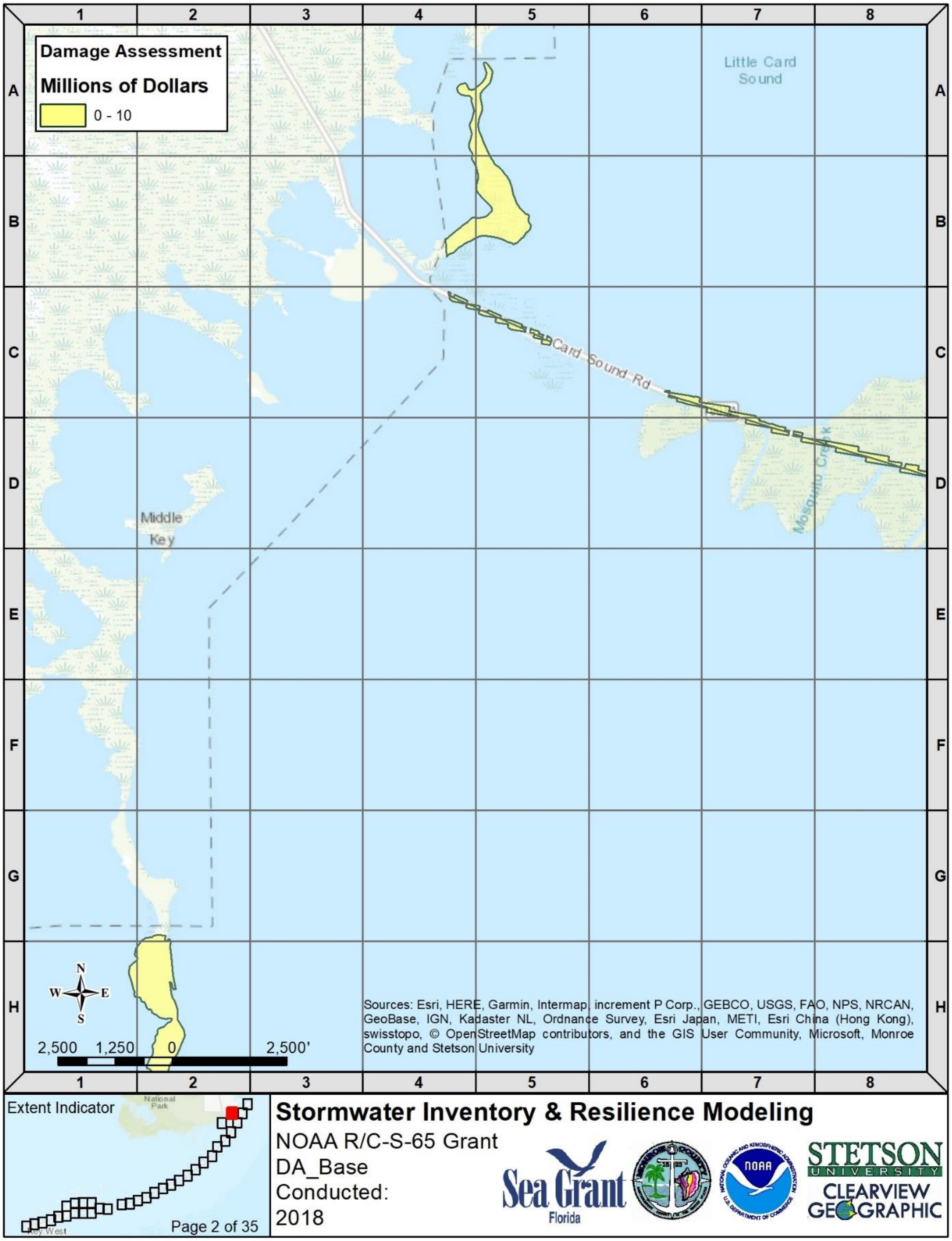

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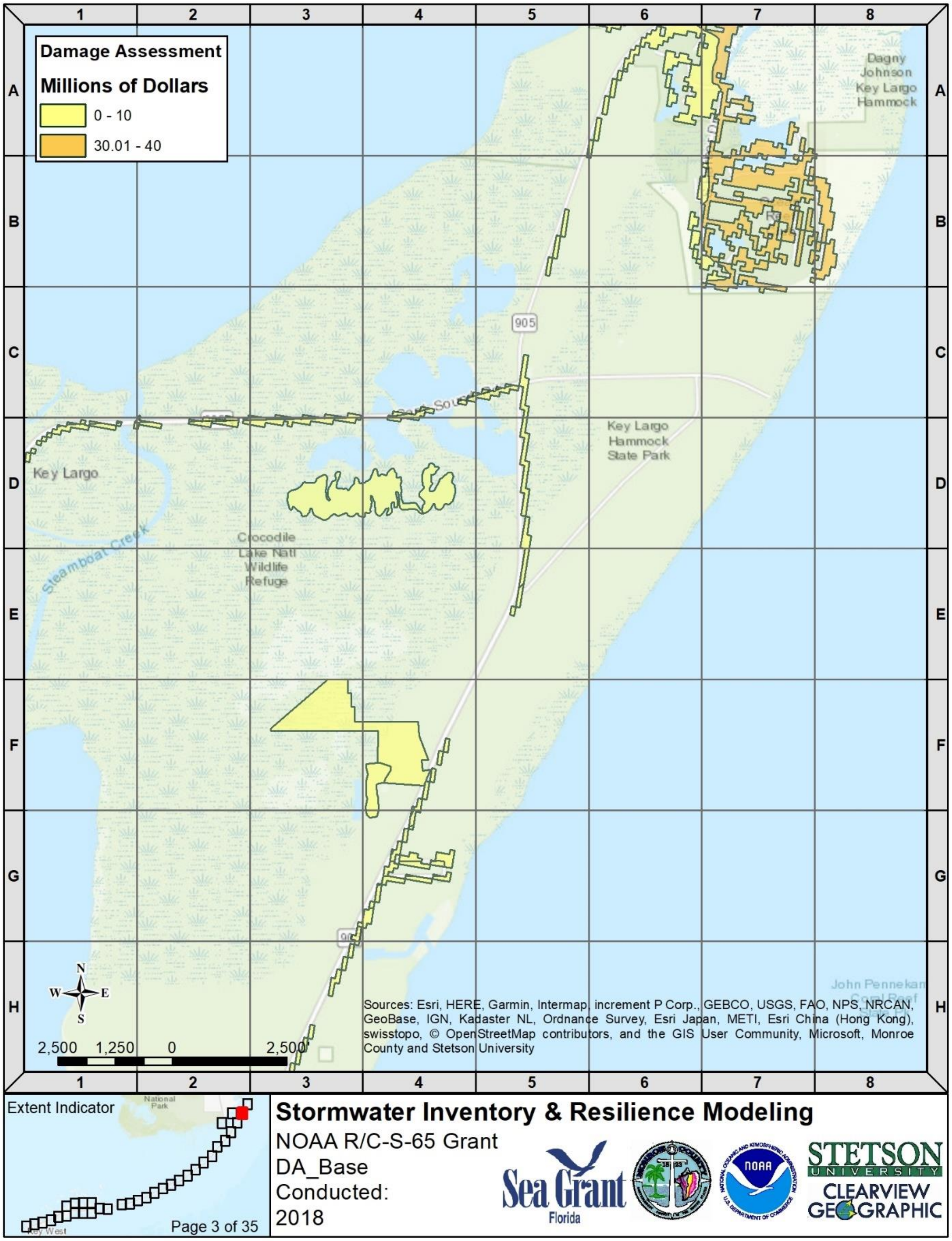

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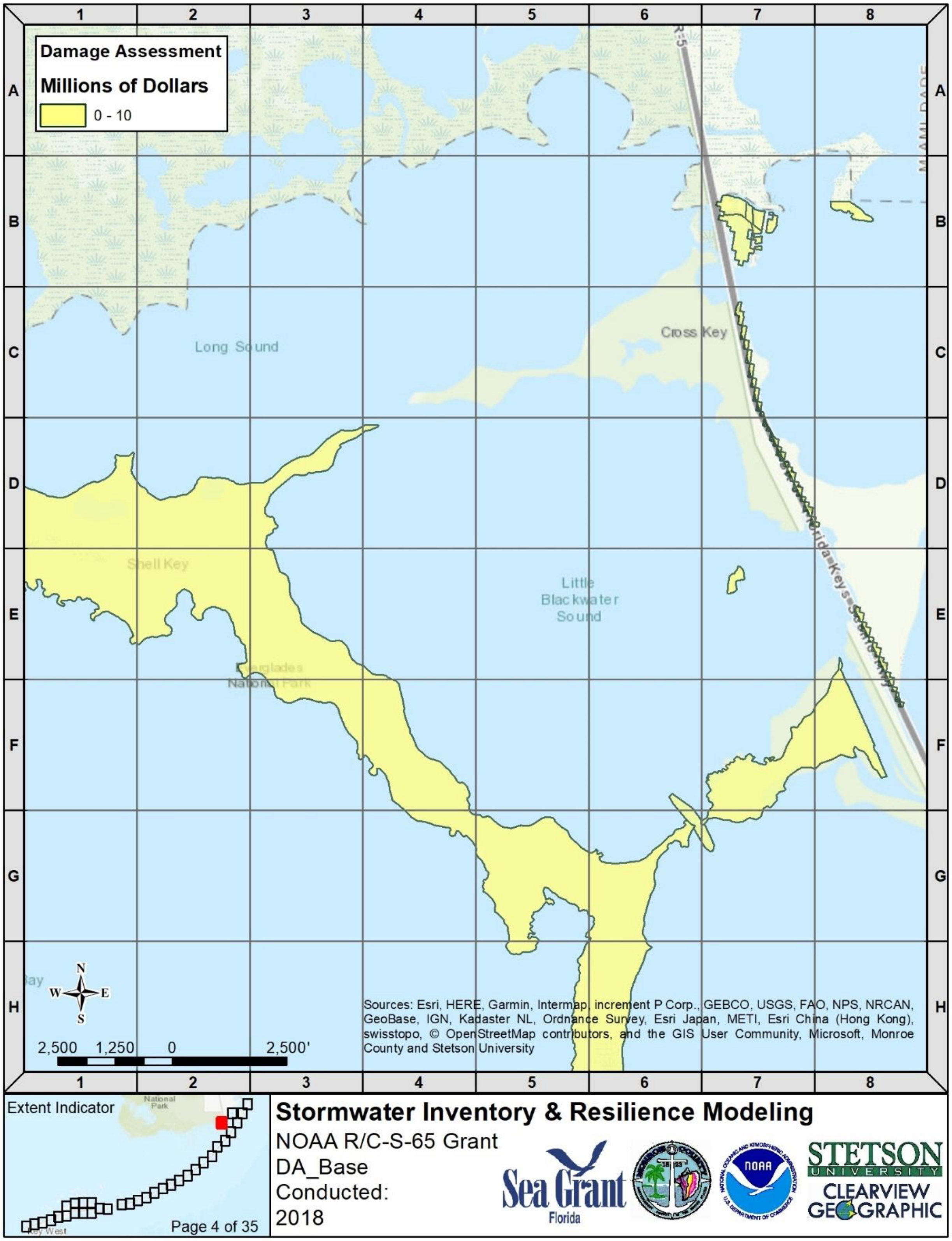

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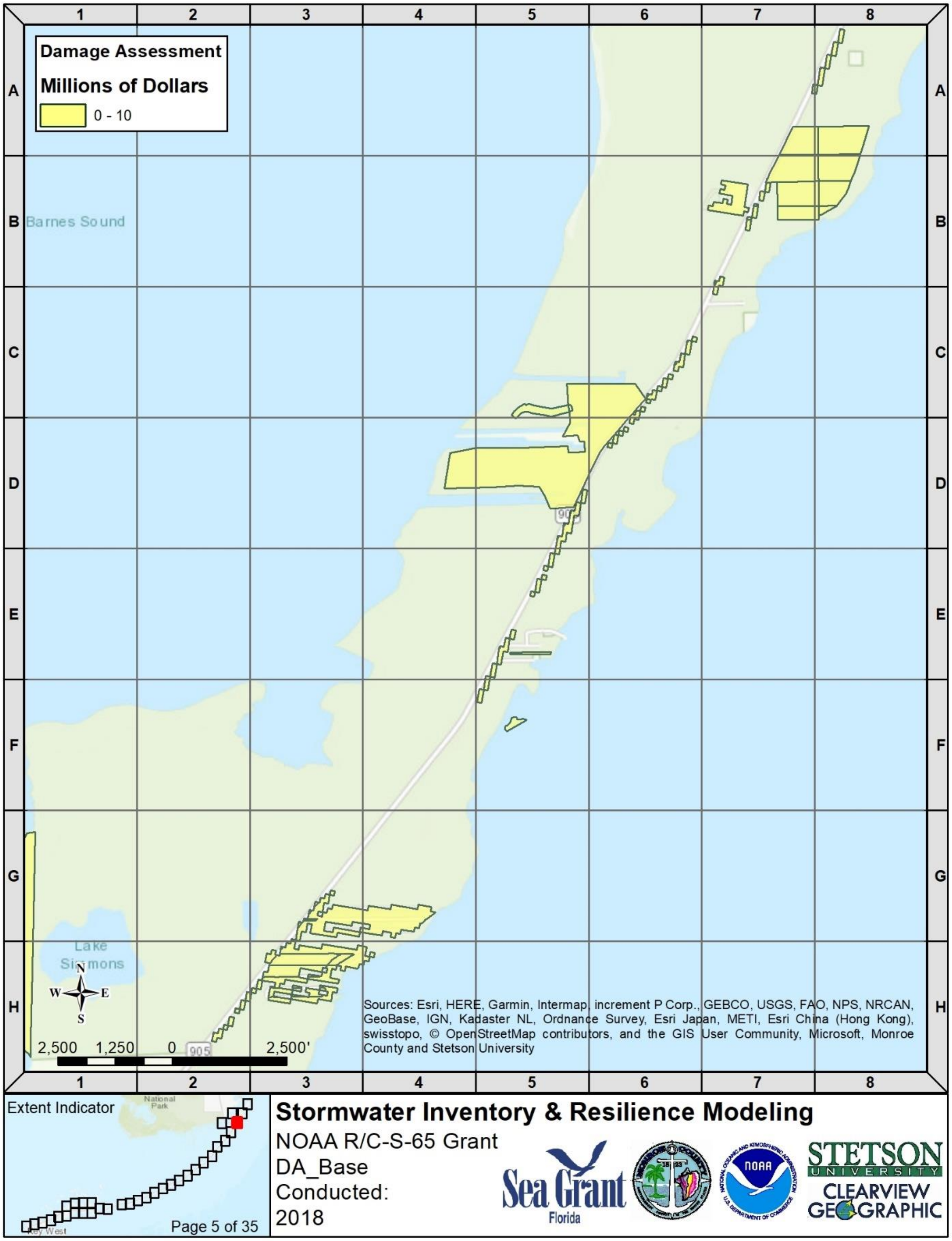

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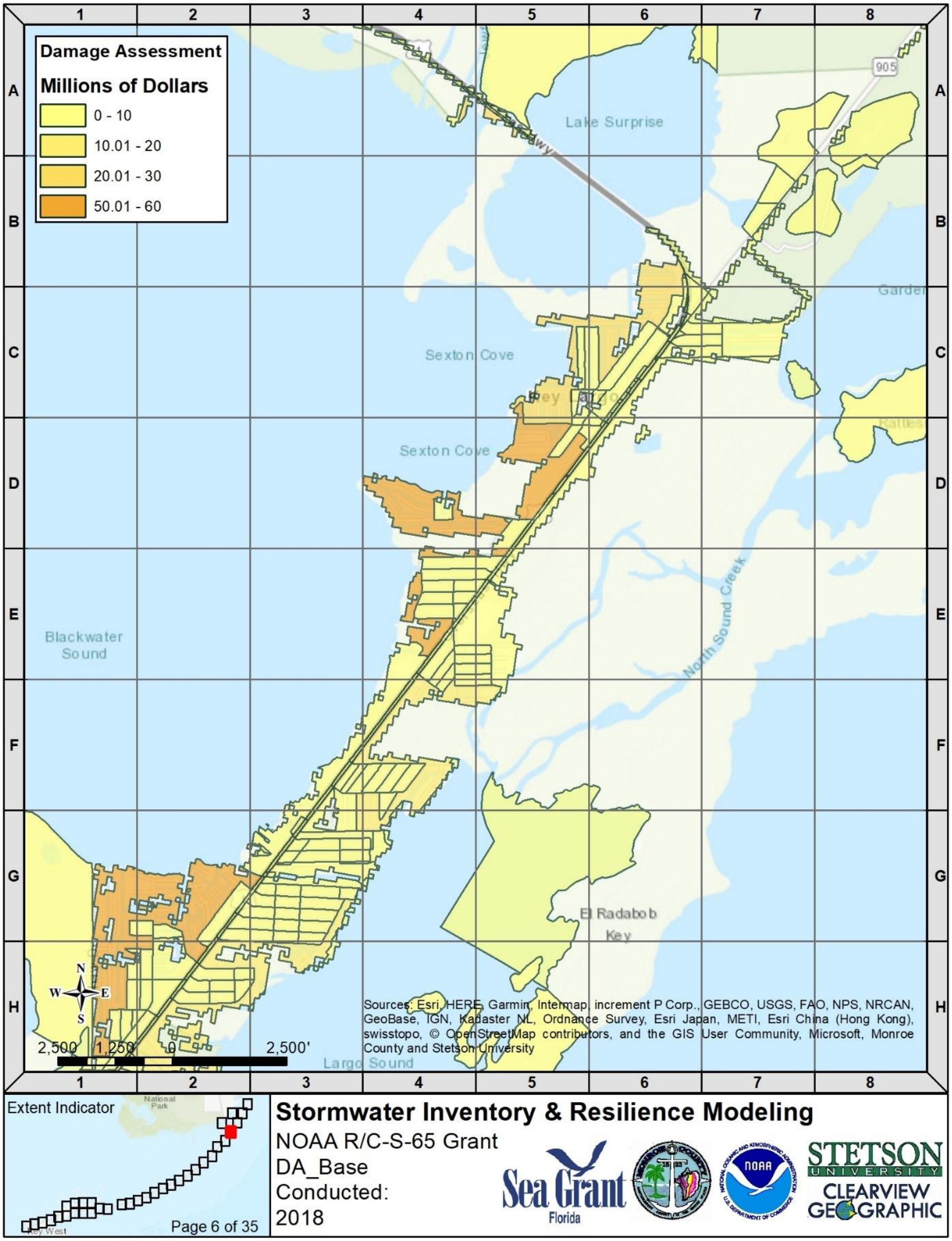

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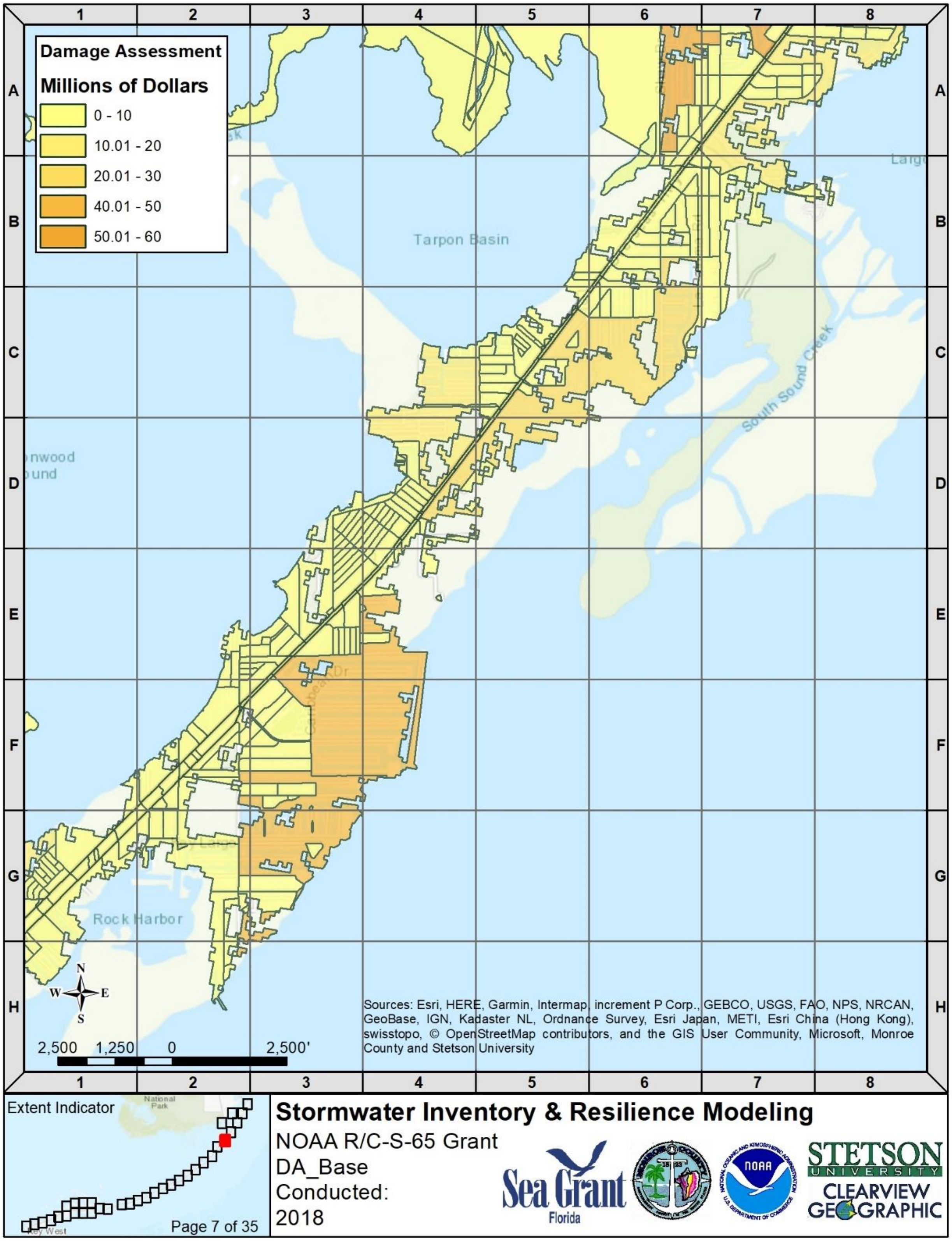

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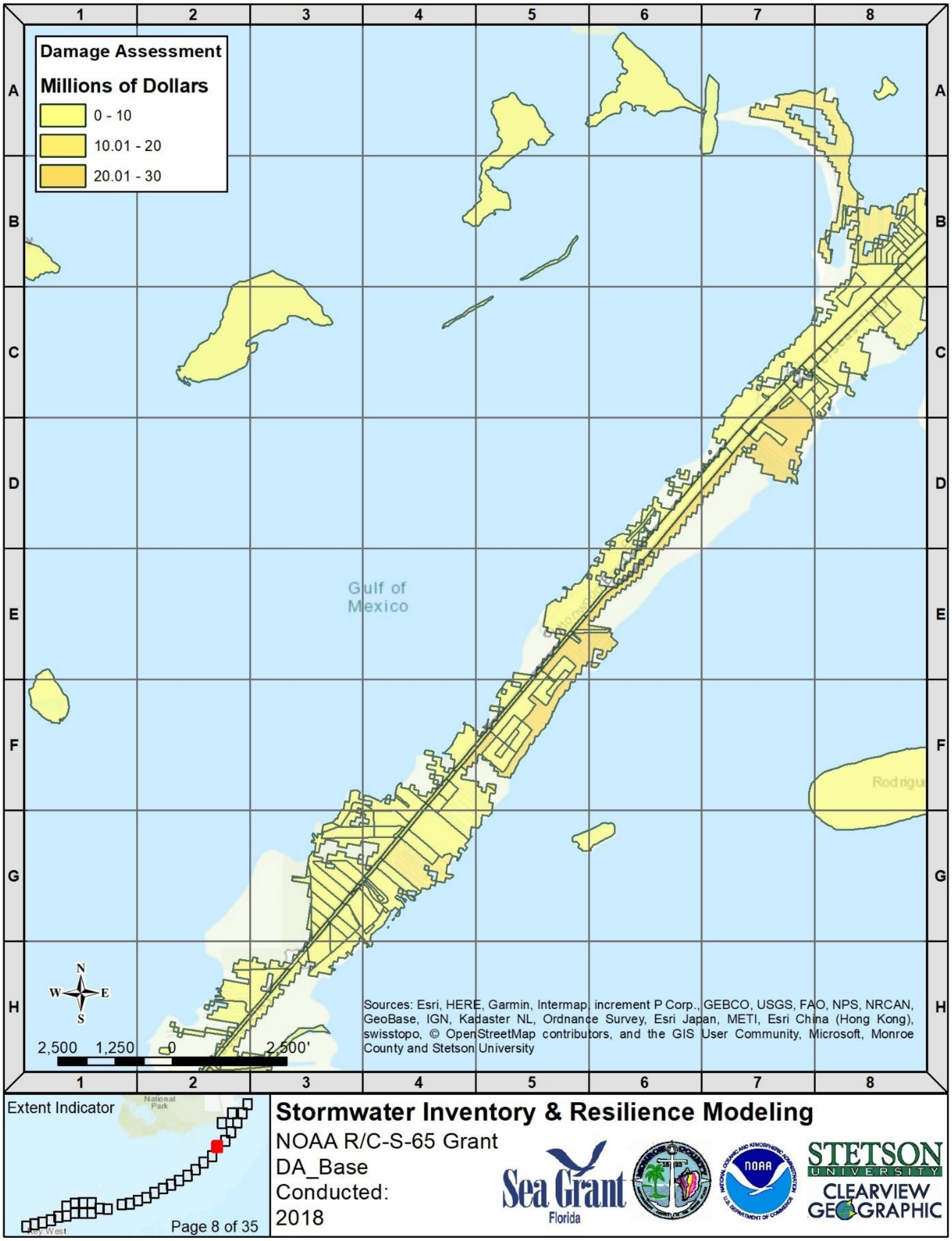

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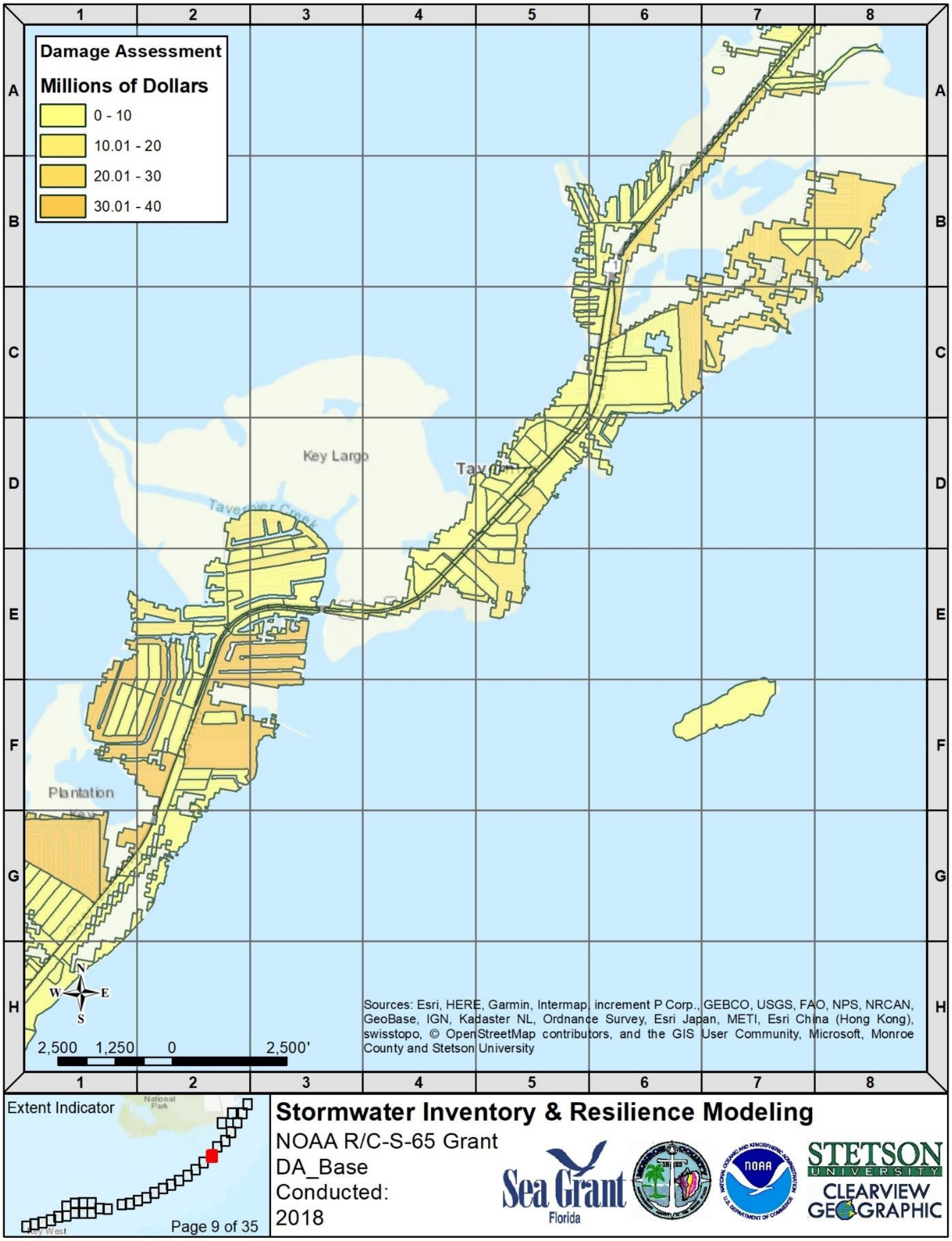

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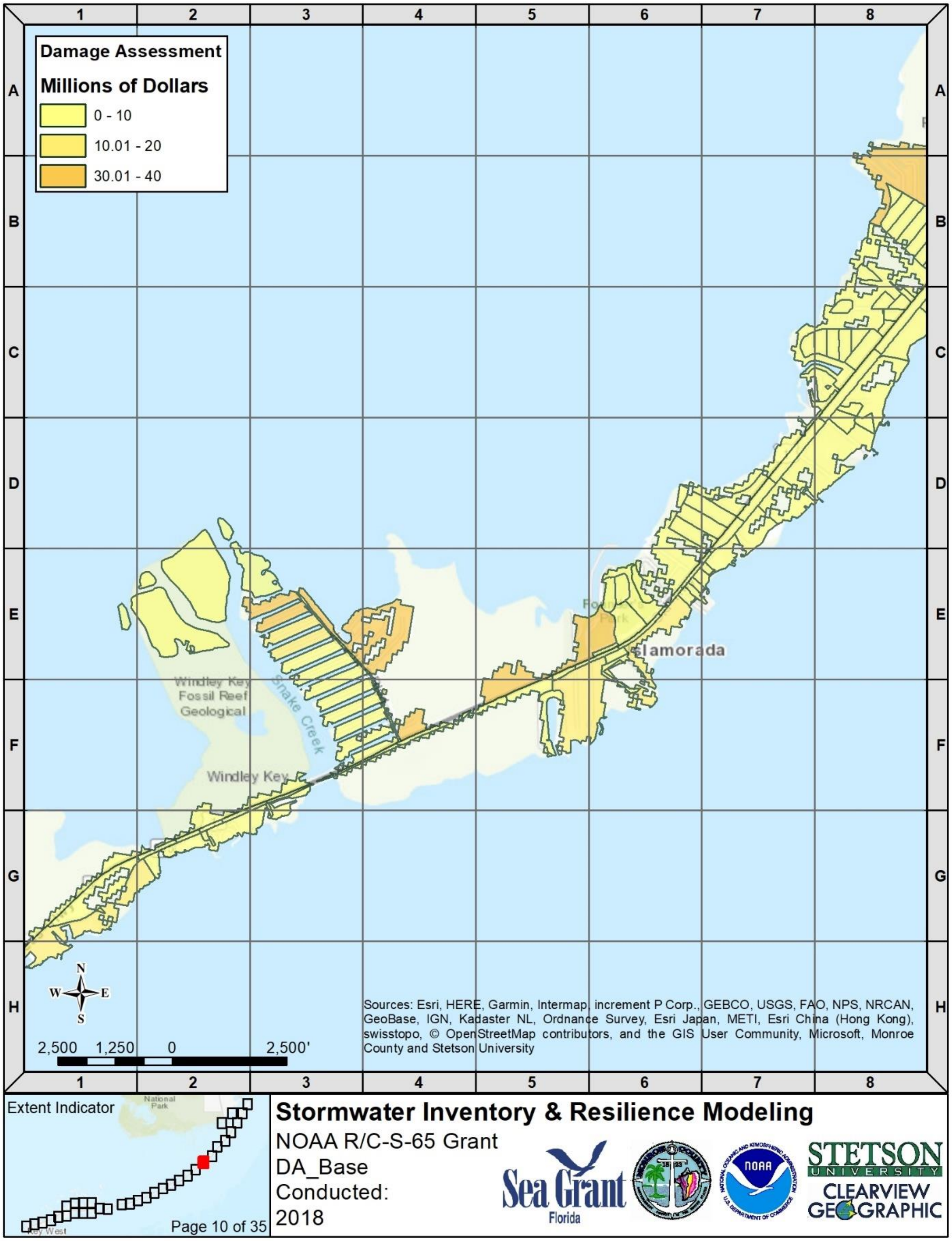

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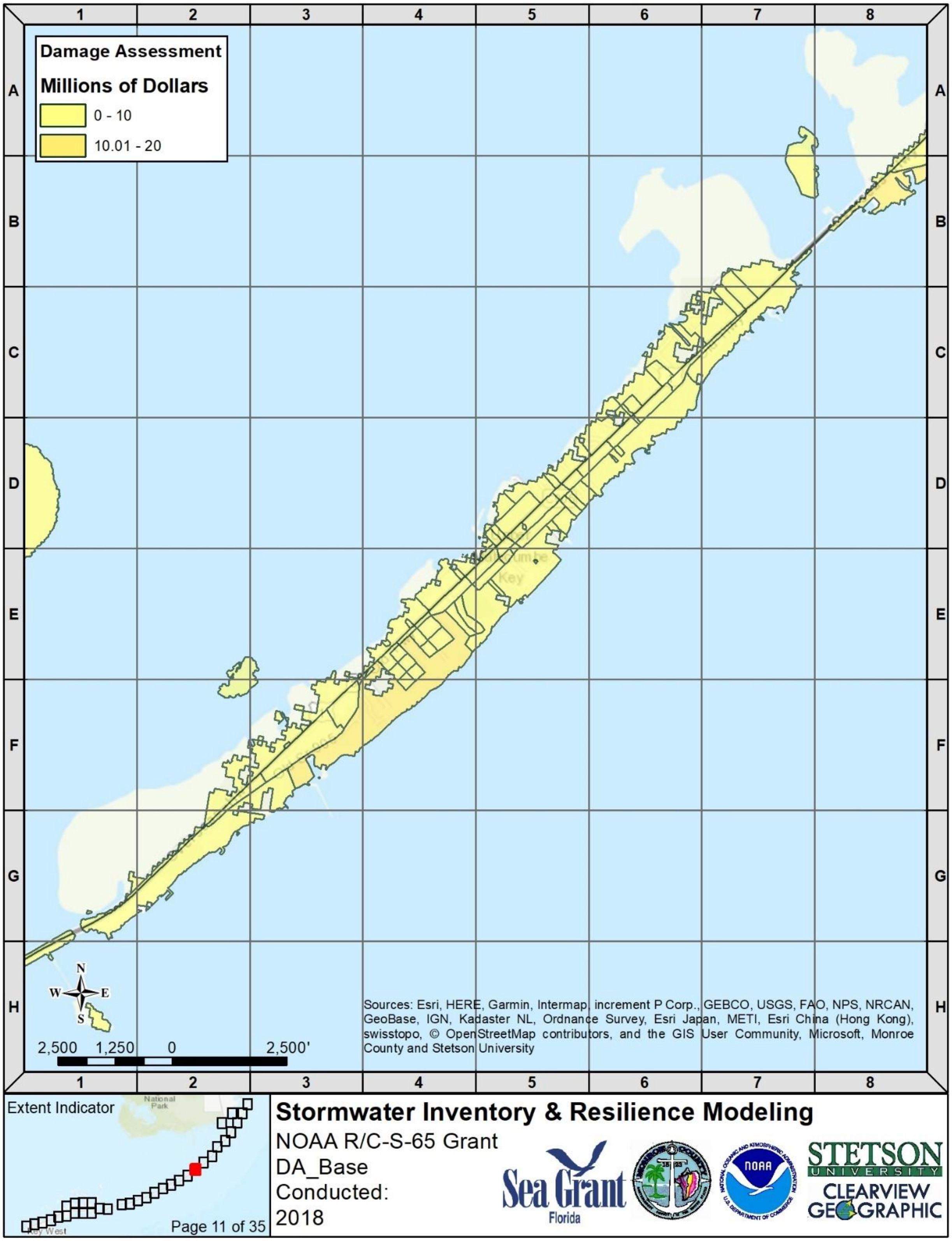

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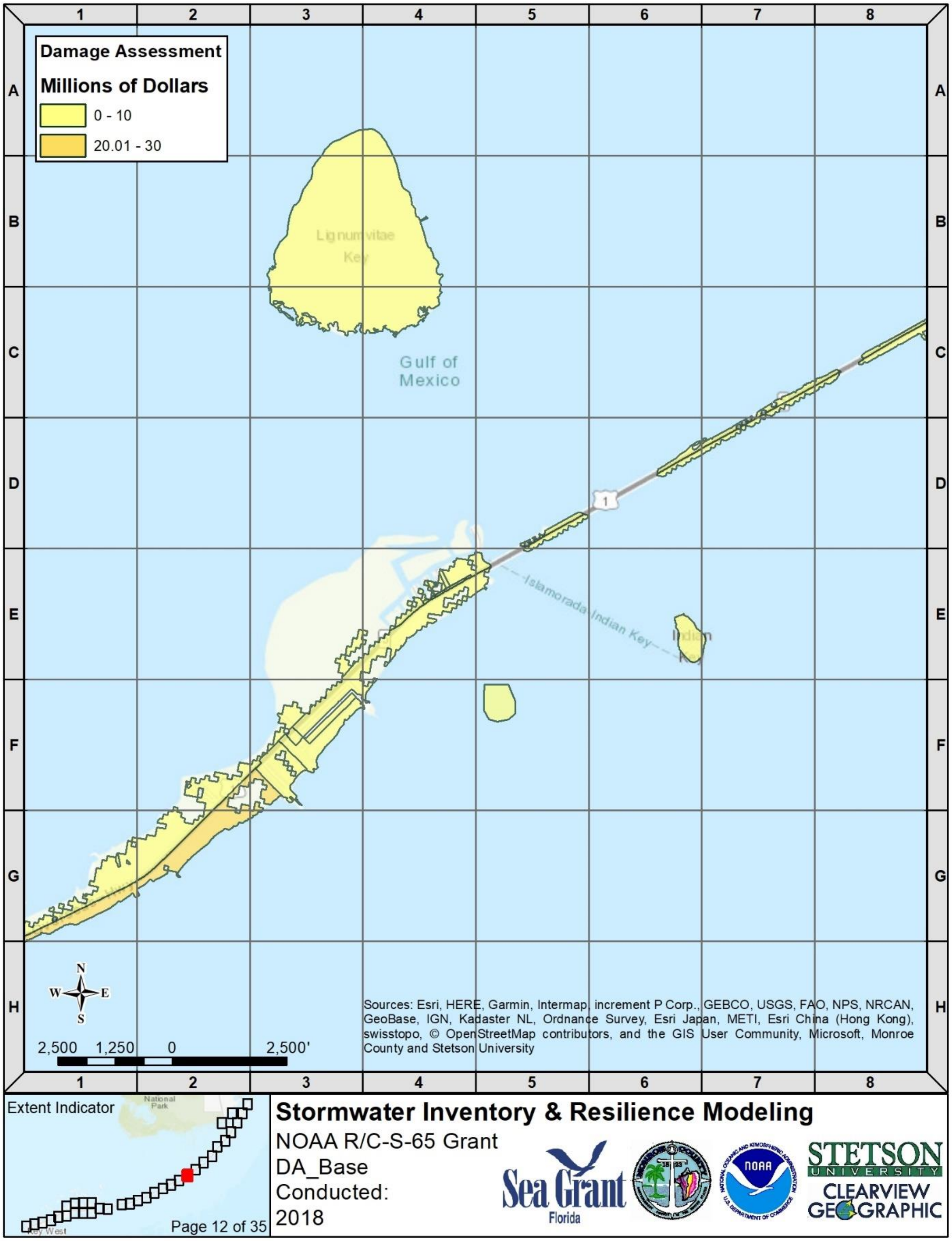

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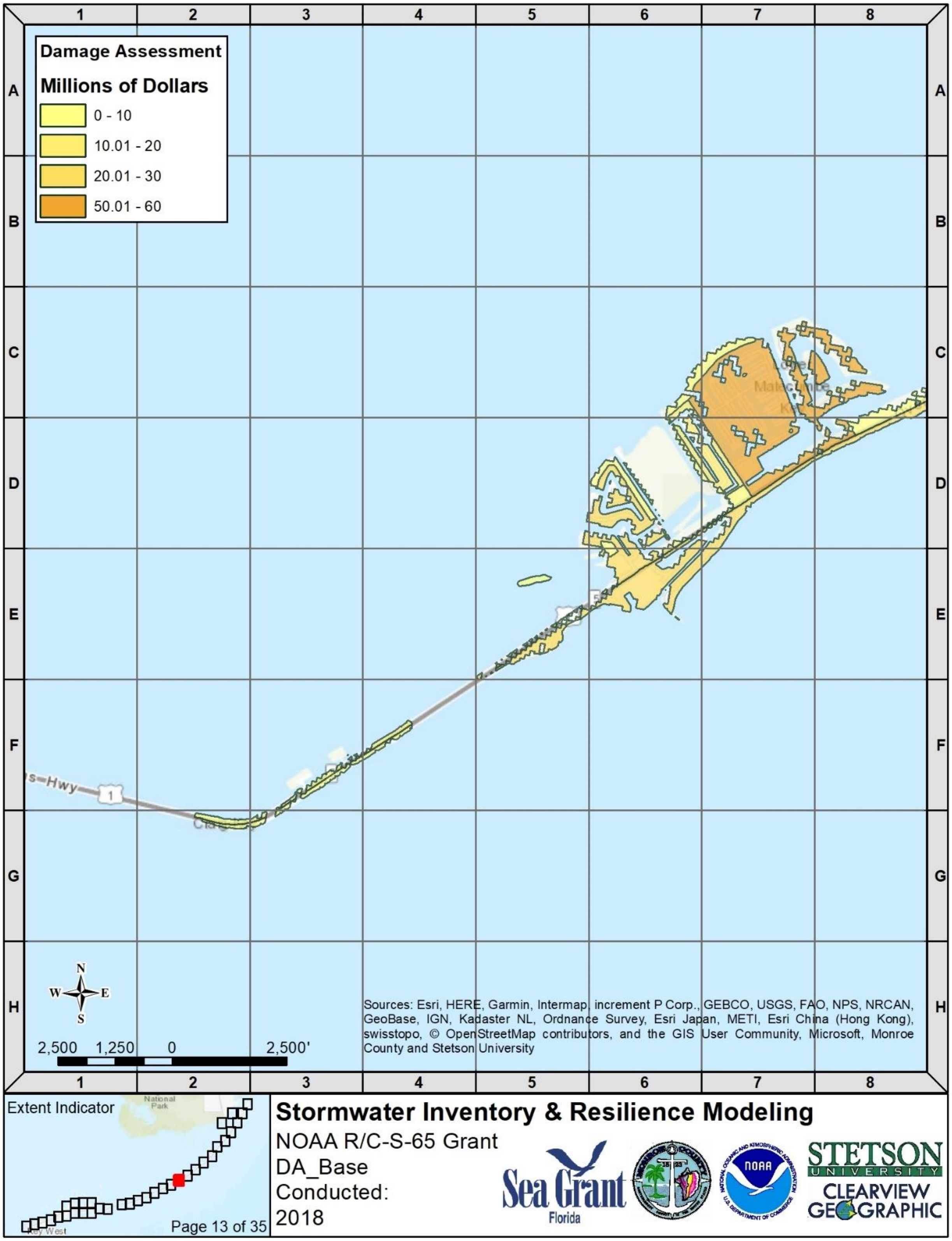

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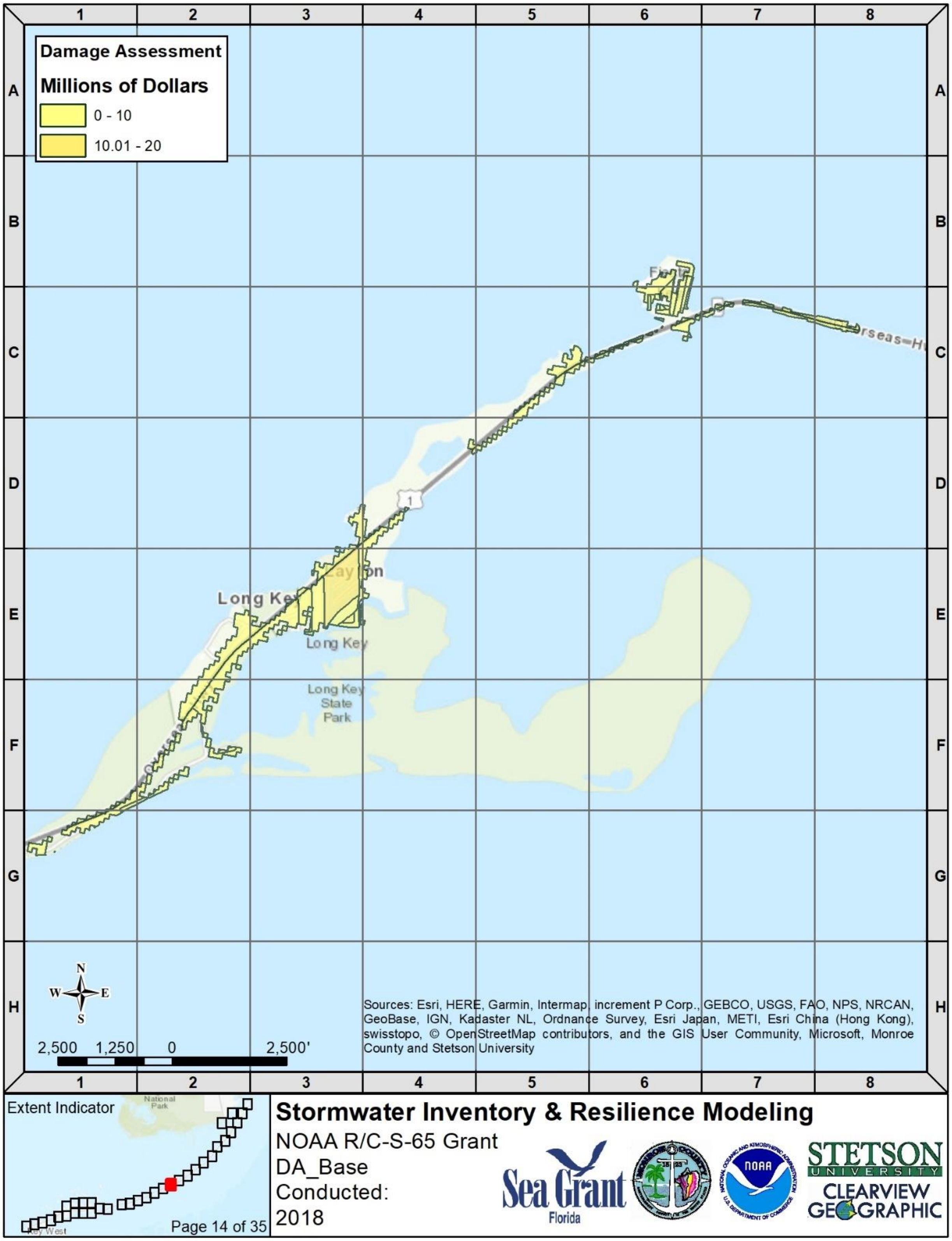

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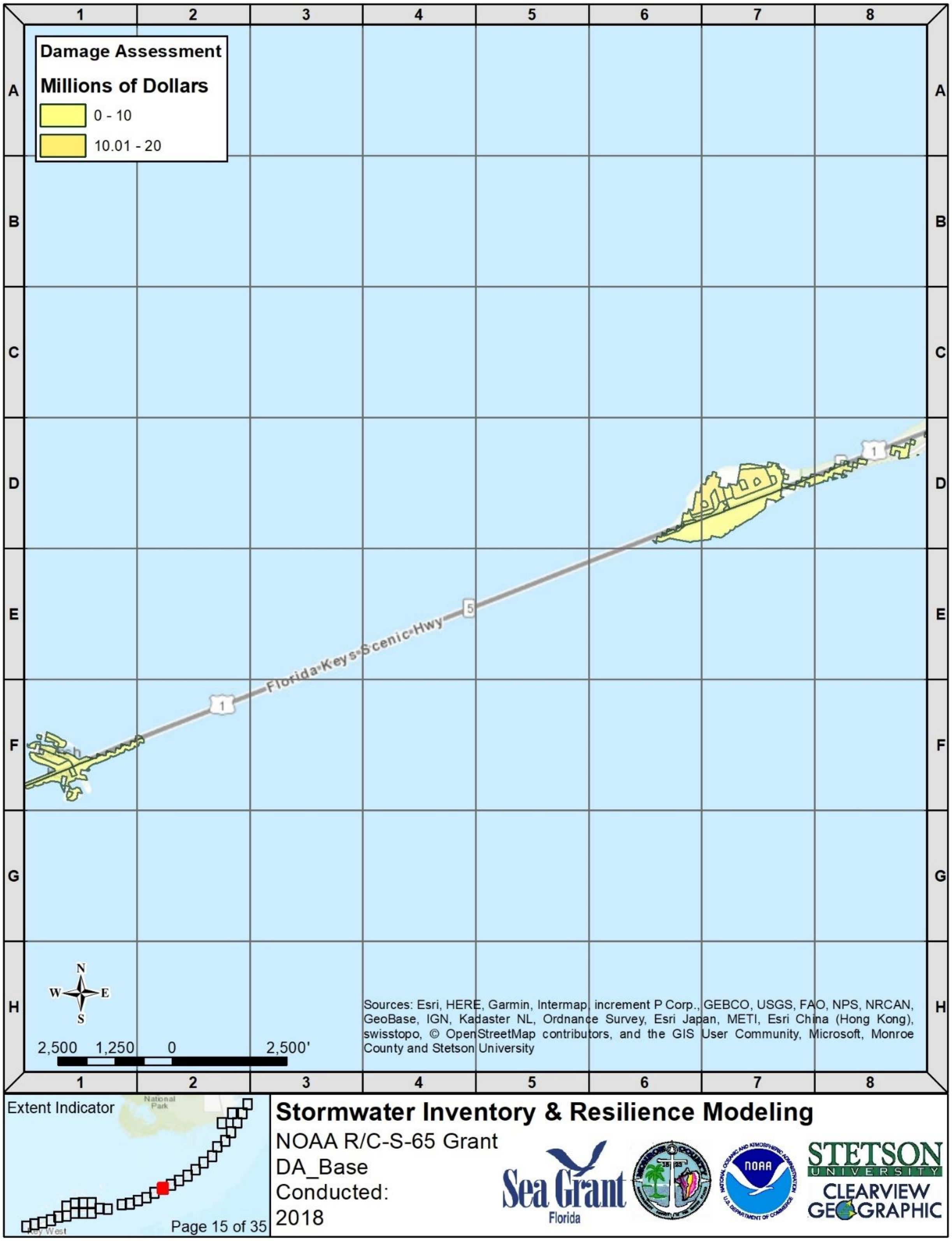

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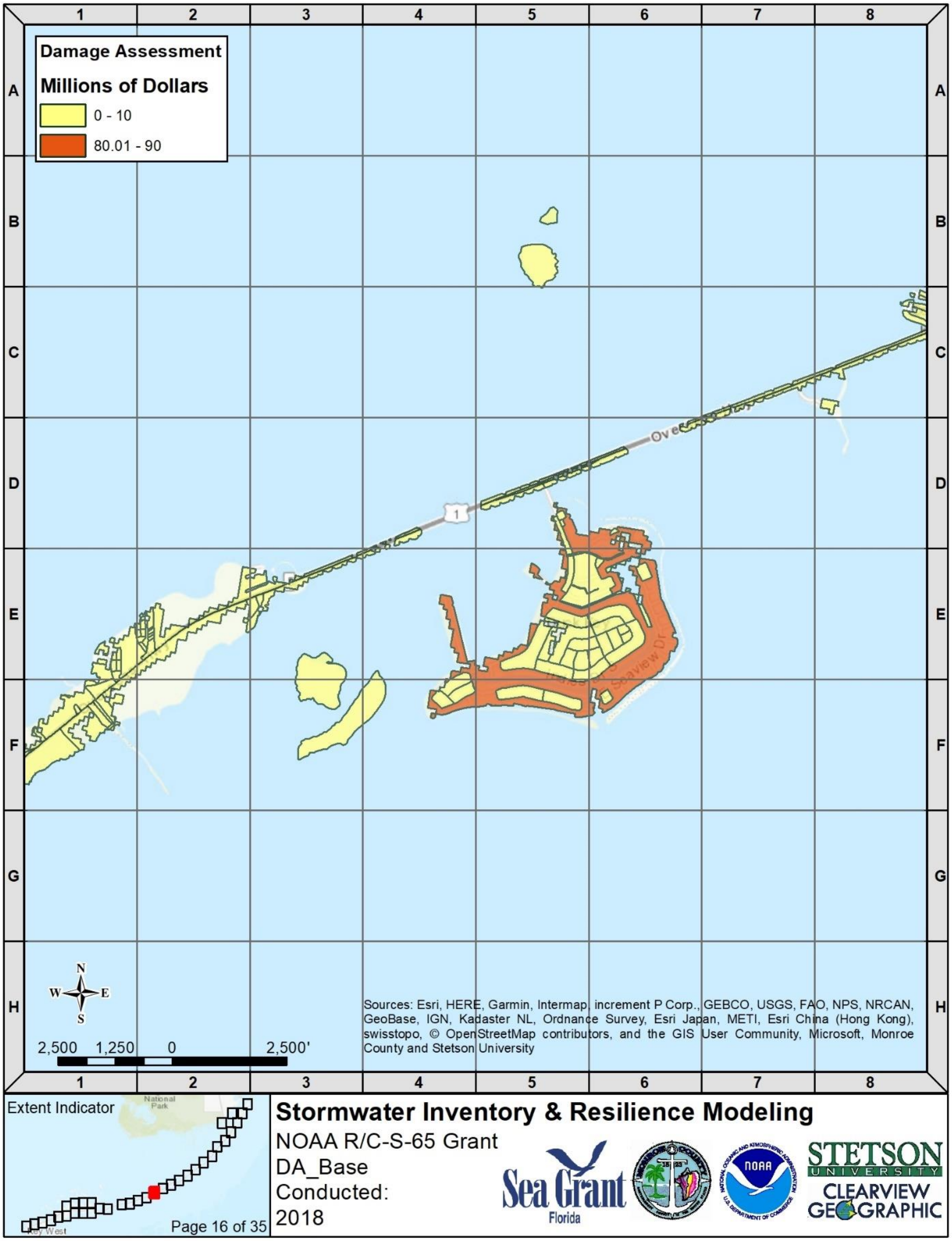

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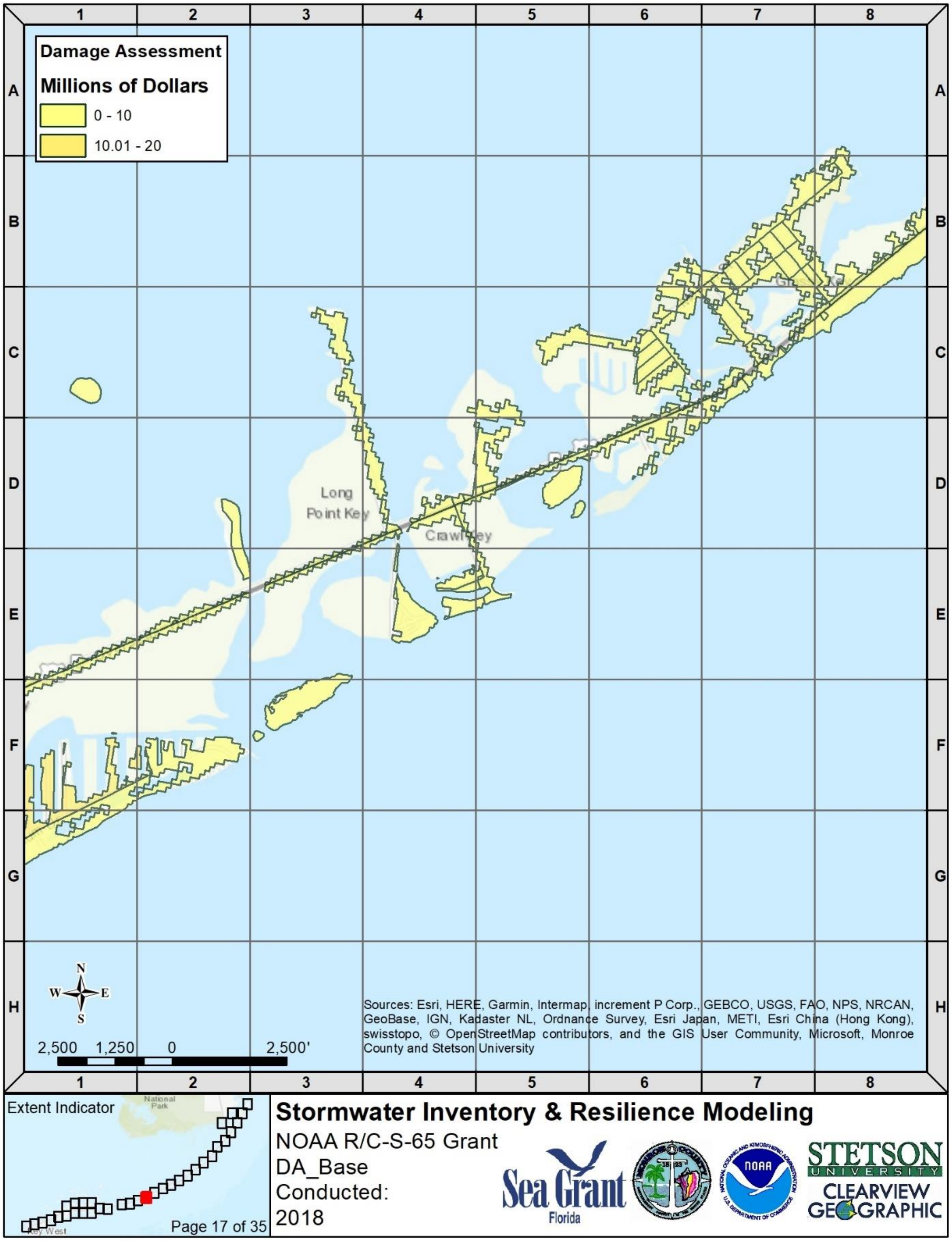

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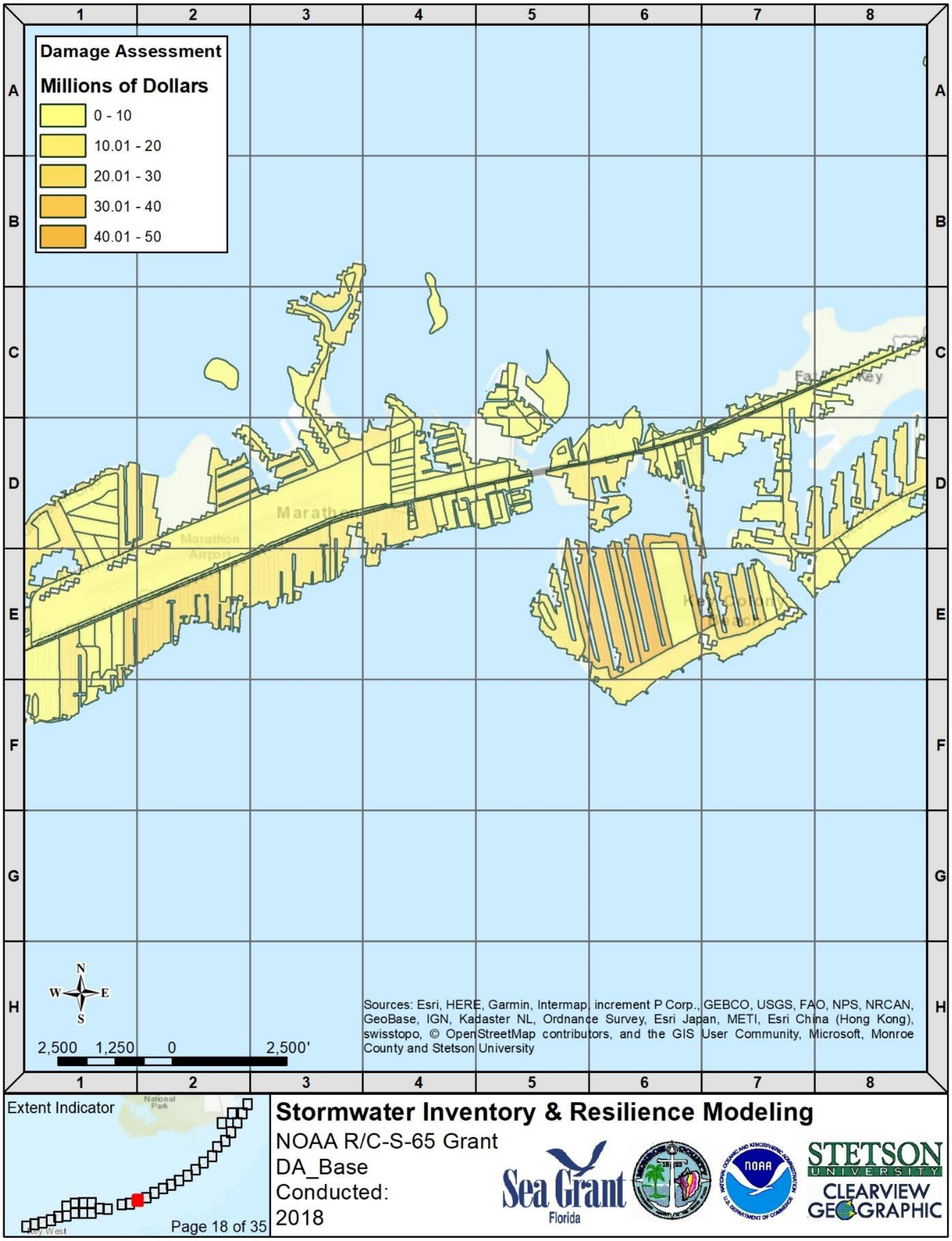

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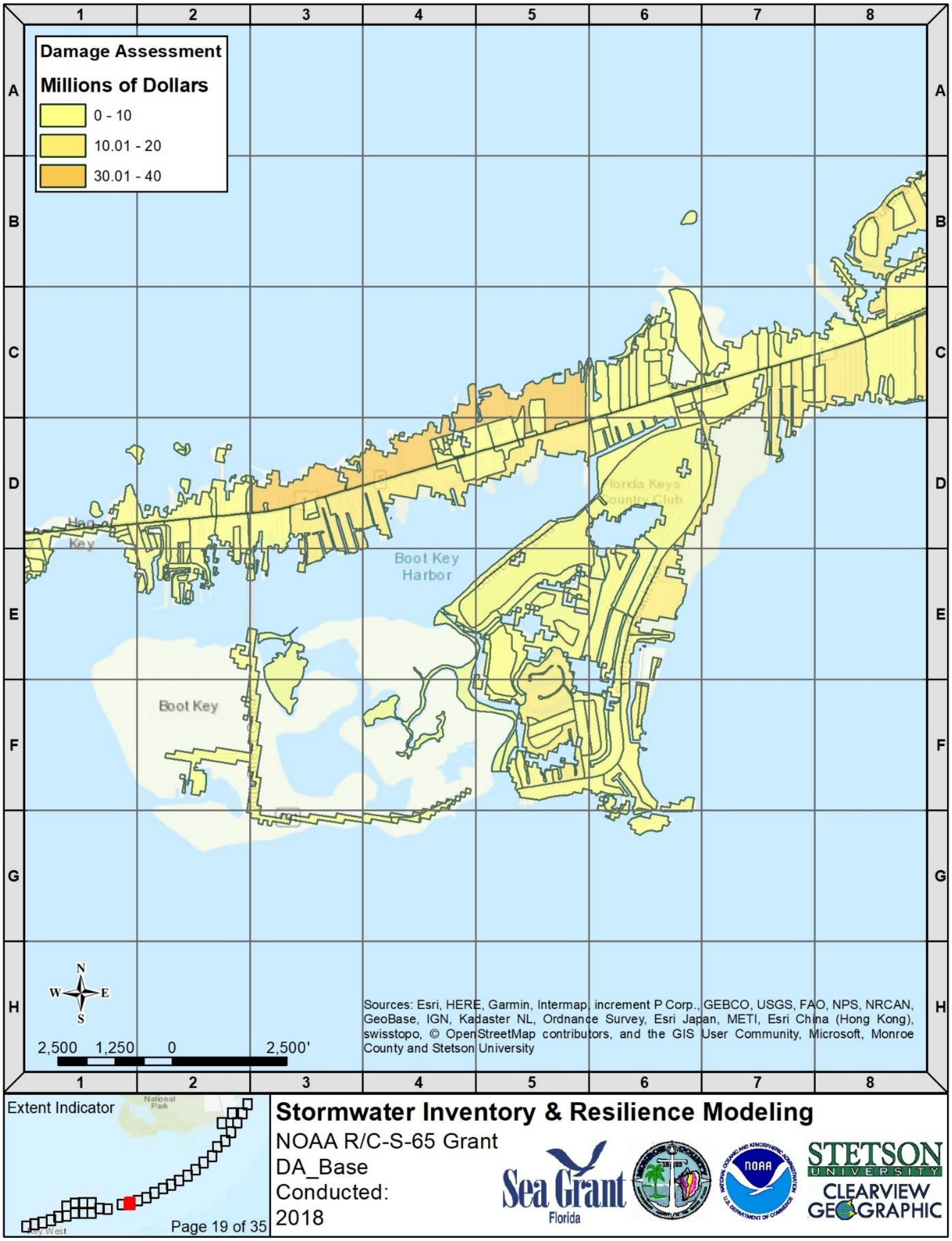

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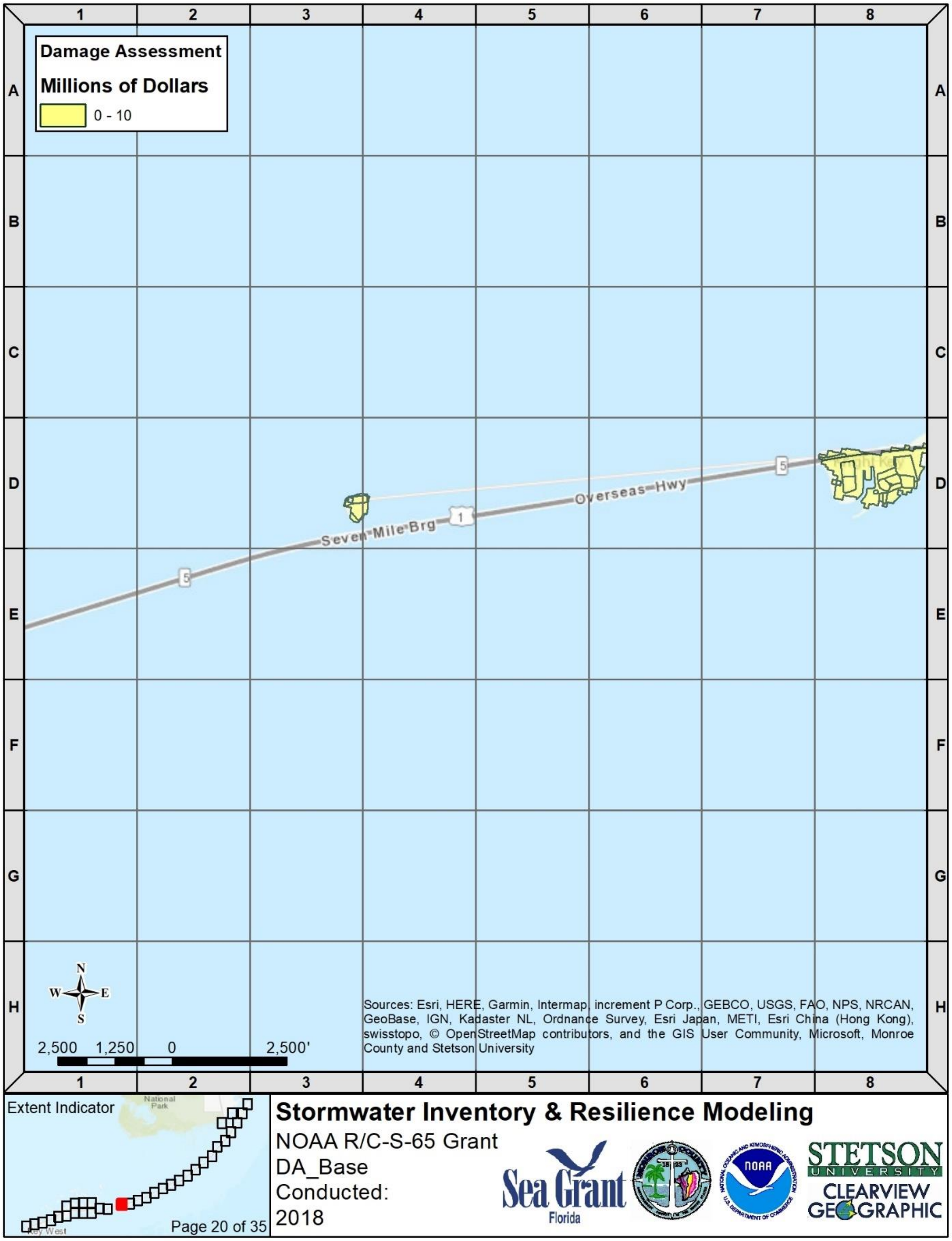

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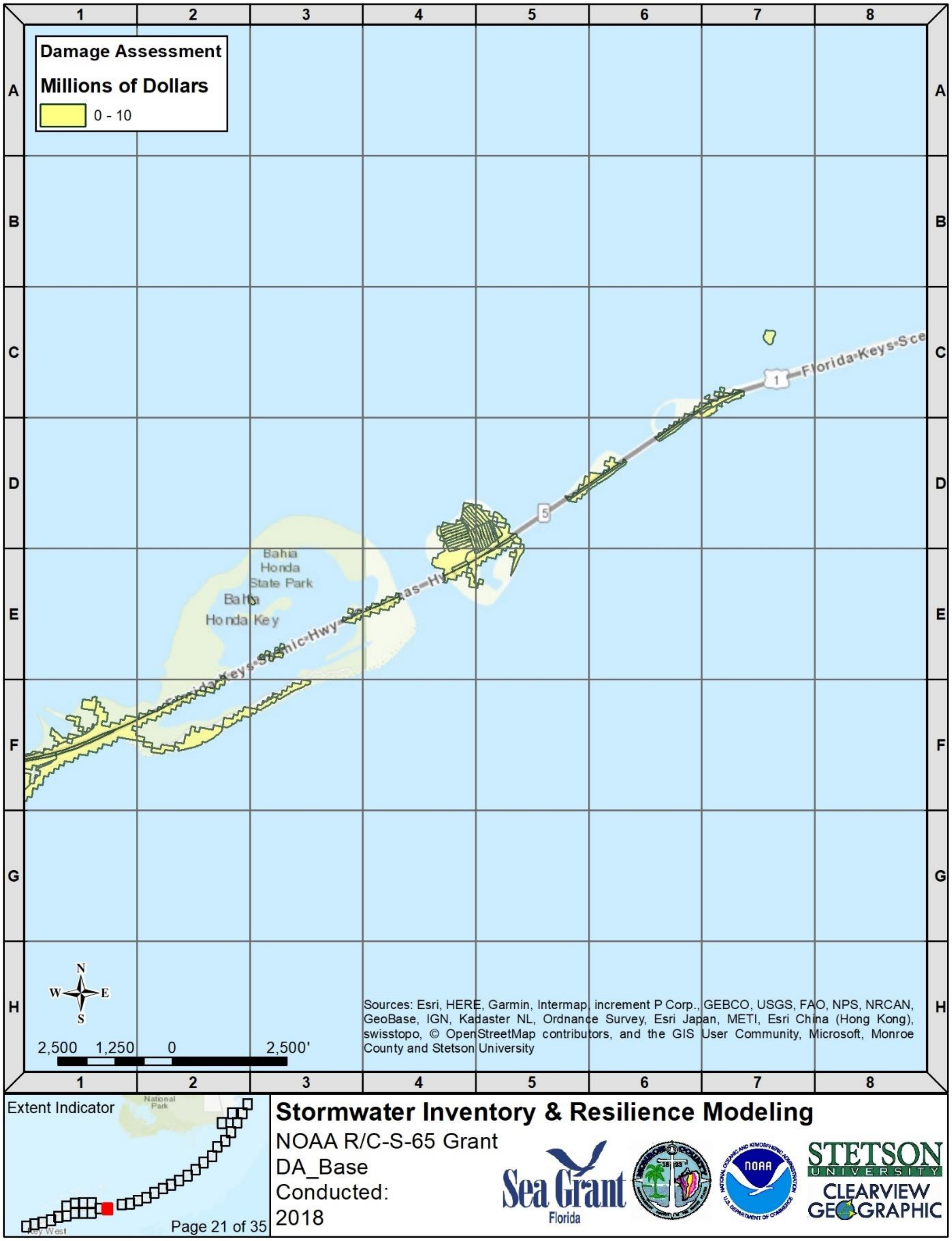

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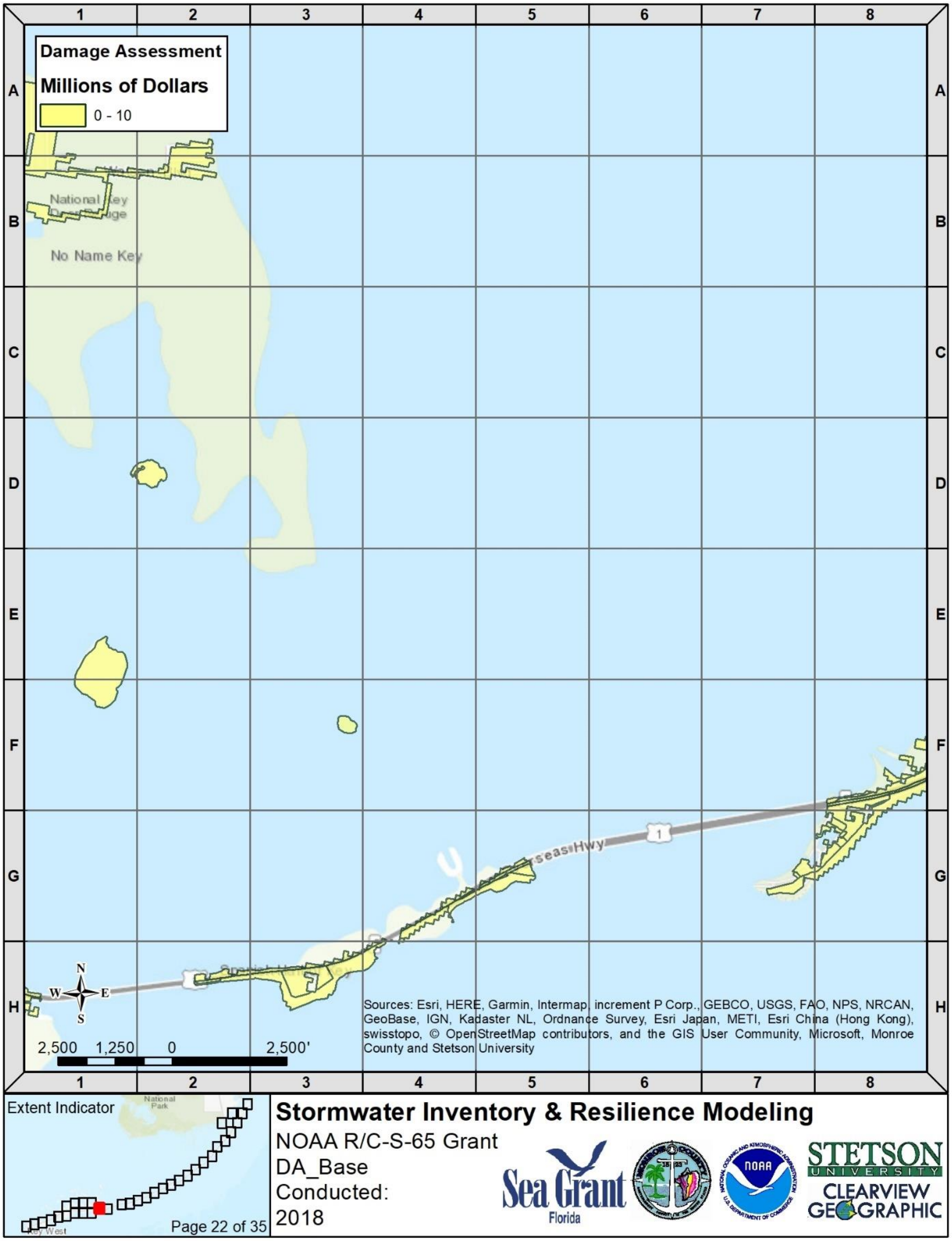

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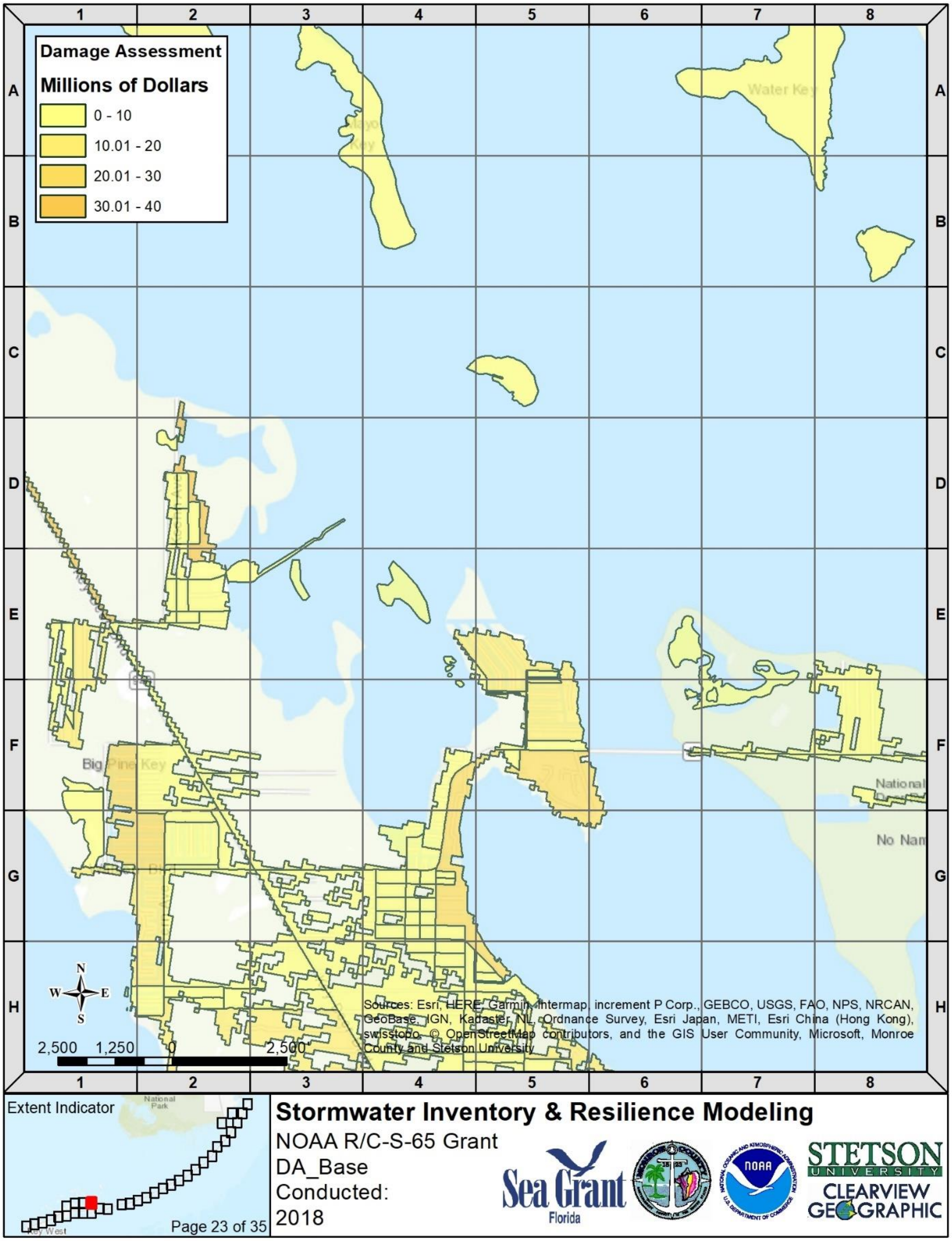

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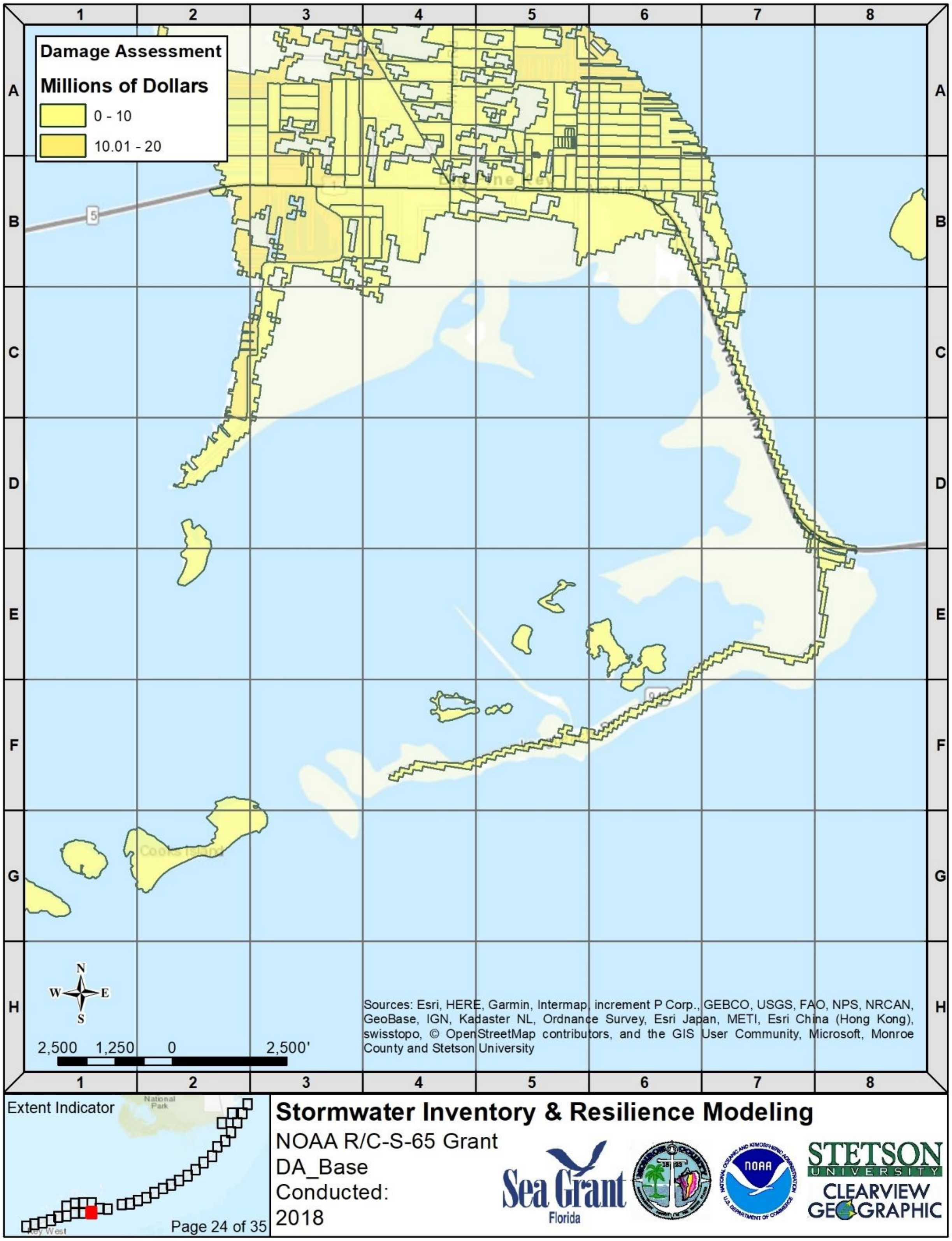

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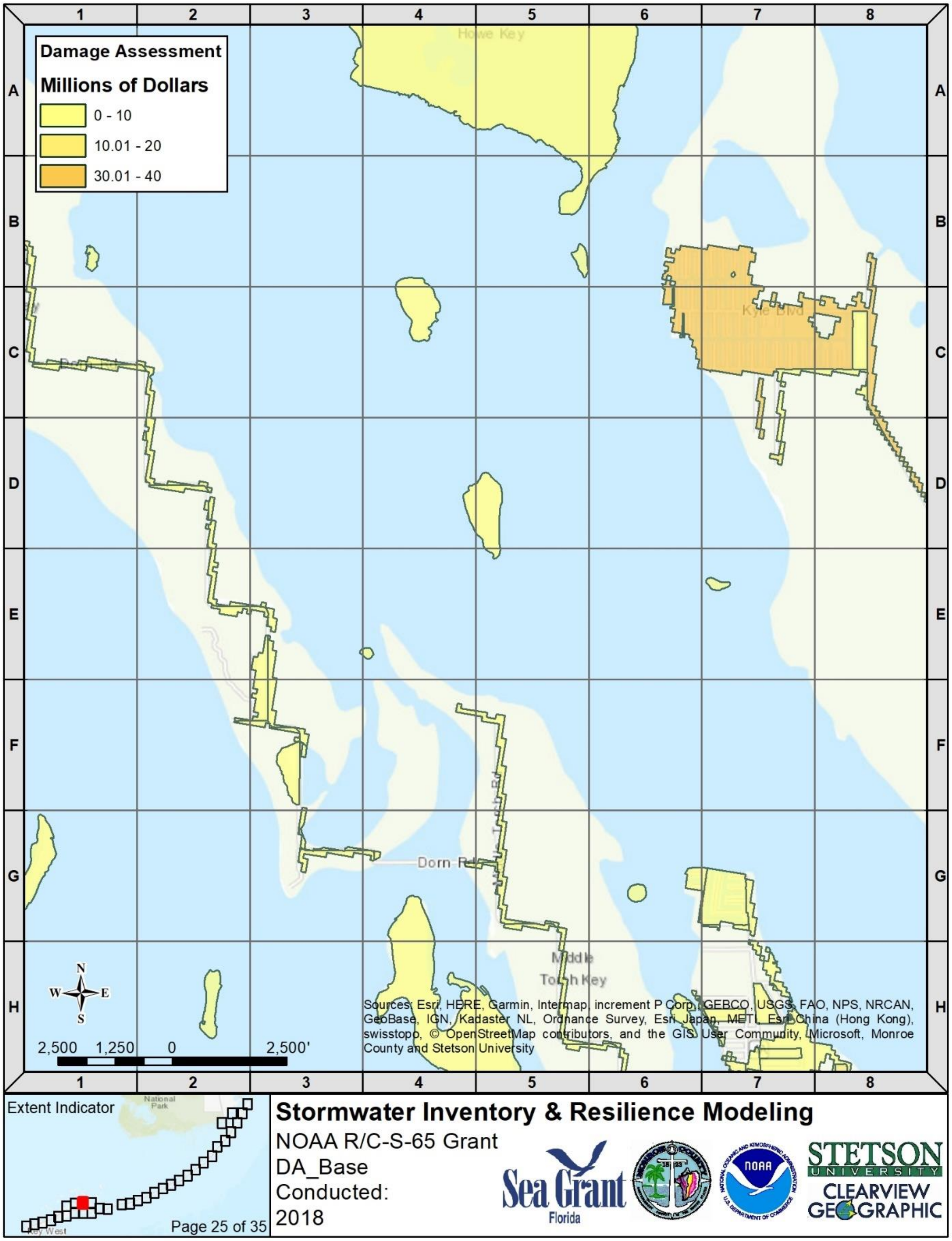

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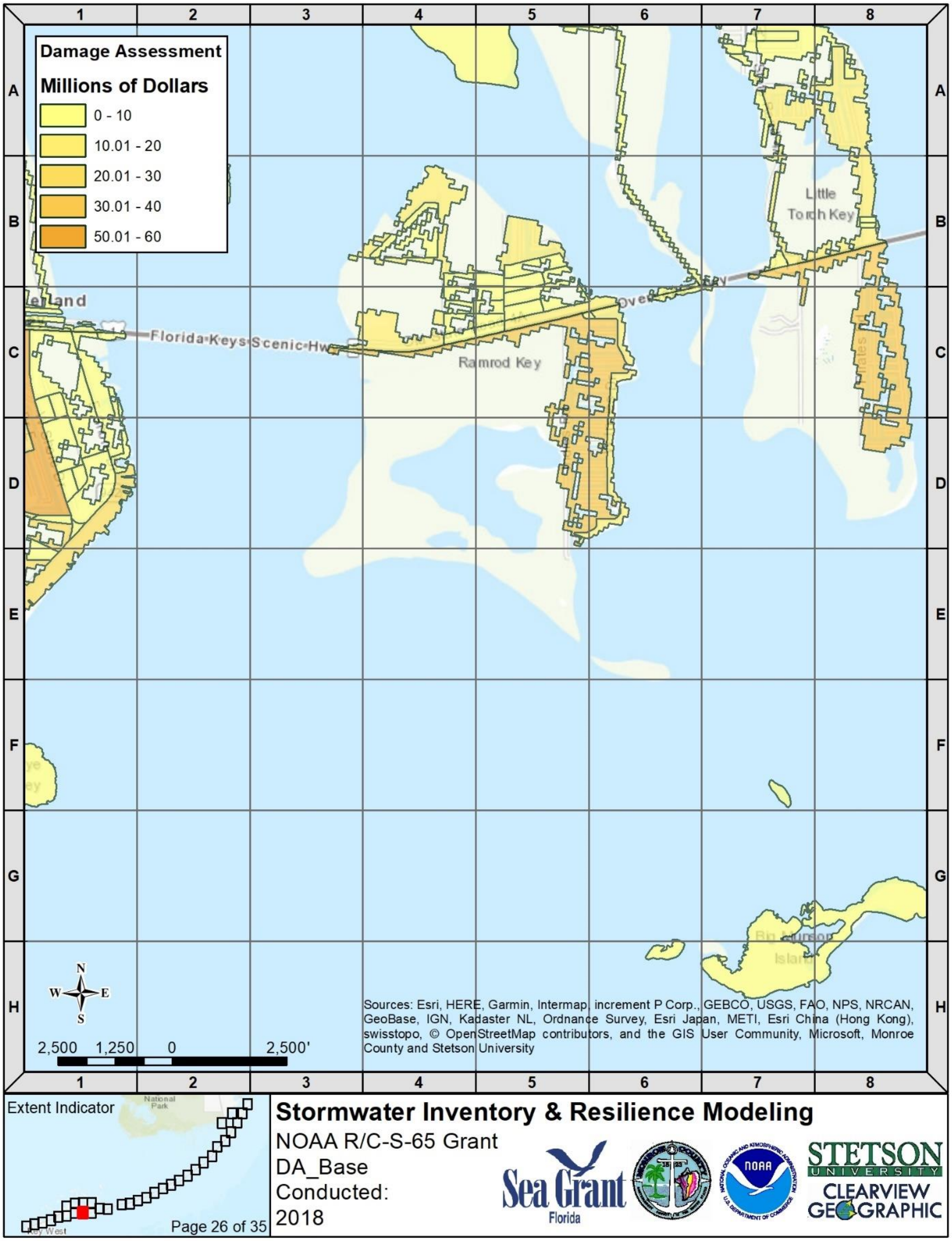

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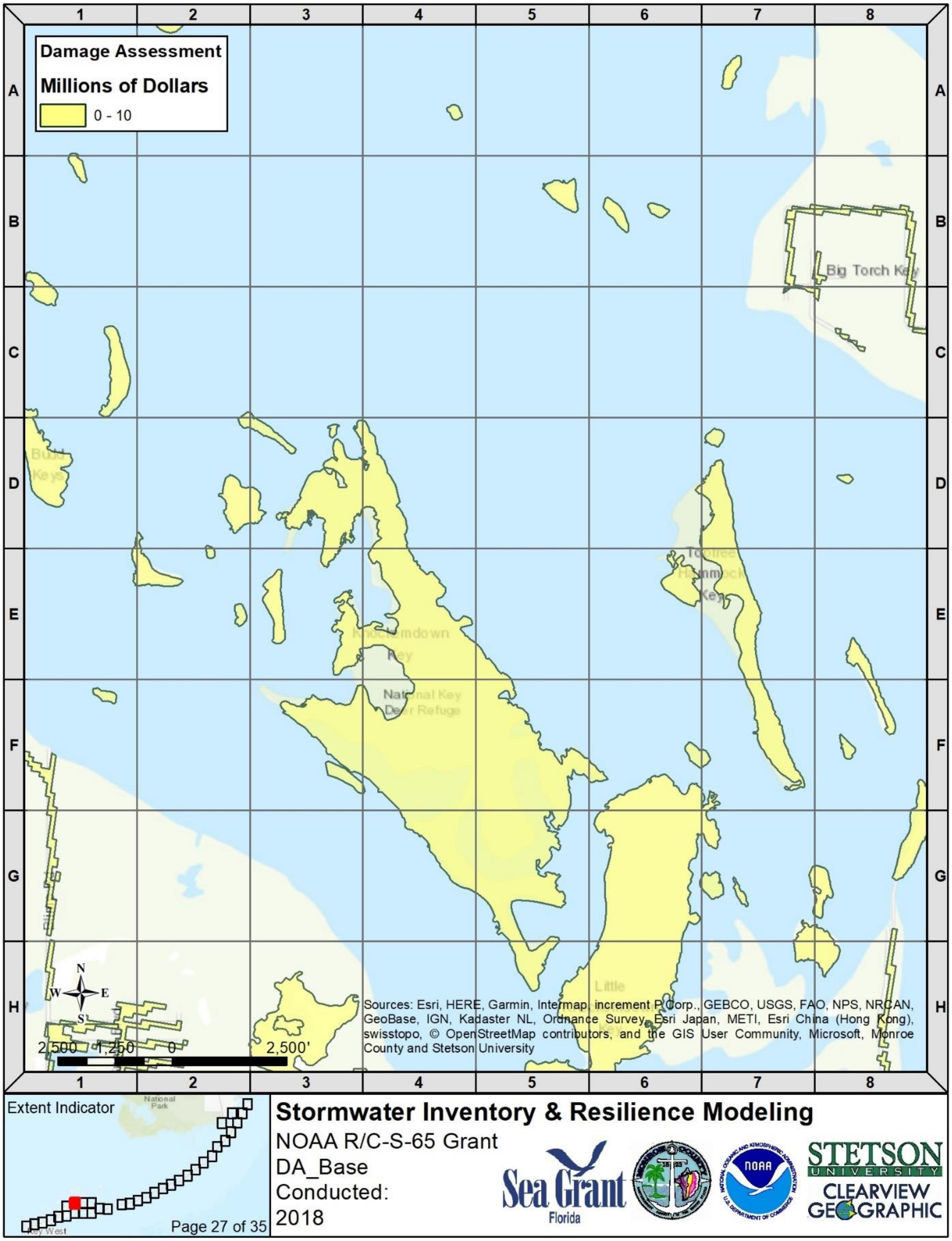

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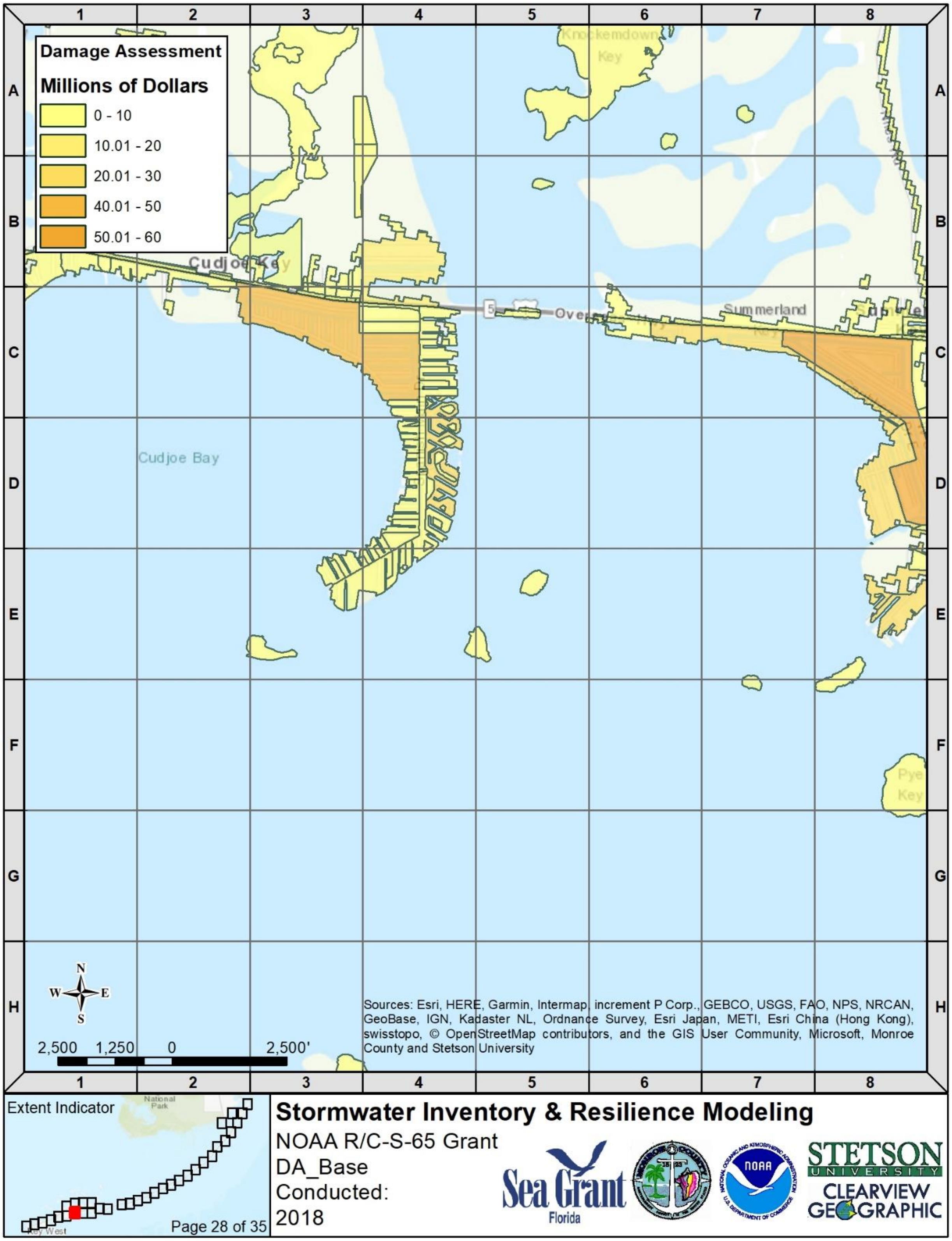

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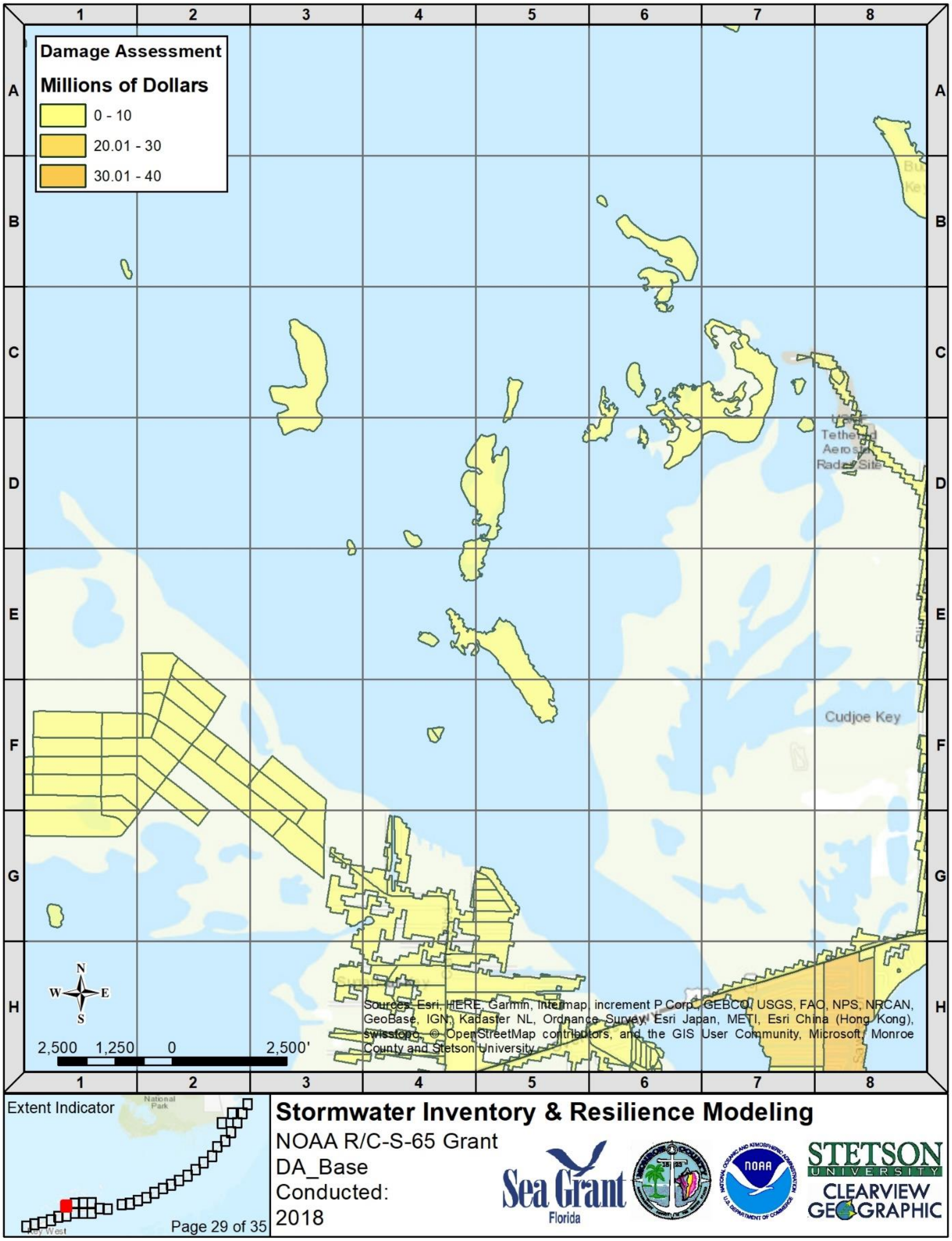

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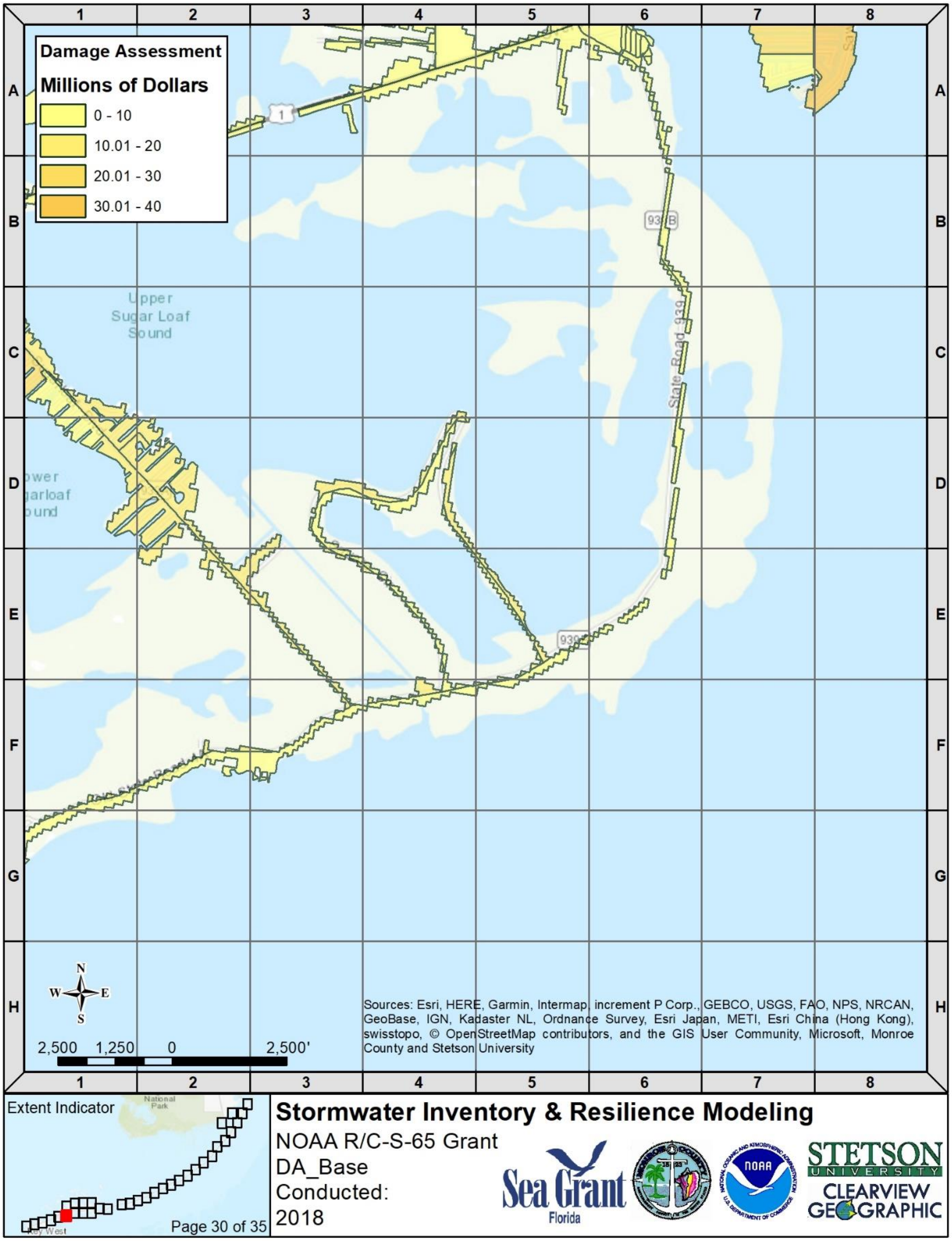

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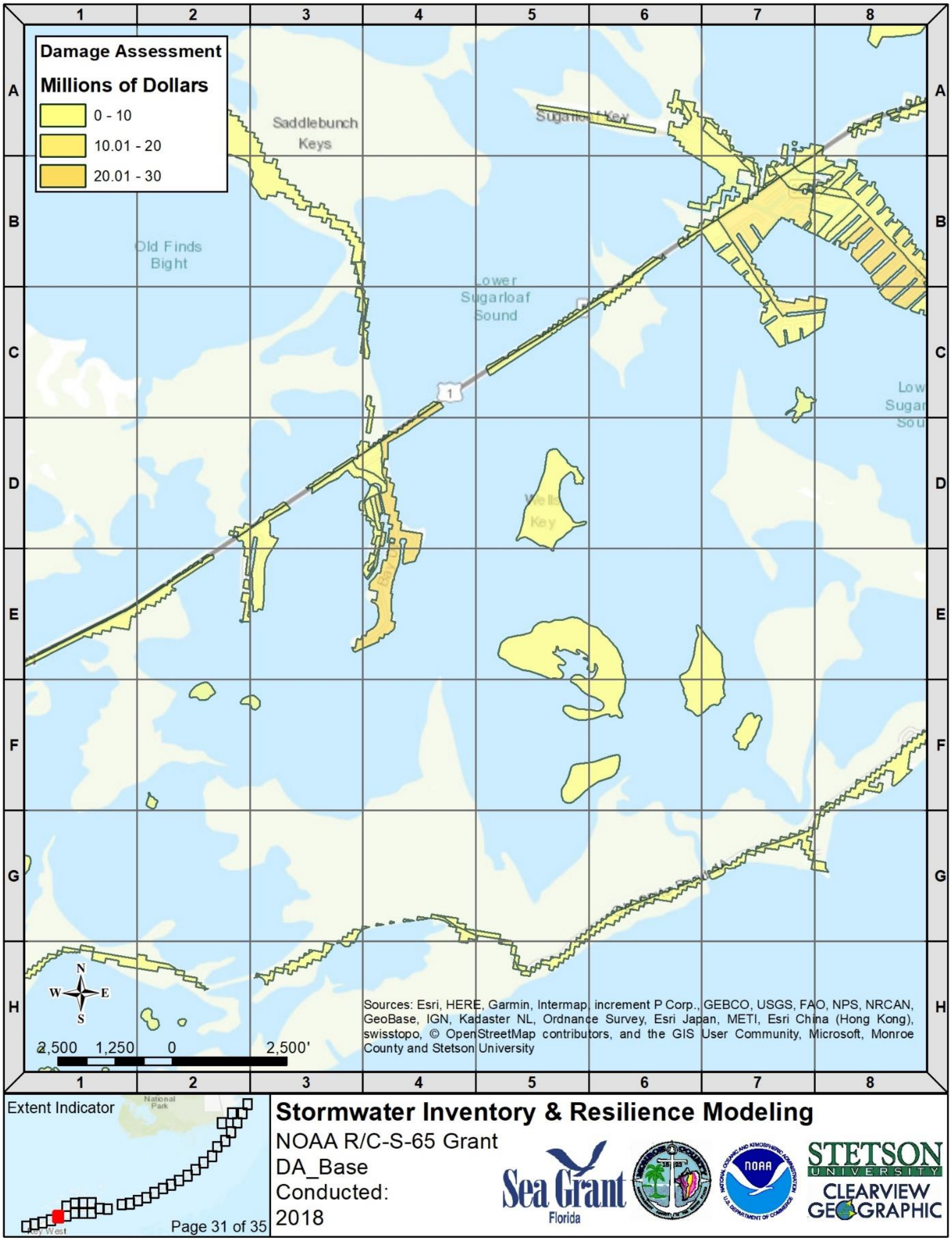

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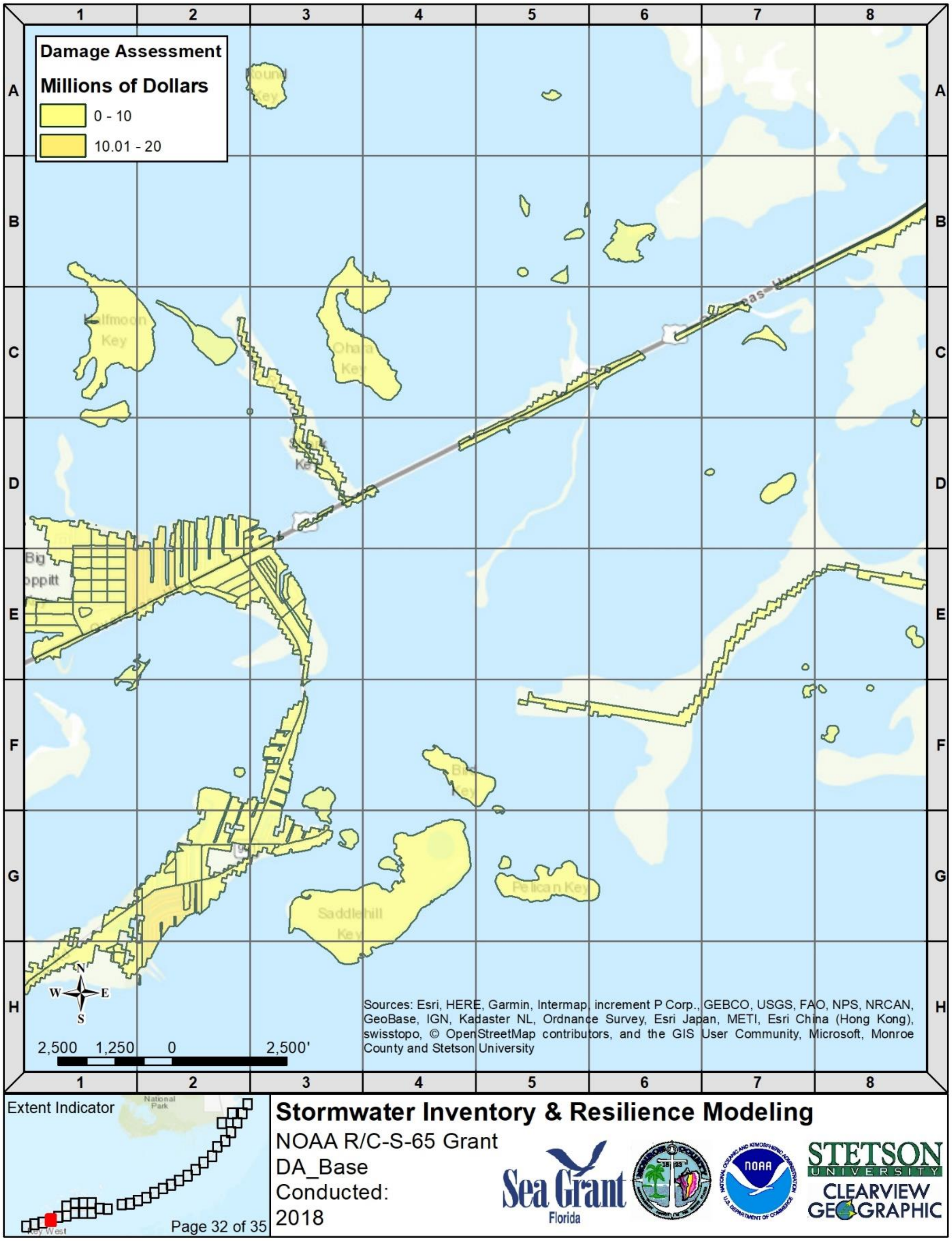

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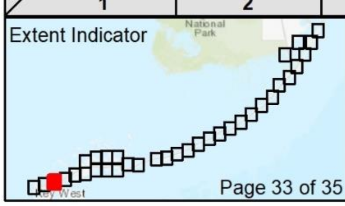

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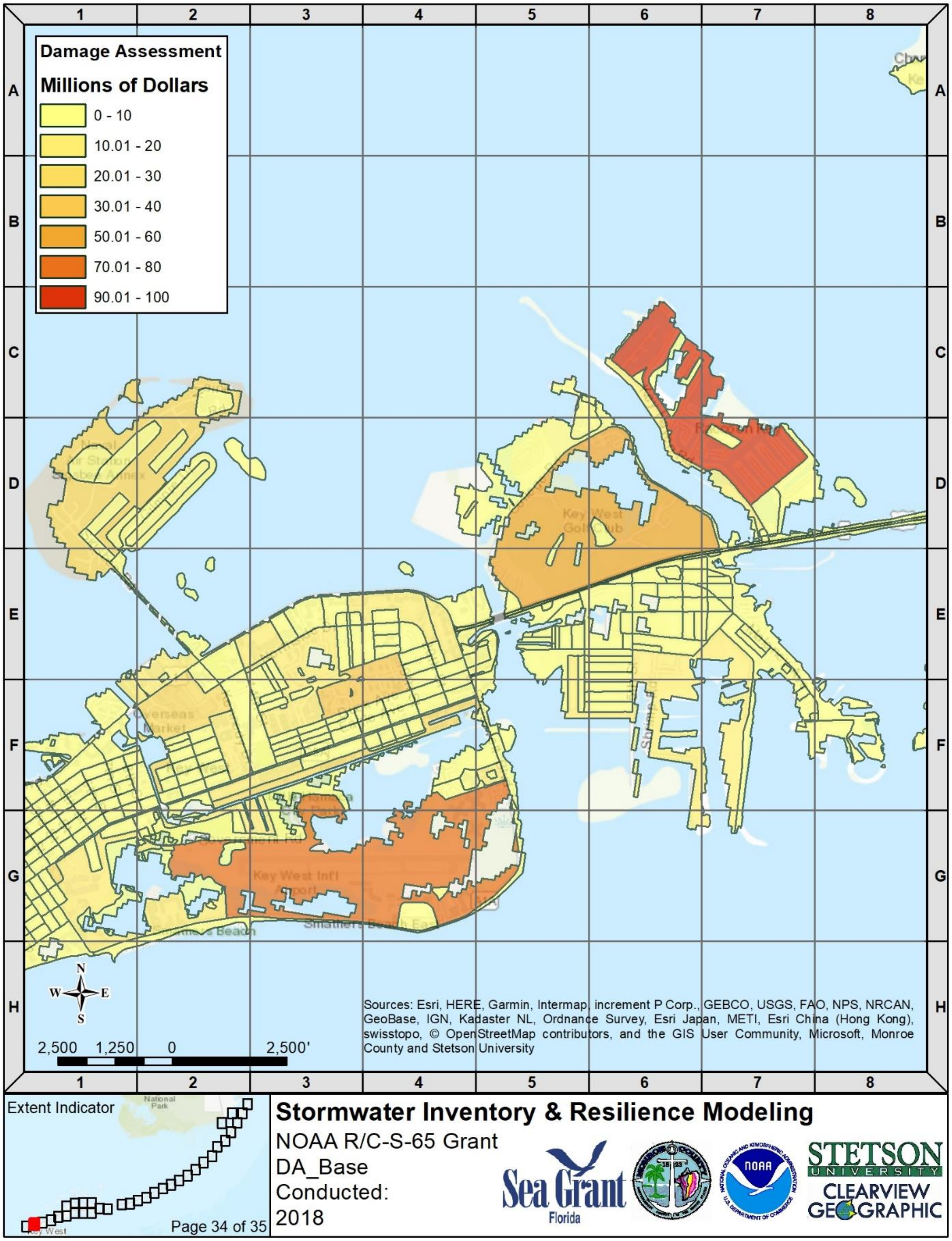

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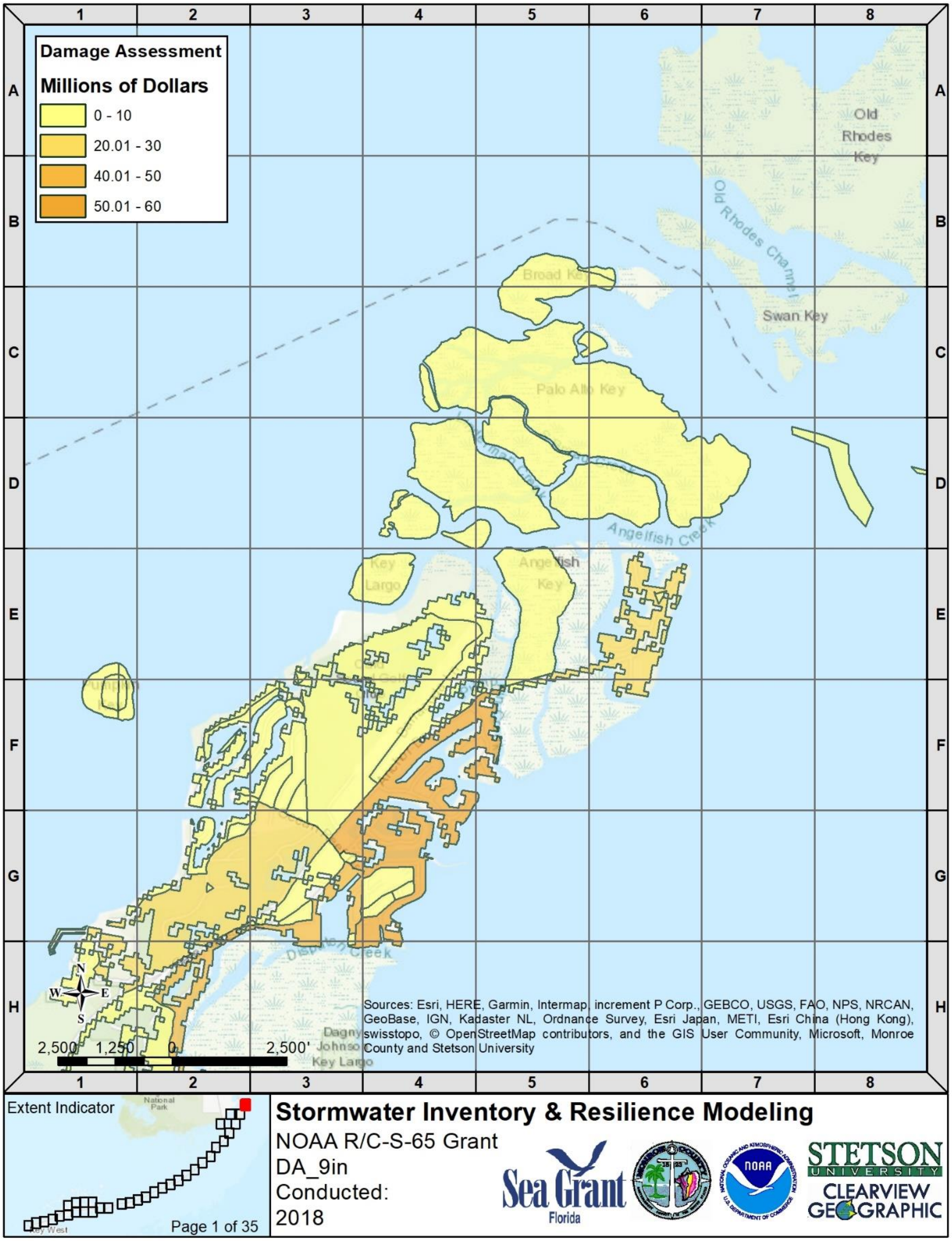
Map Series 8: Hazus-MH 100-Year Coastal Flood Model Damage Assessment for Monroe County
2060 Low Sea-Level Rise (14”) & 2014 Assessed Valuations



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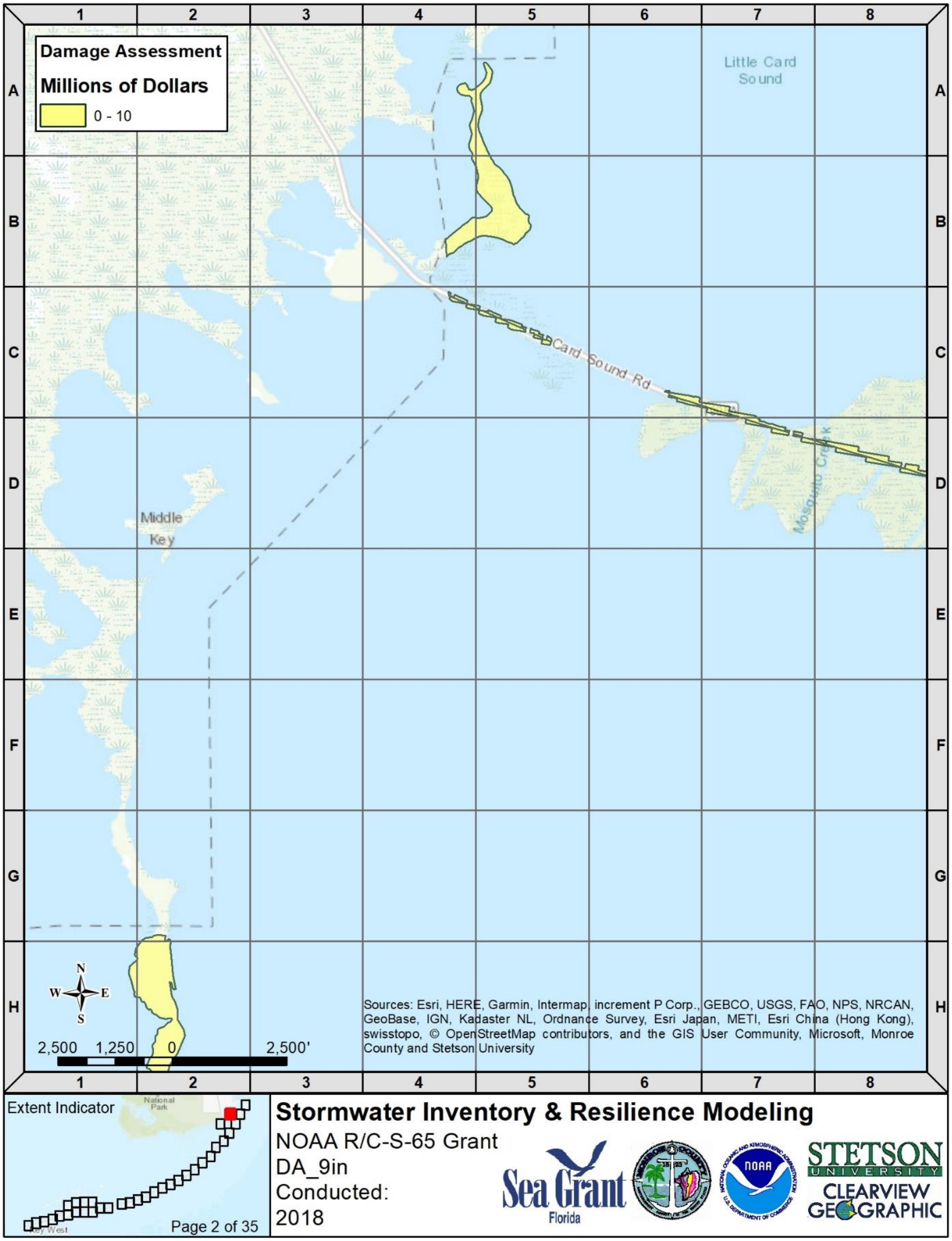

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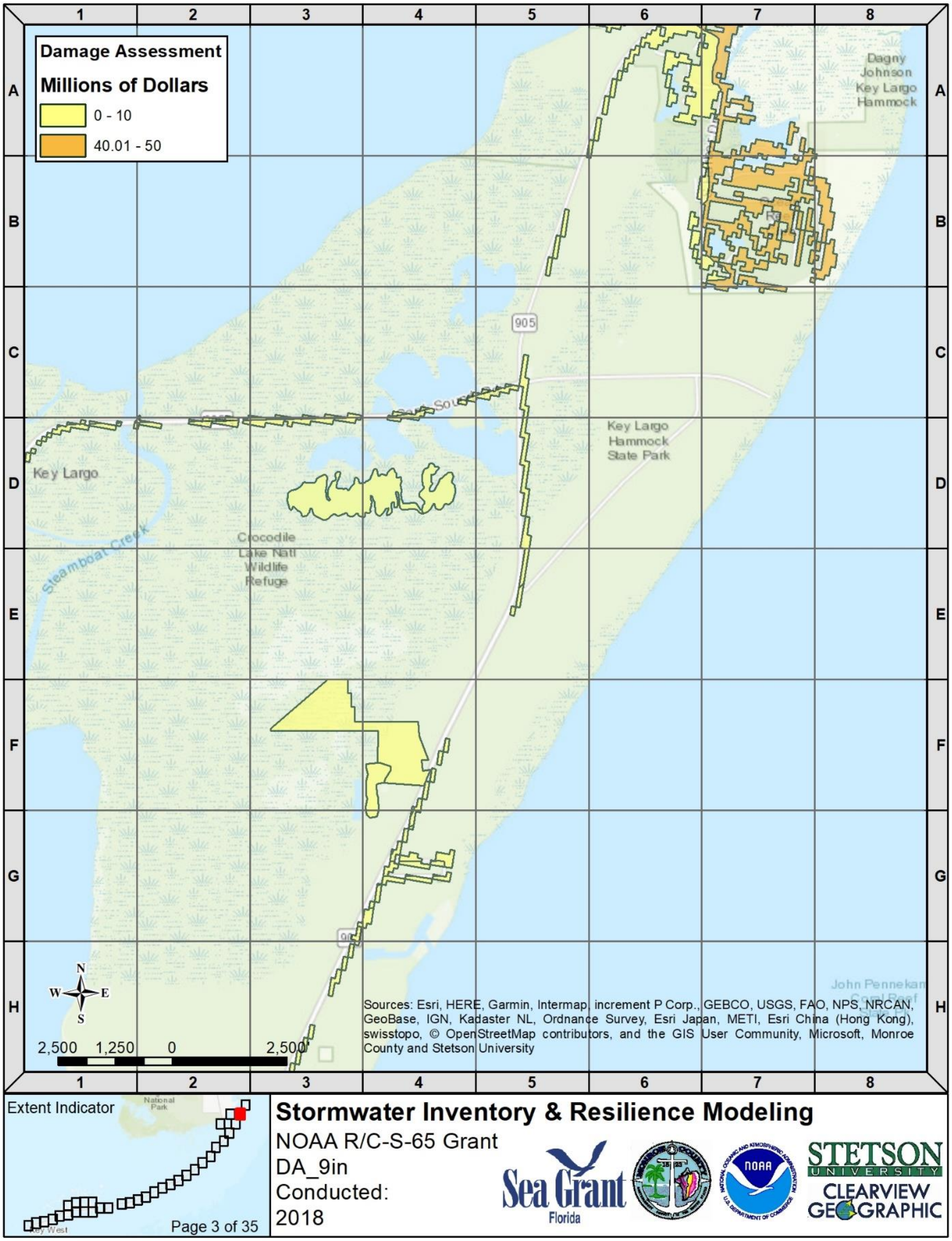

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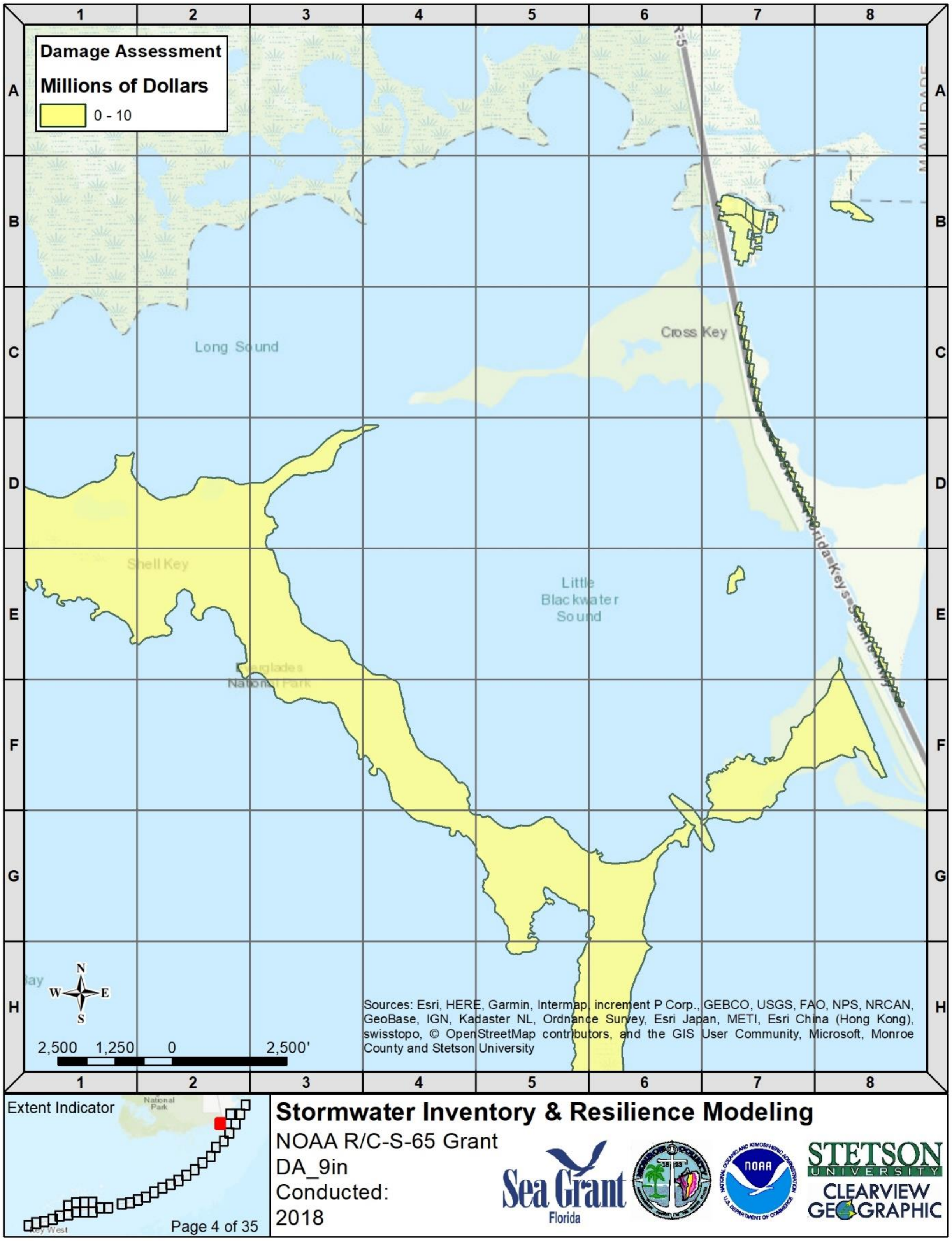

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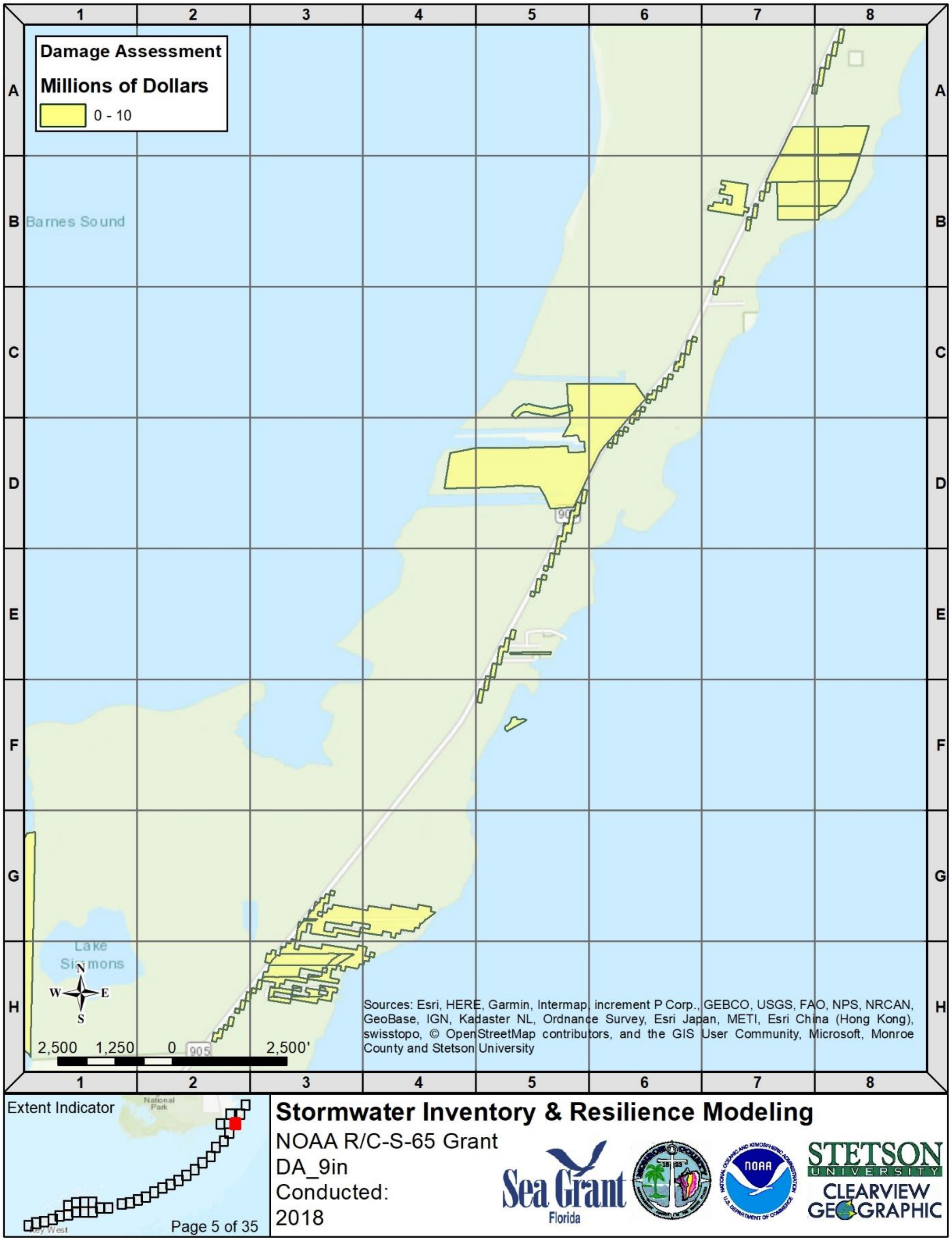

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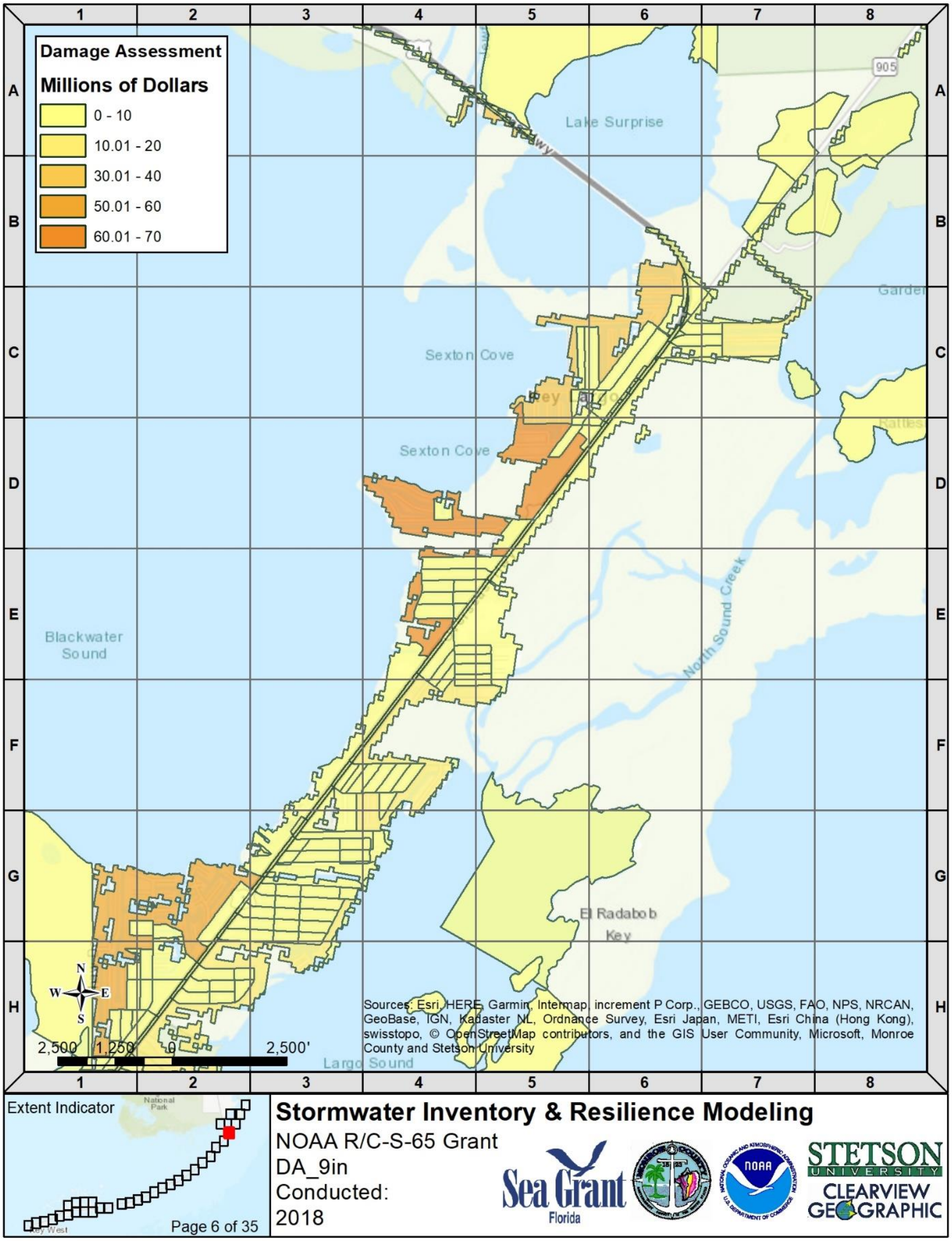

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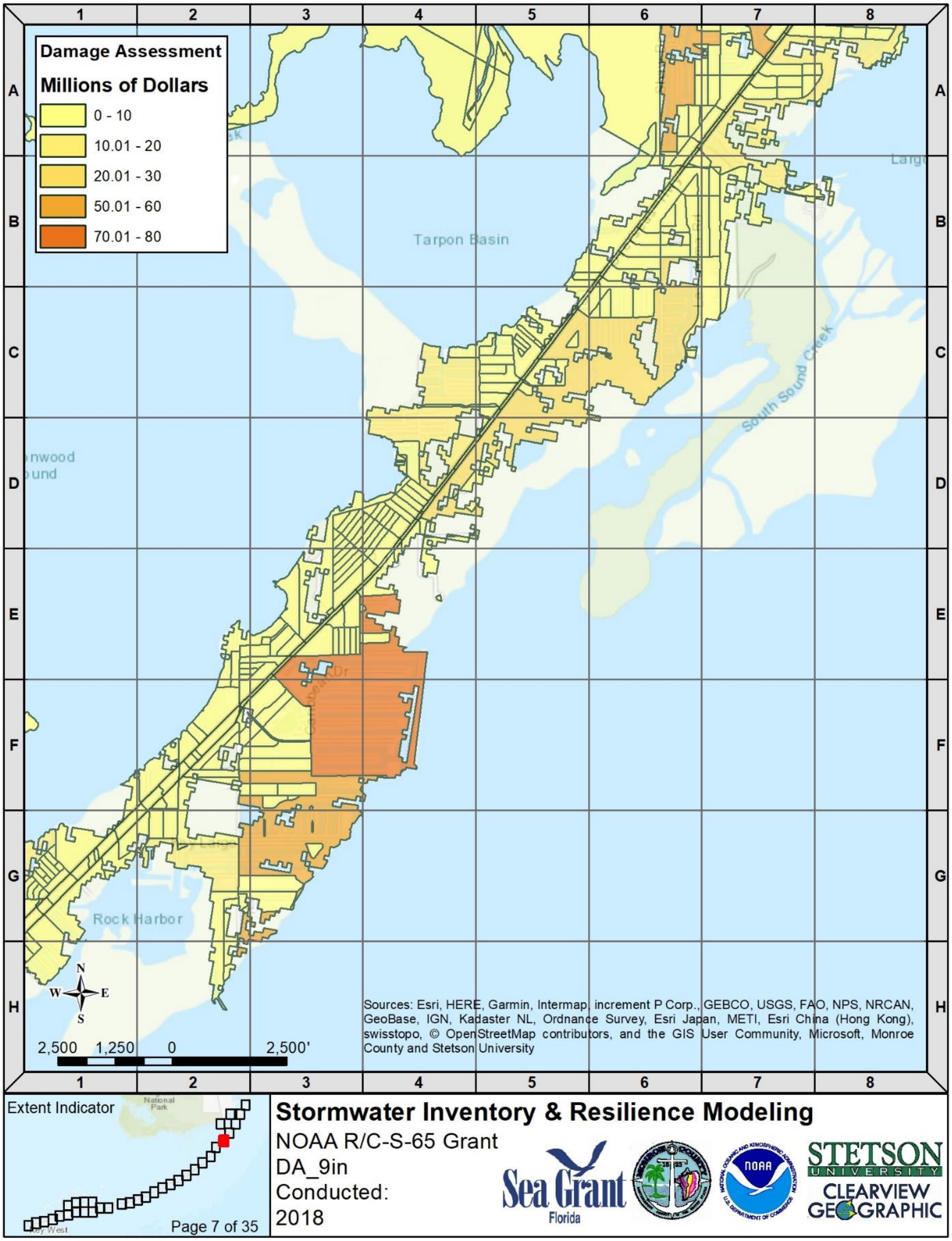

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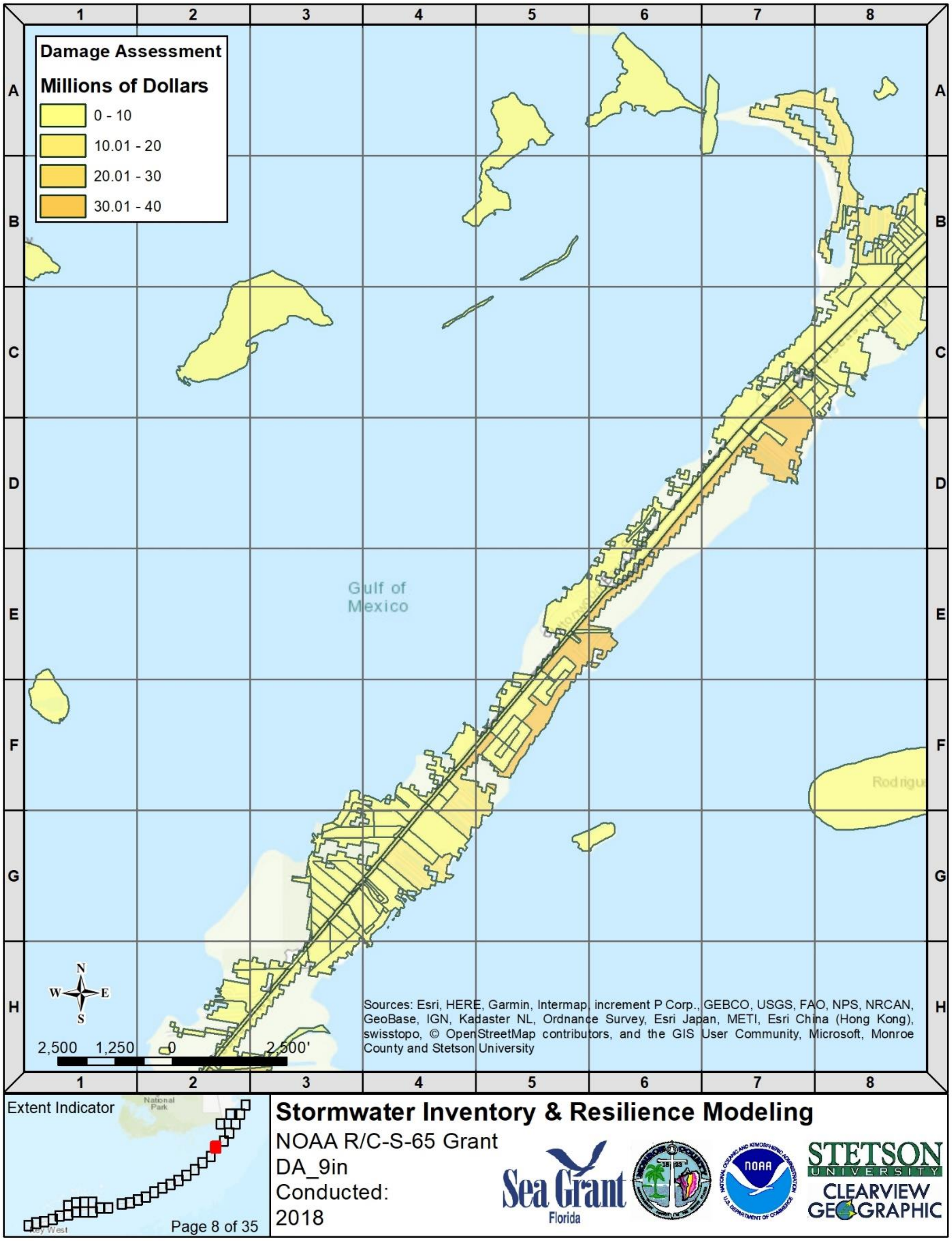

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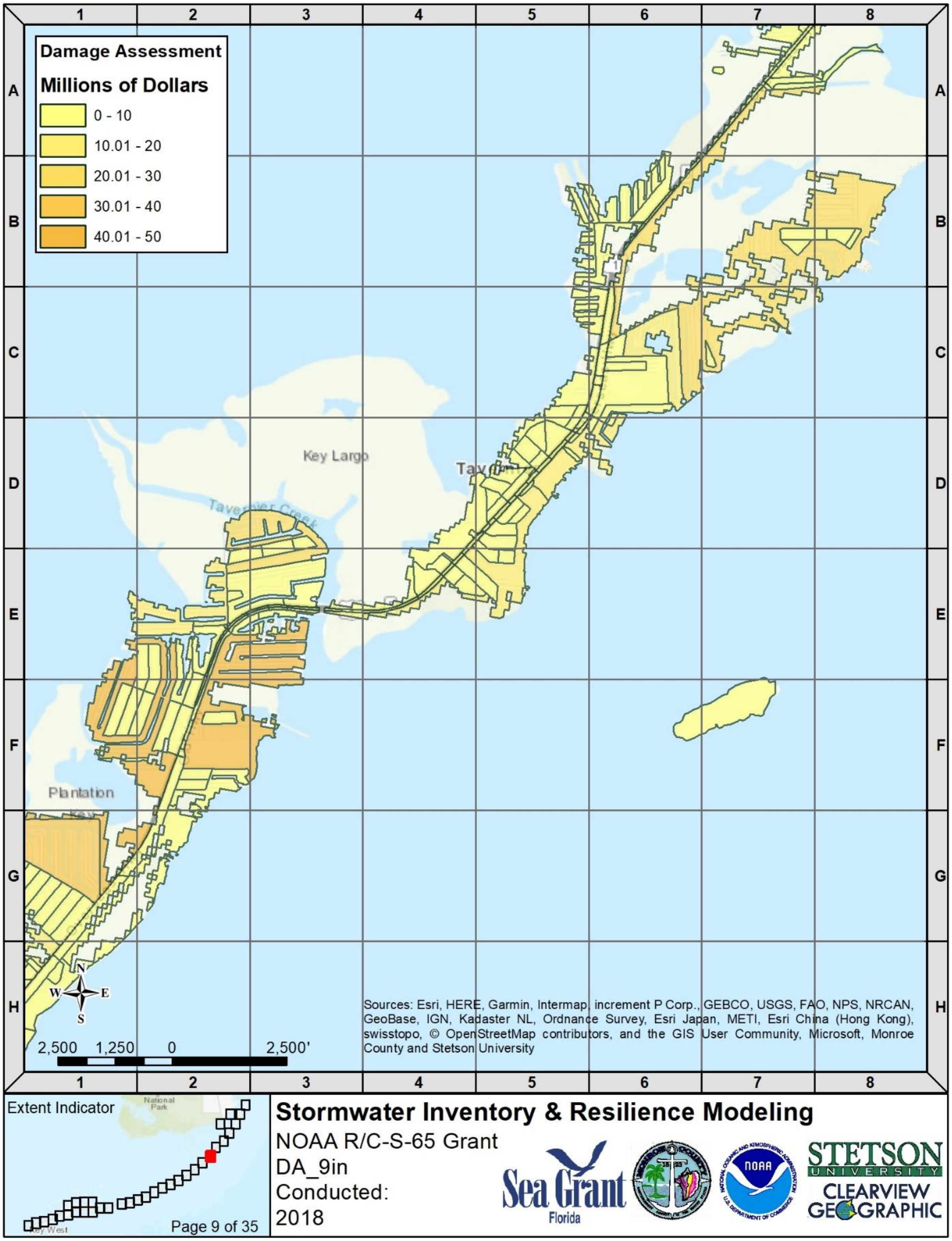

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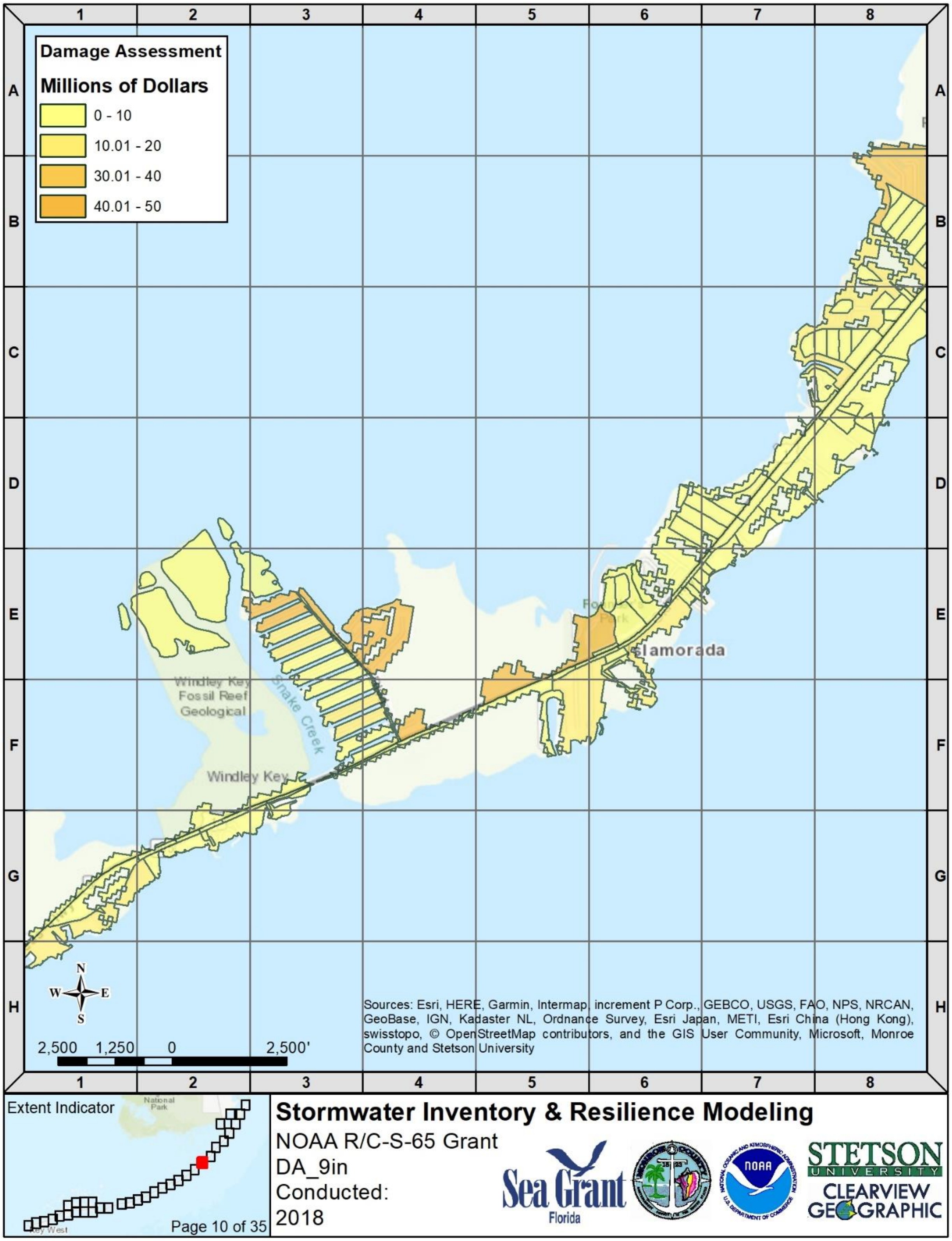

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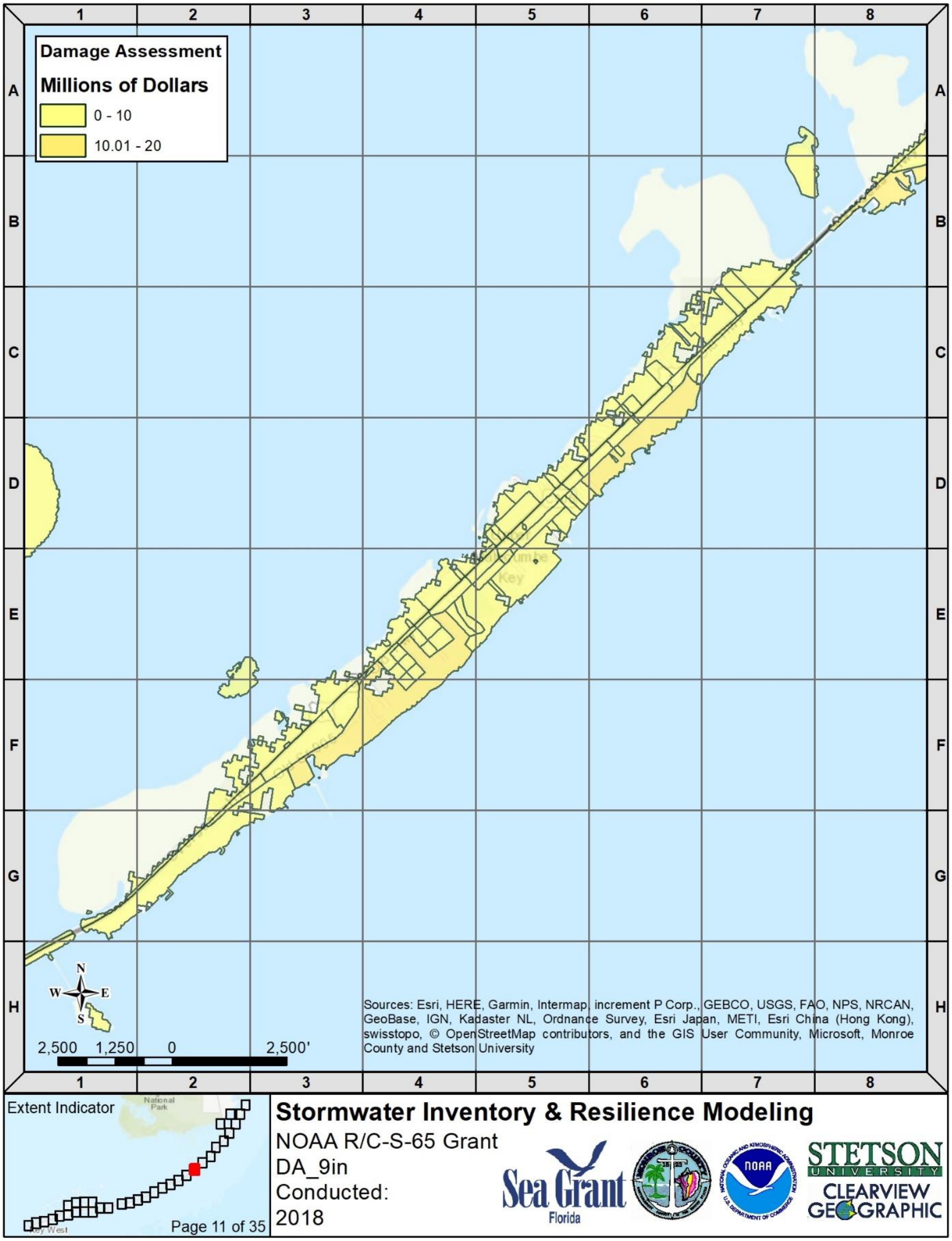

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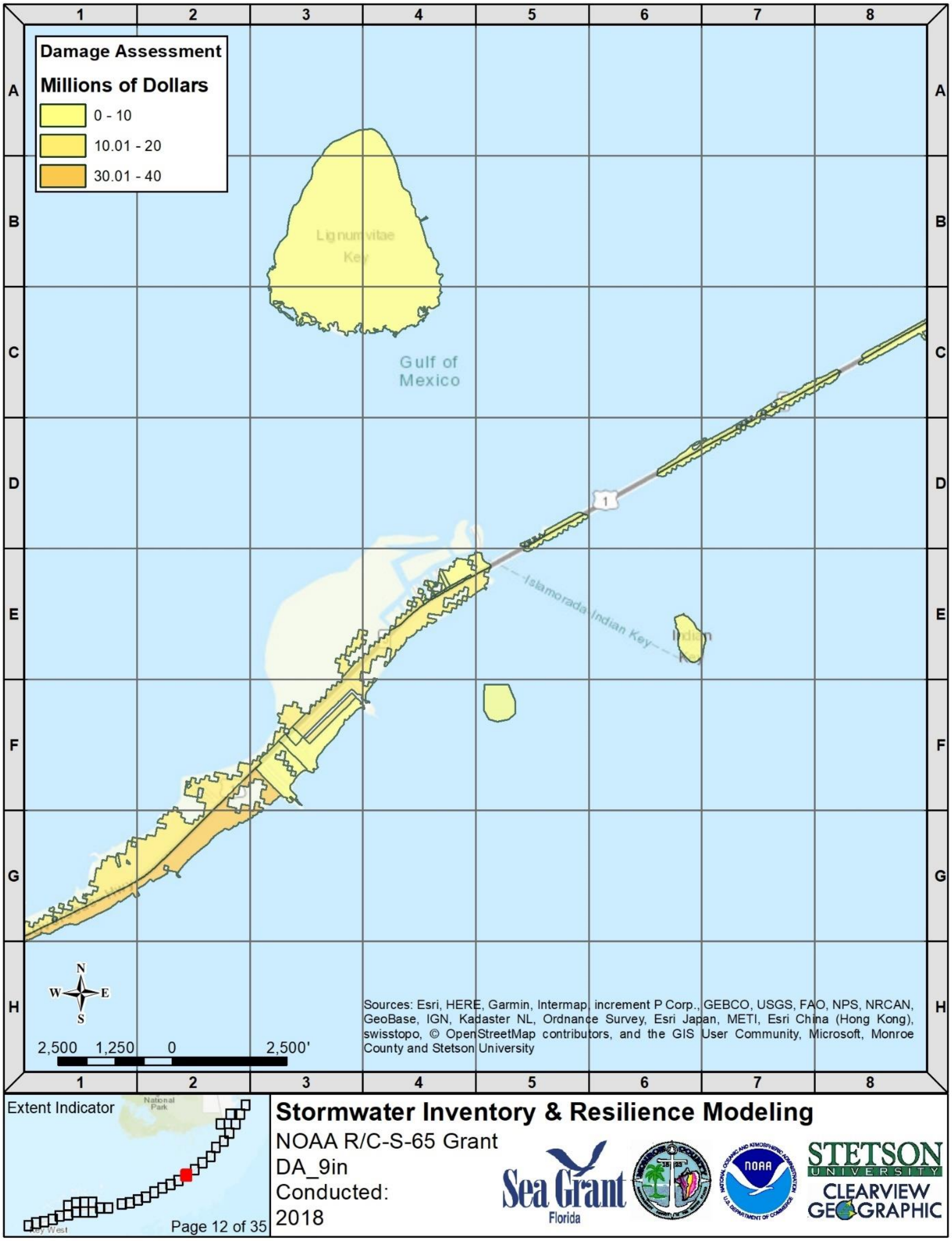

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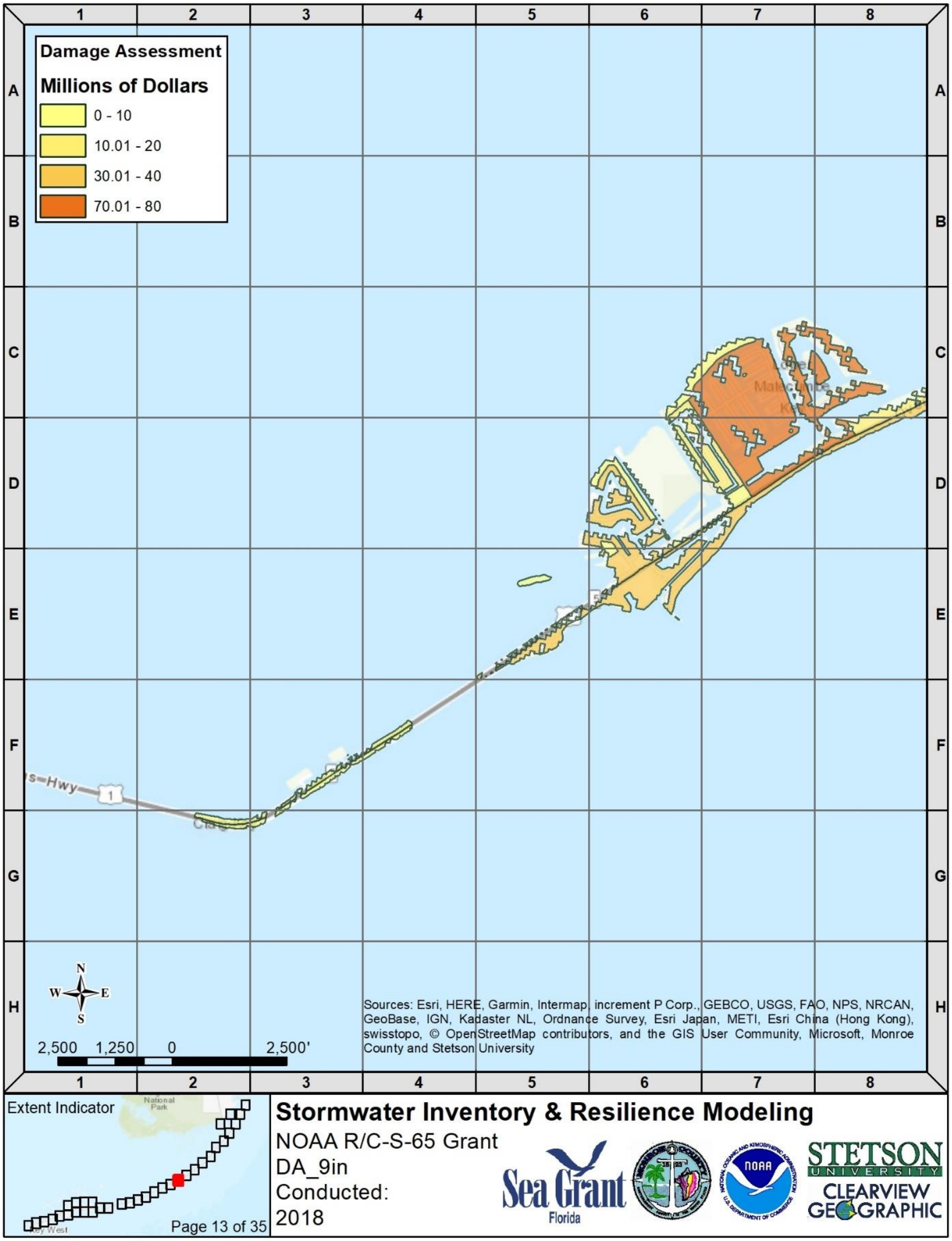

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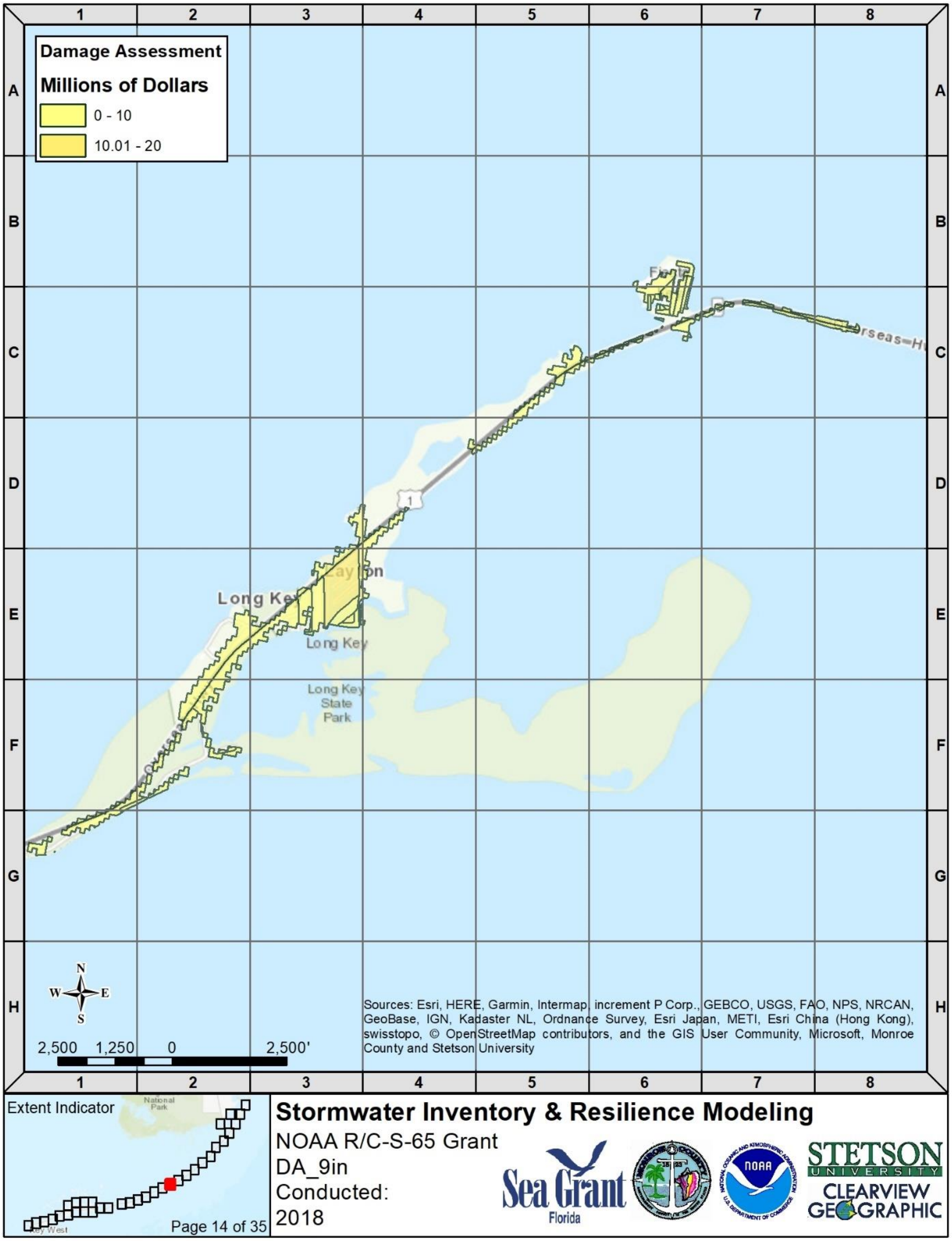

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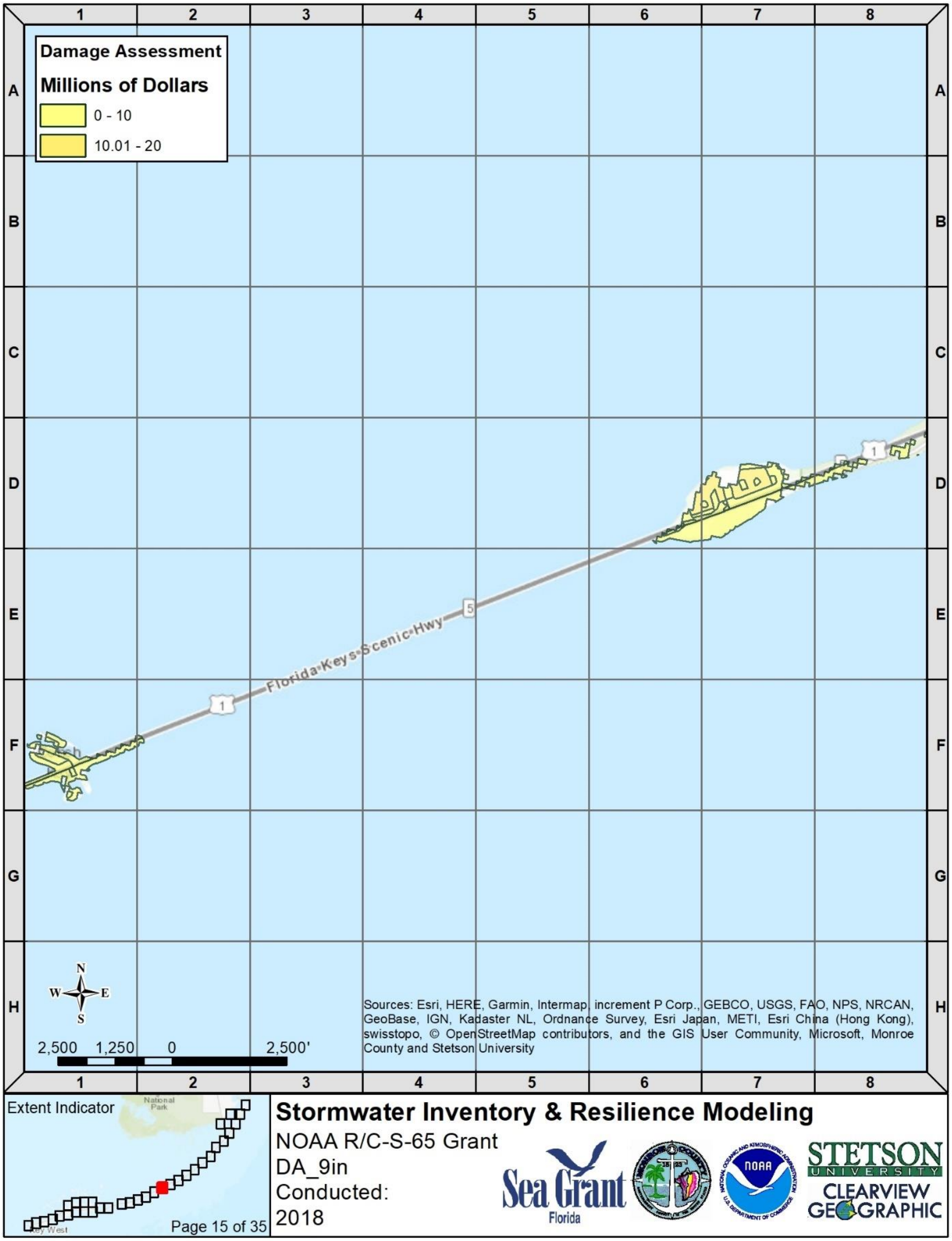

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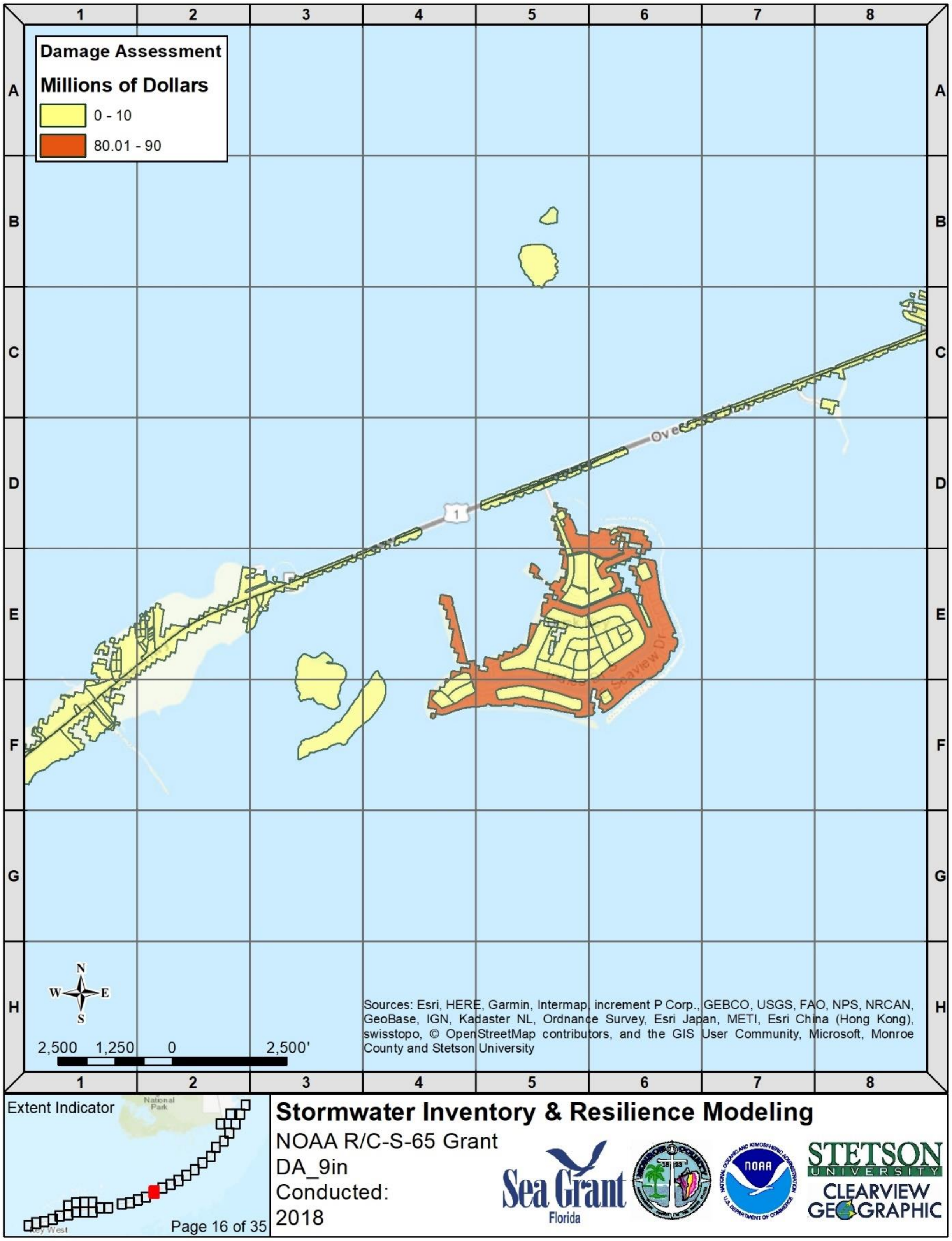

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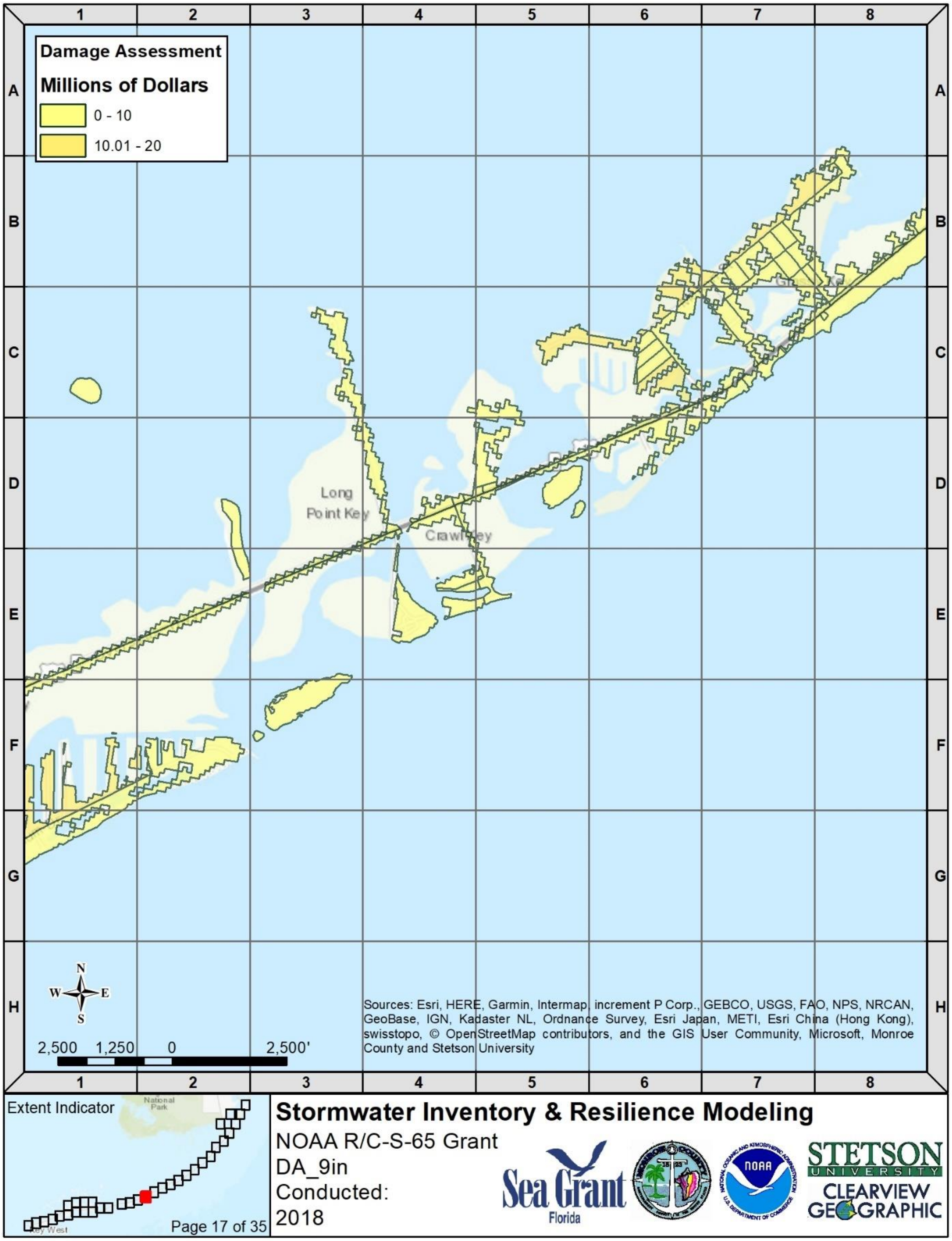

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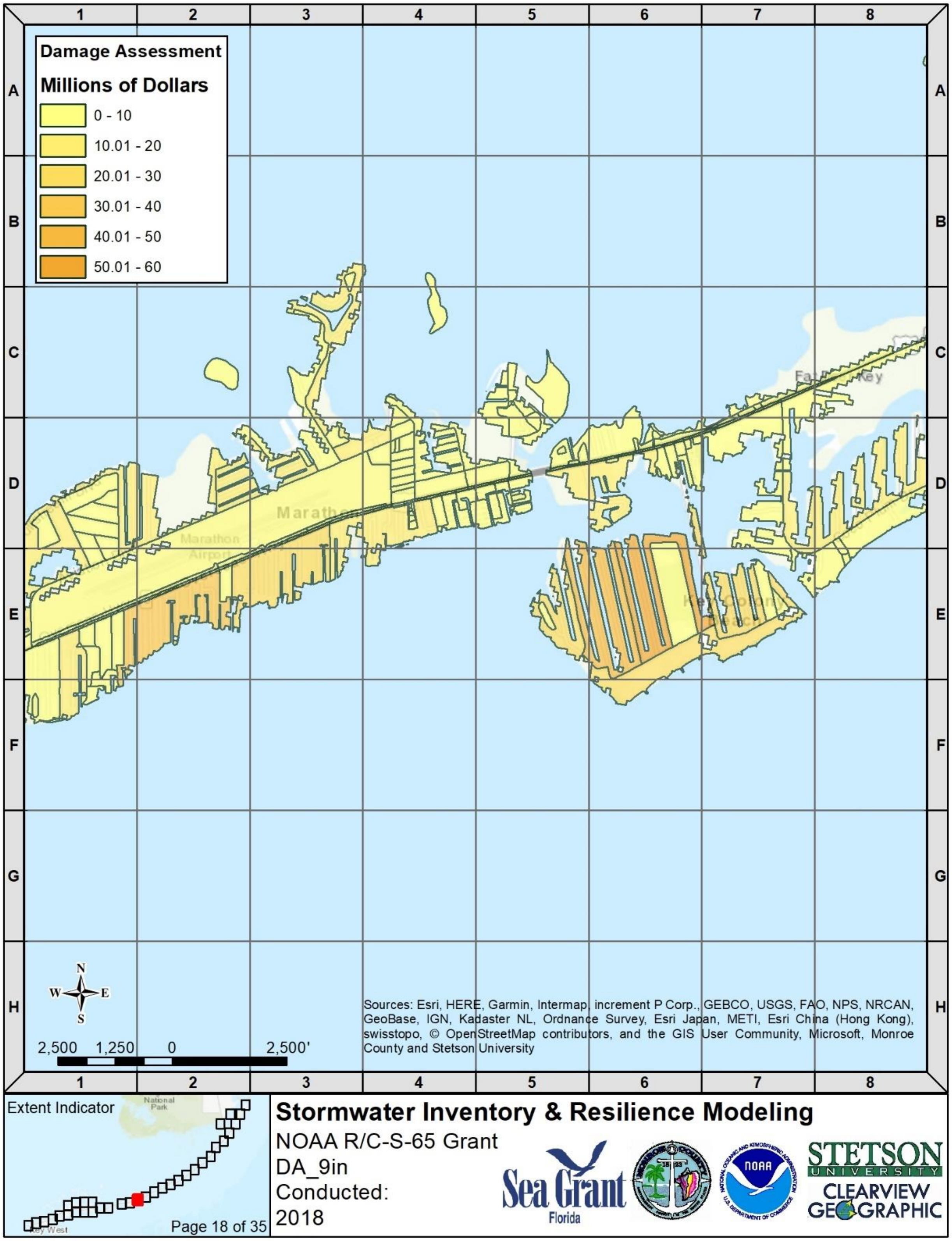

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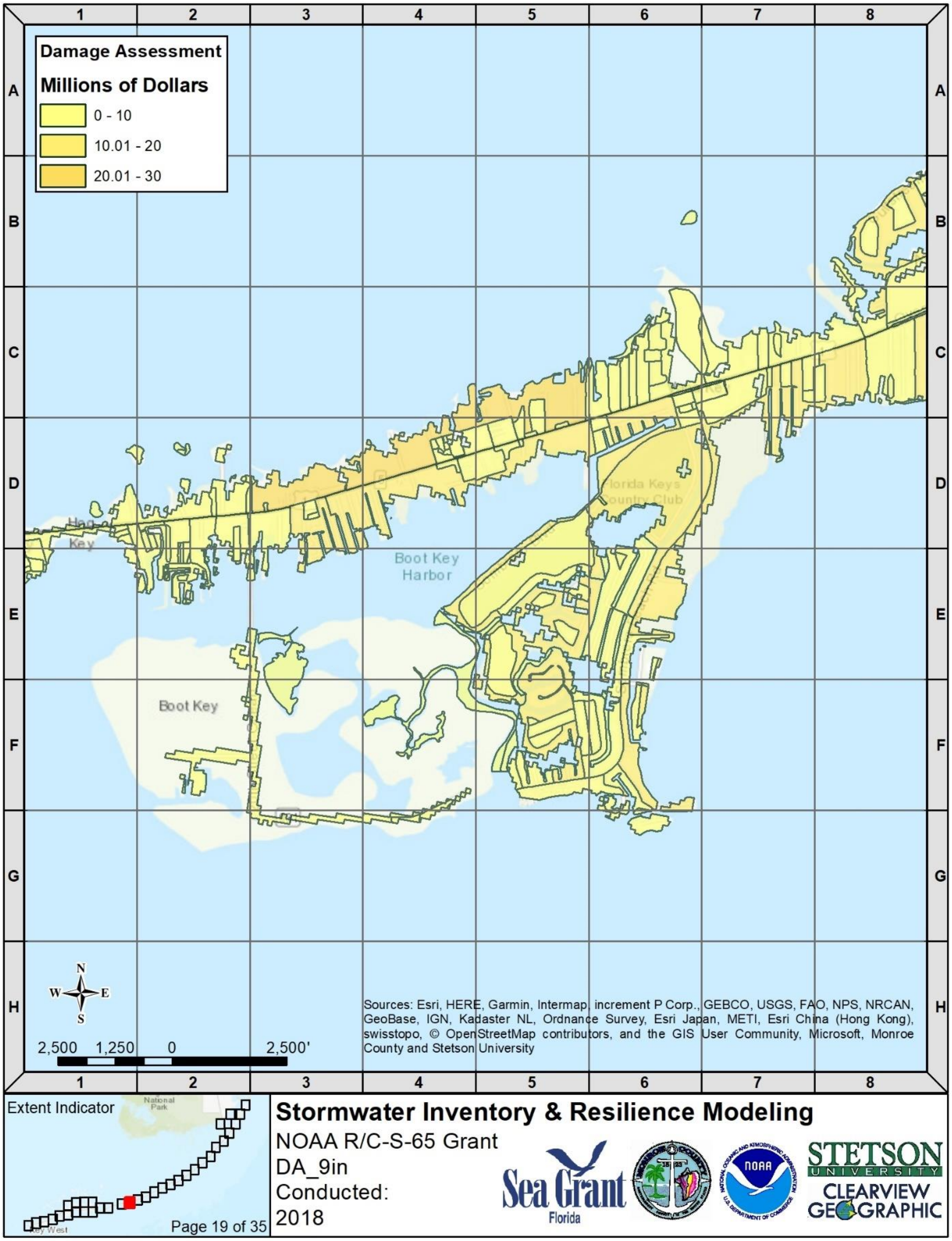

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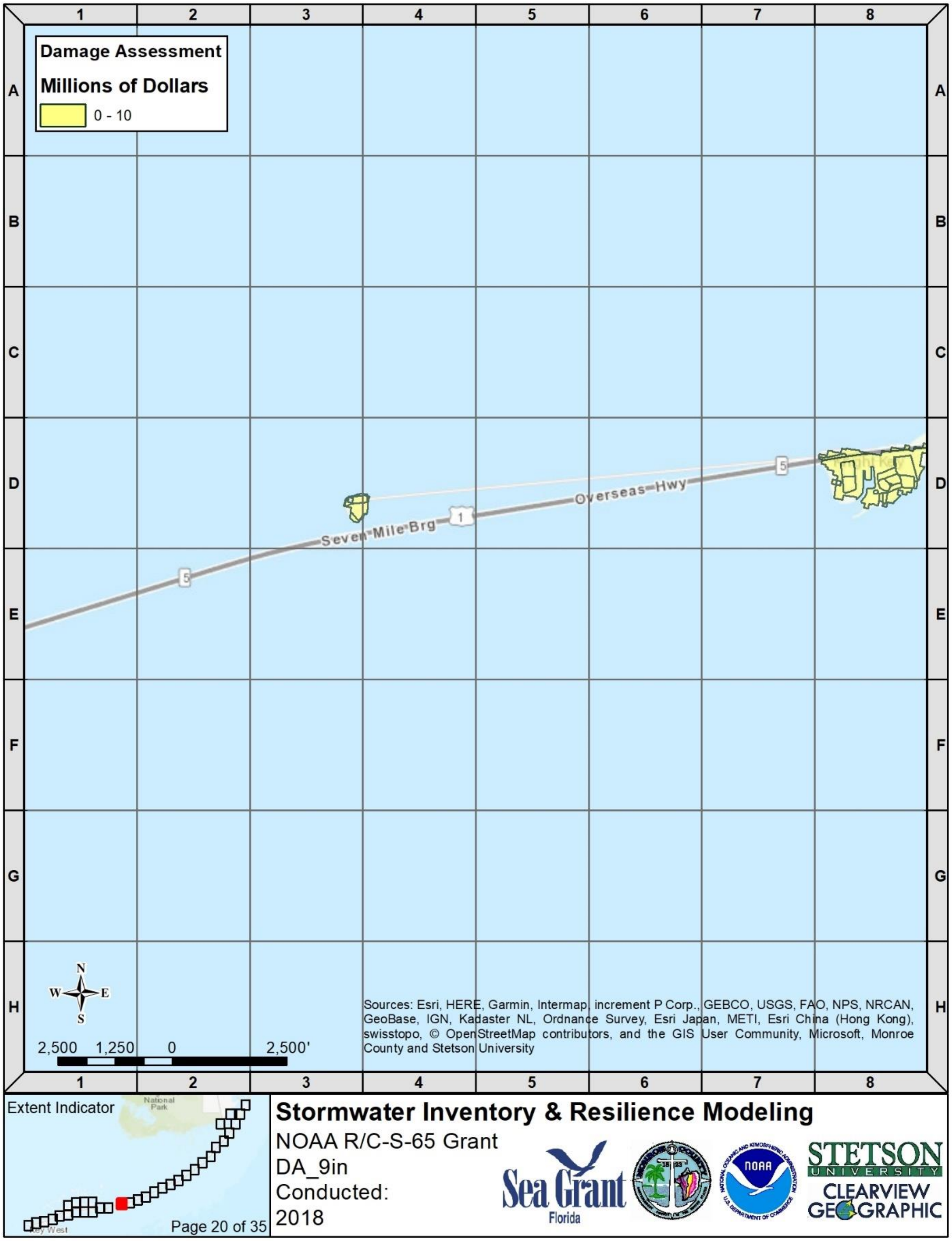

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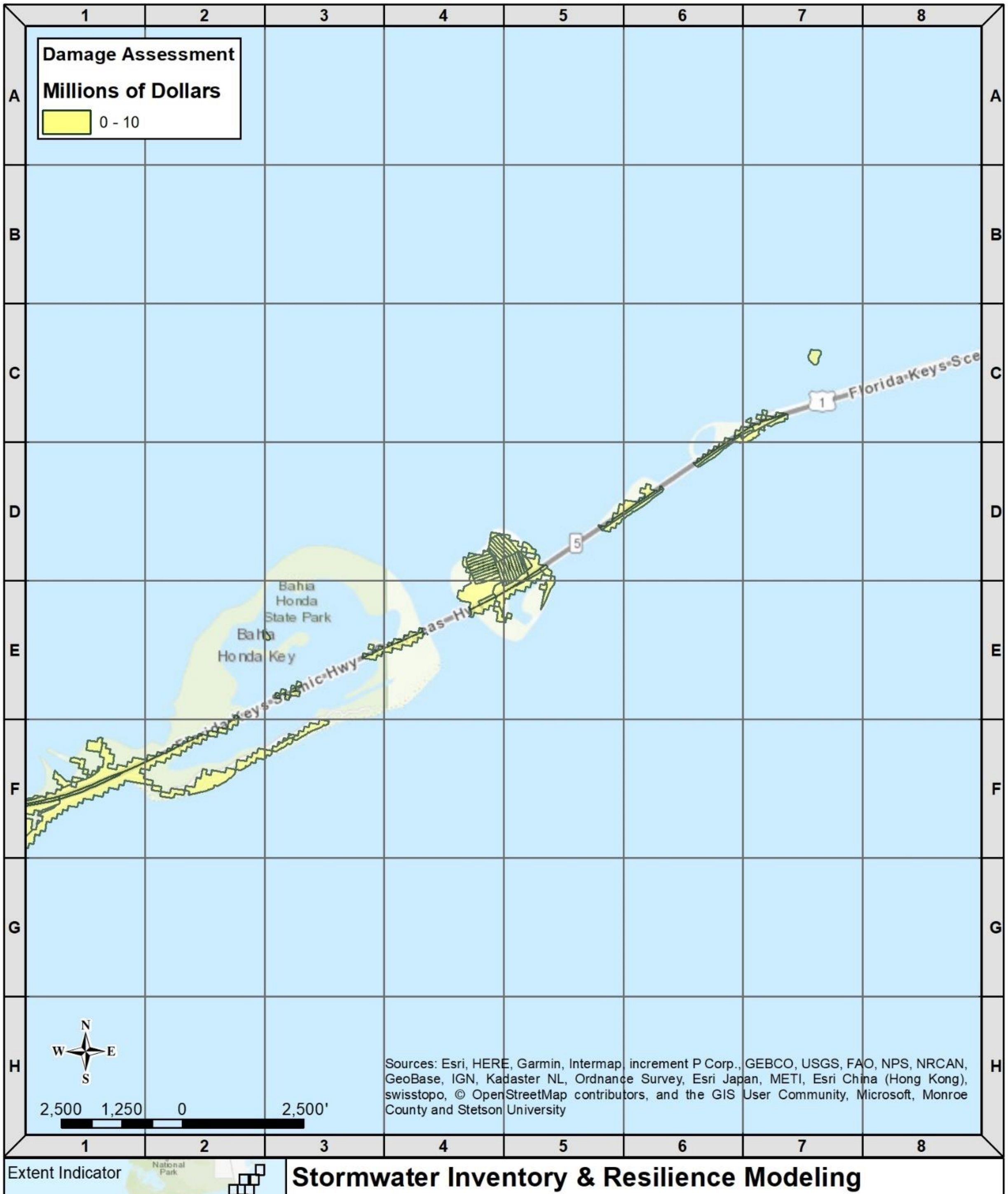

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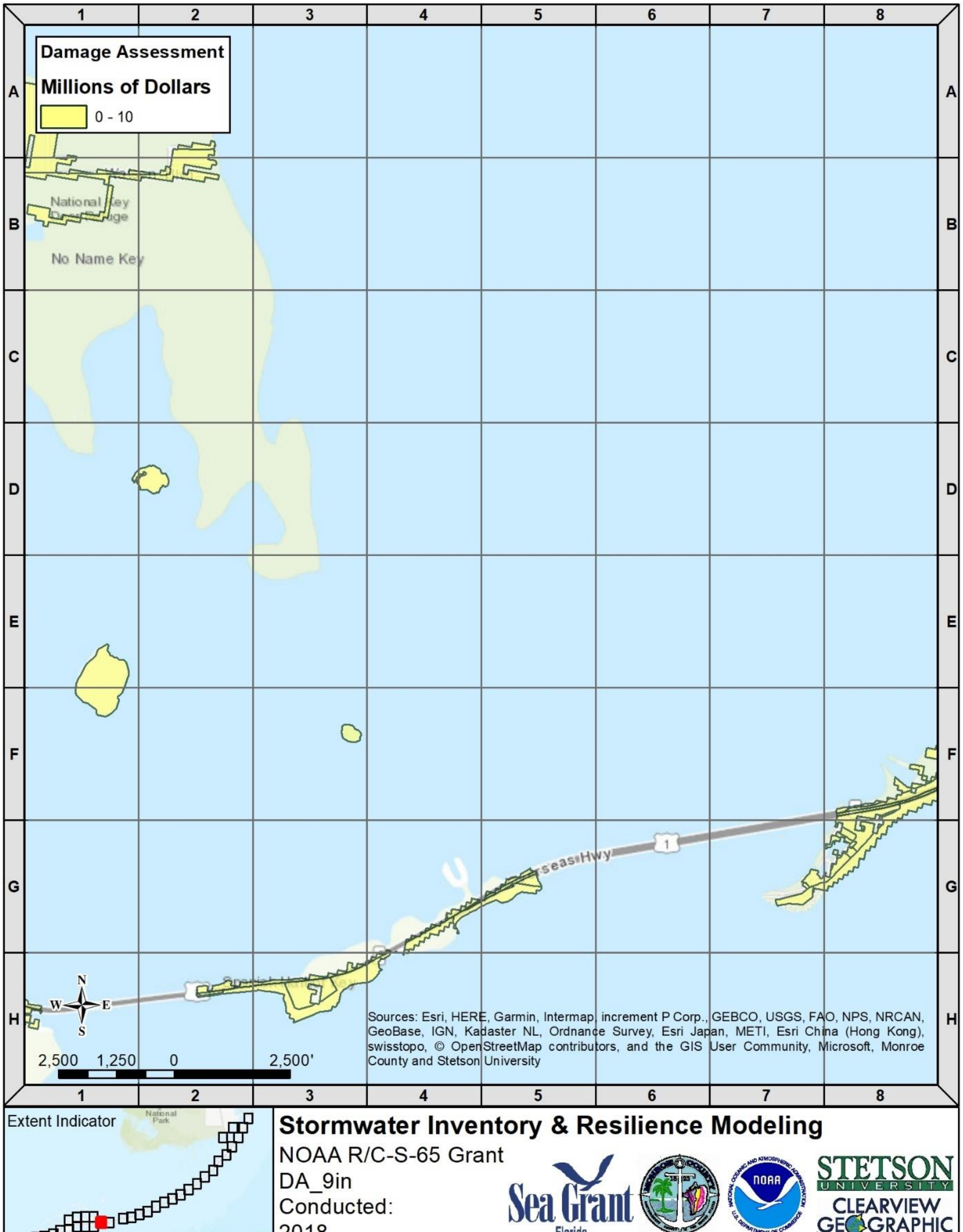

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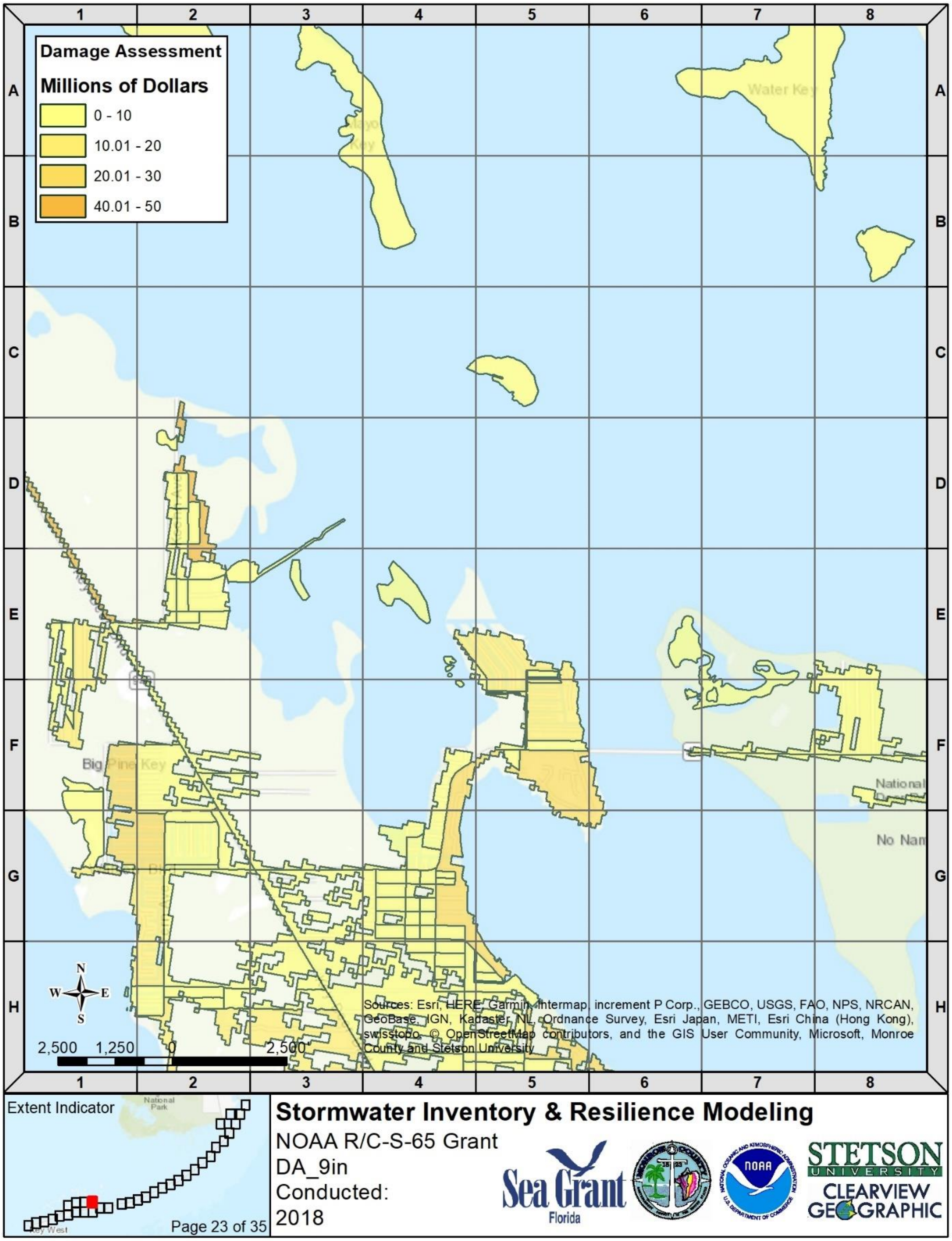

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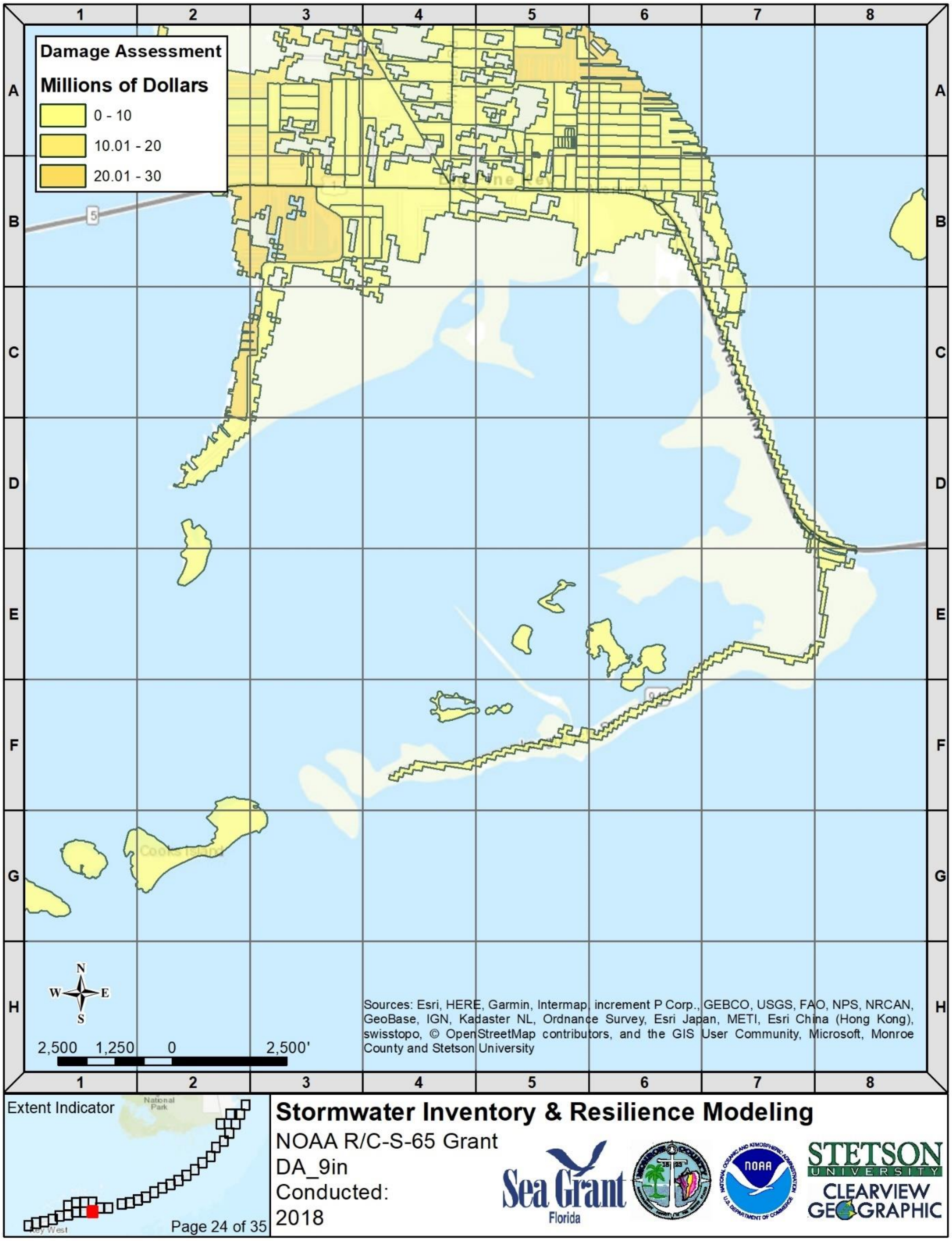

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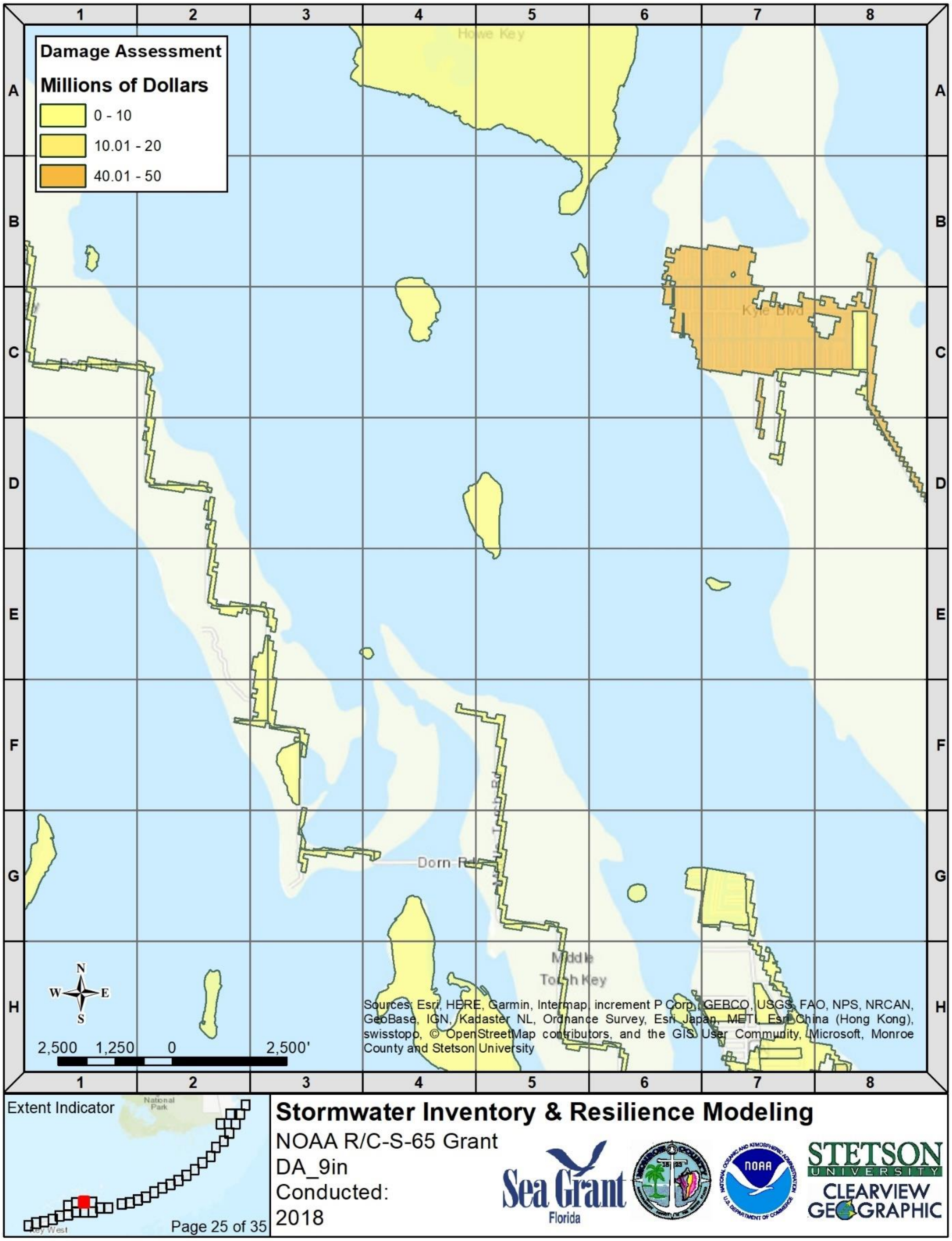

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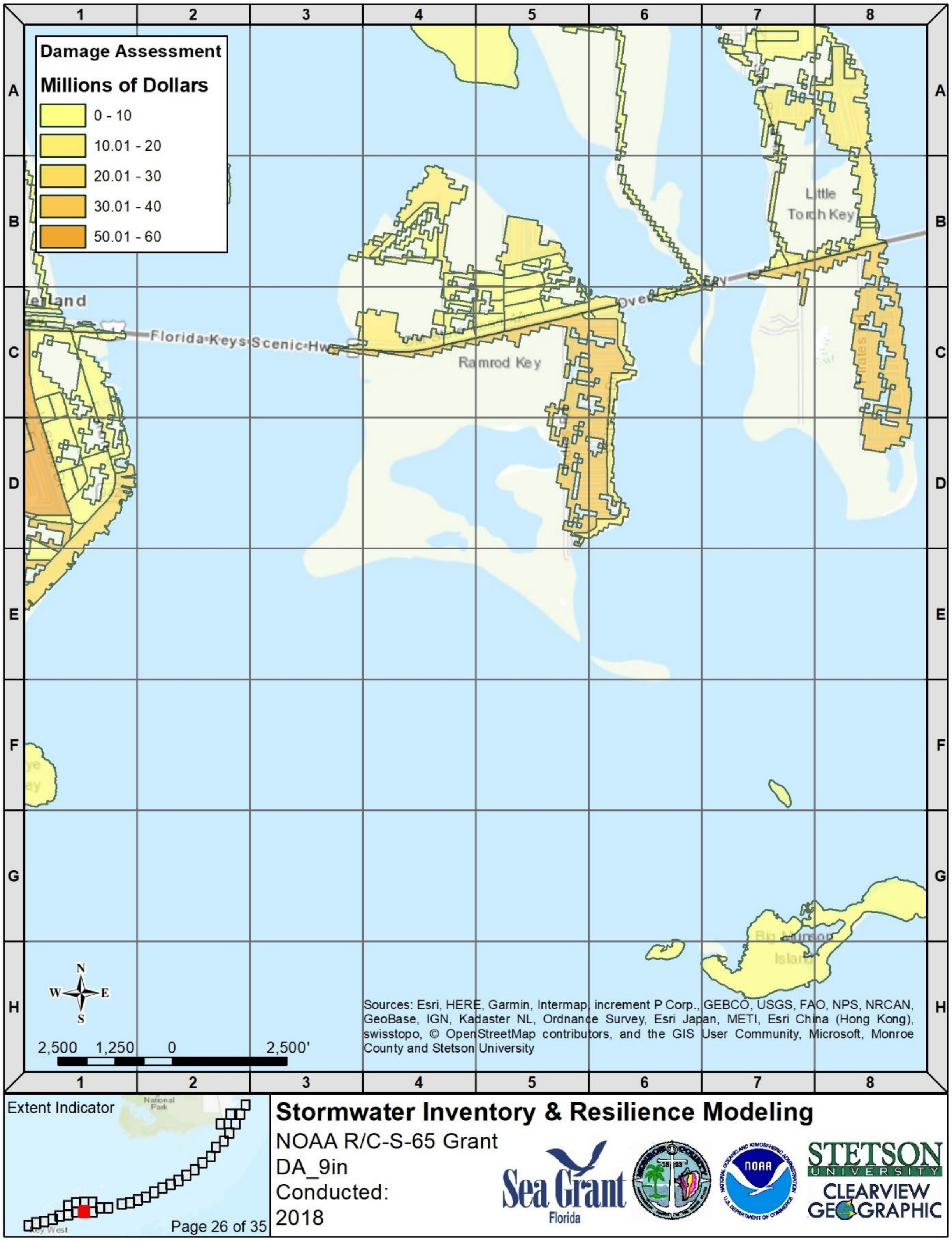

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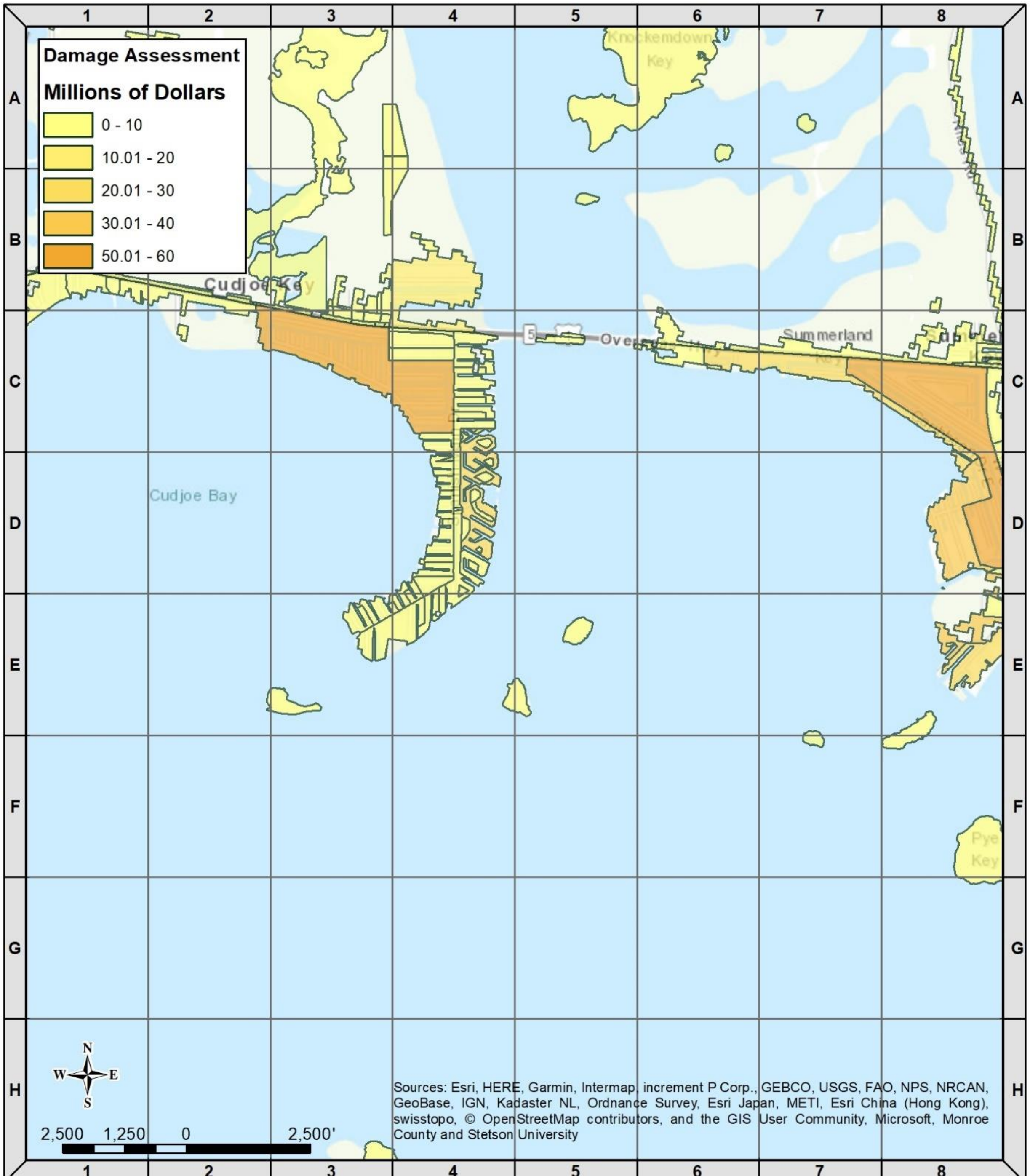

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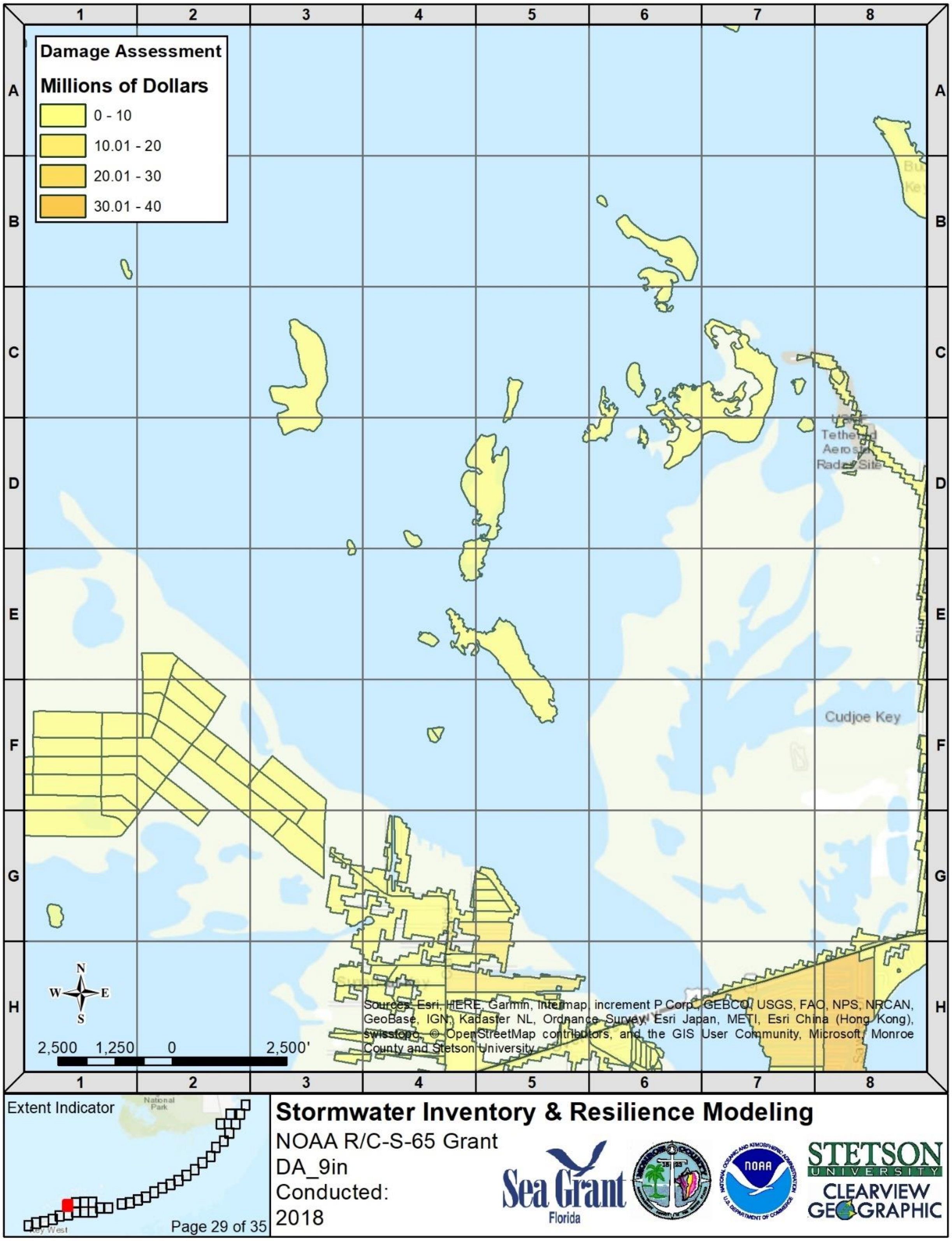

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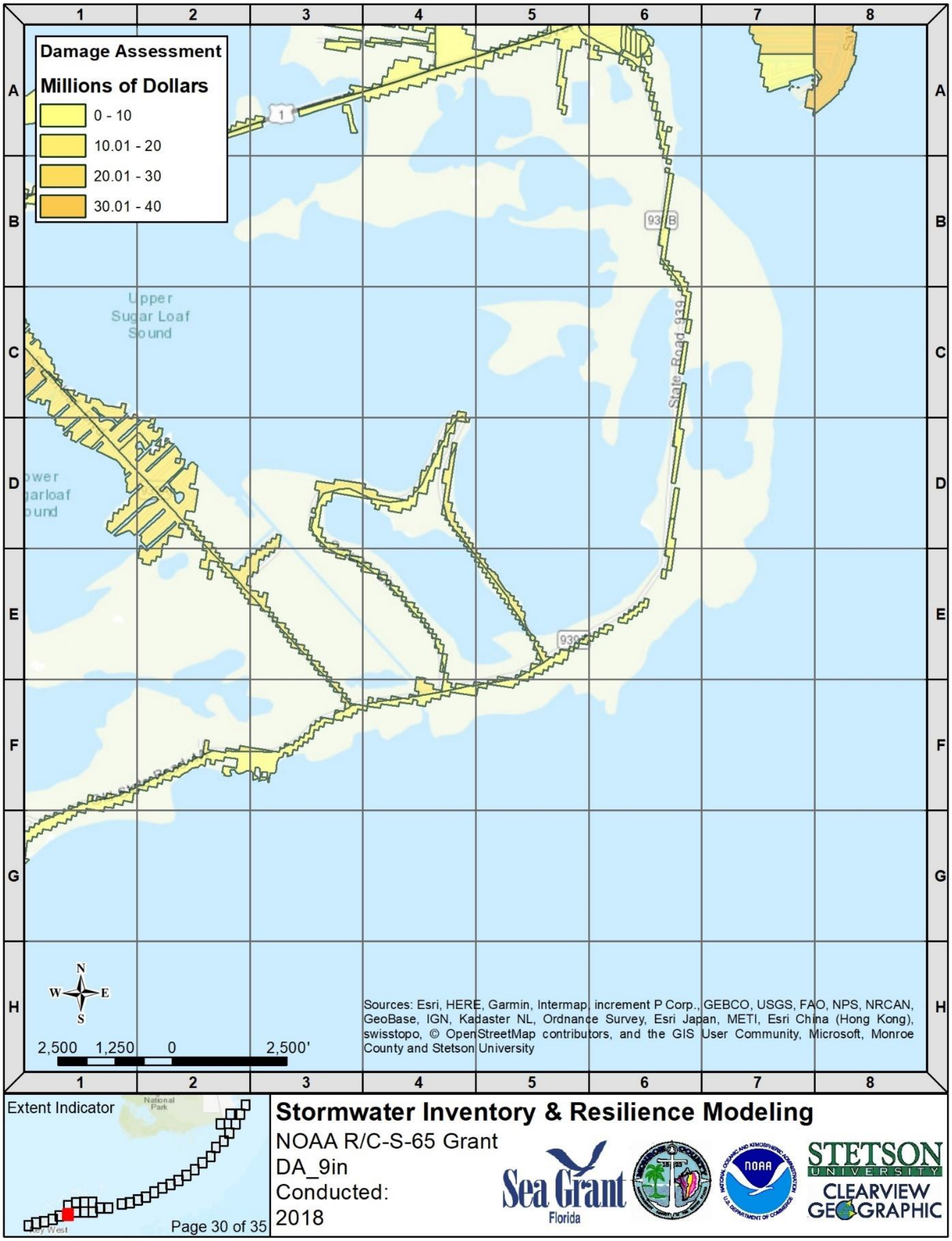

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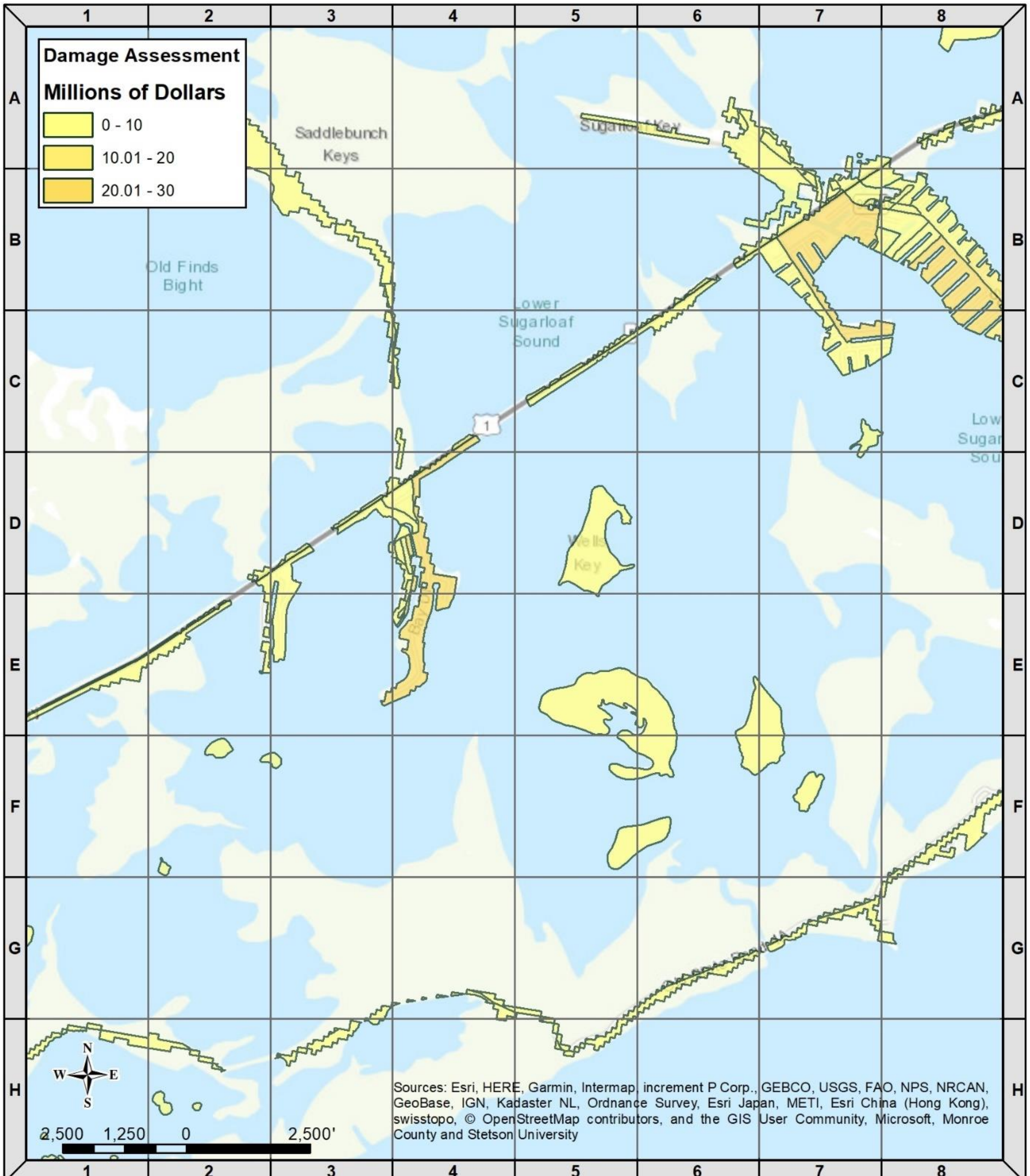

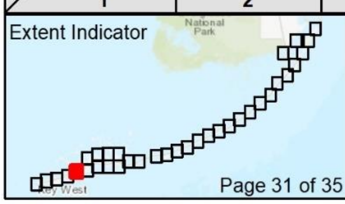

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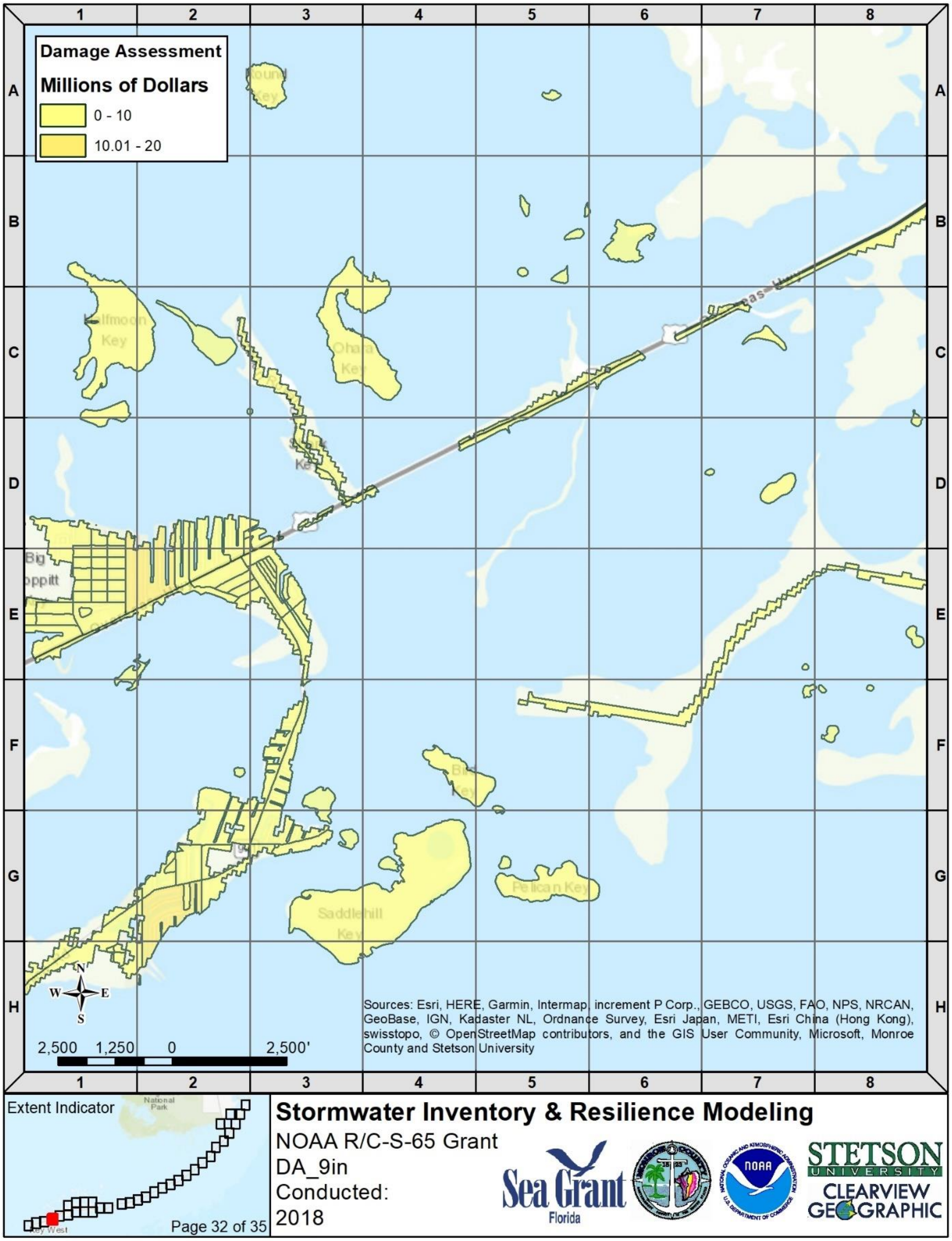

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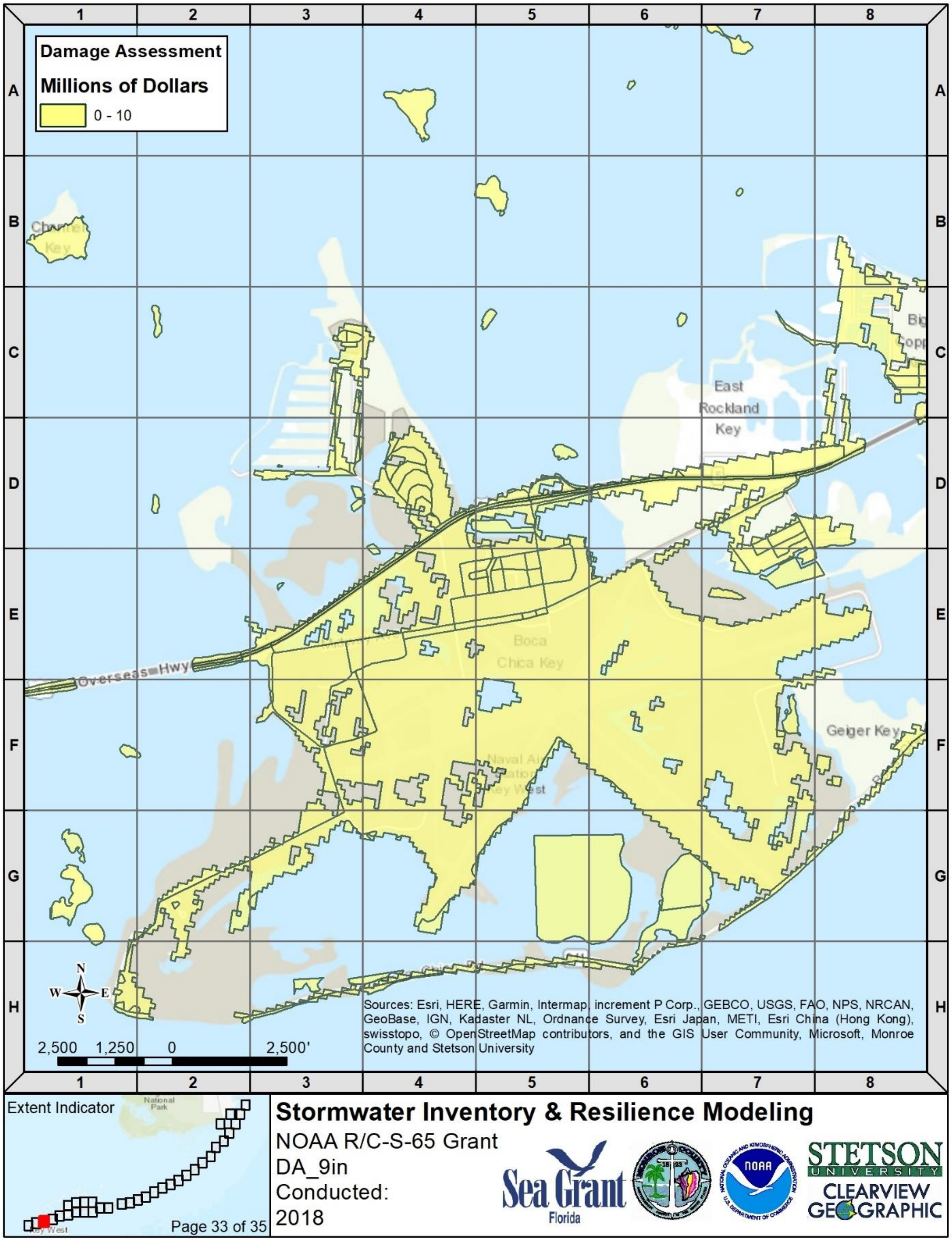

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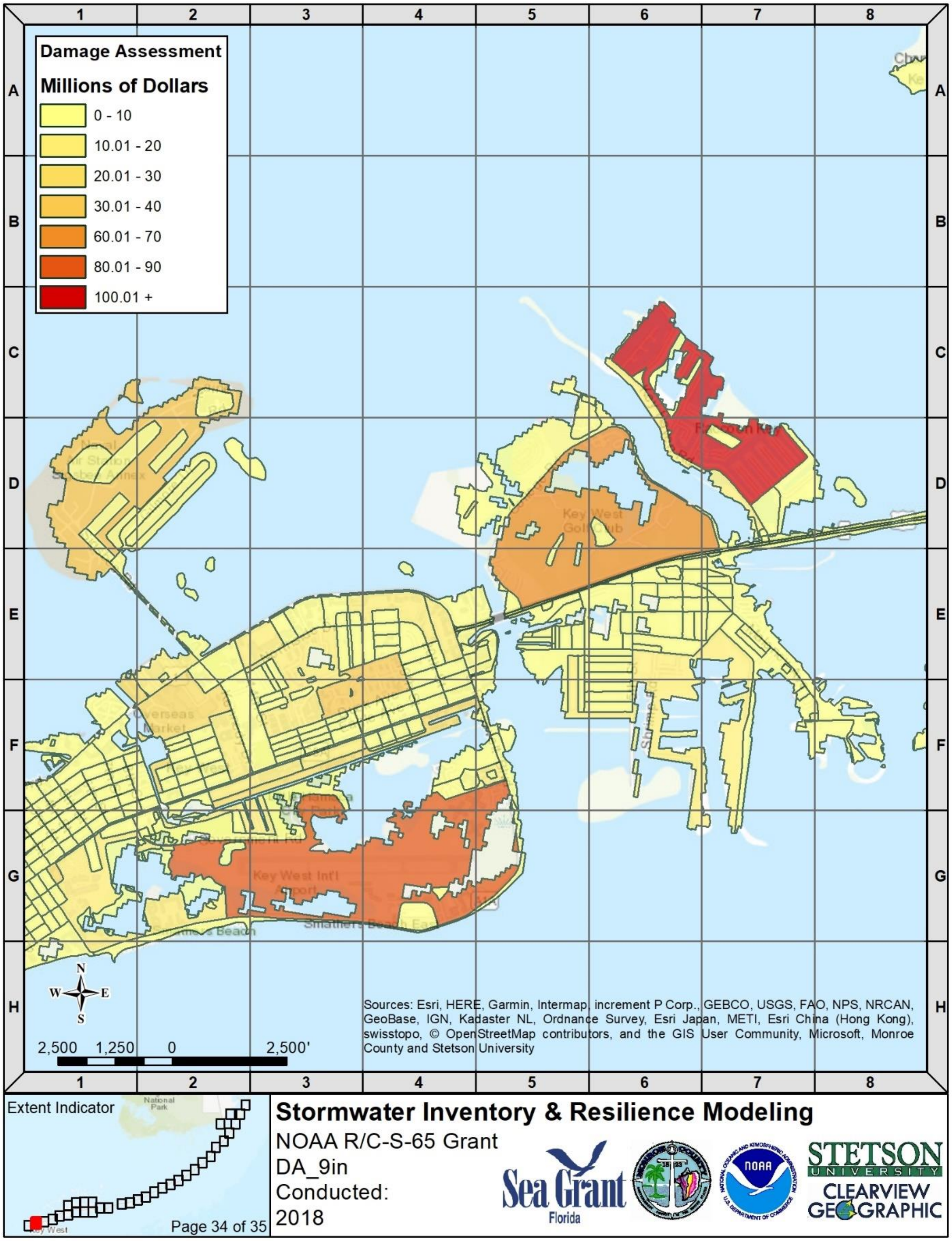

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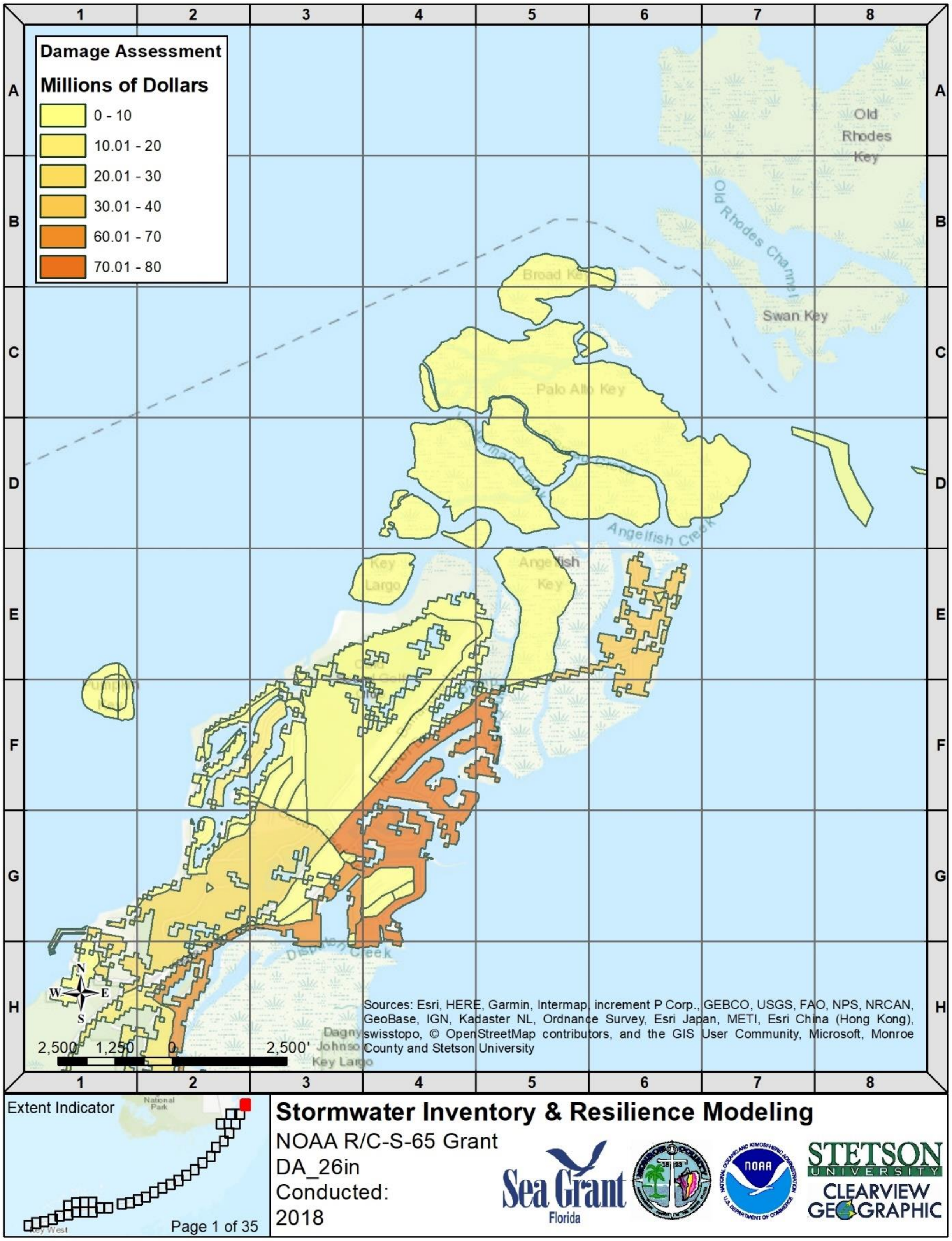

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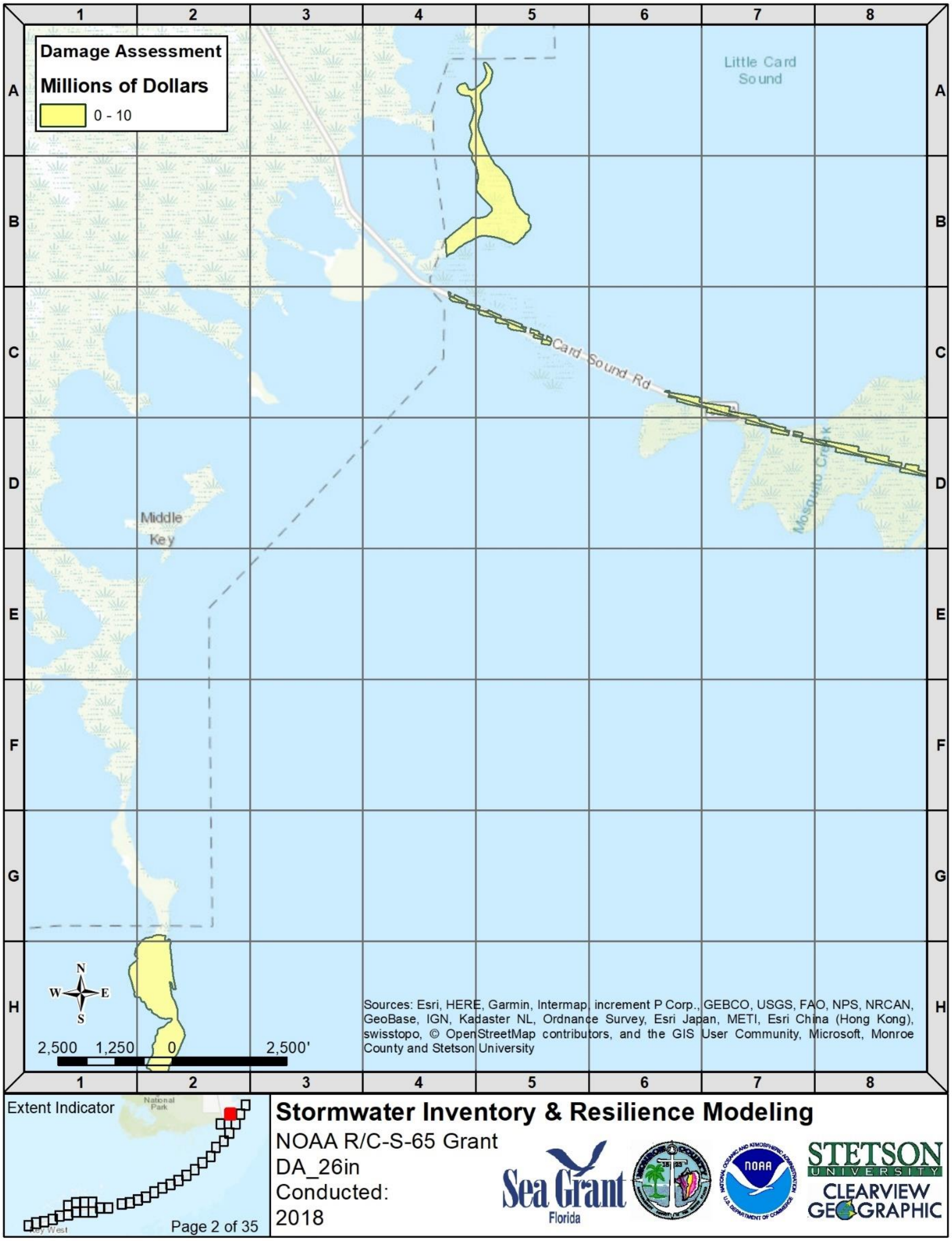

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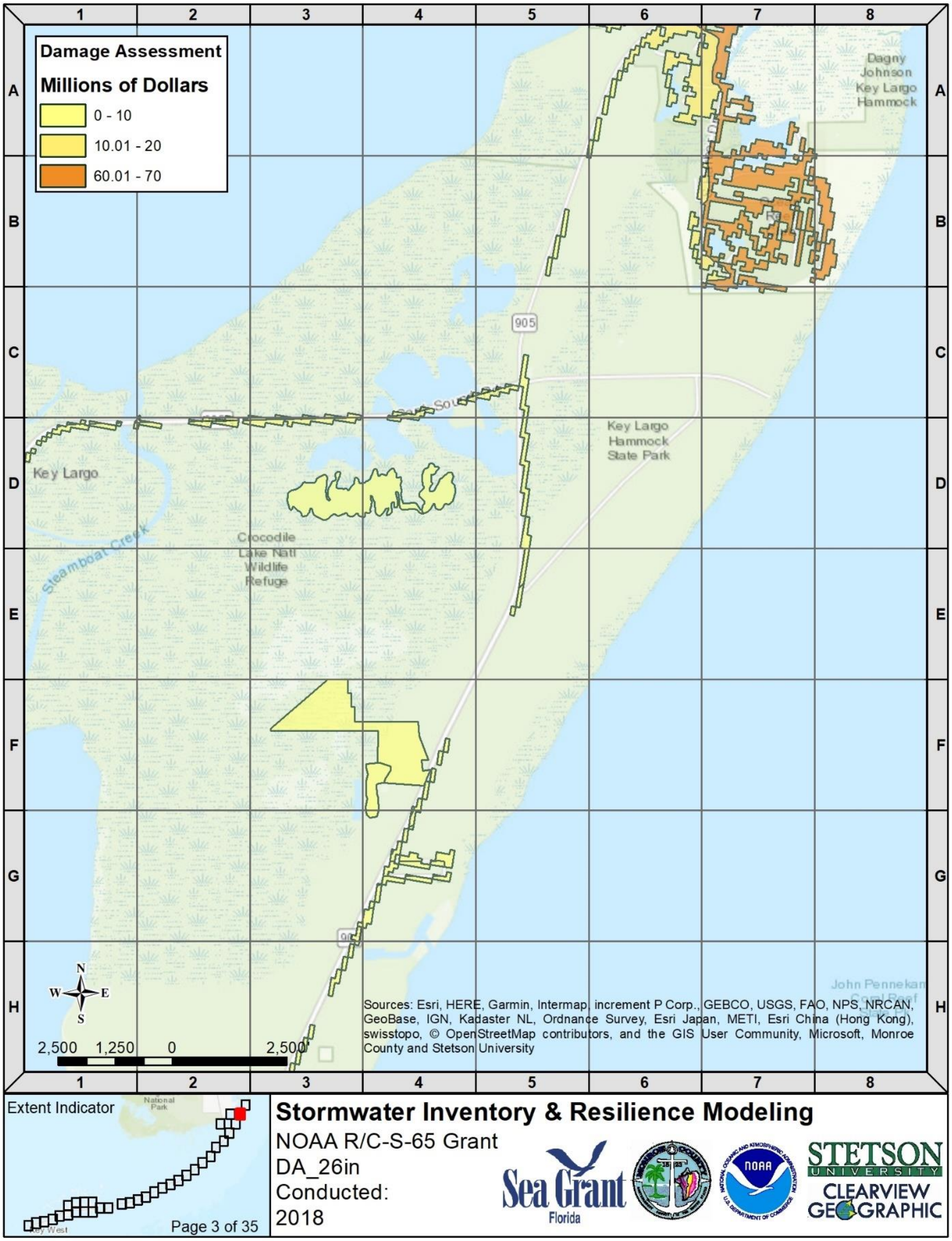

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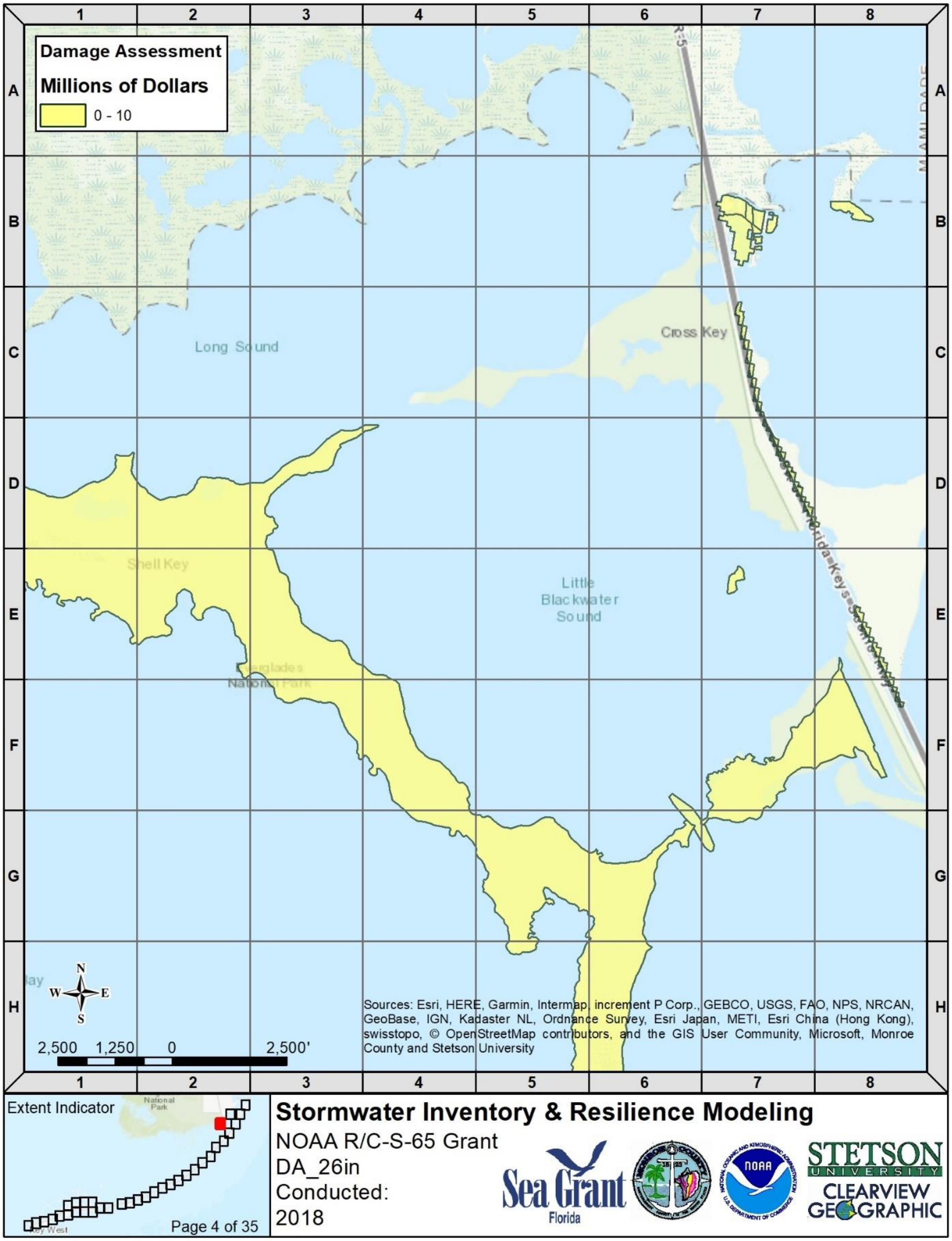

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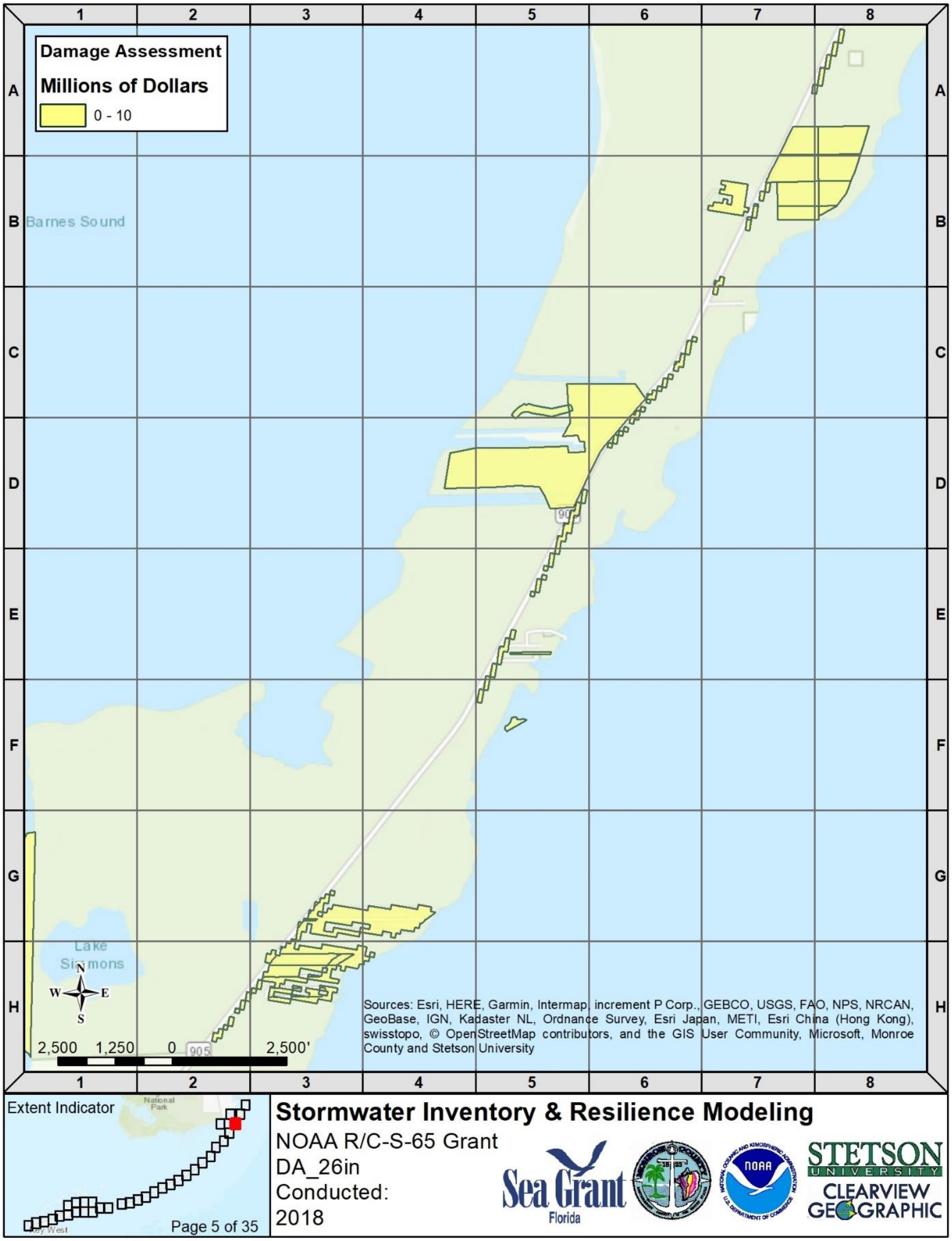

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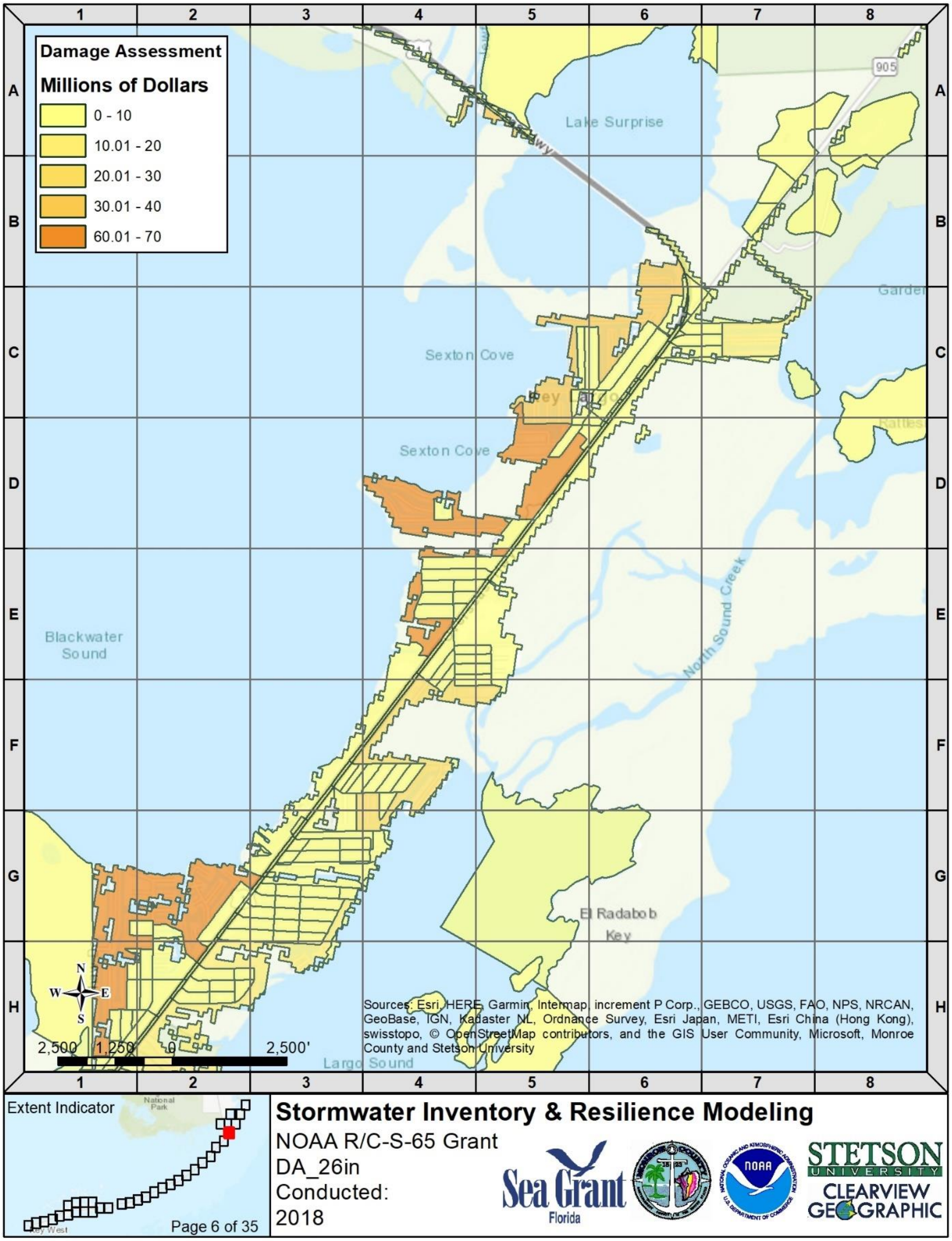

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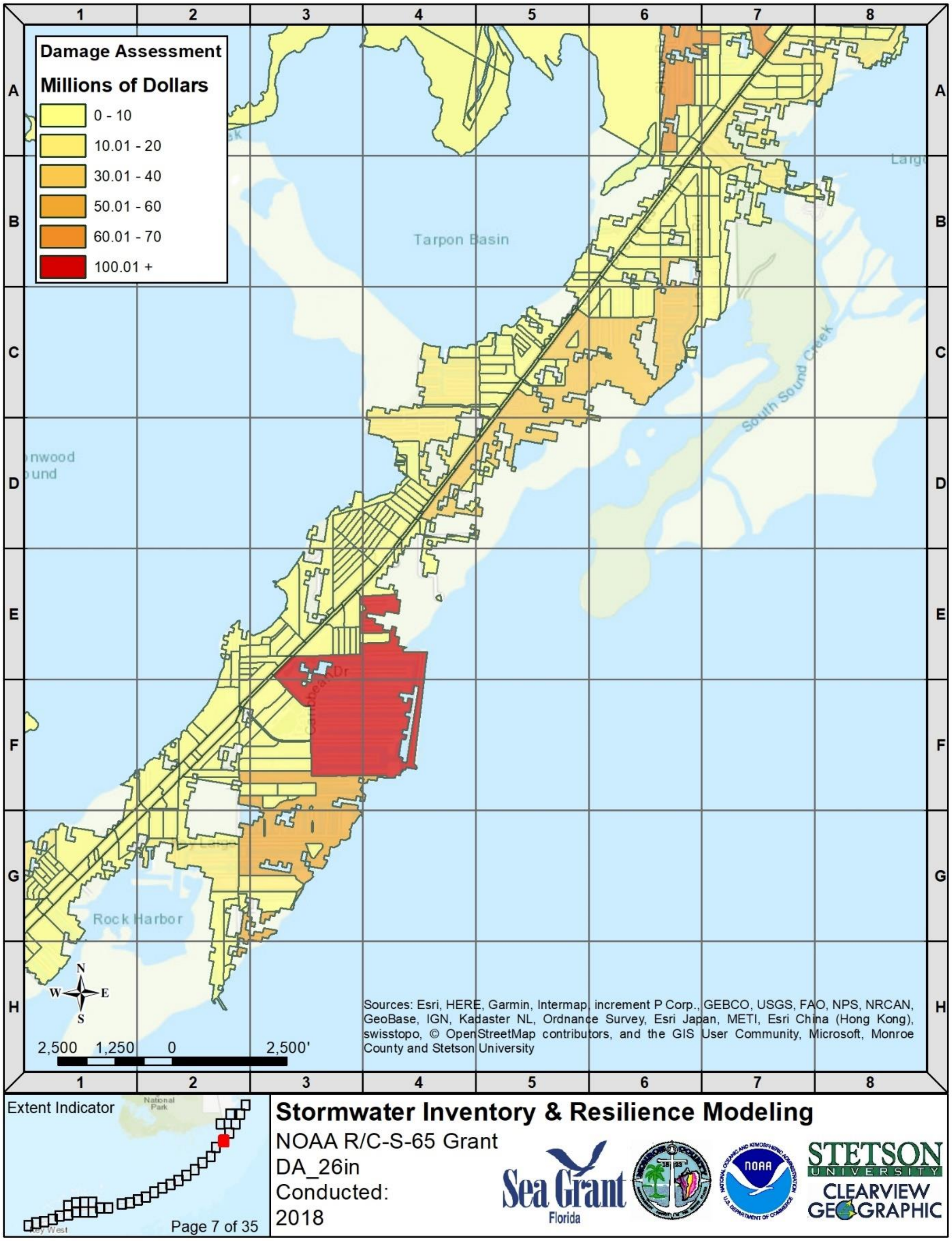

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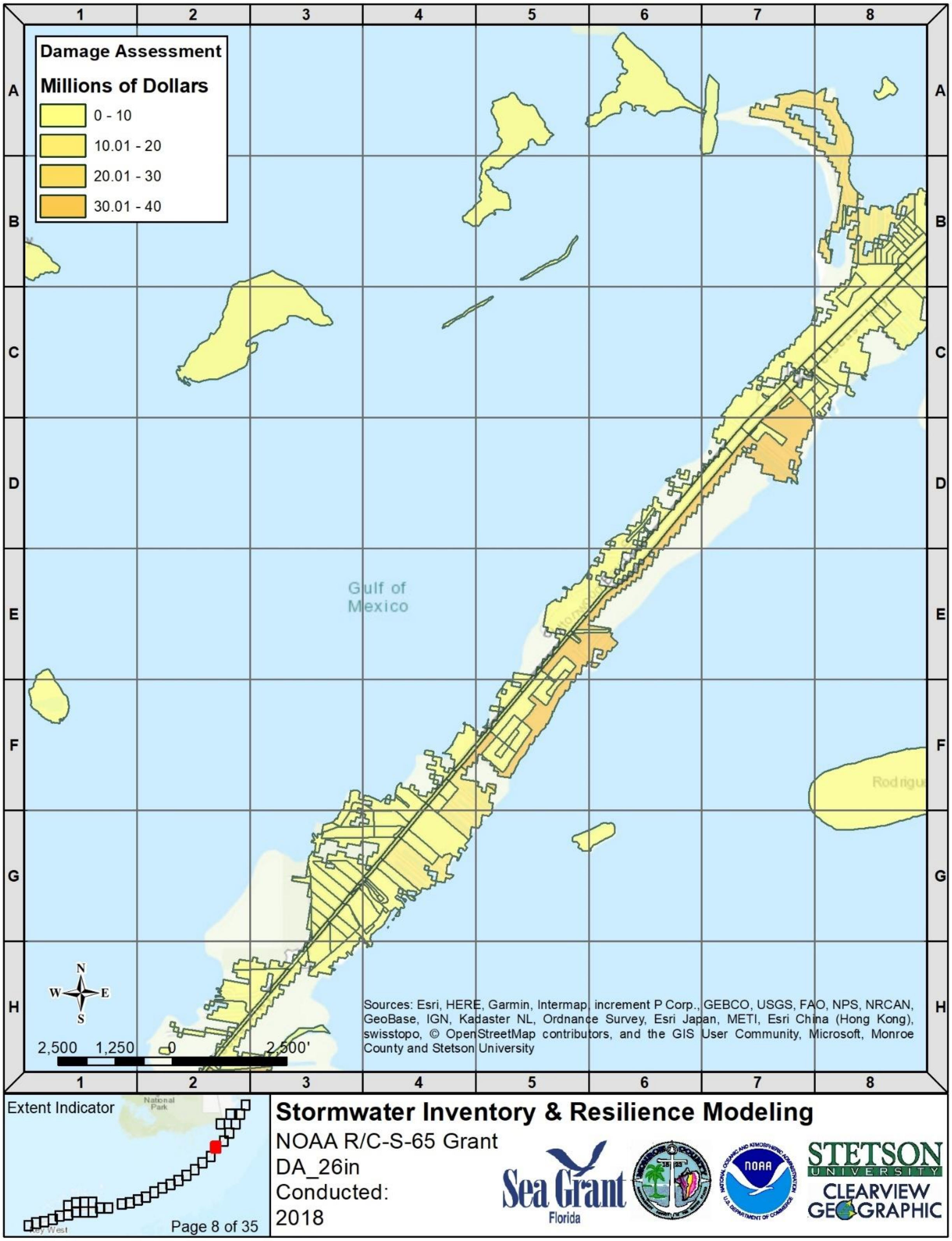

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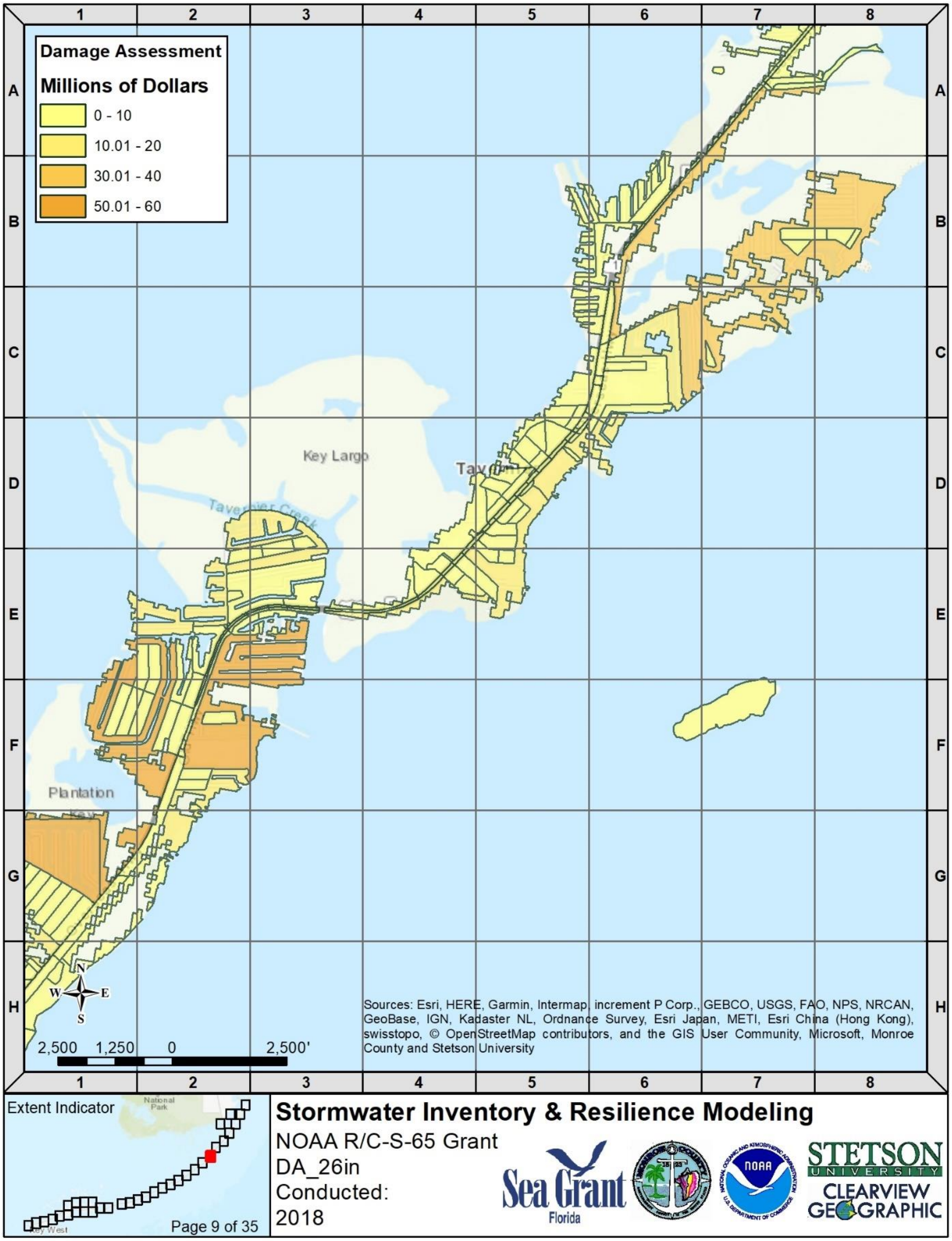

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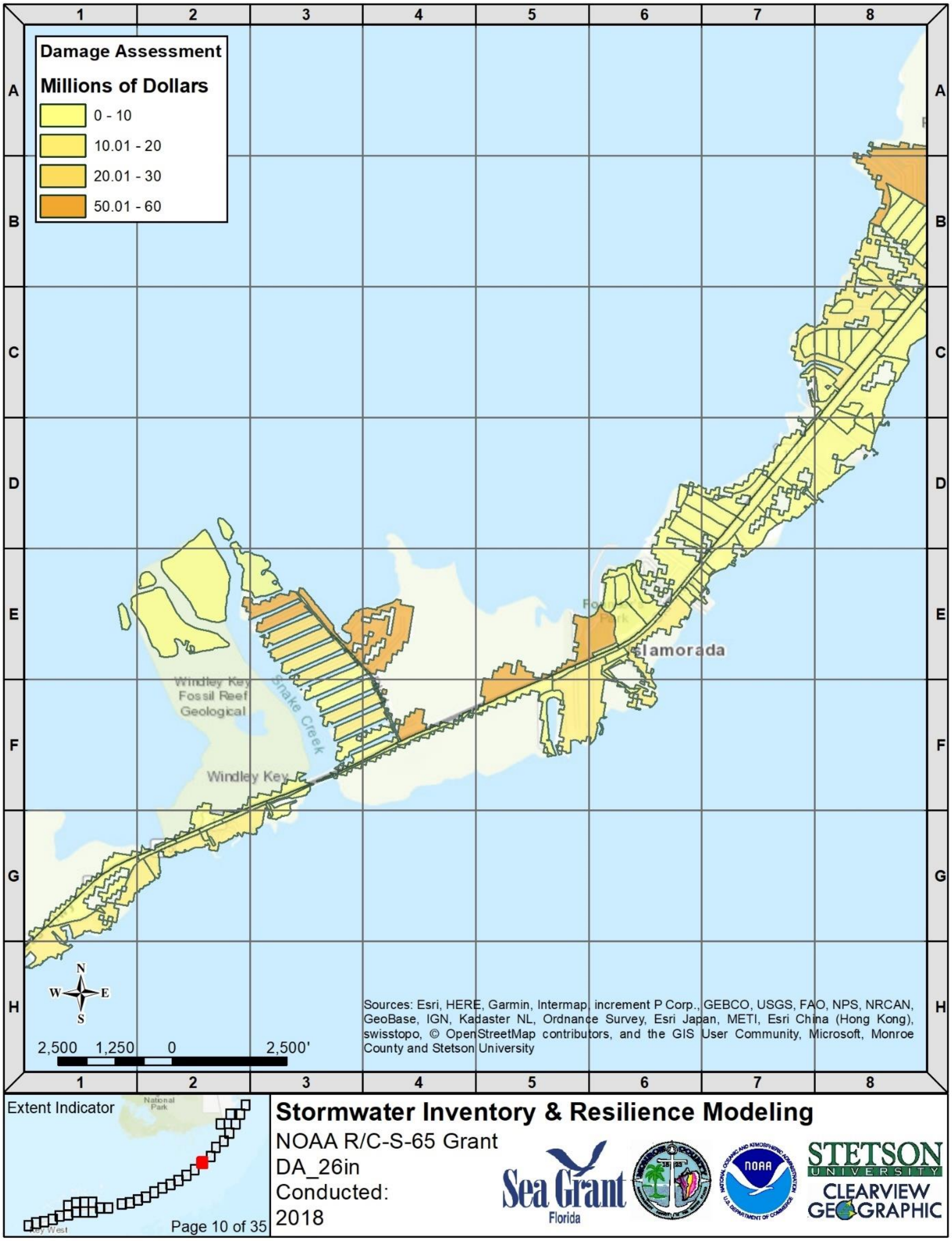

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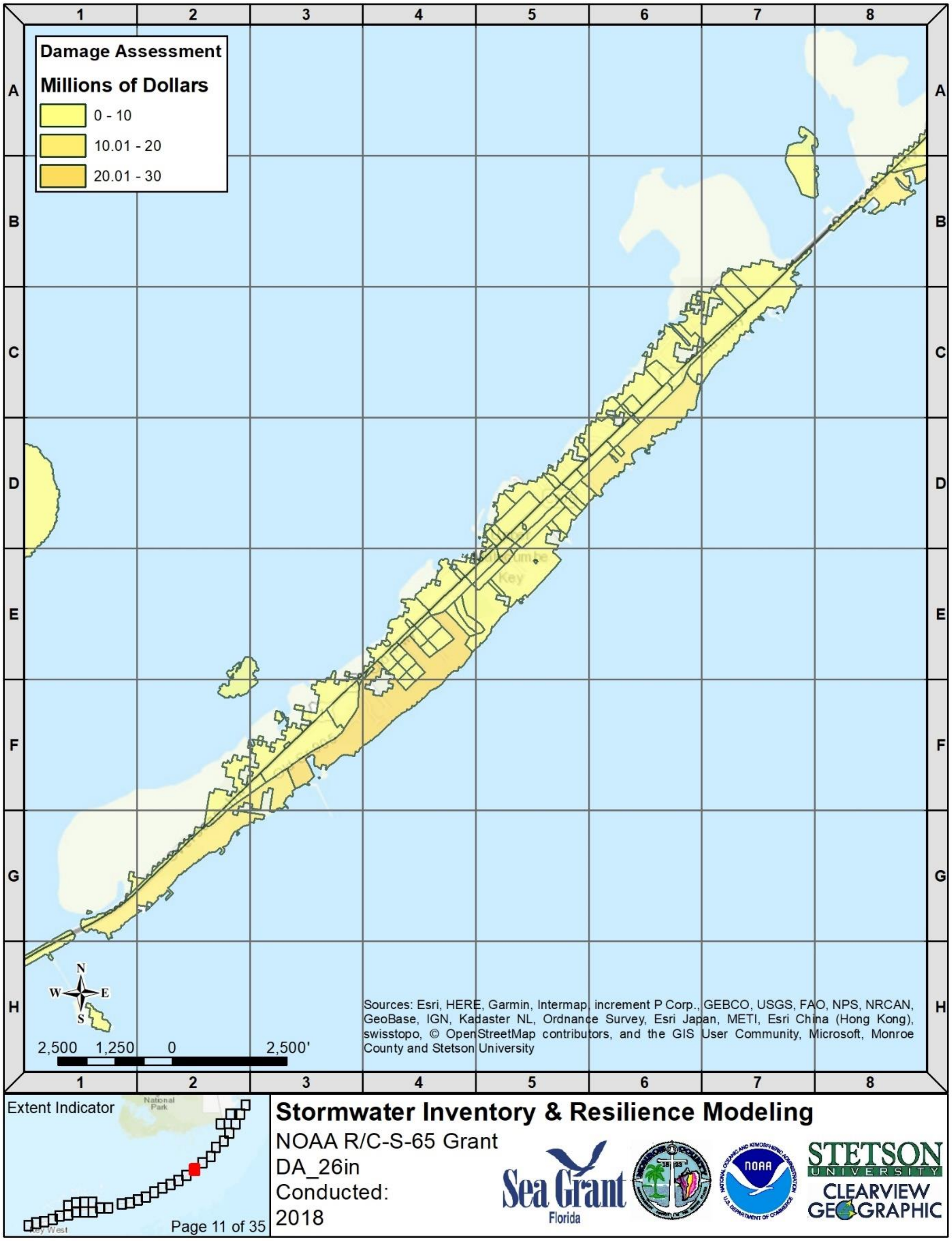

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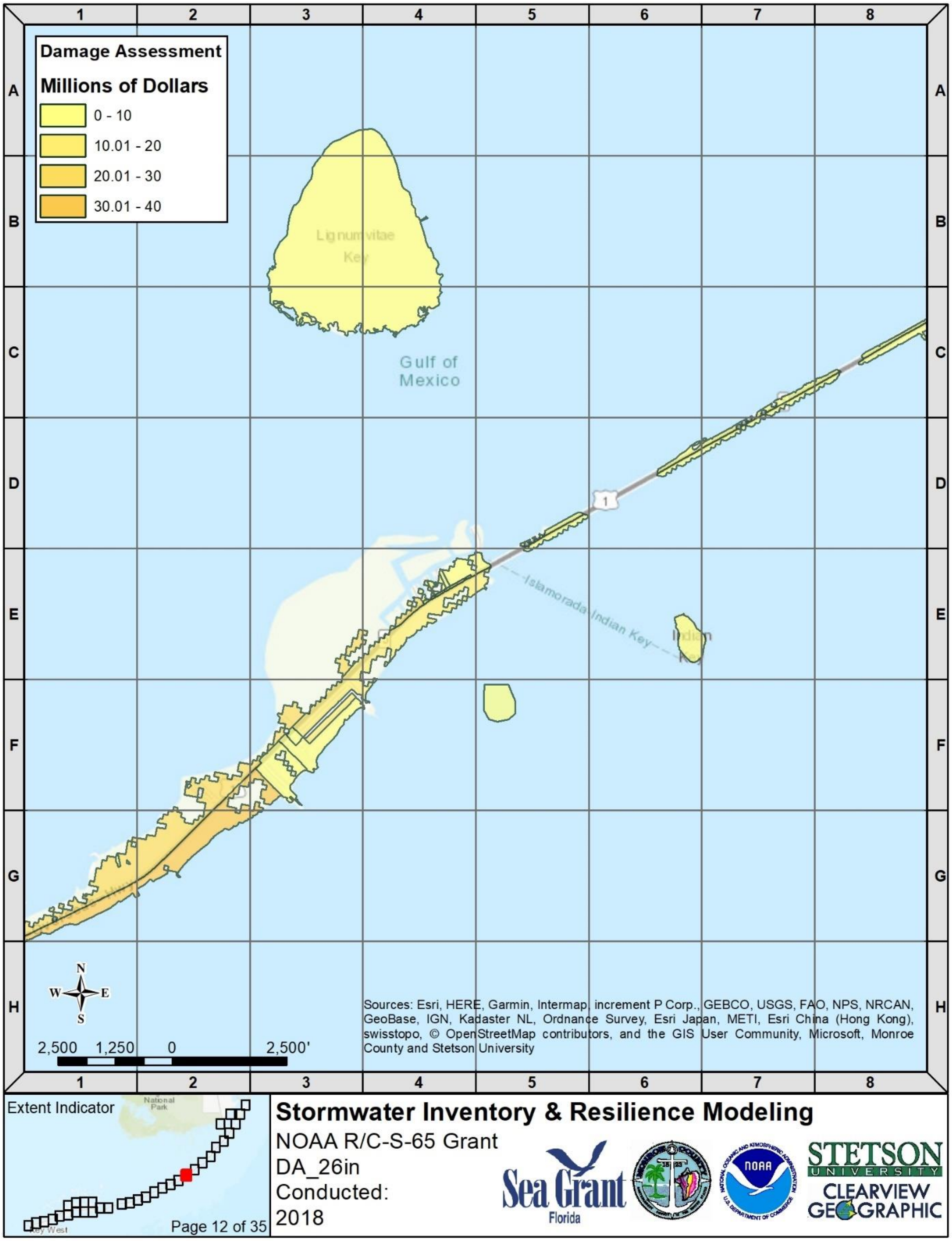

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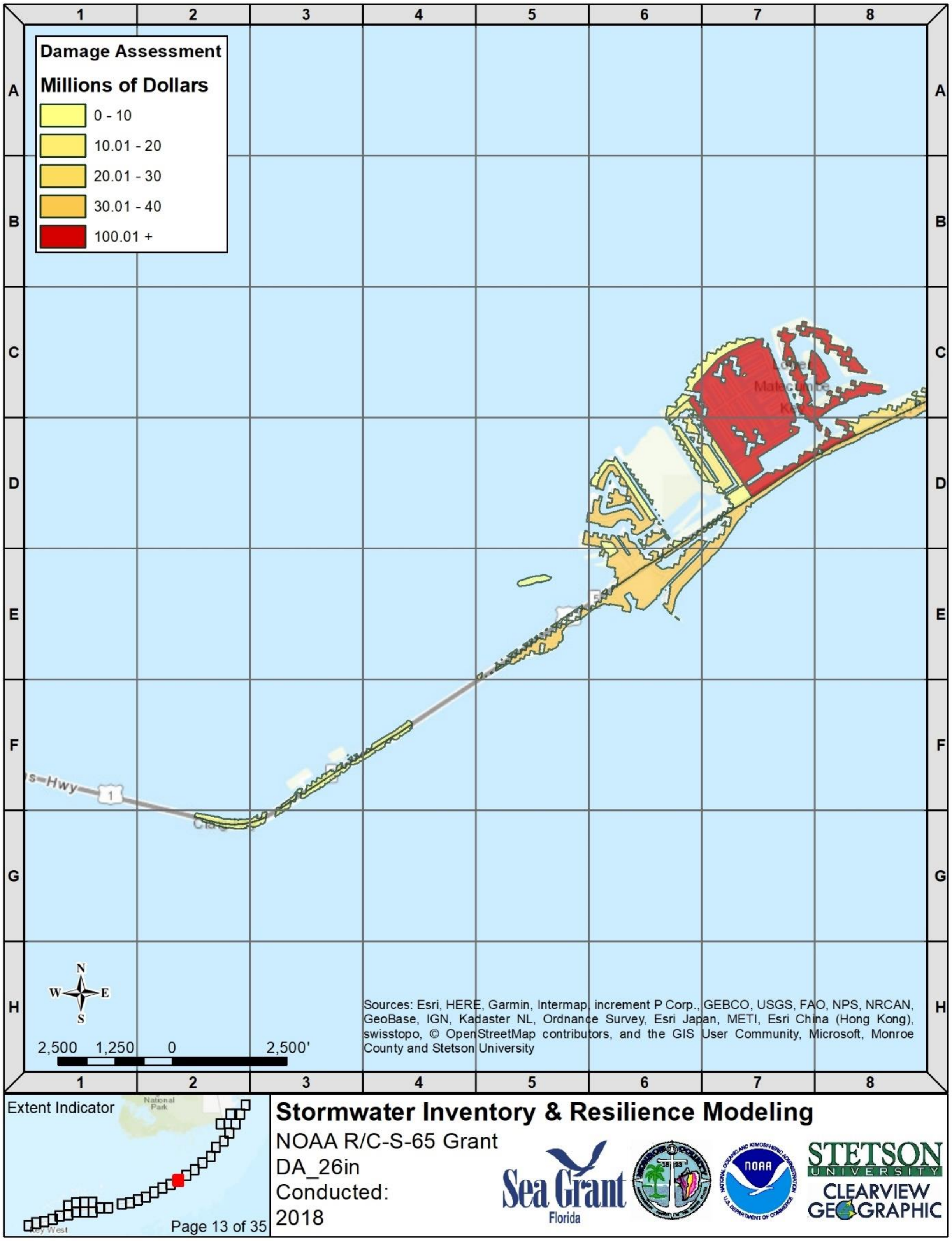

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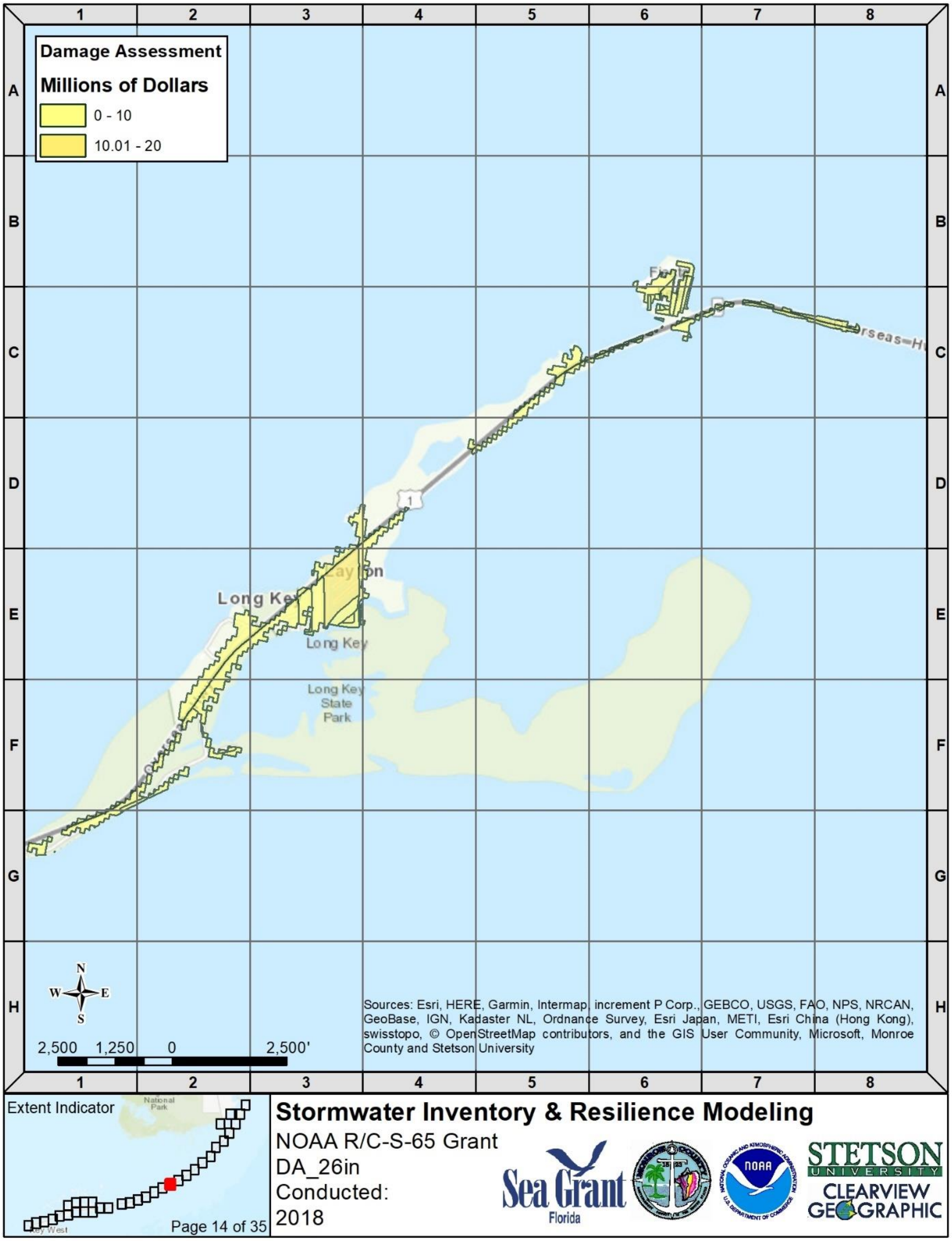

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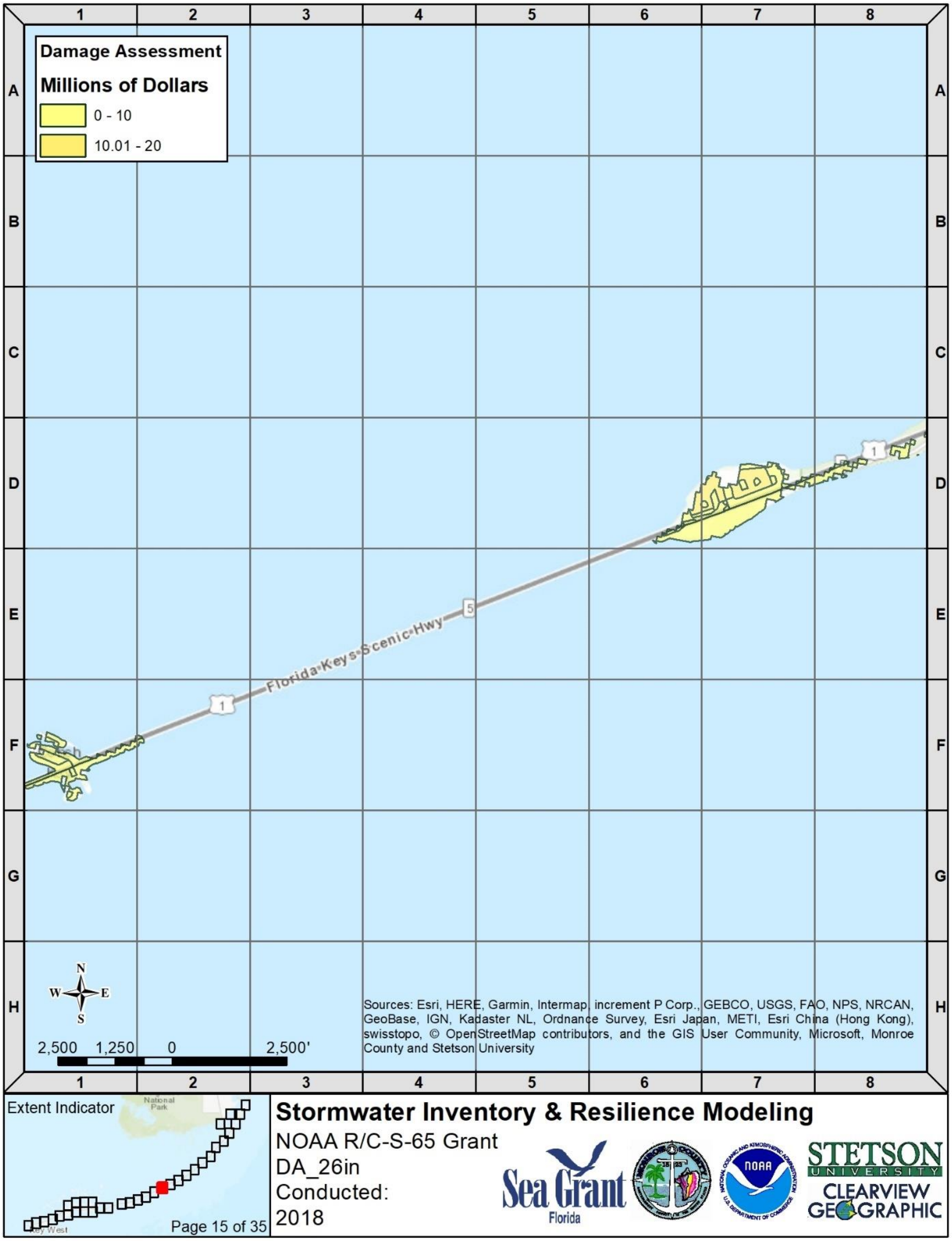

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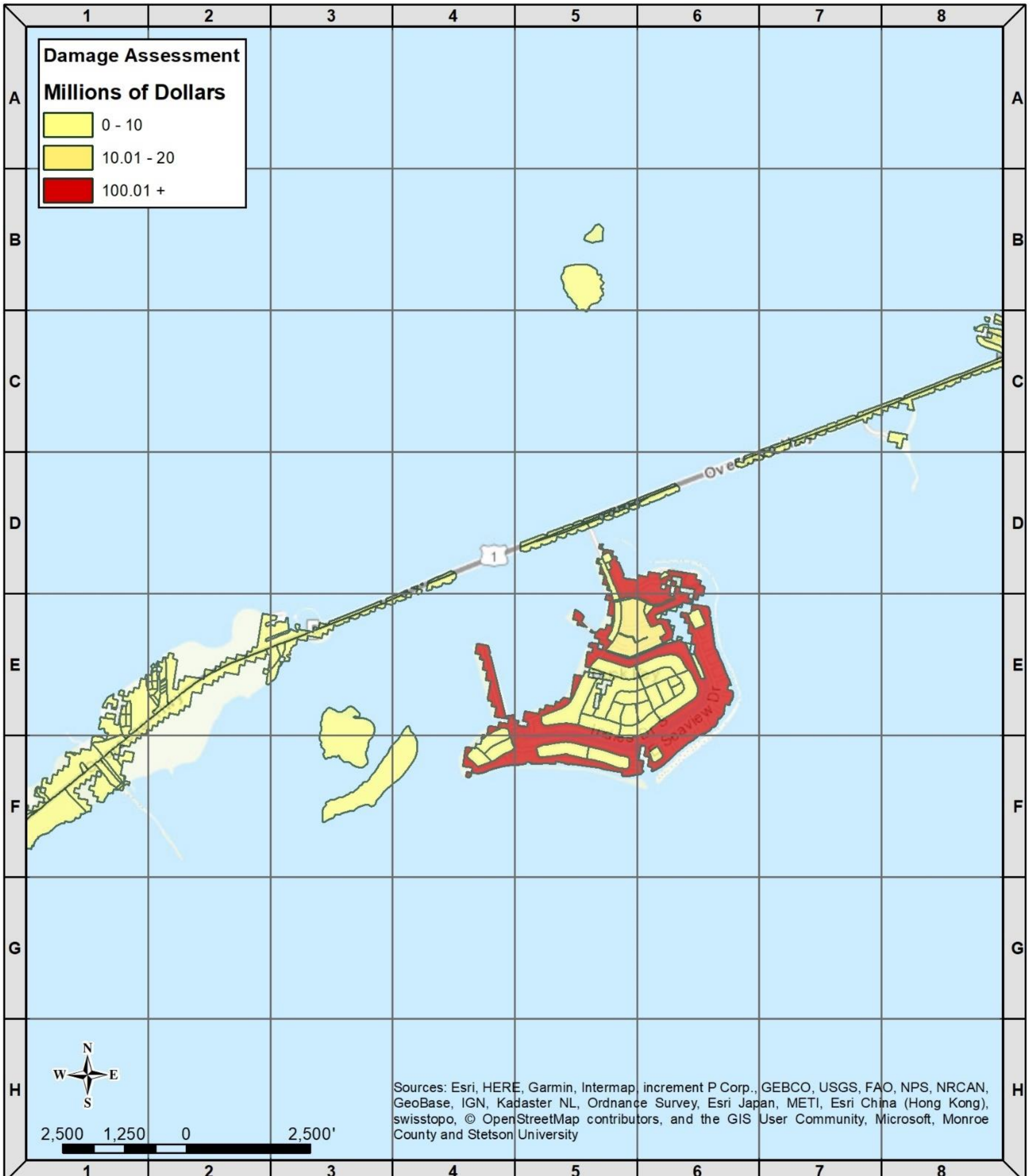

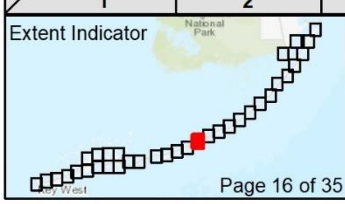

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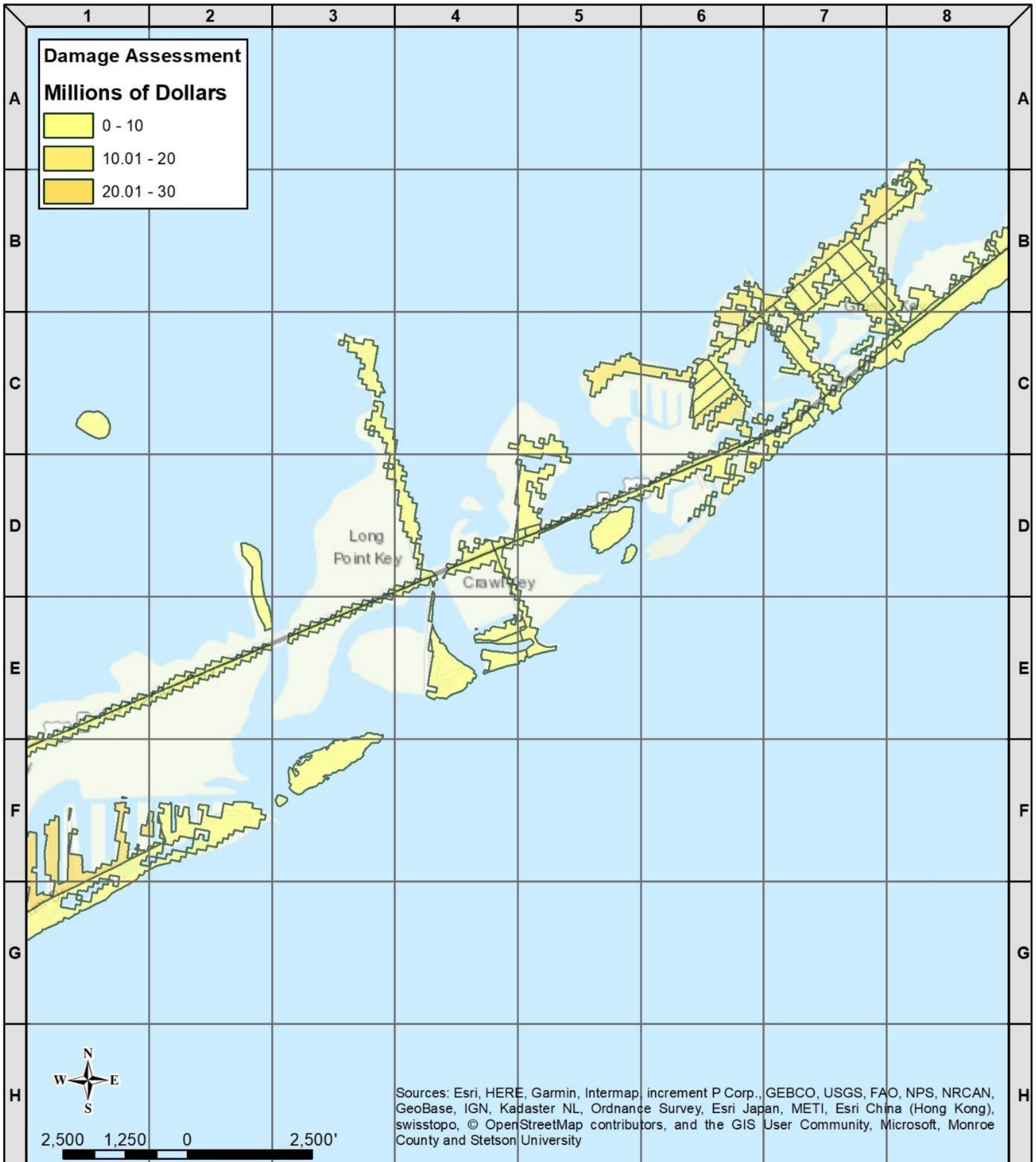

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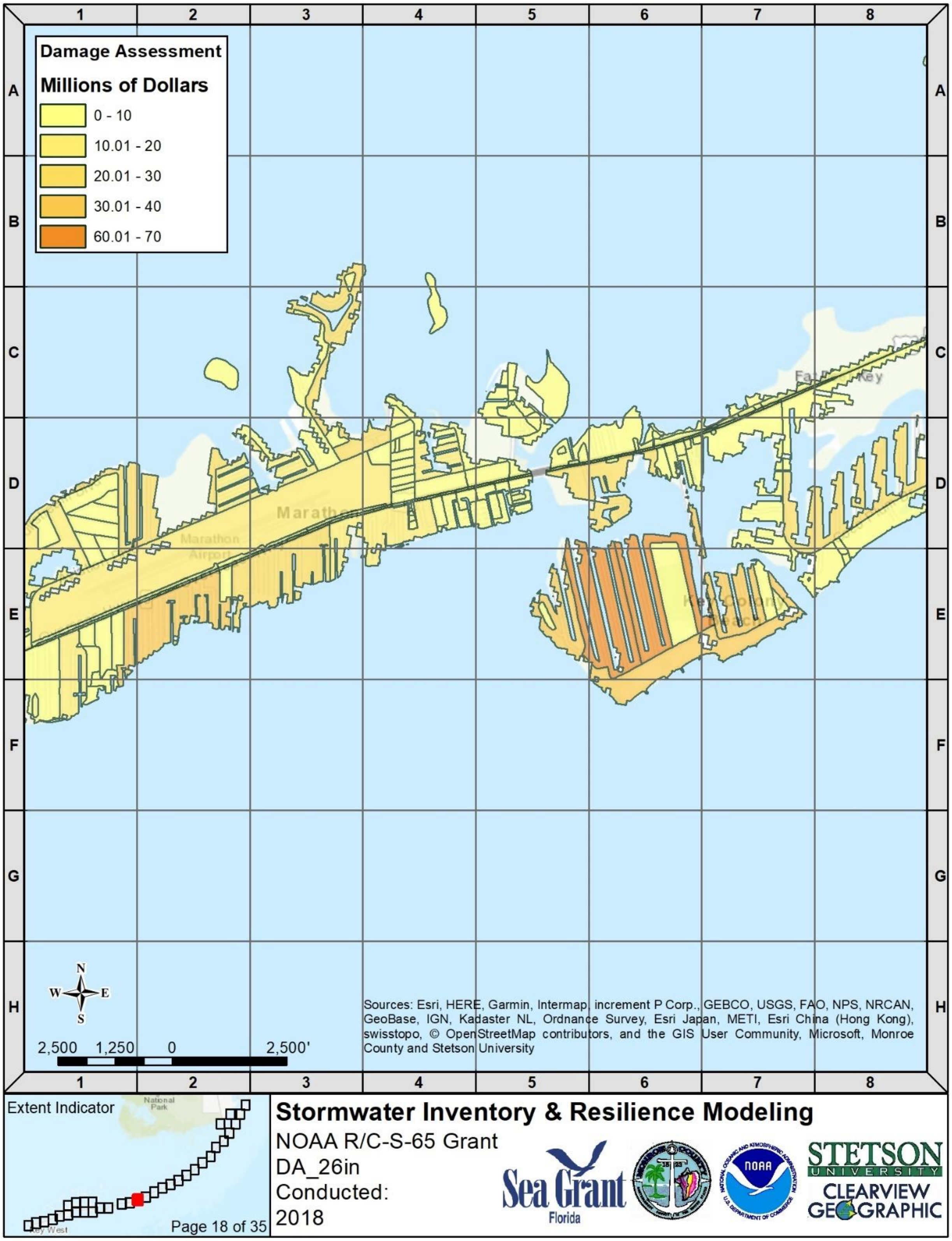

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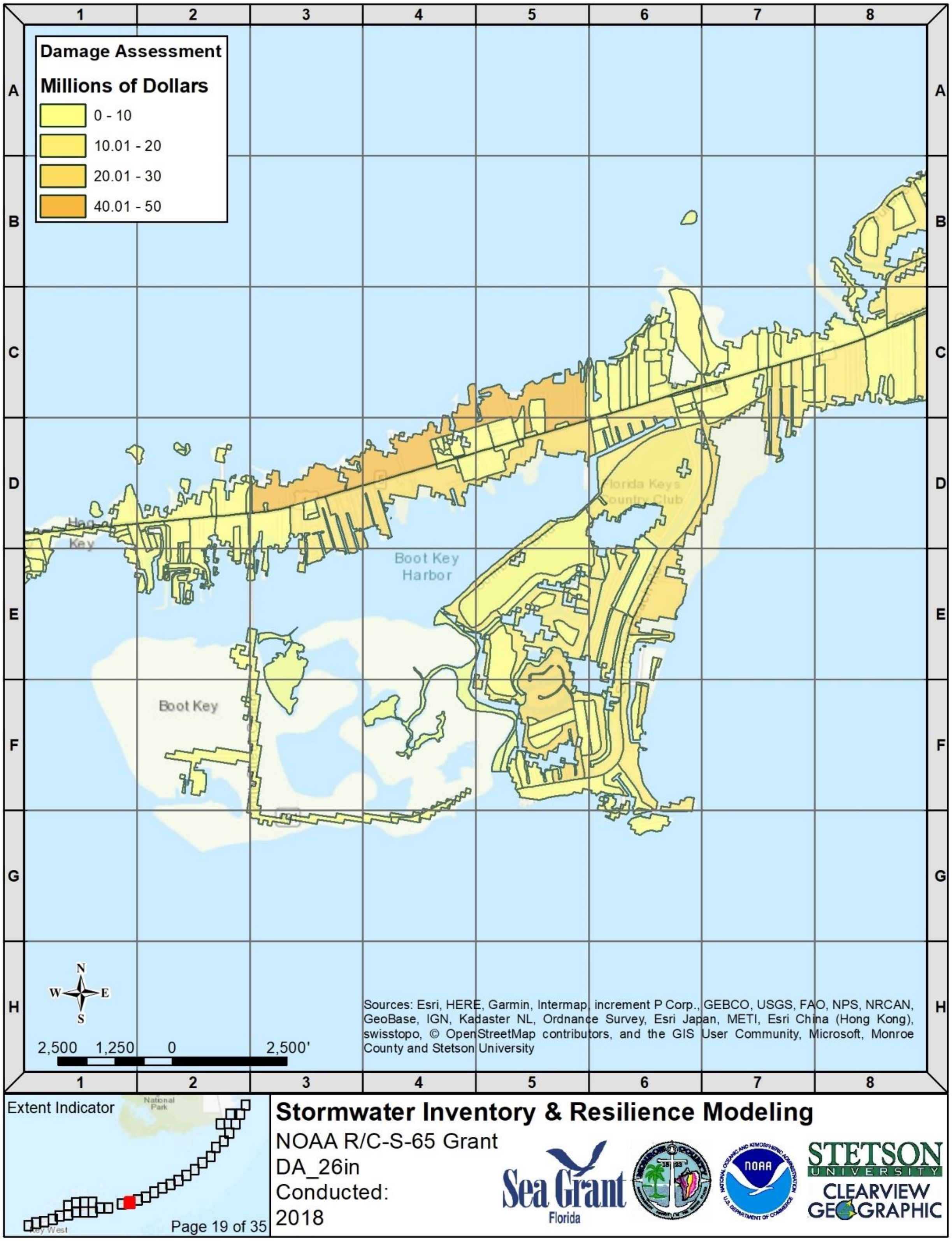

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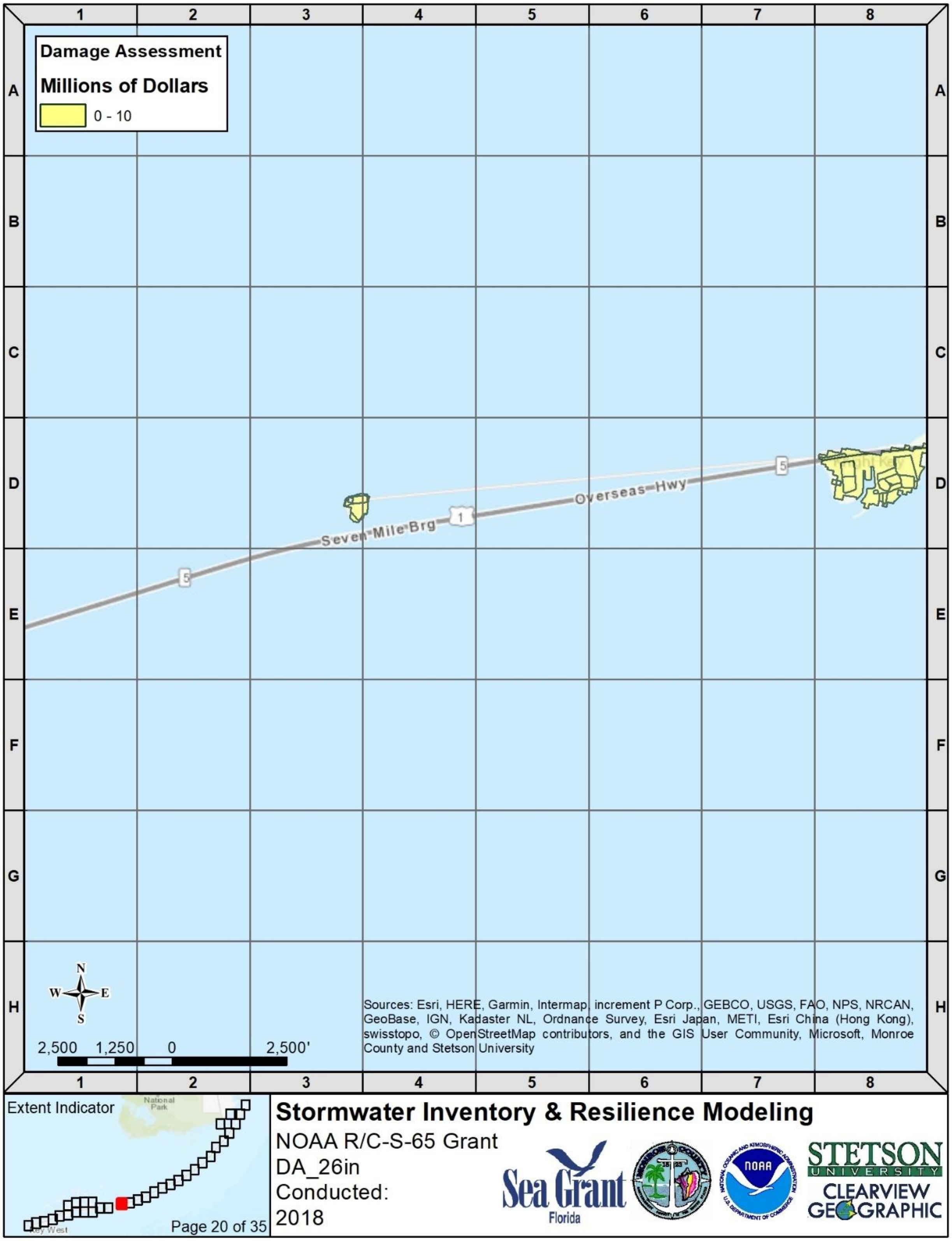

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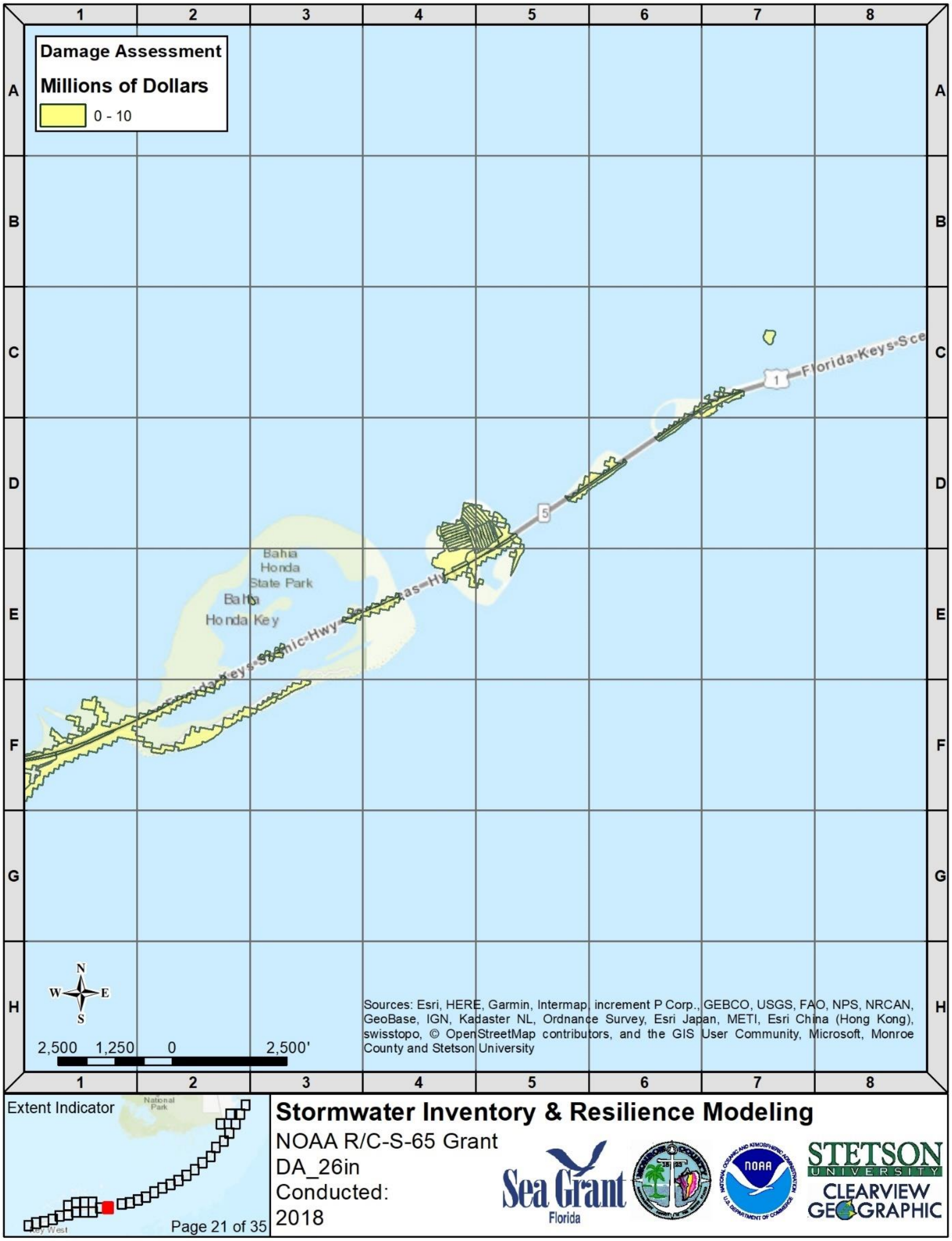

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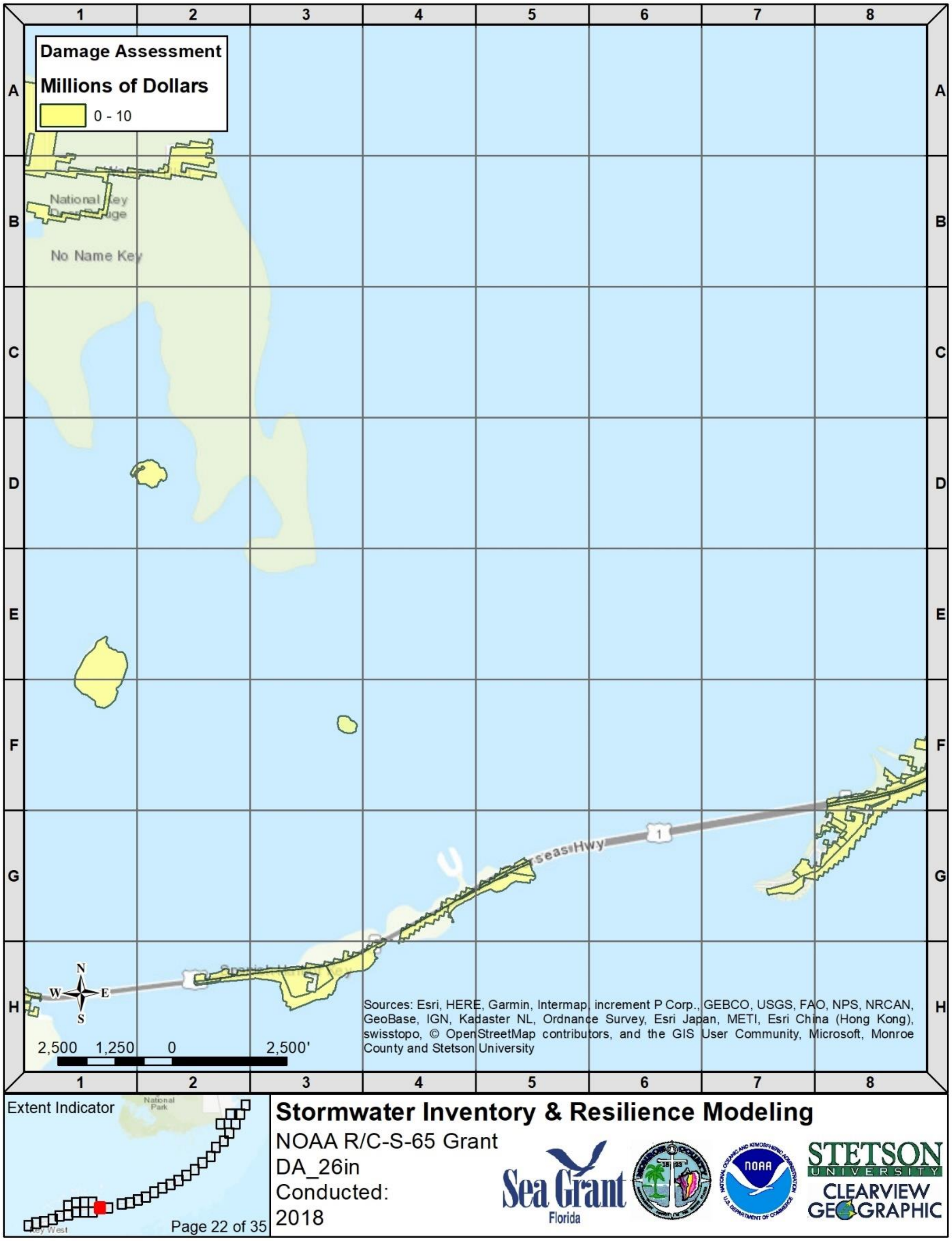

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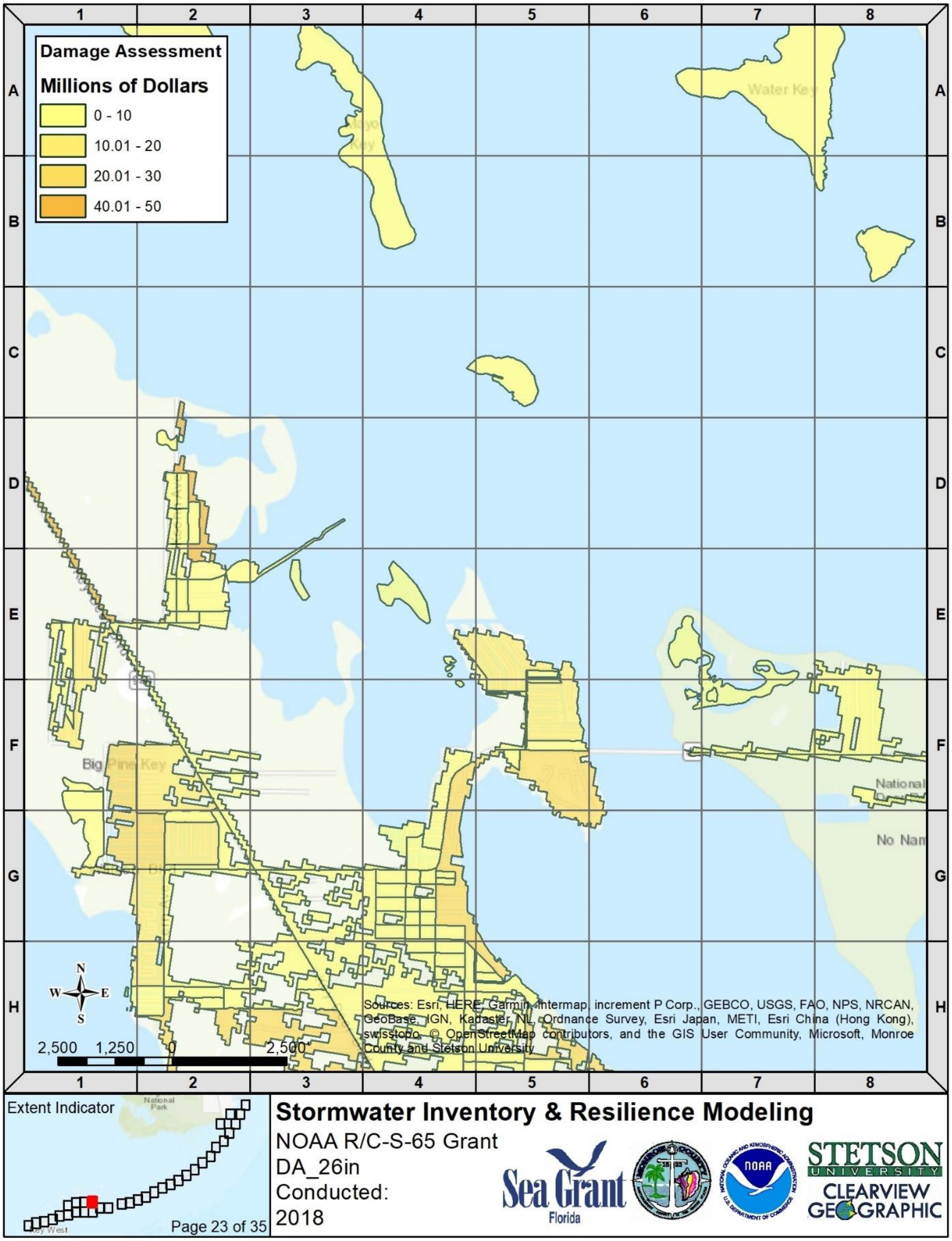

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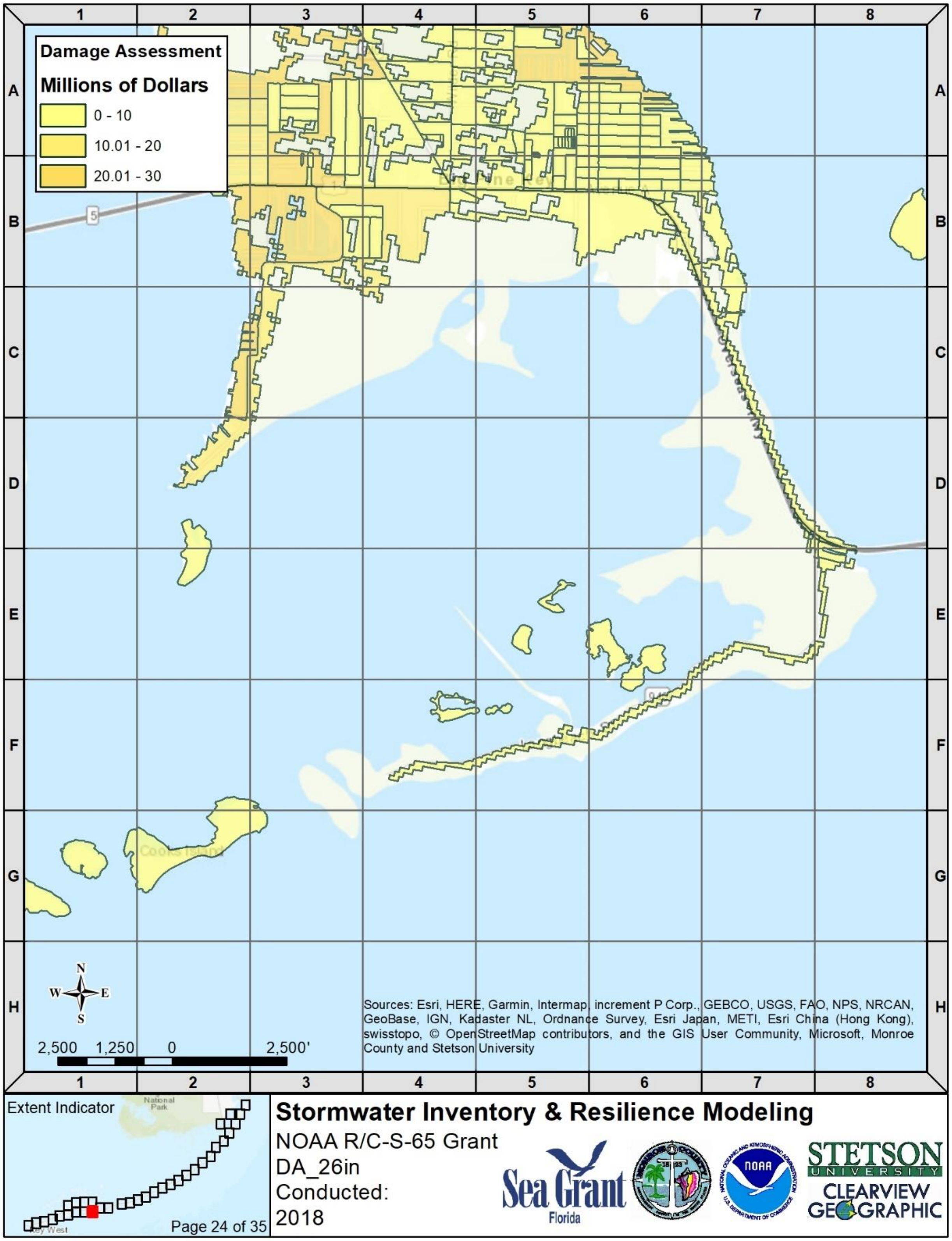

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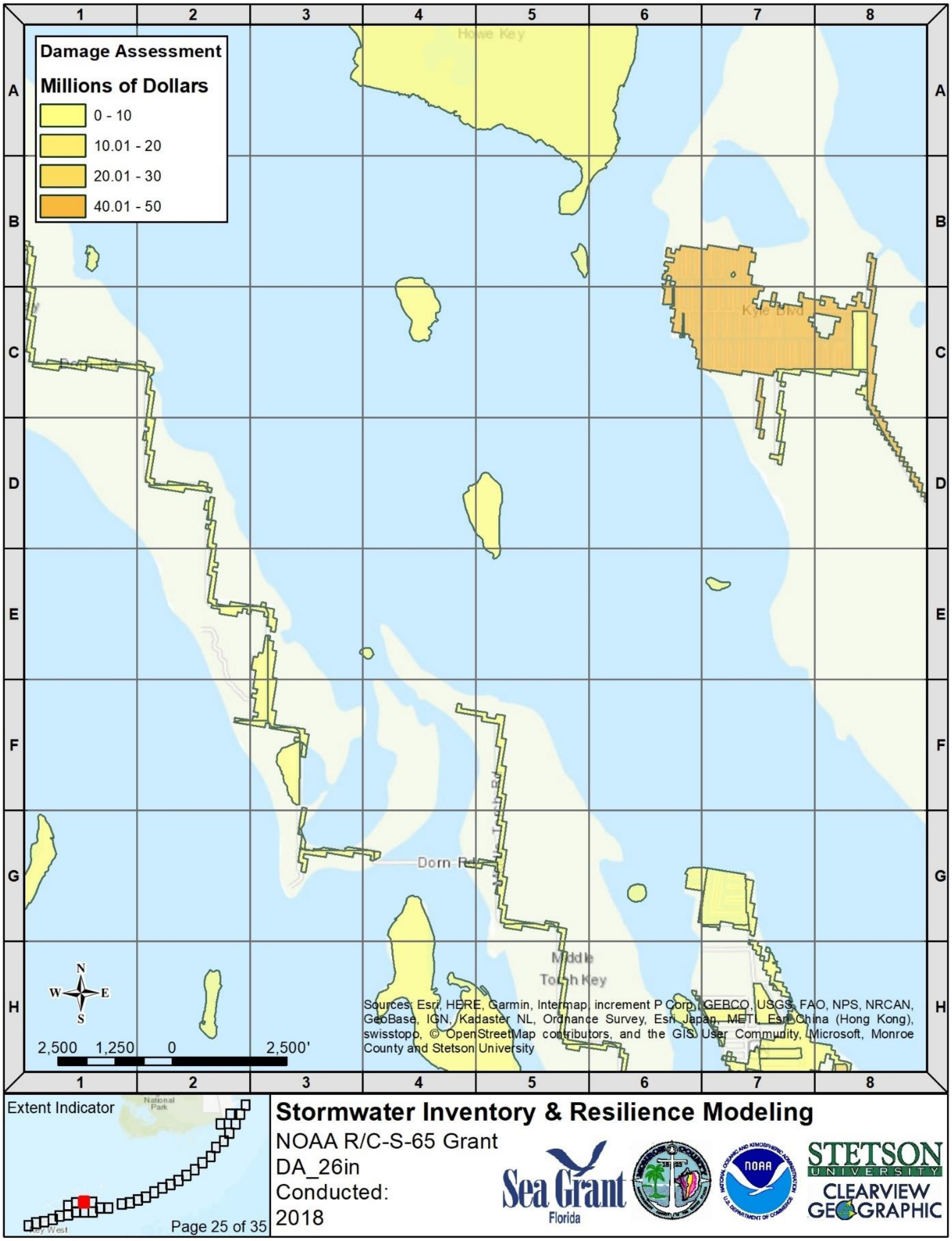

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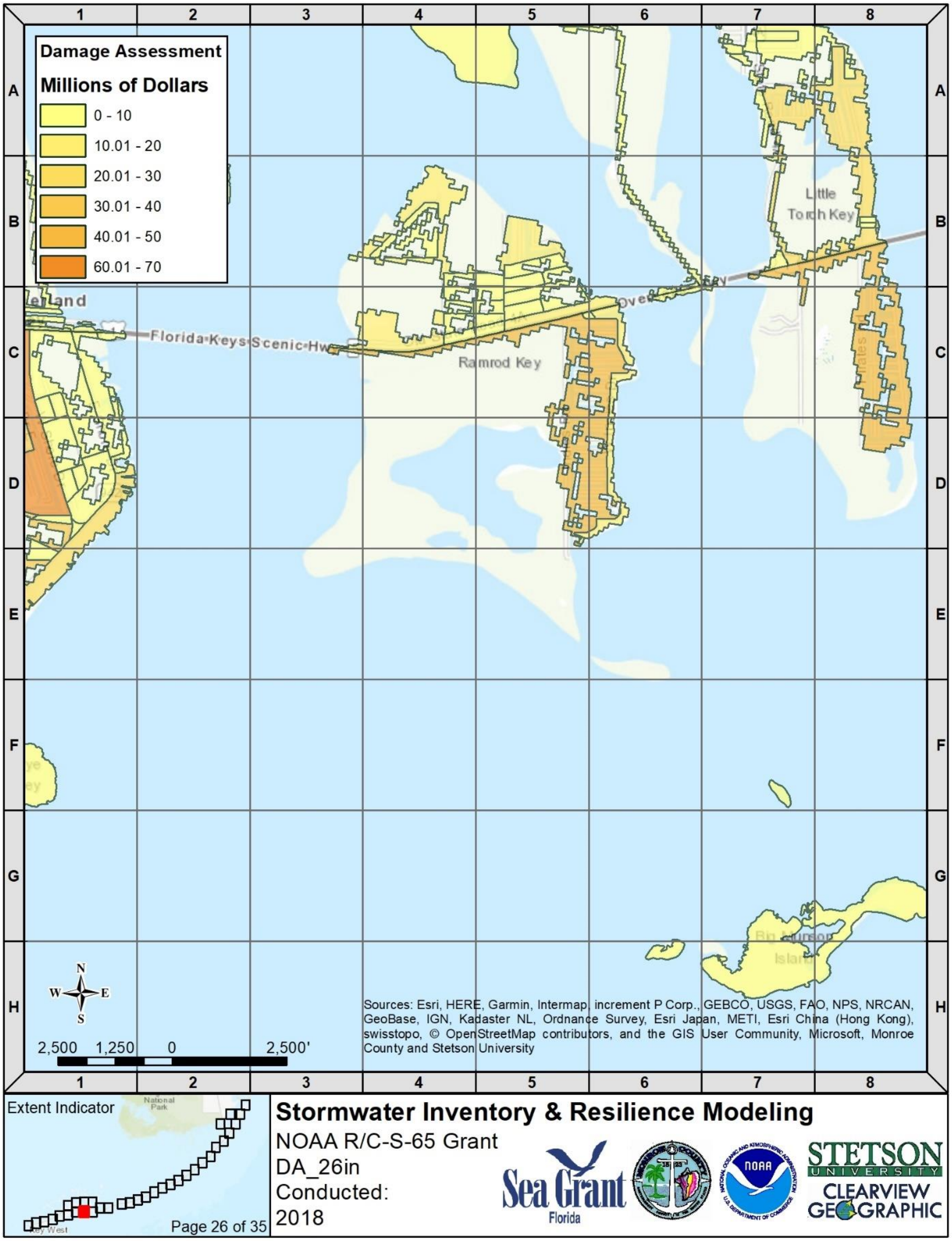

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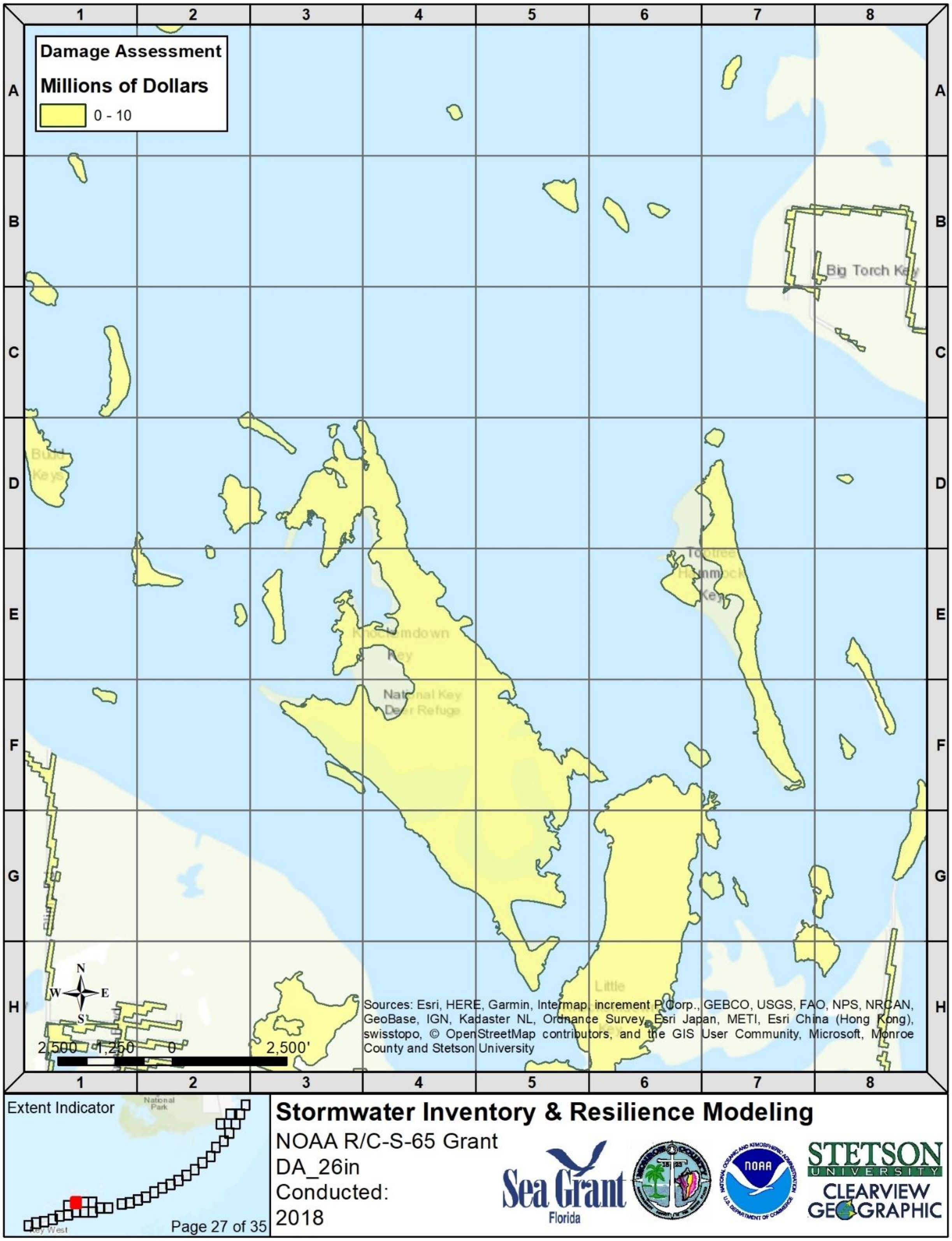

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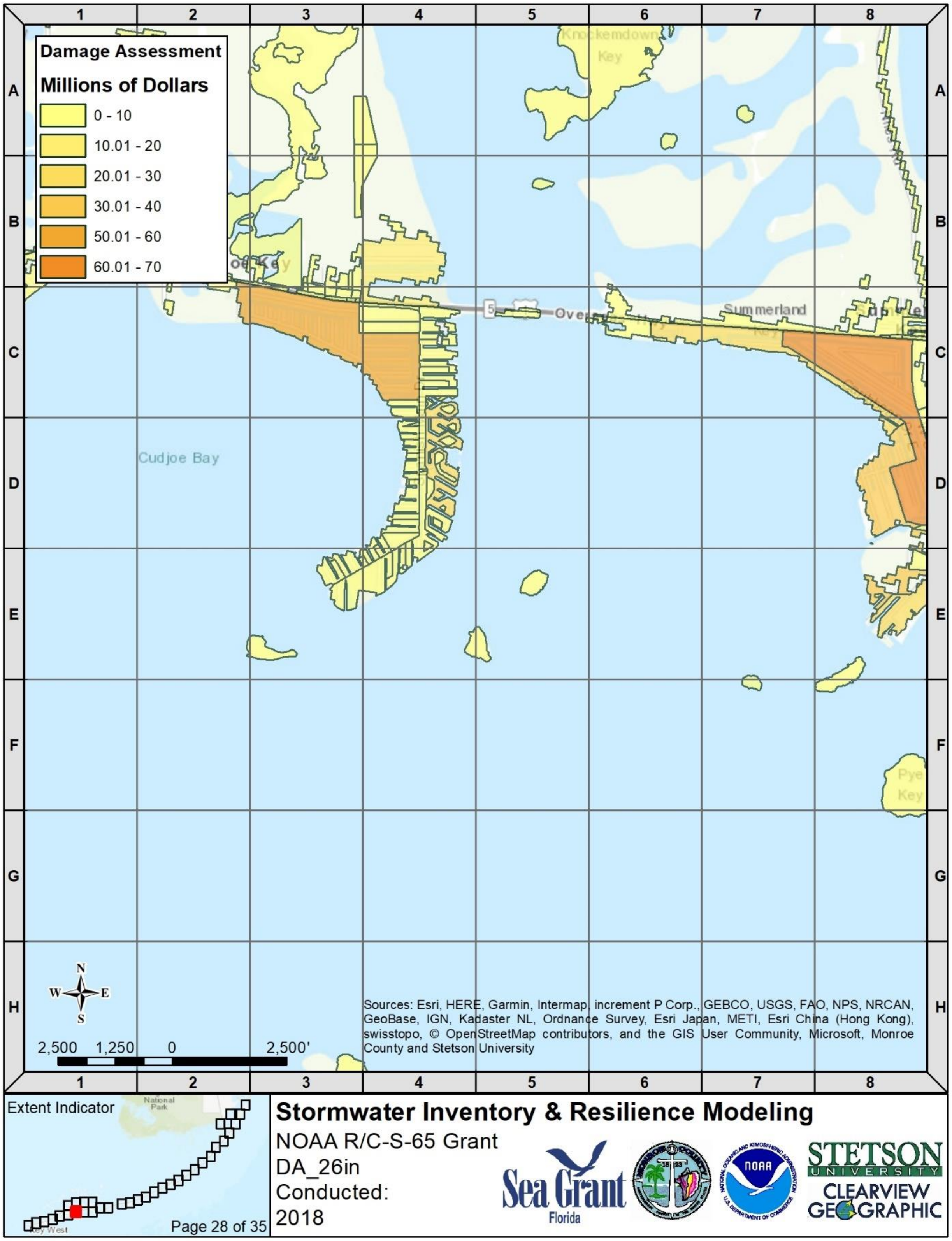

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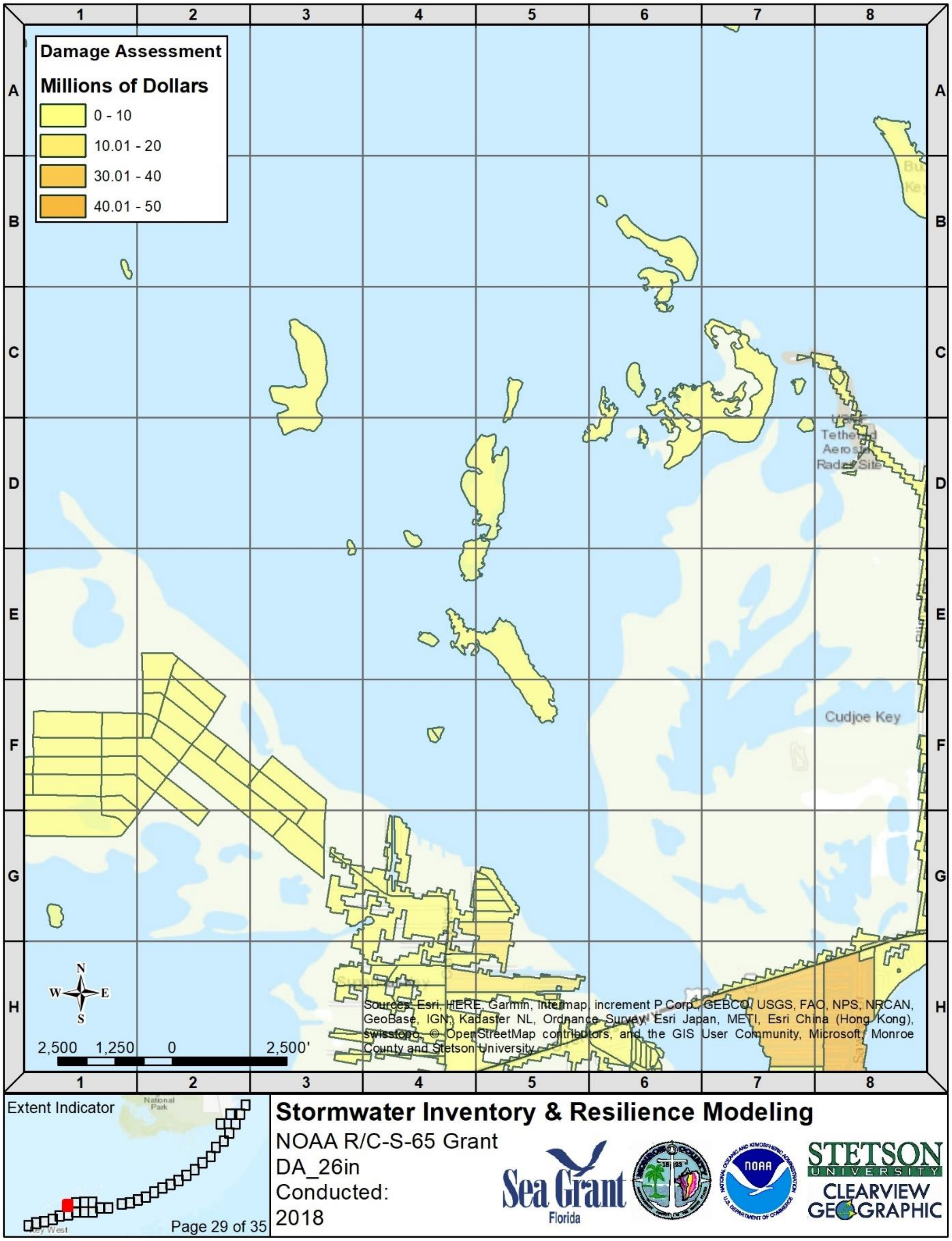

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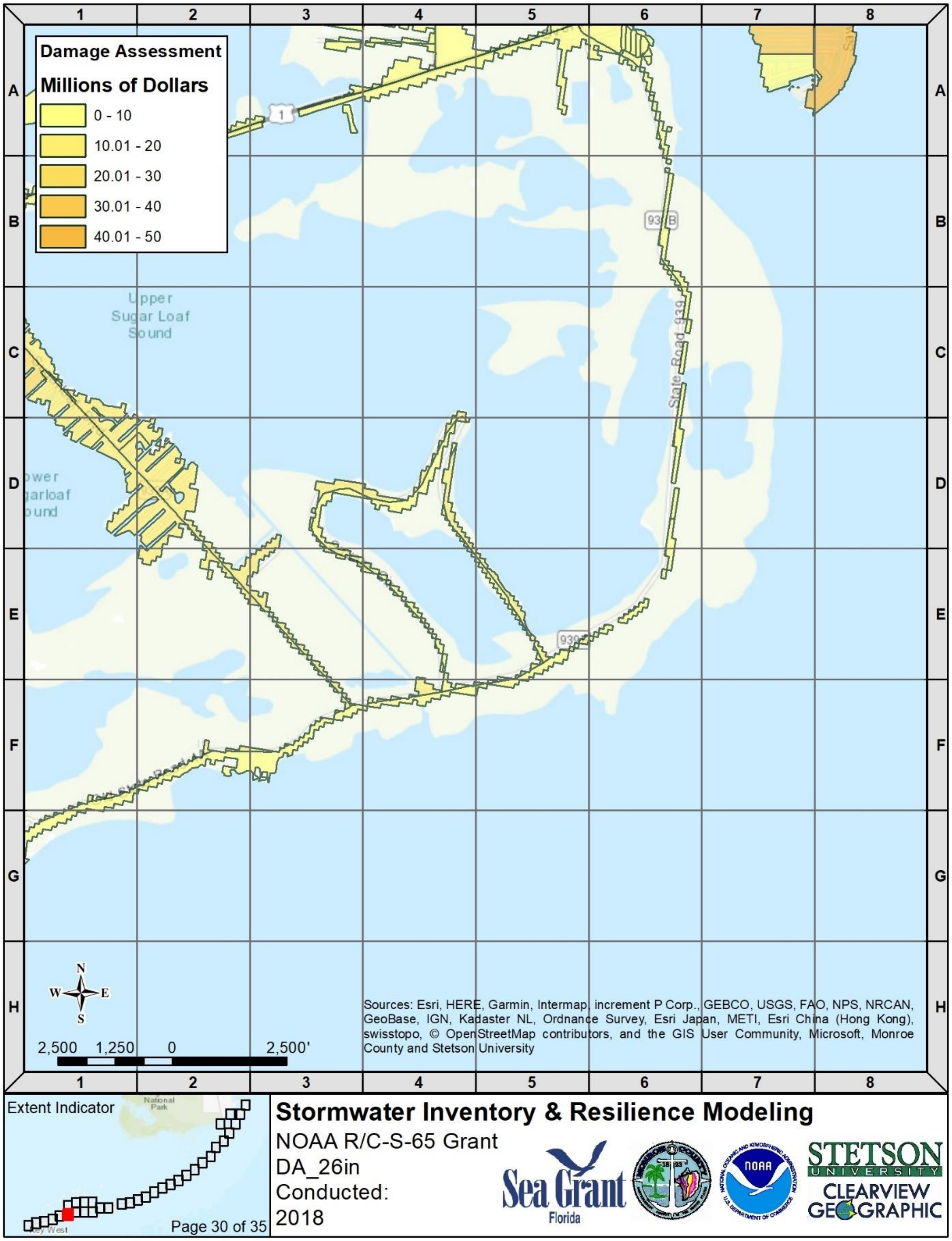

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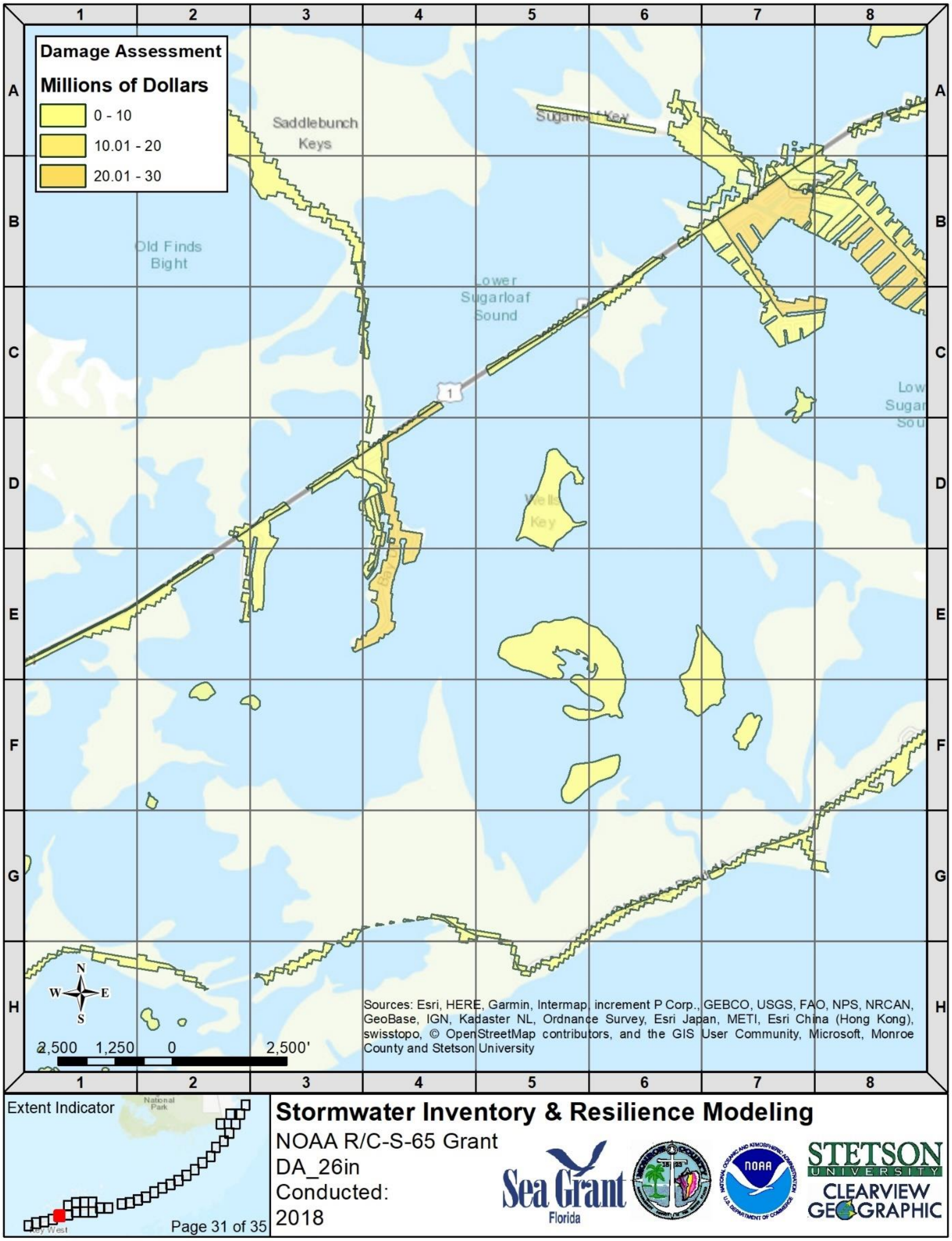

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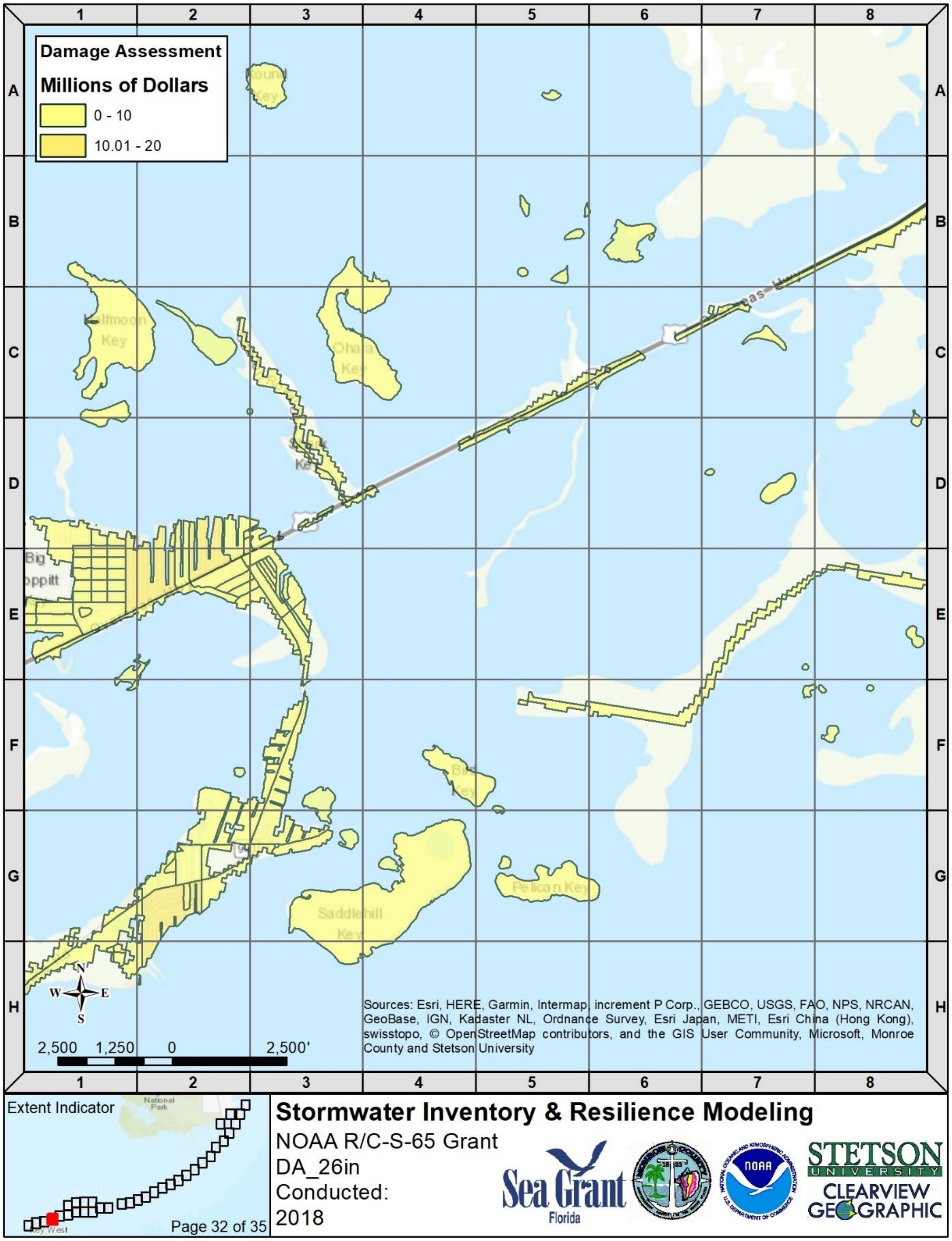

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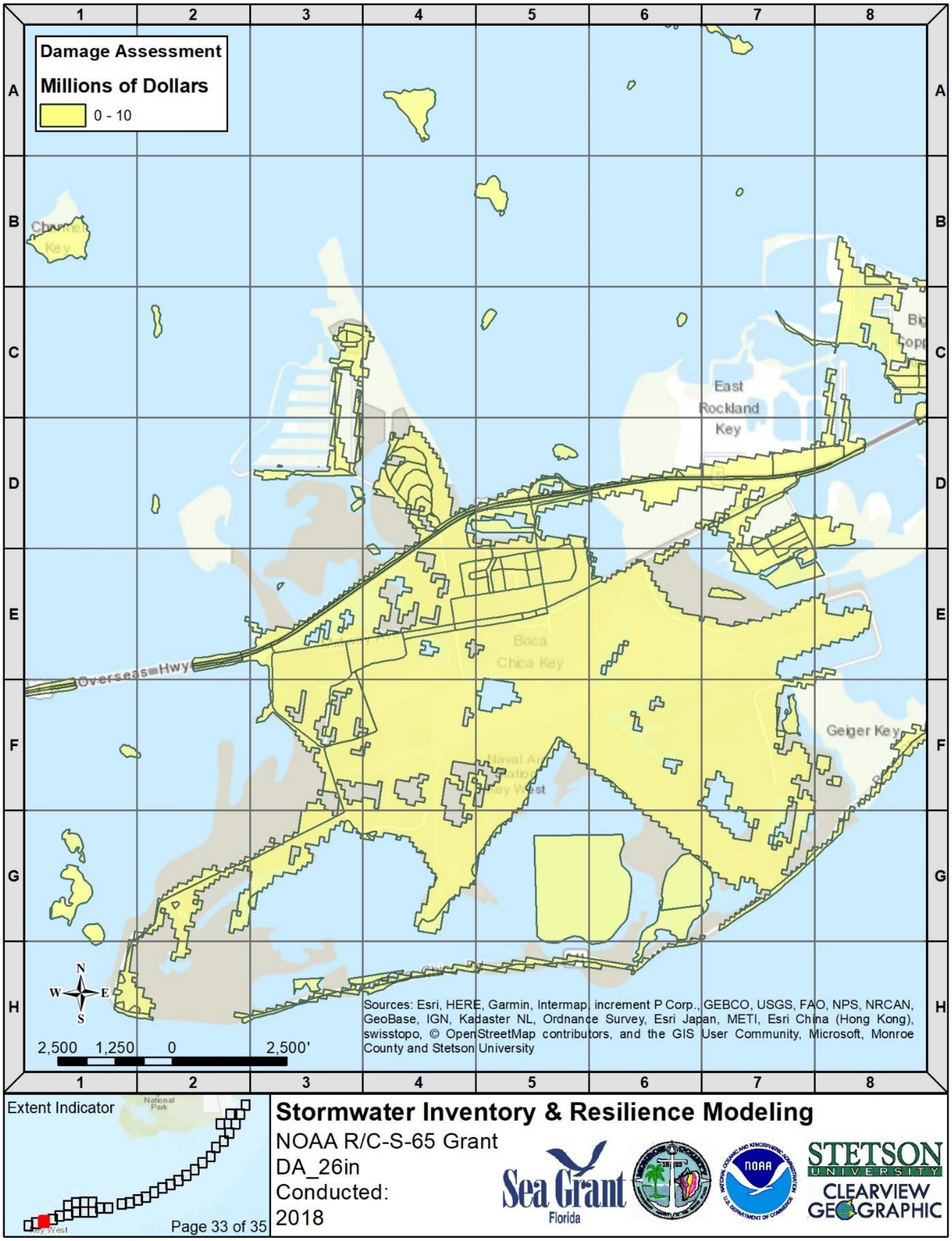

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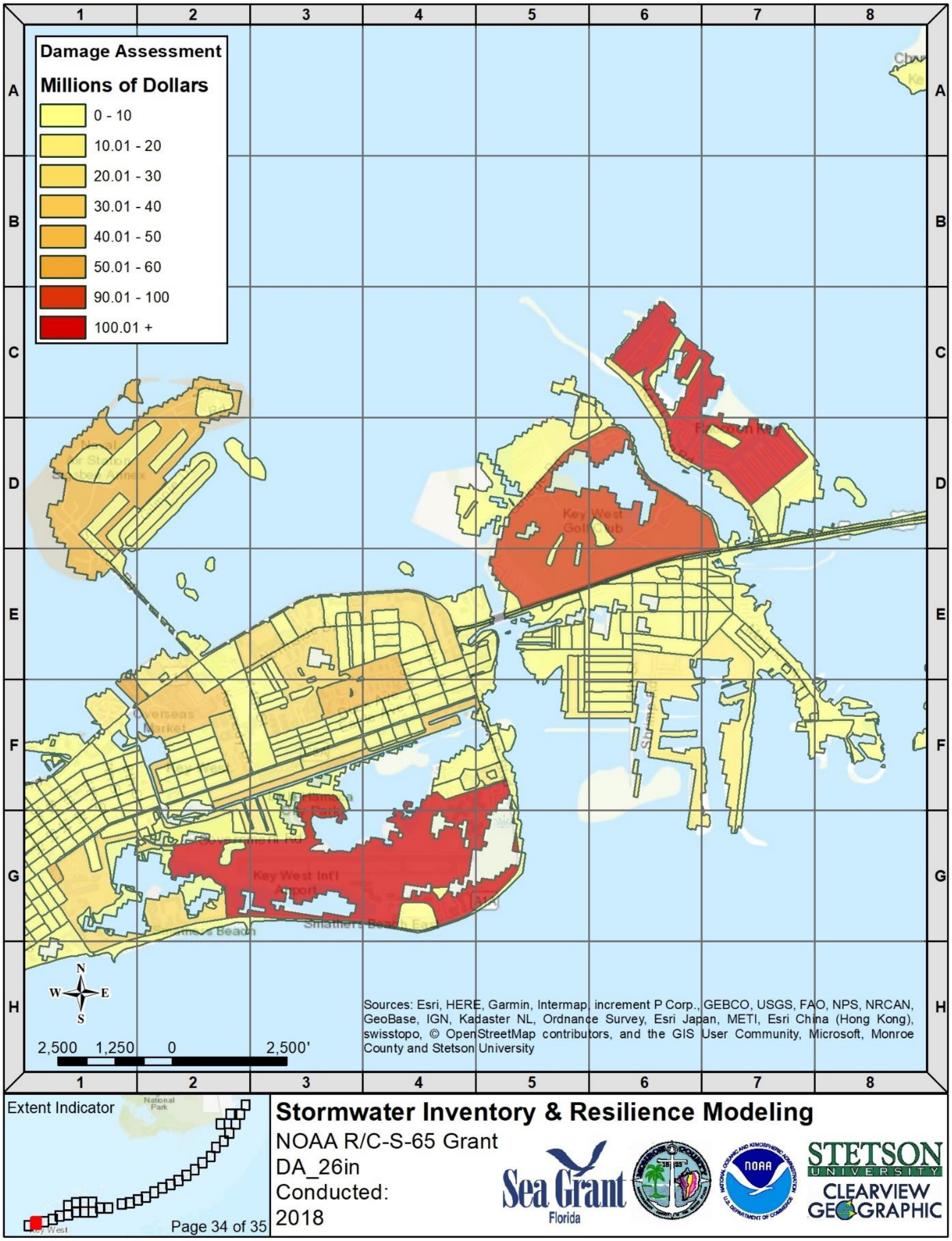

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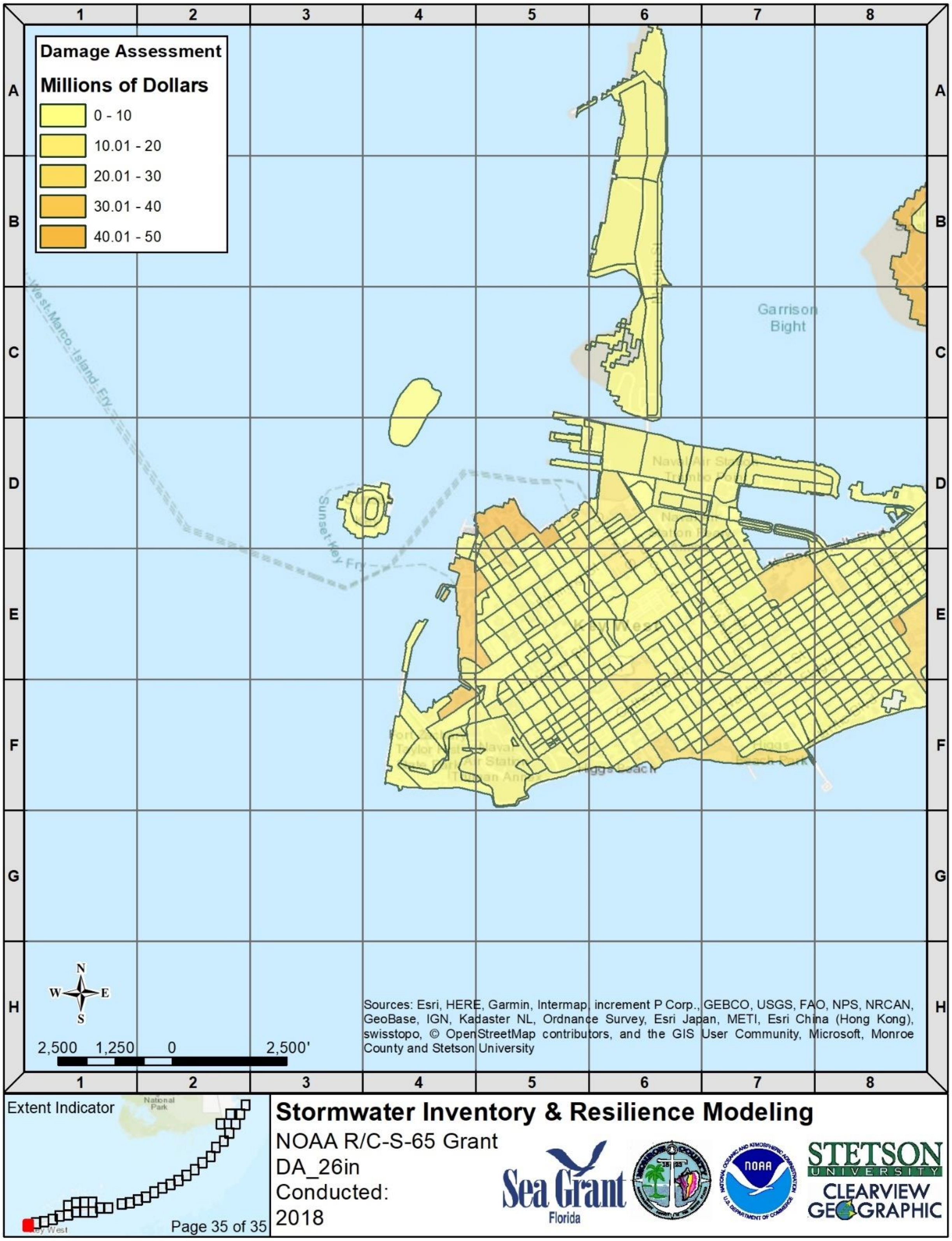

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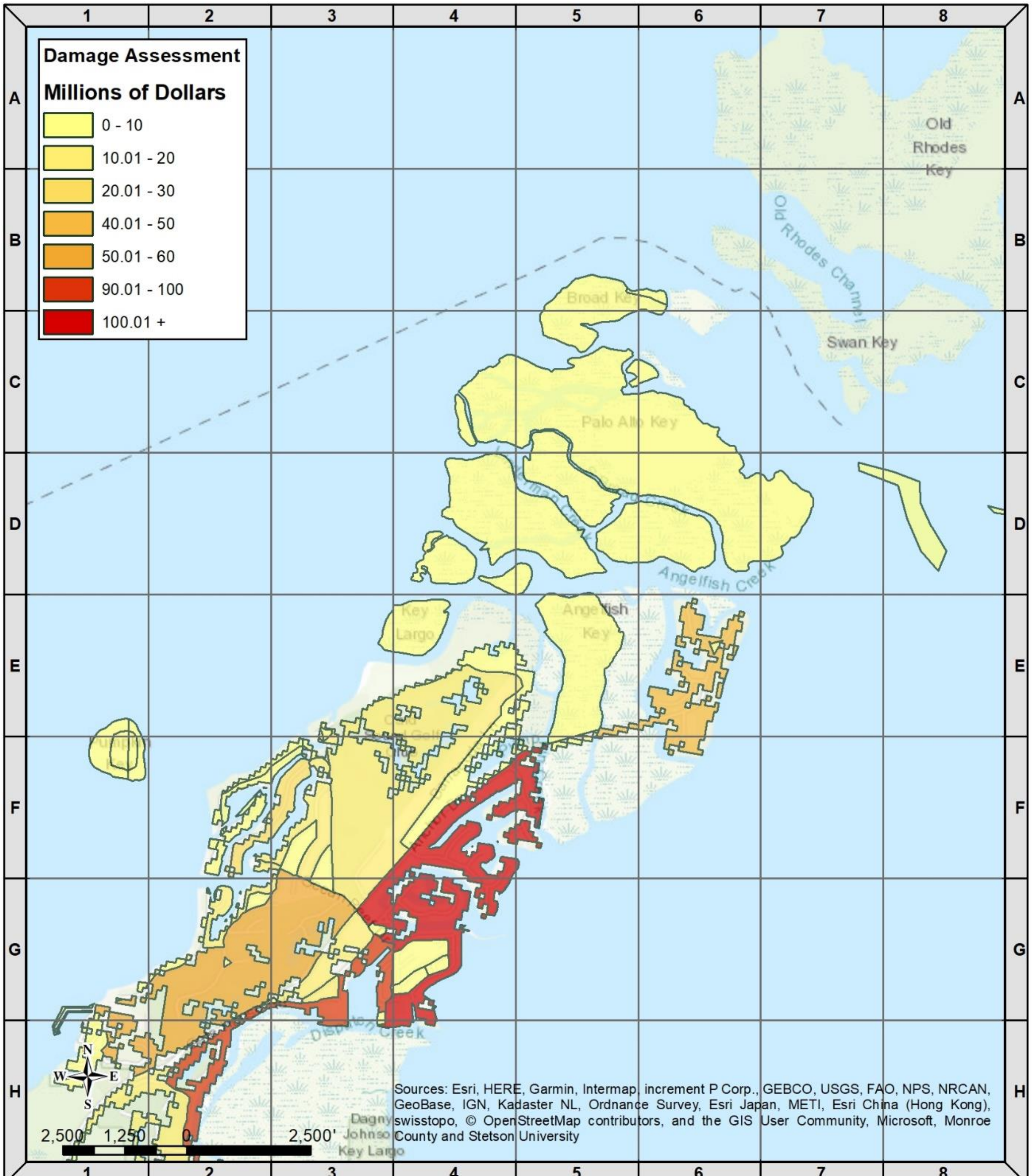

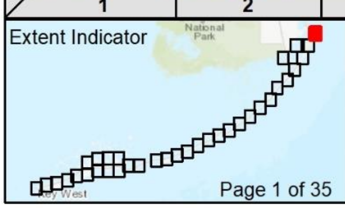

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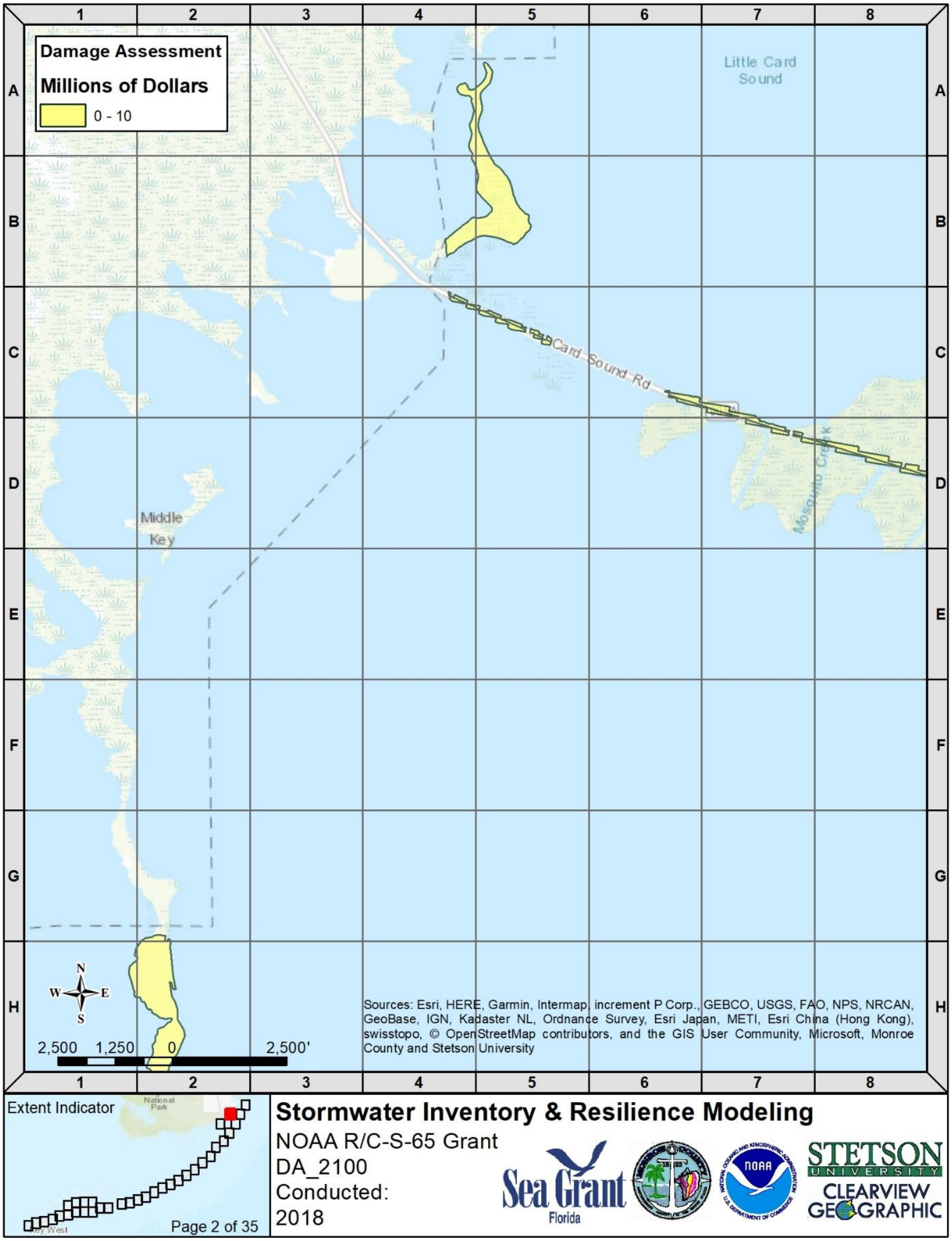

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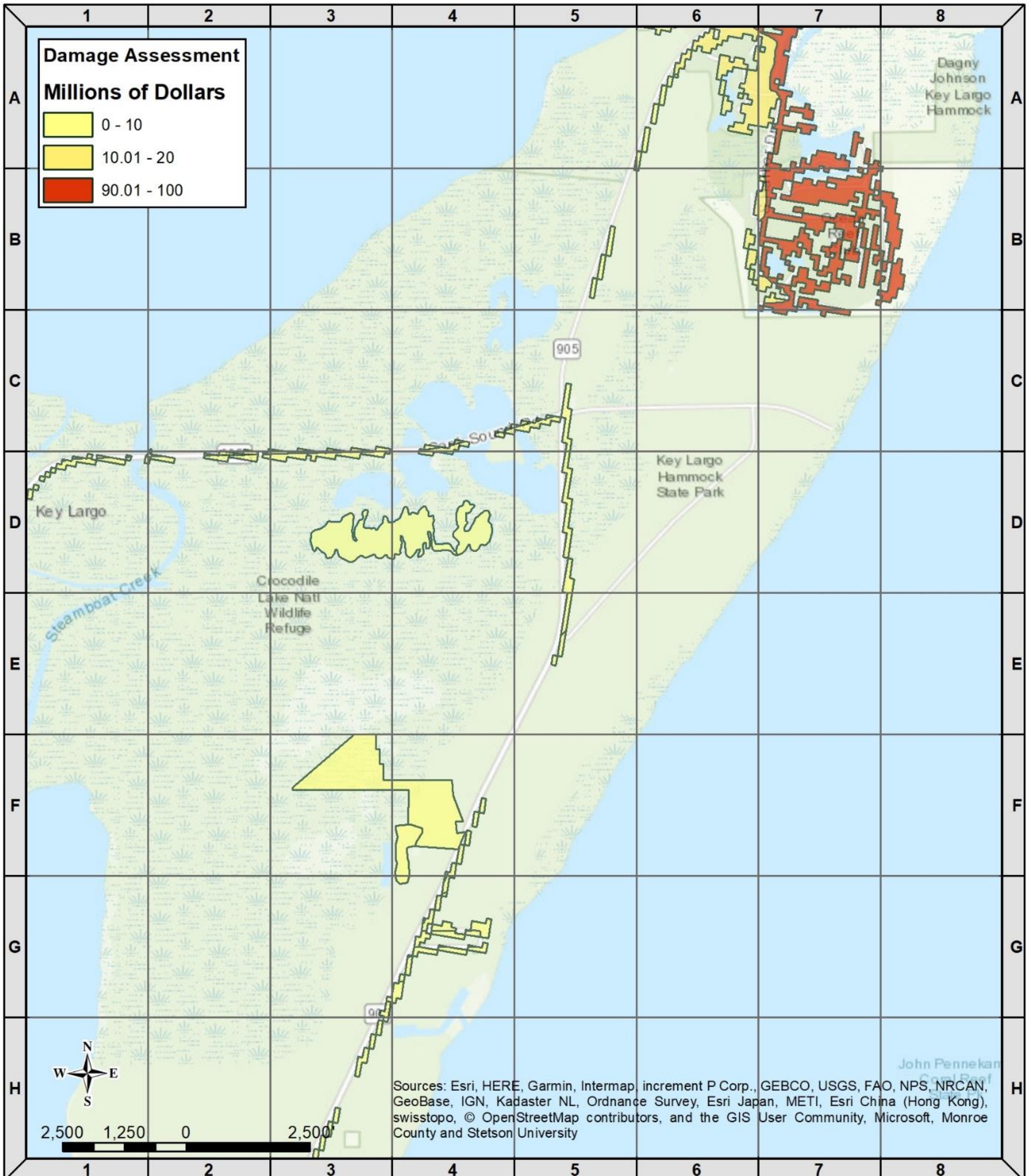

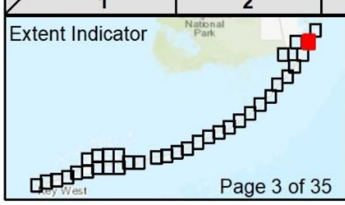

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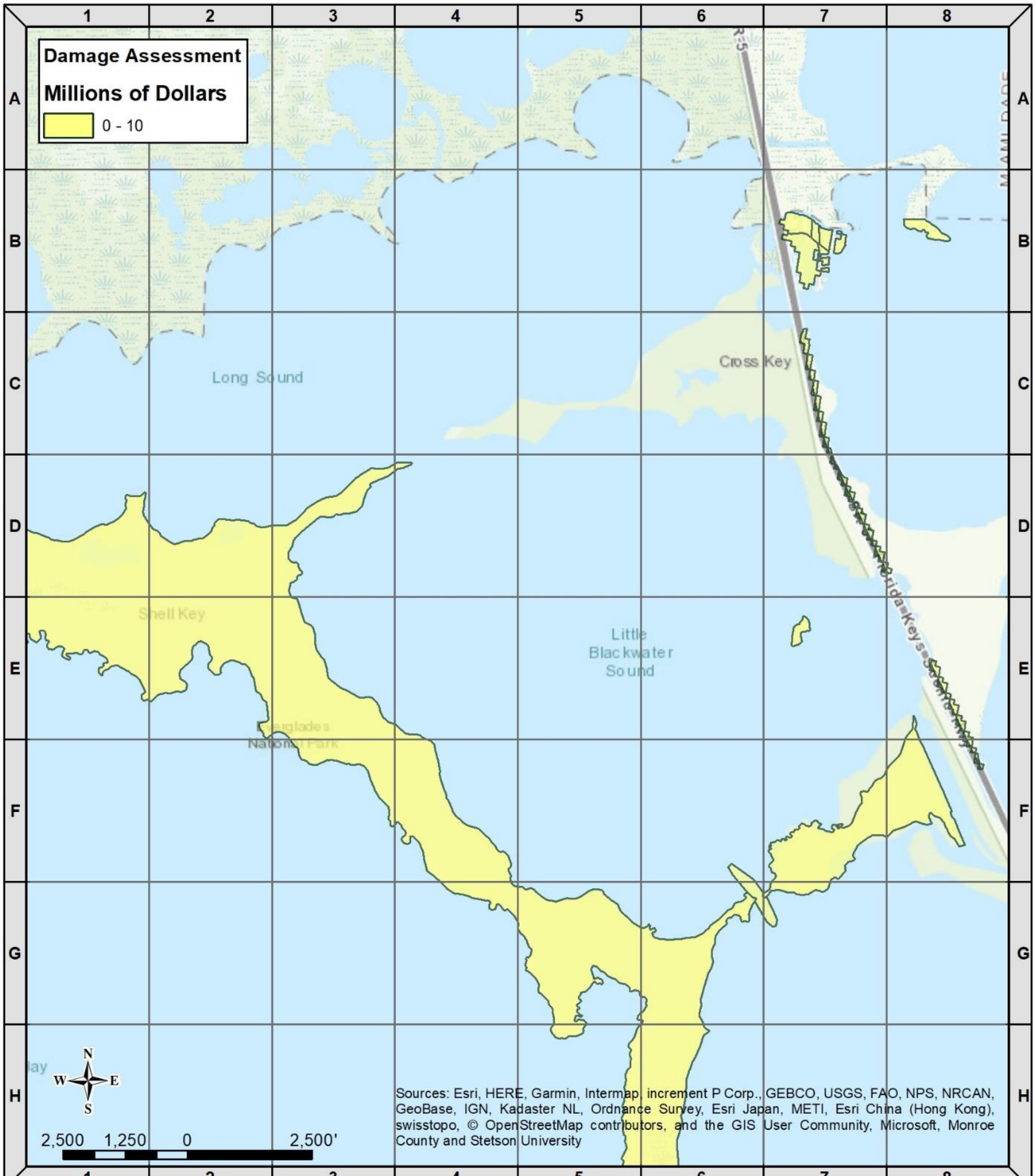

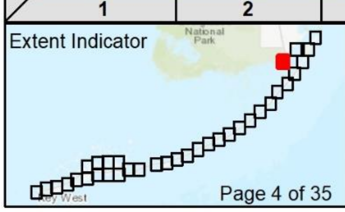

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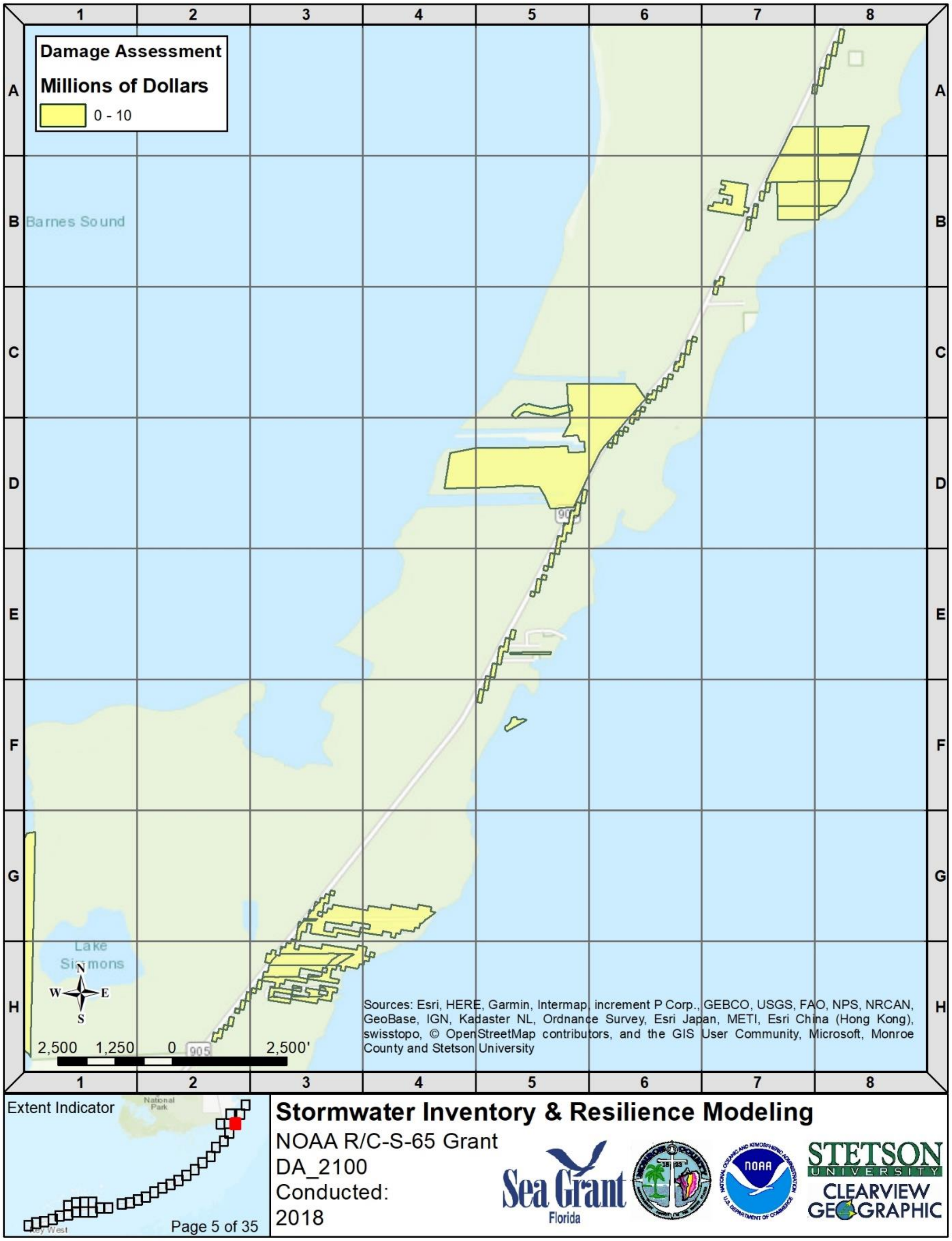

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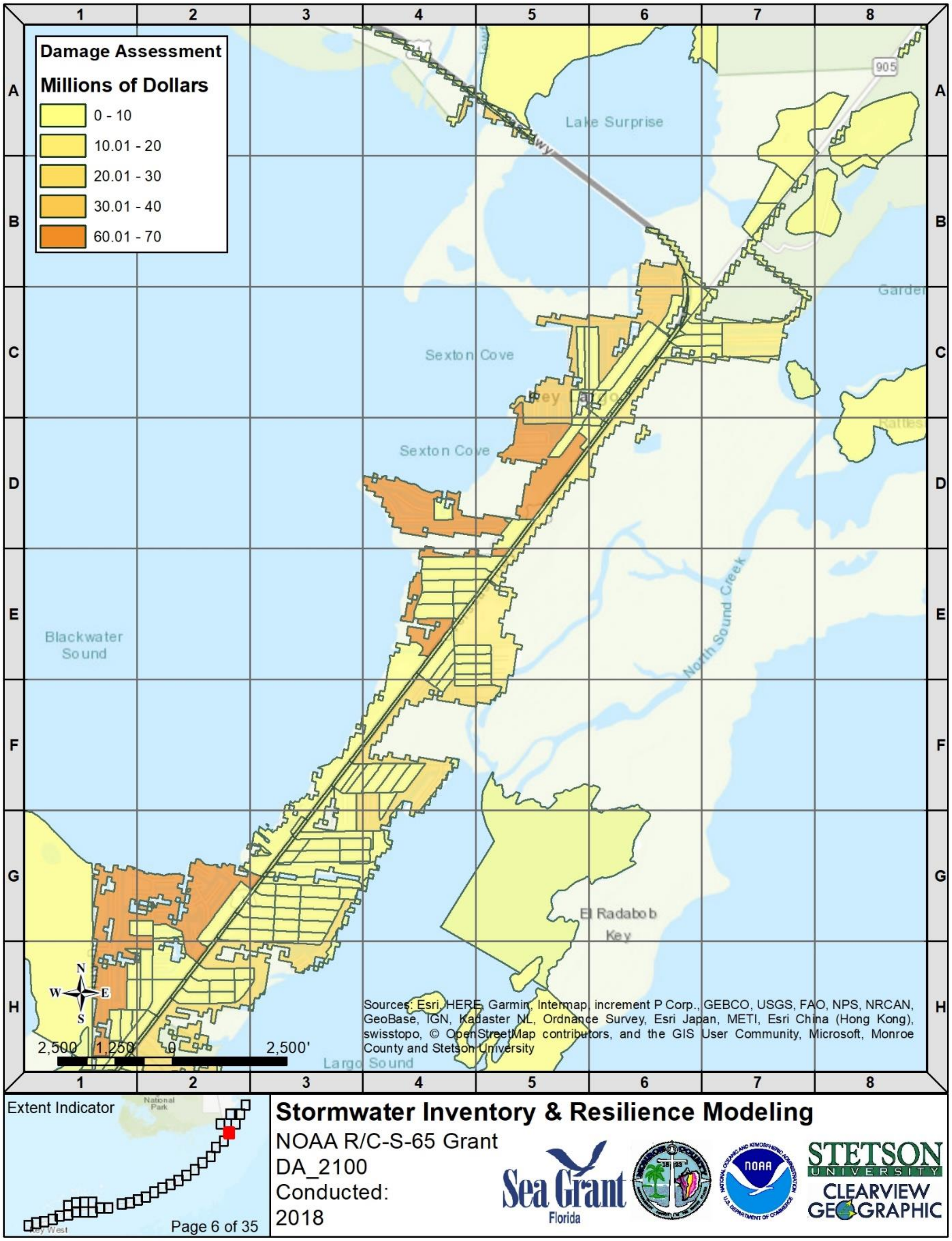

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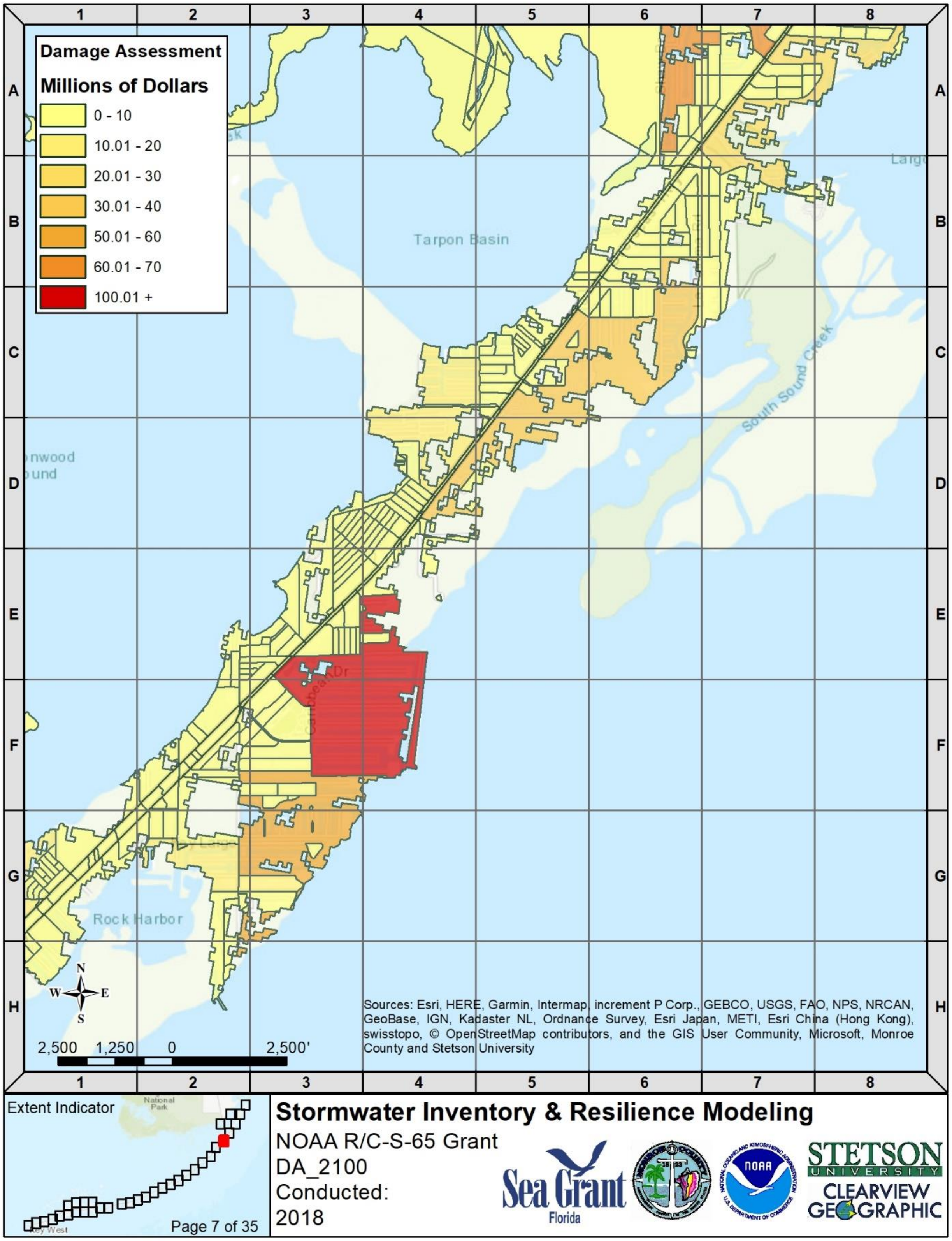

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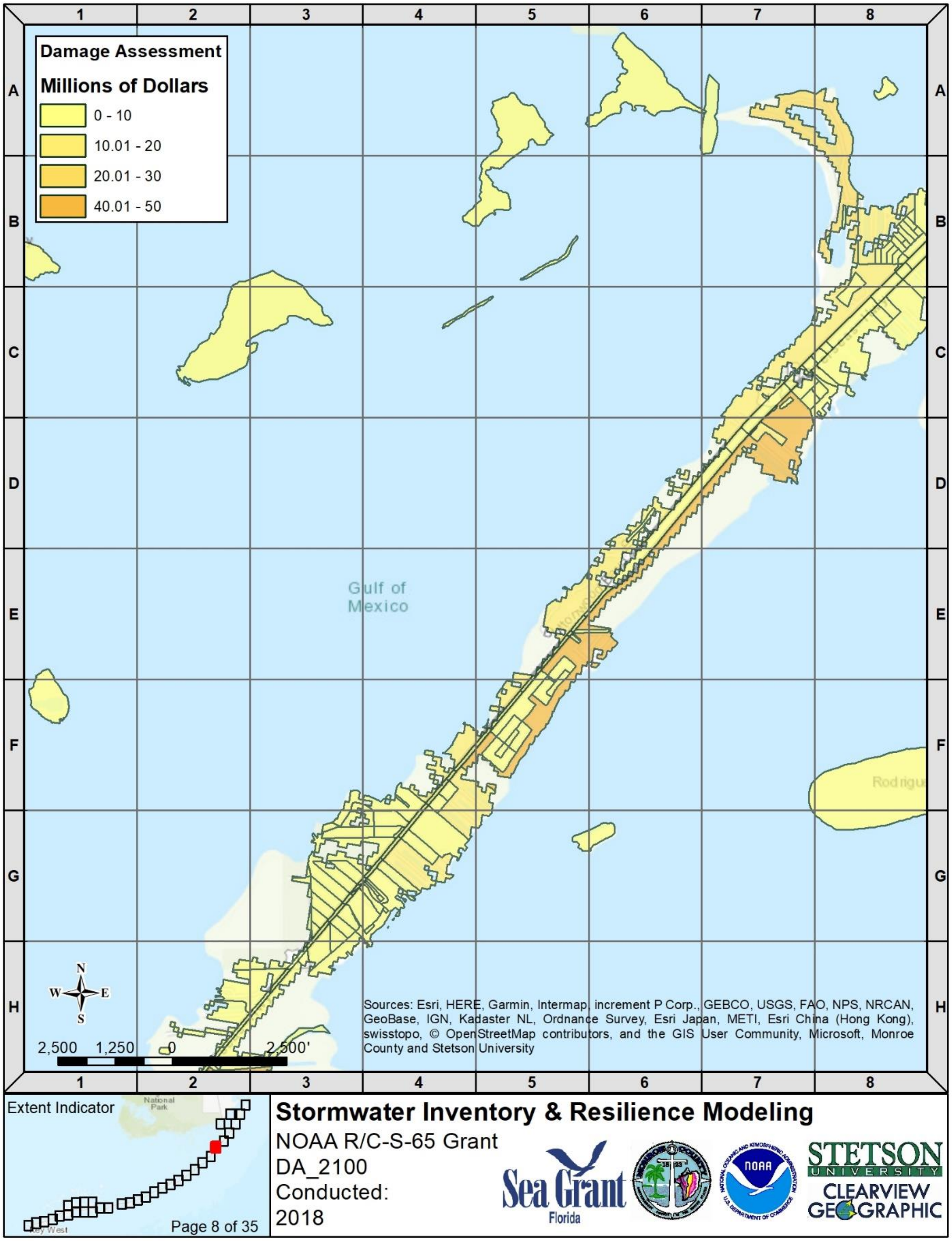

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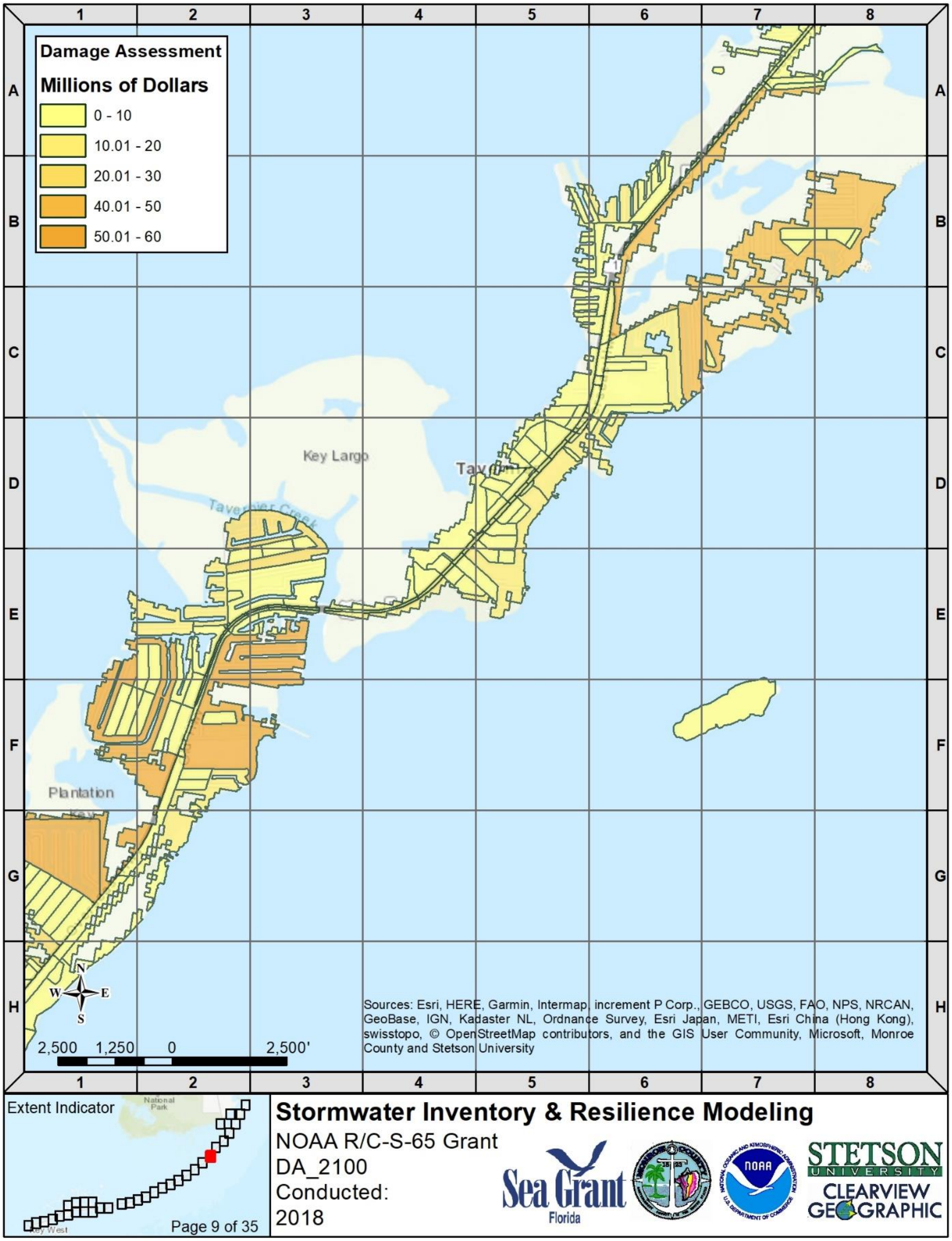

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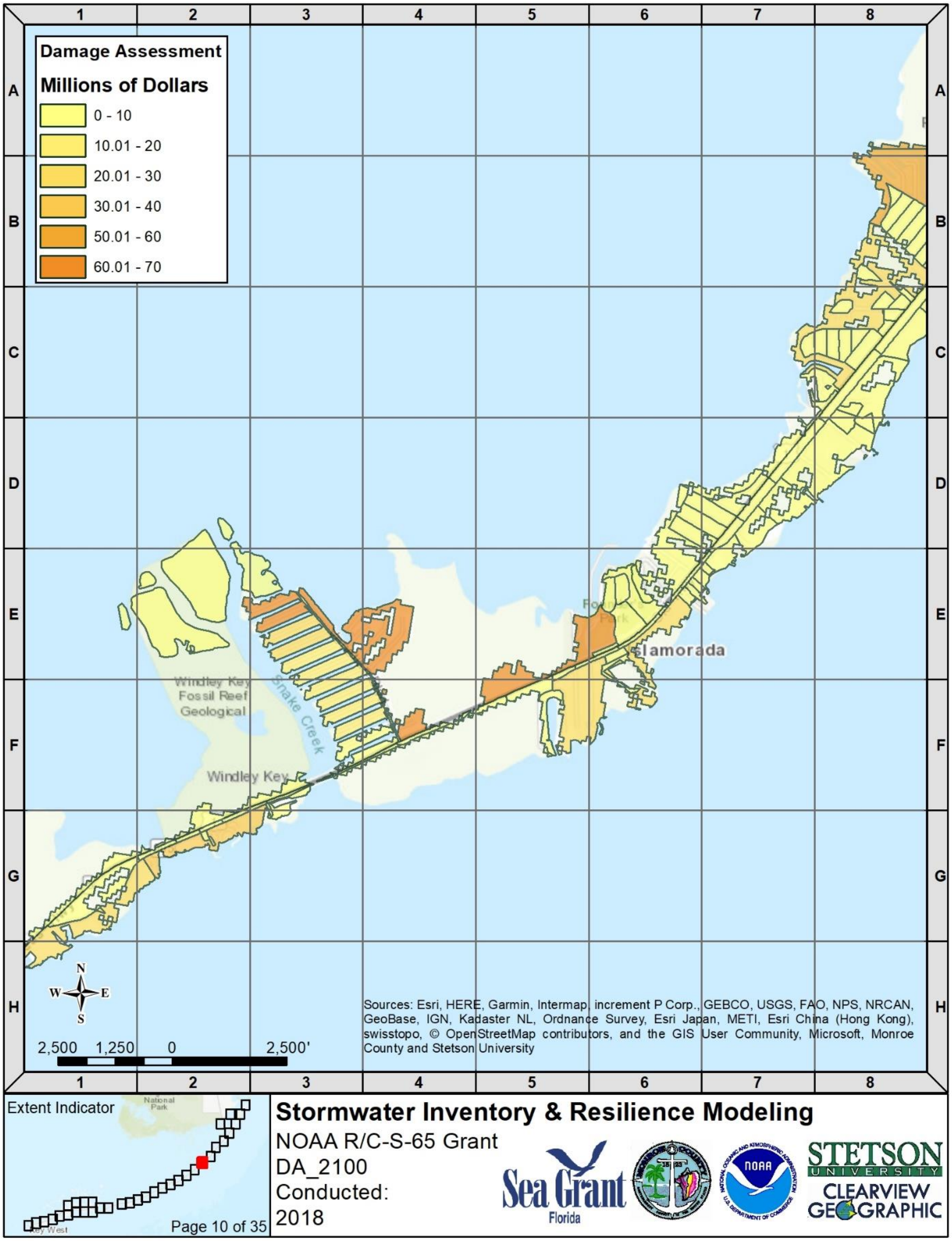

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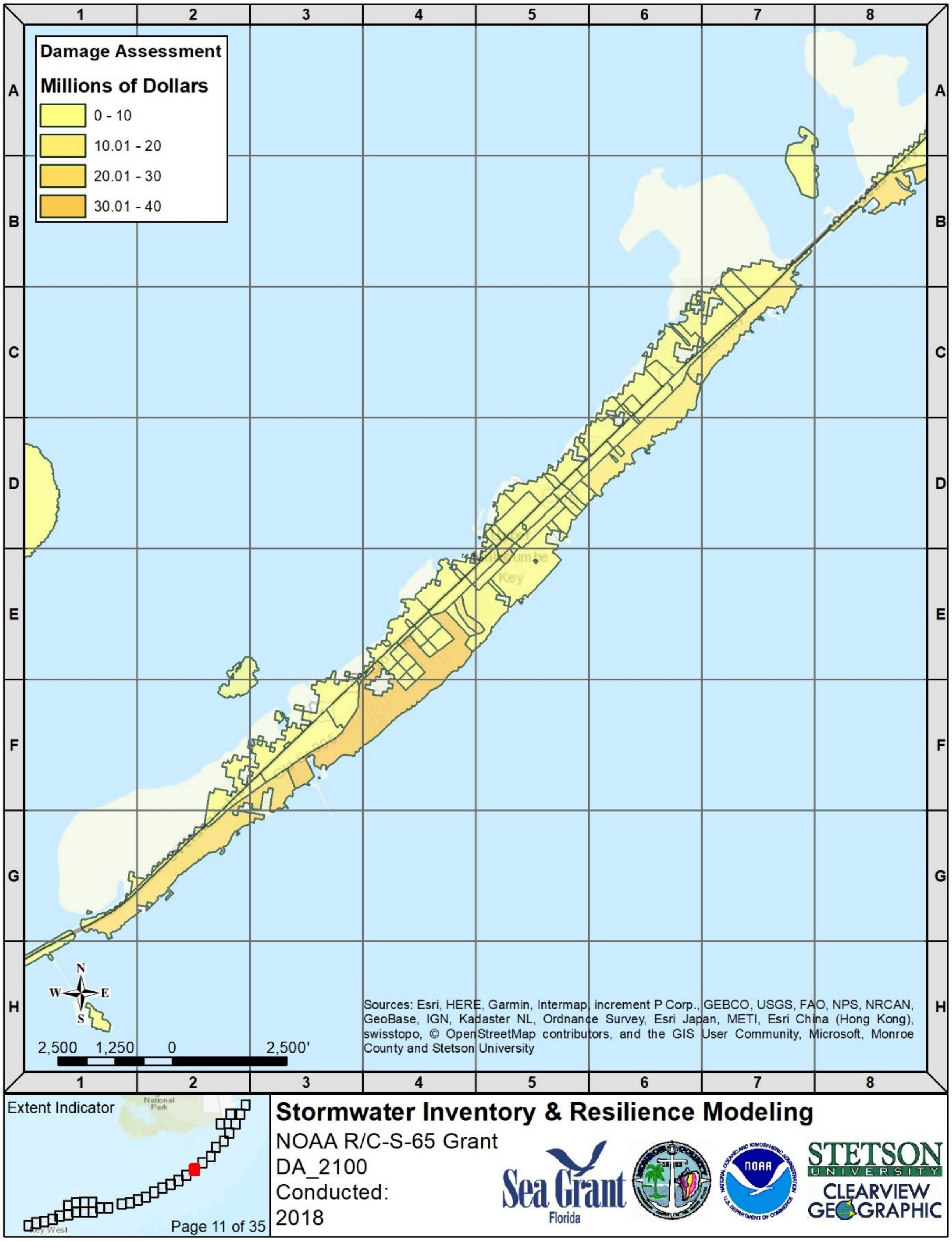

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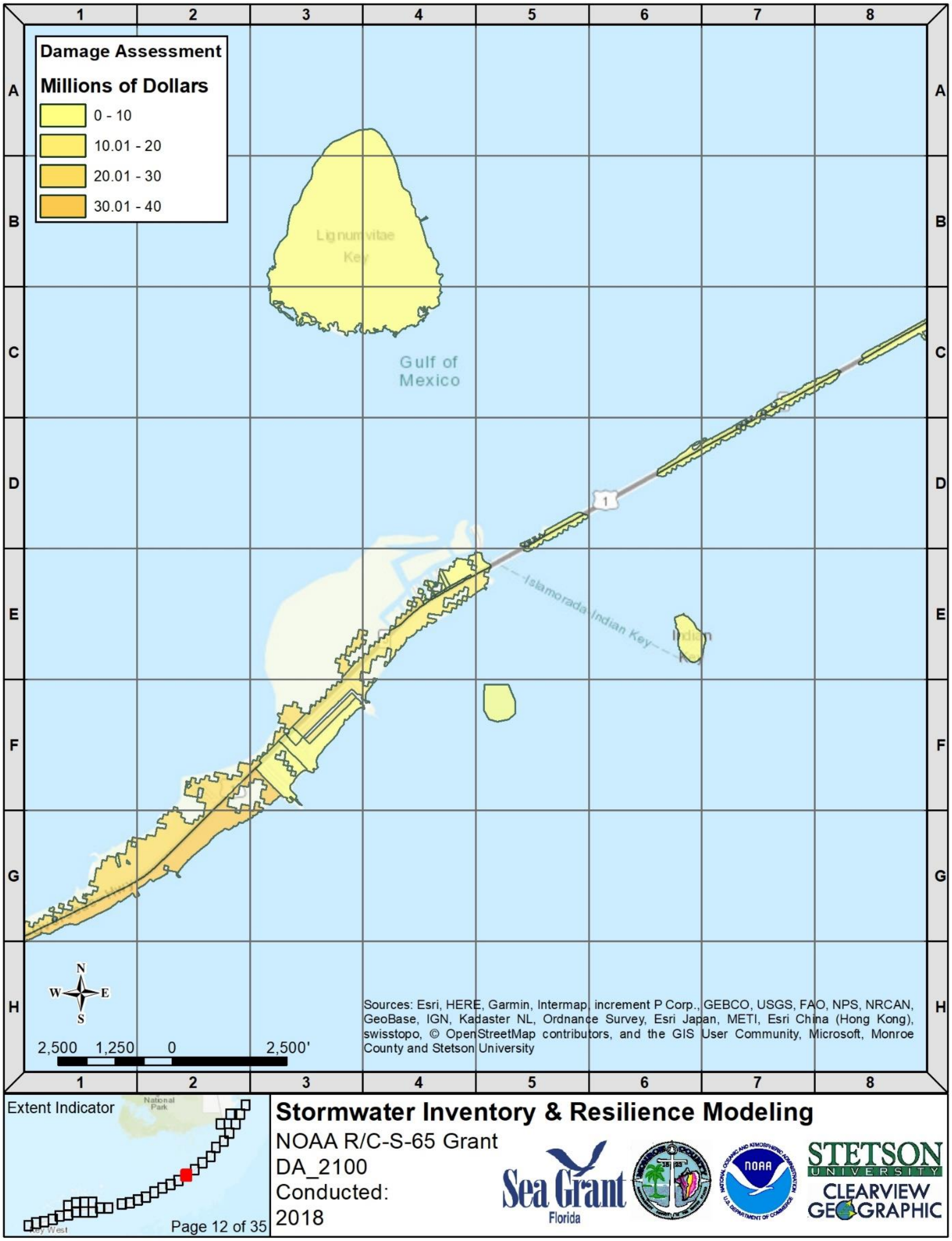

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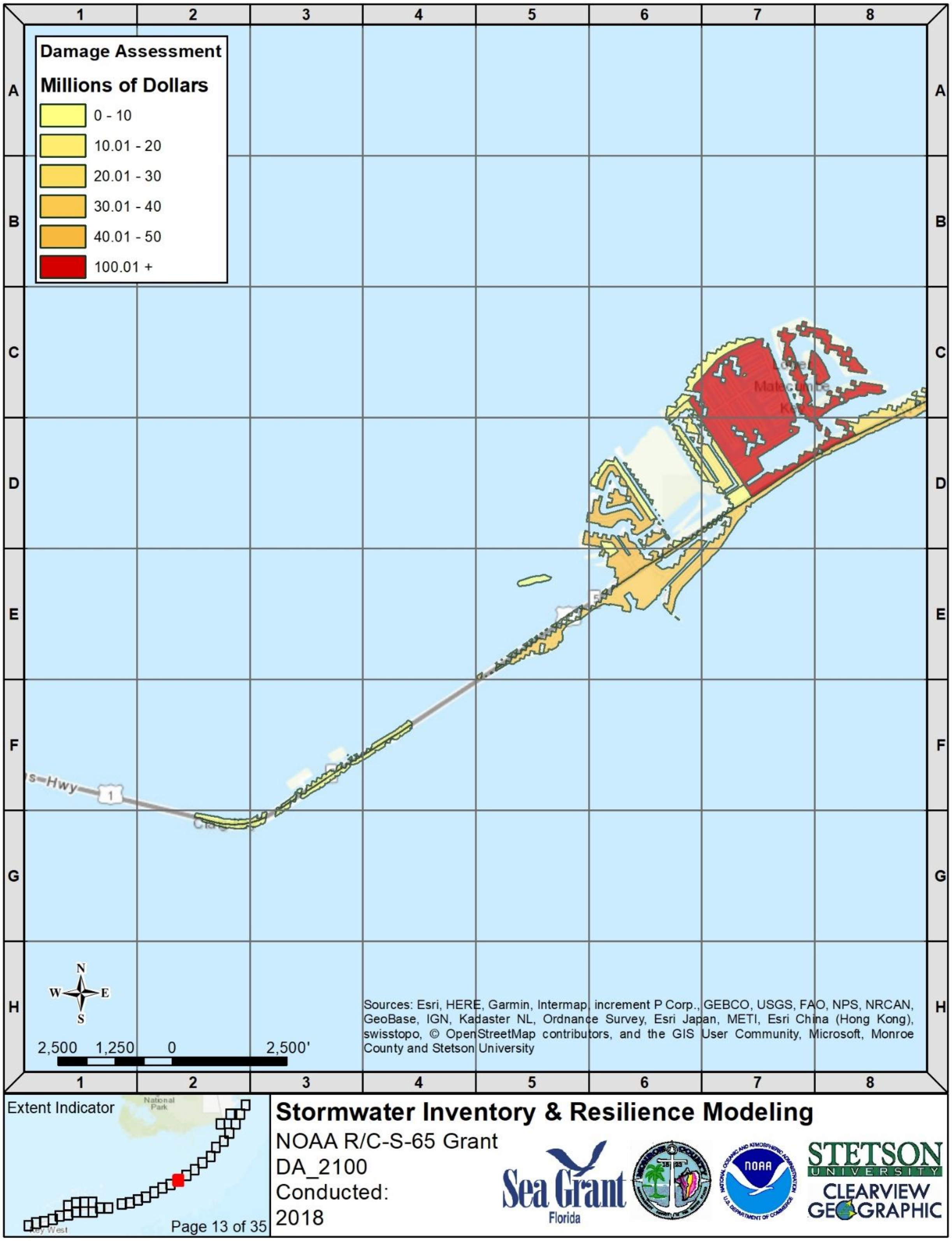

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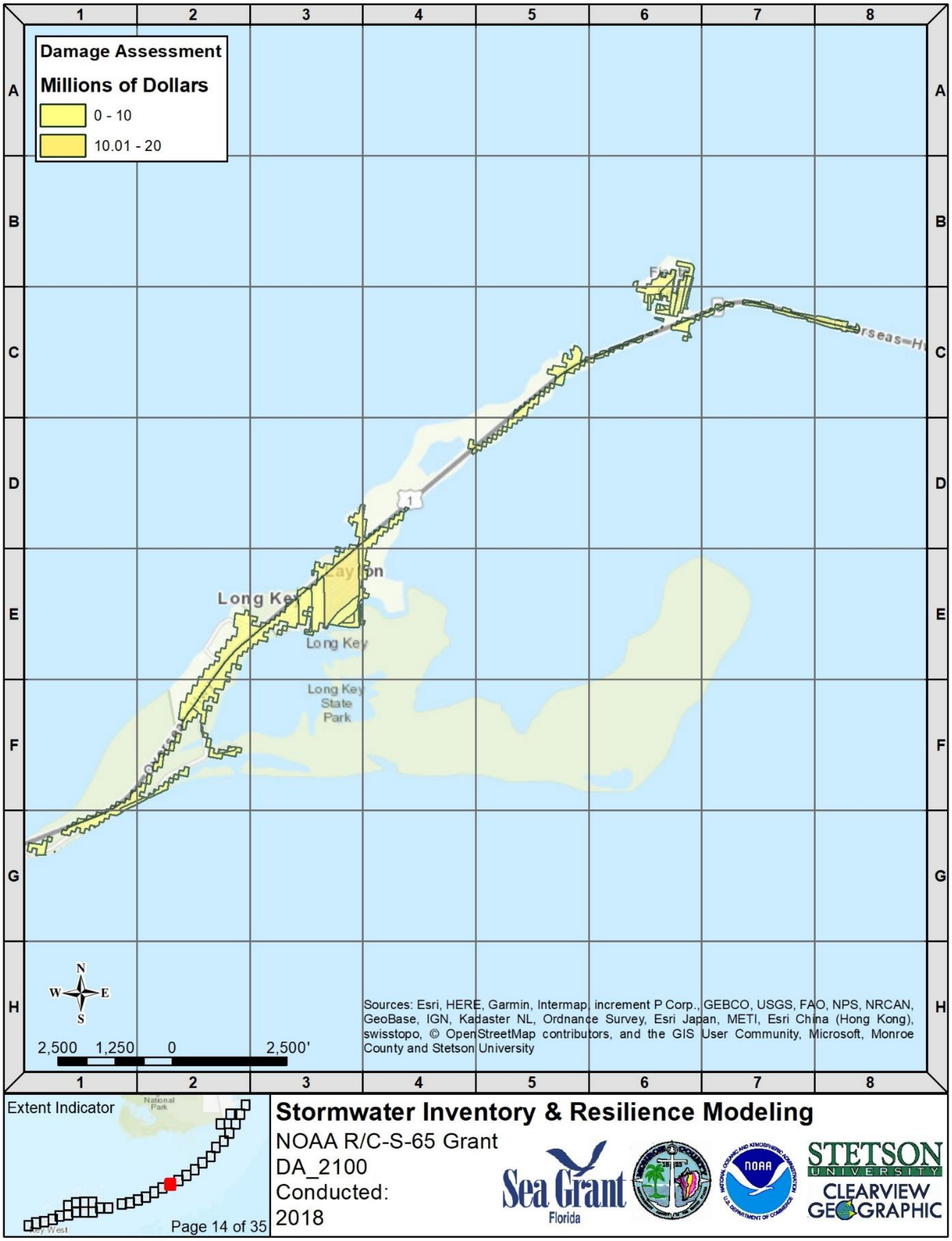

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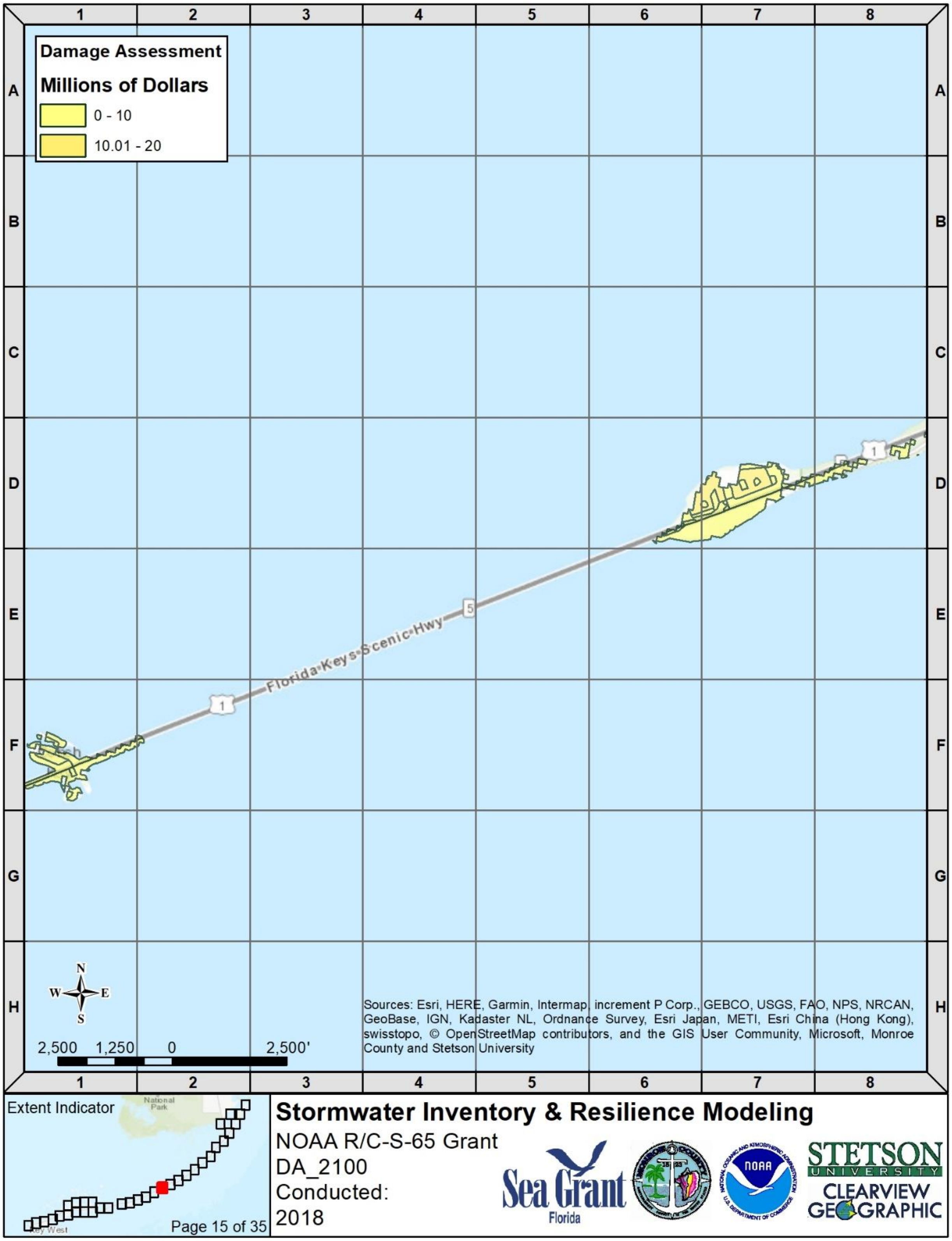

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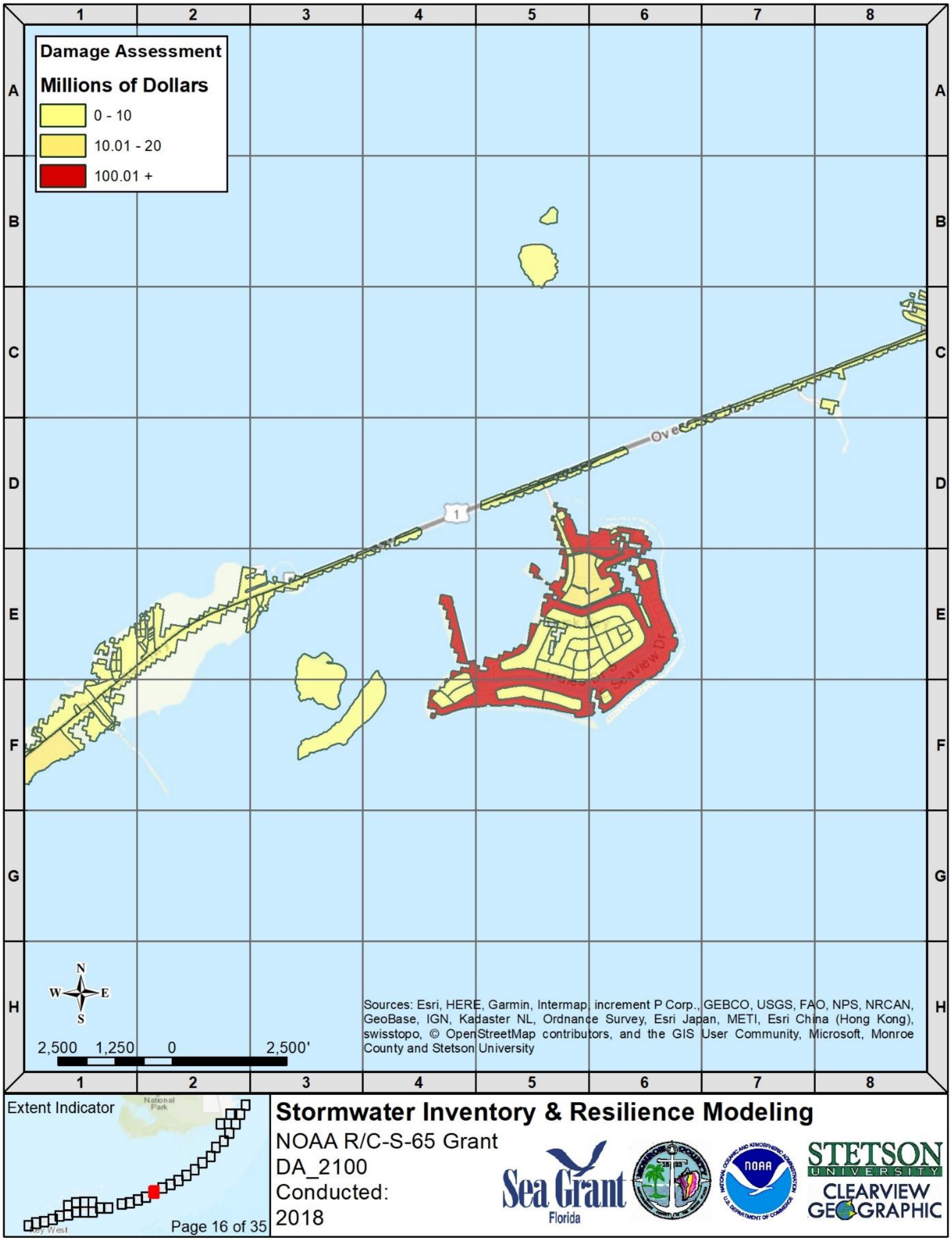

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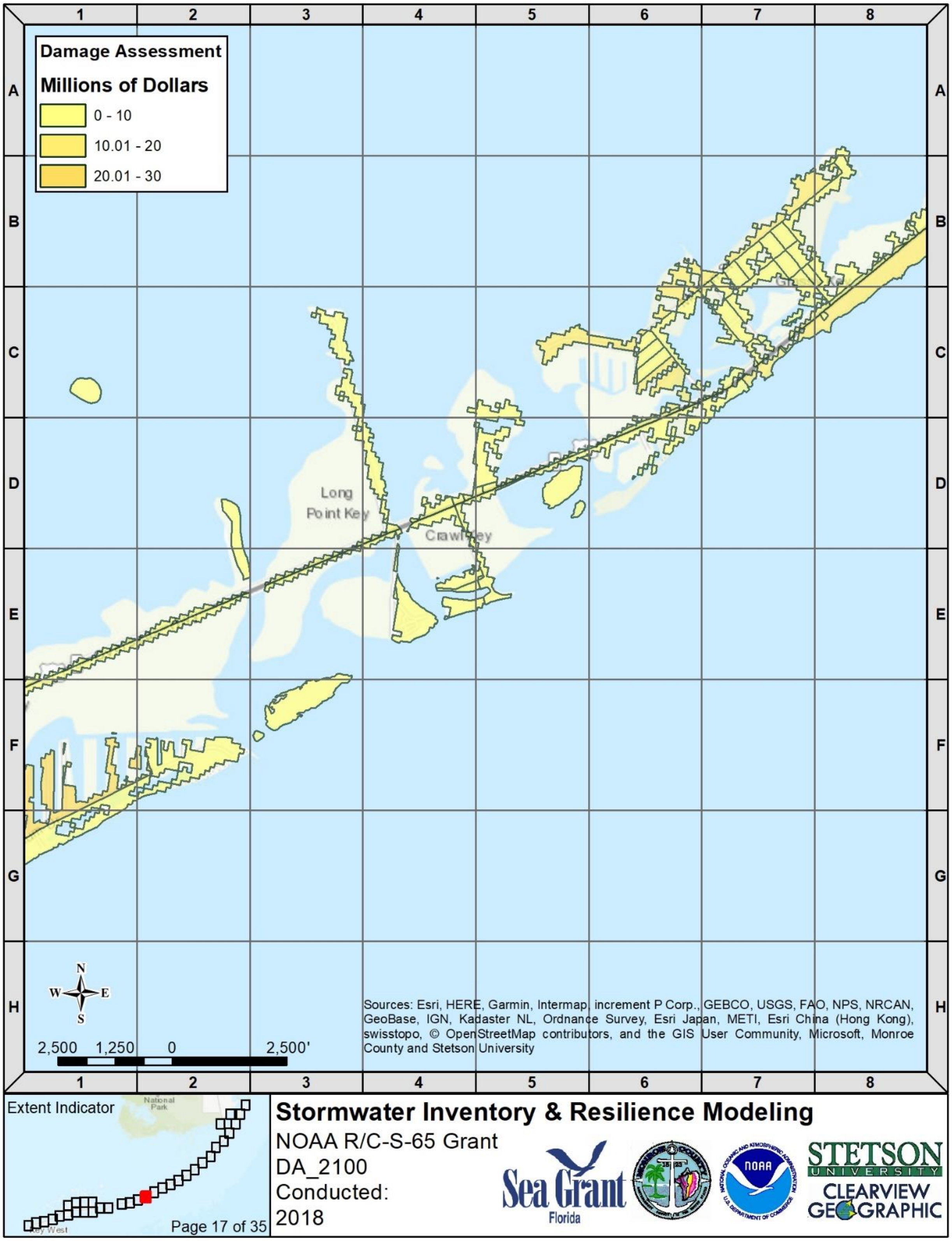

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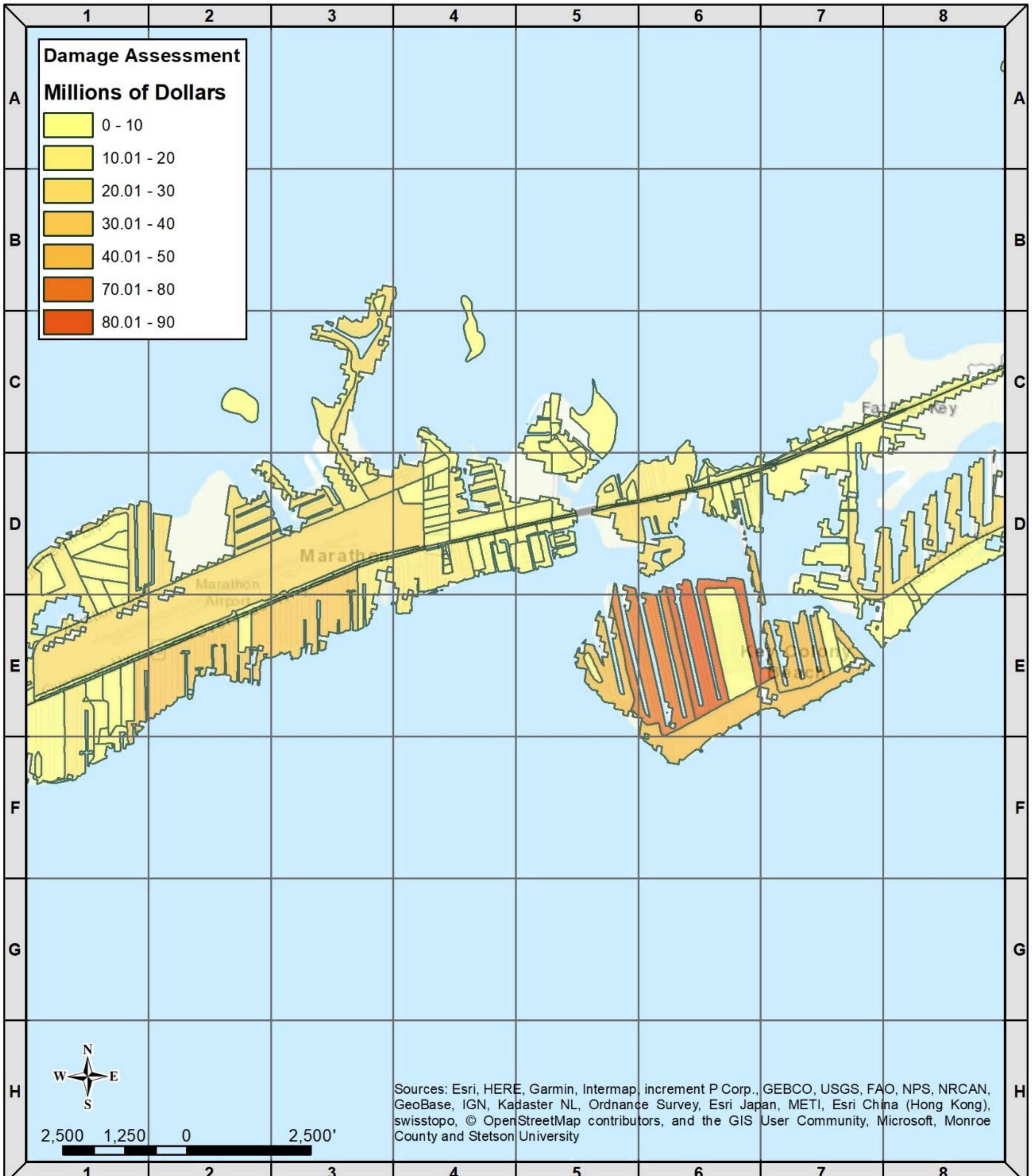

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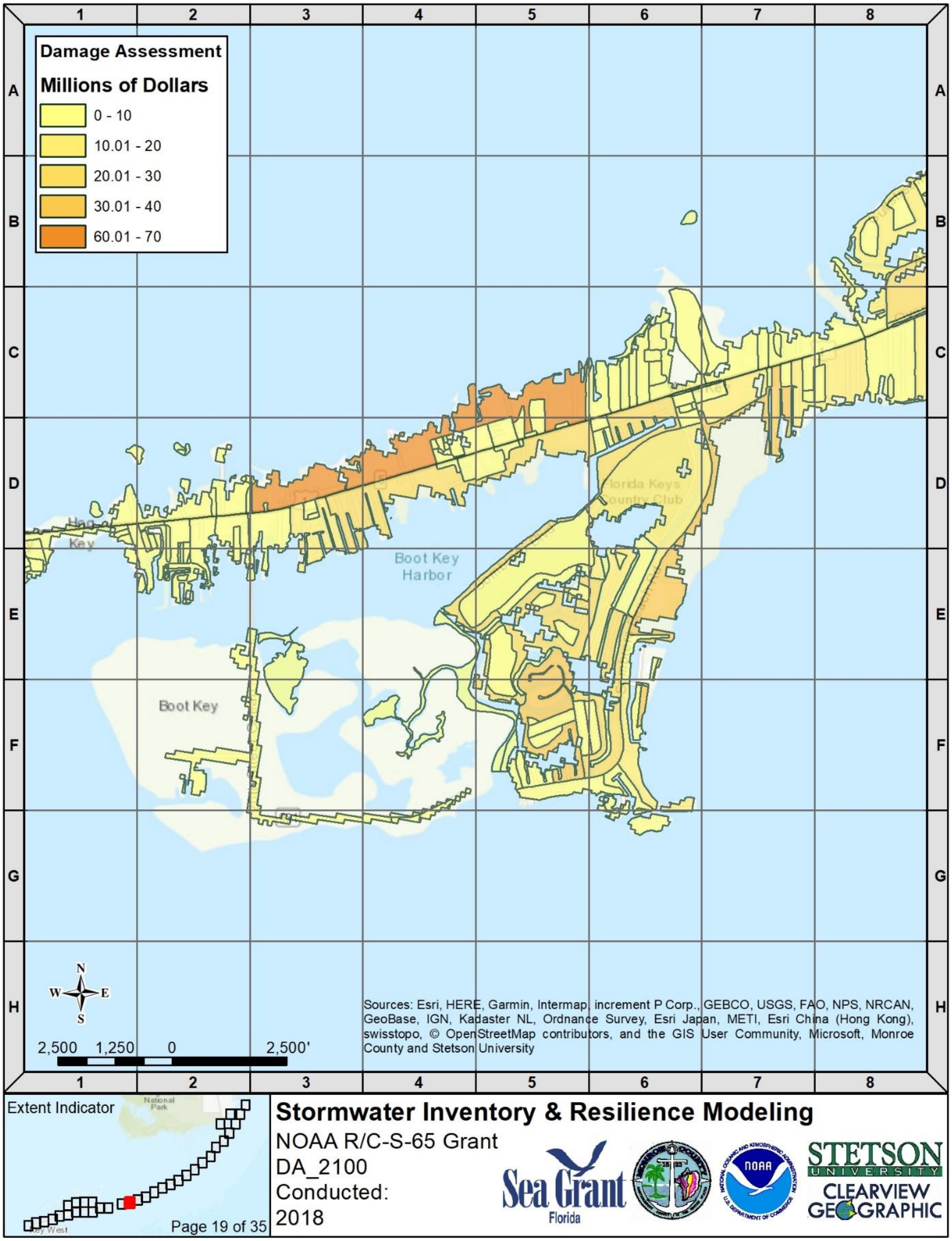

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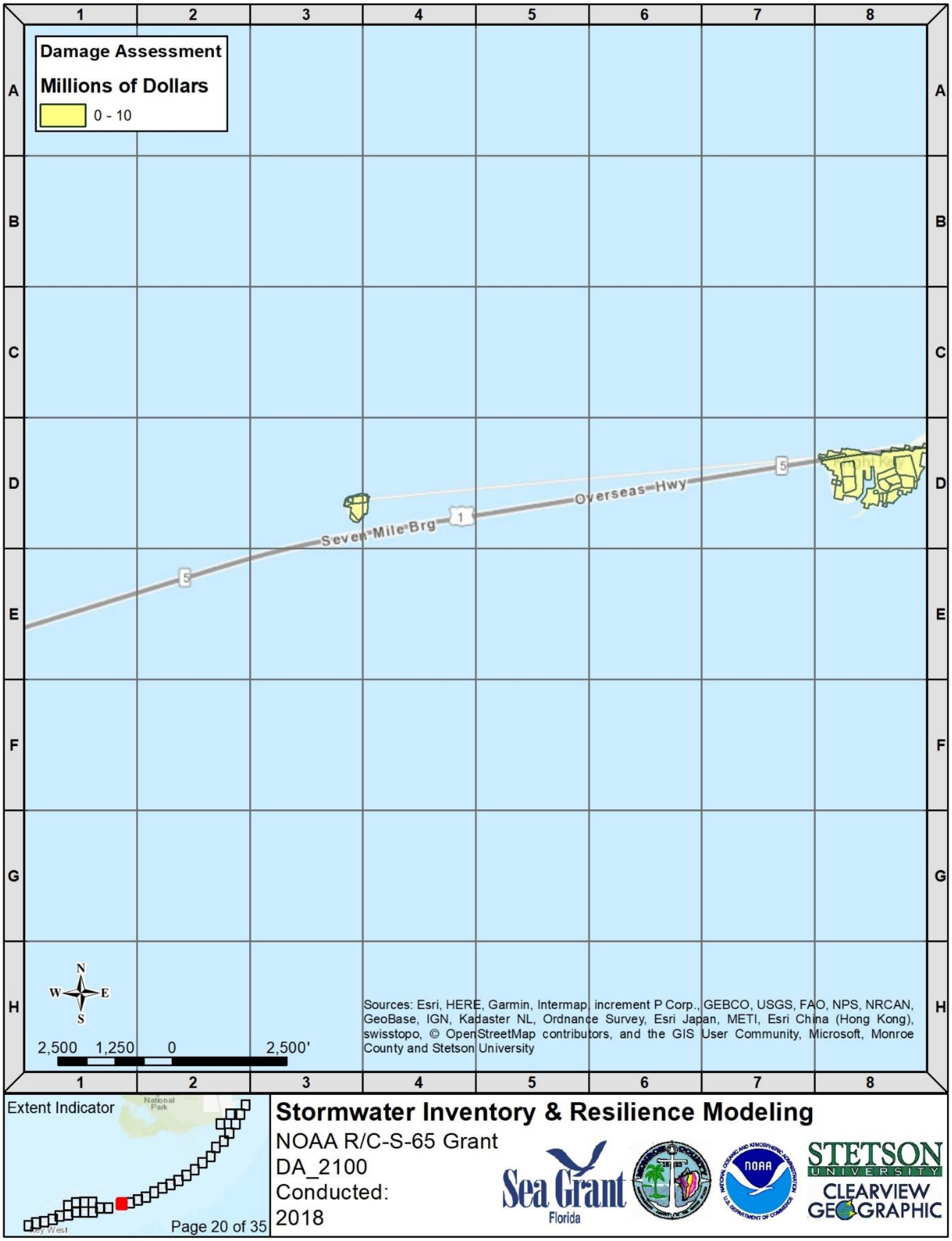

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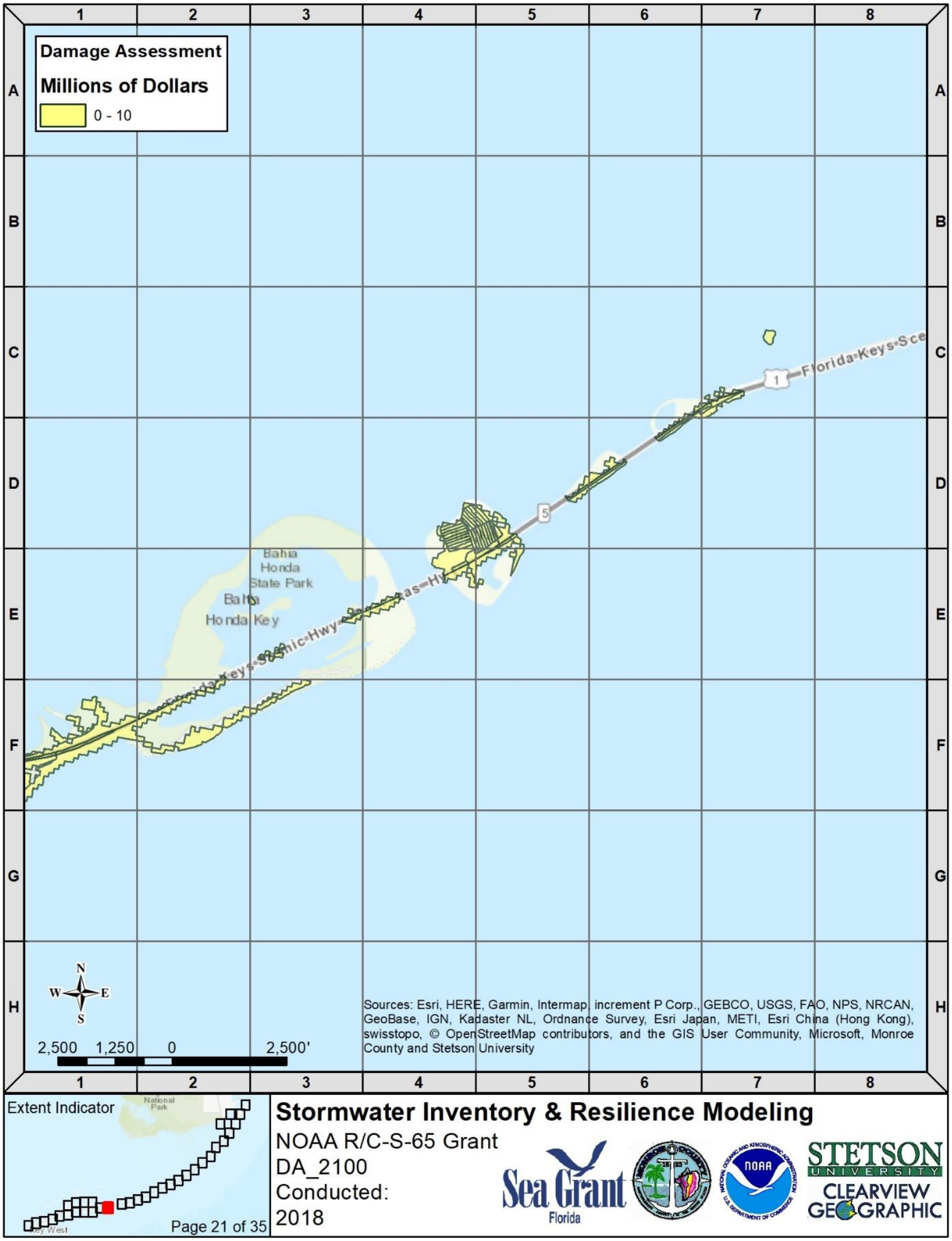

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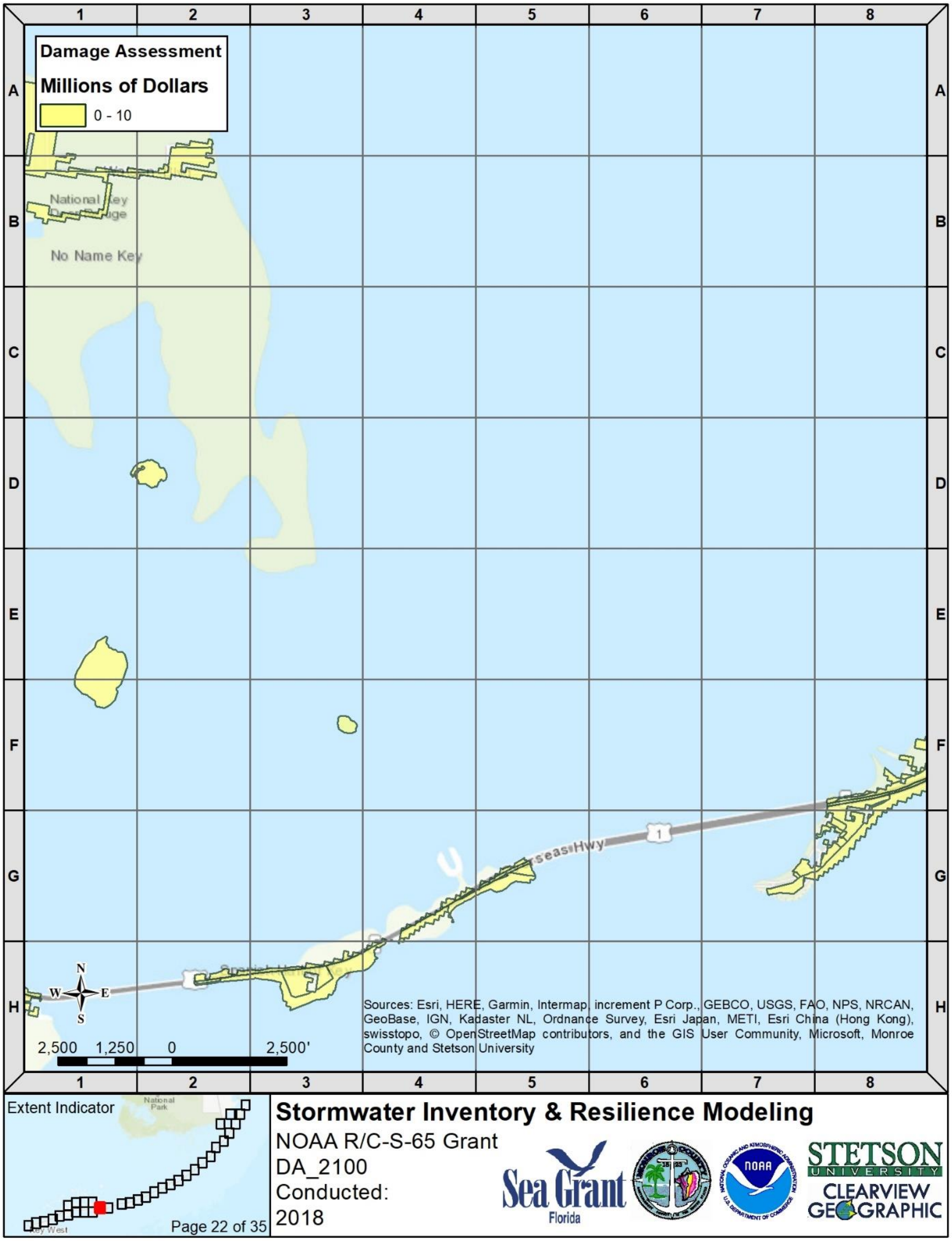

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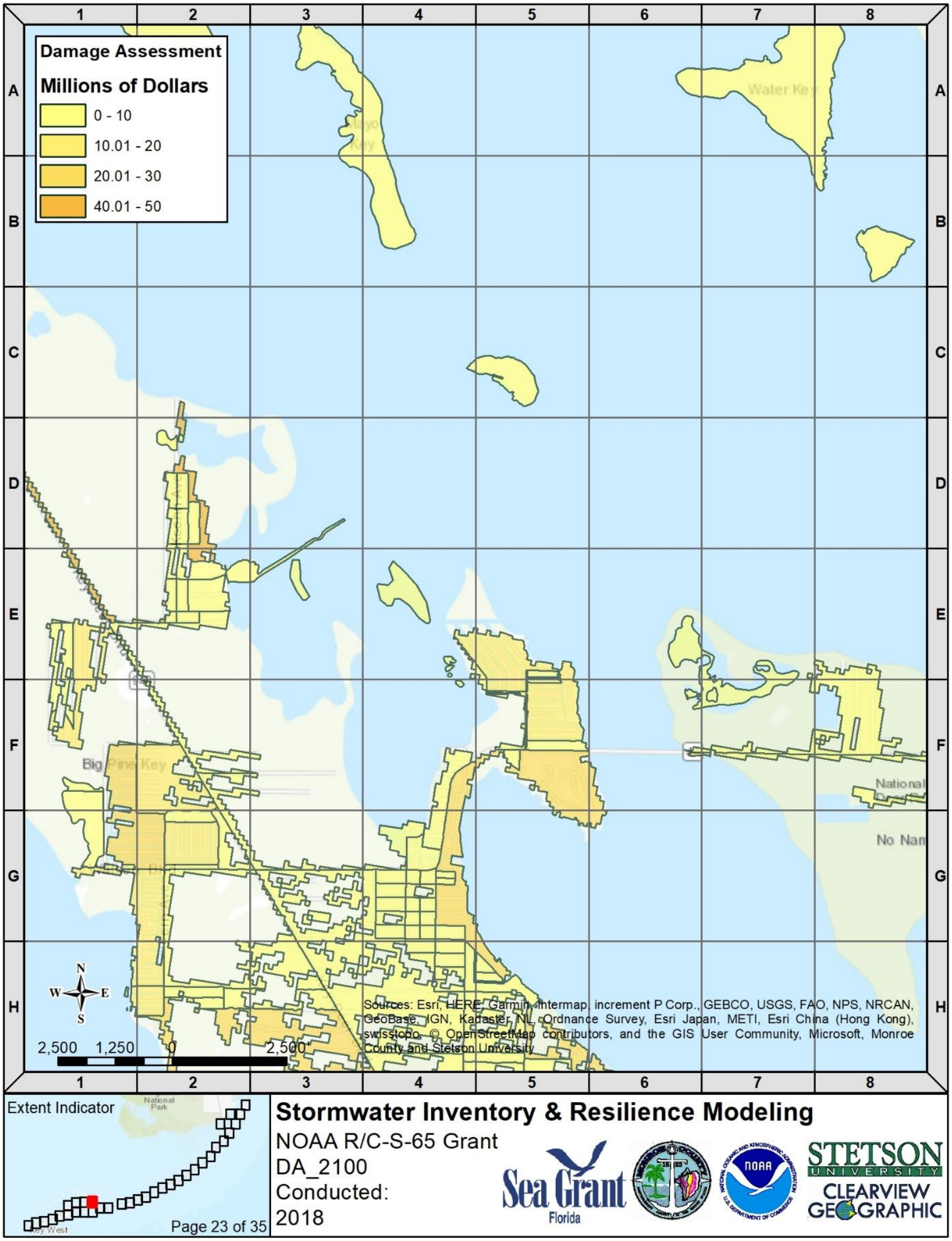

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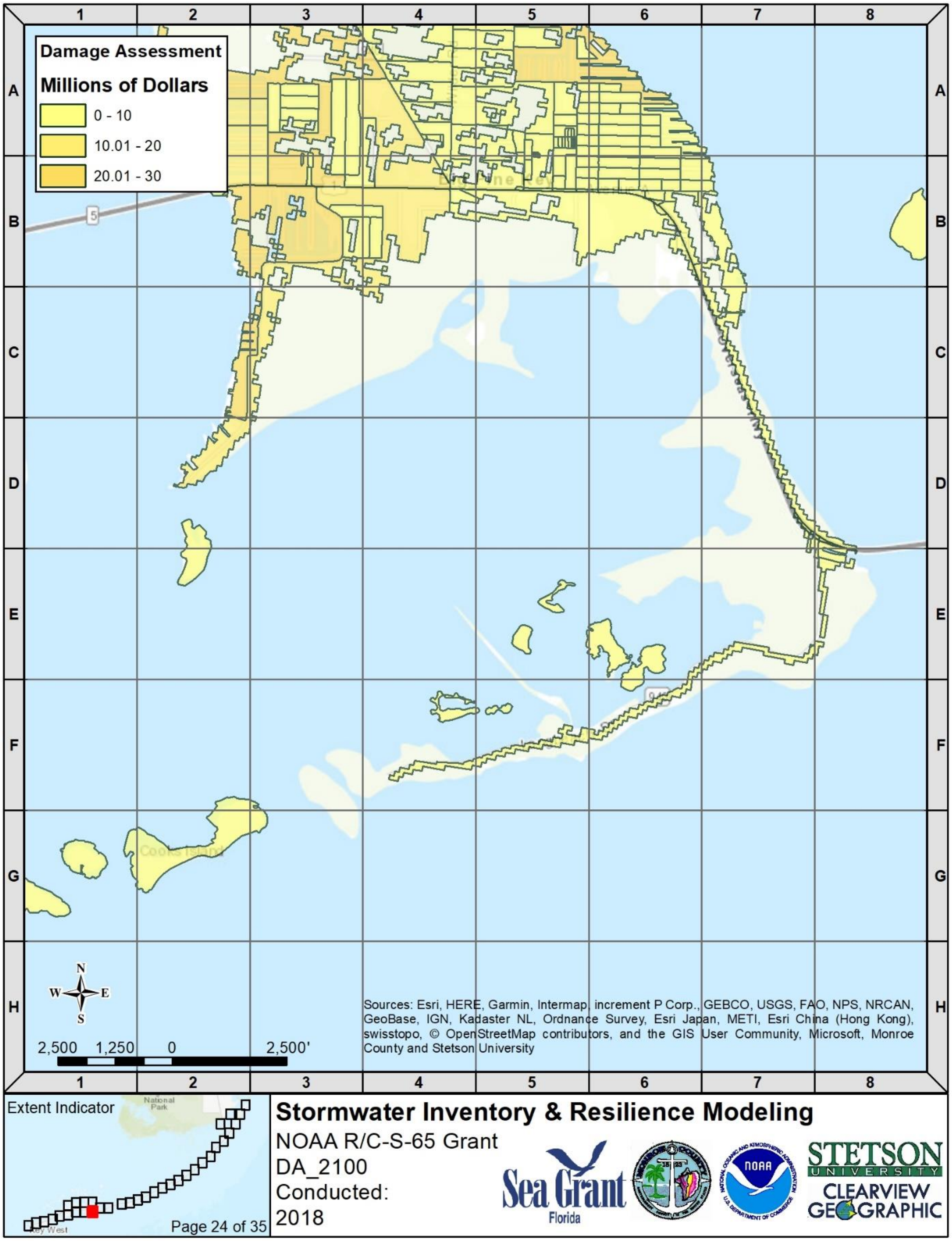

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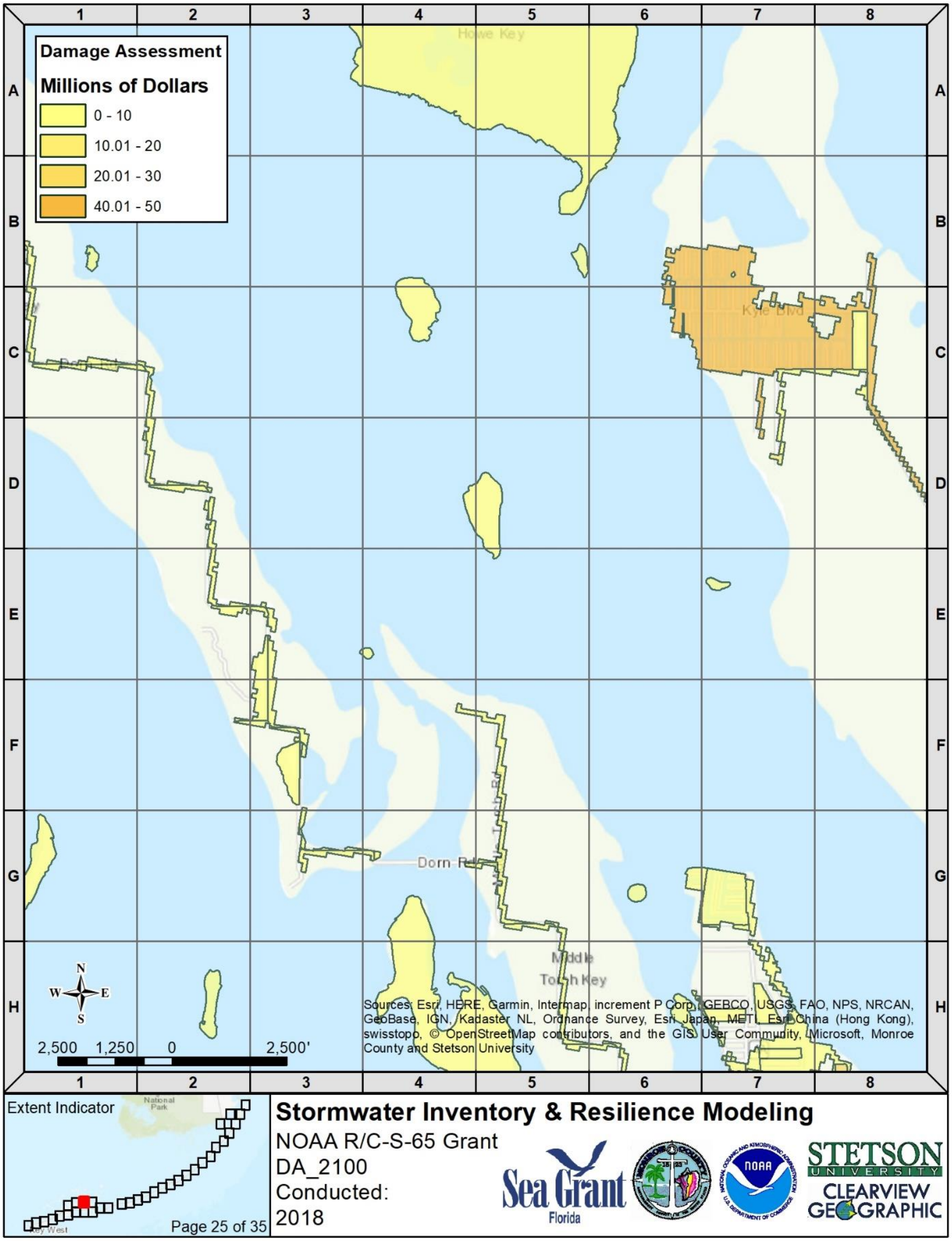

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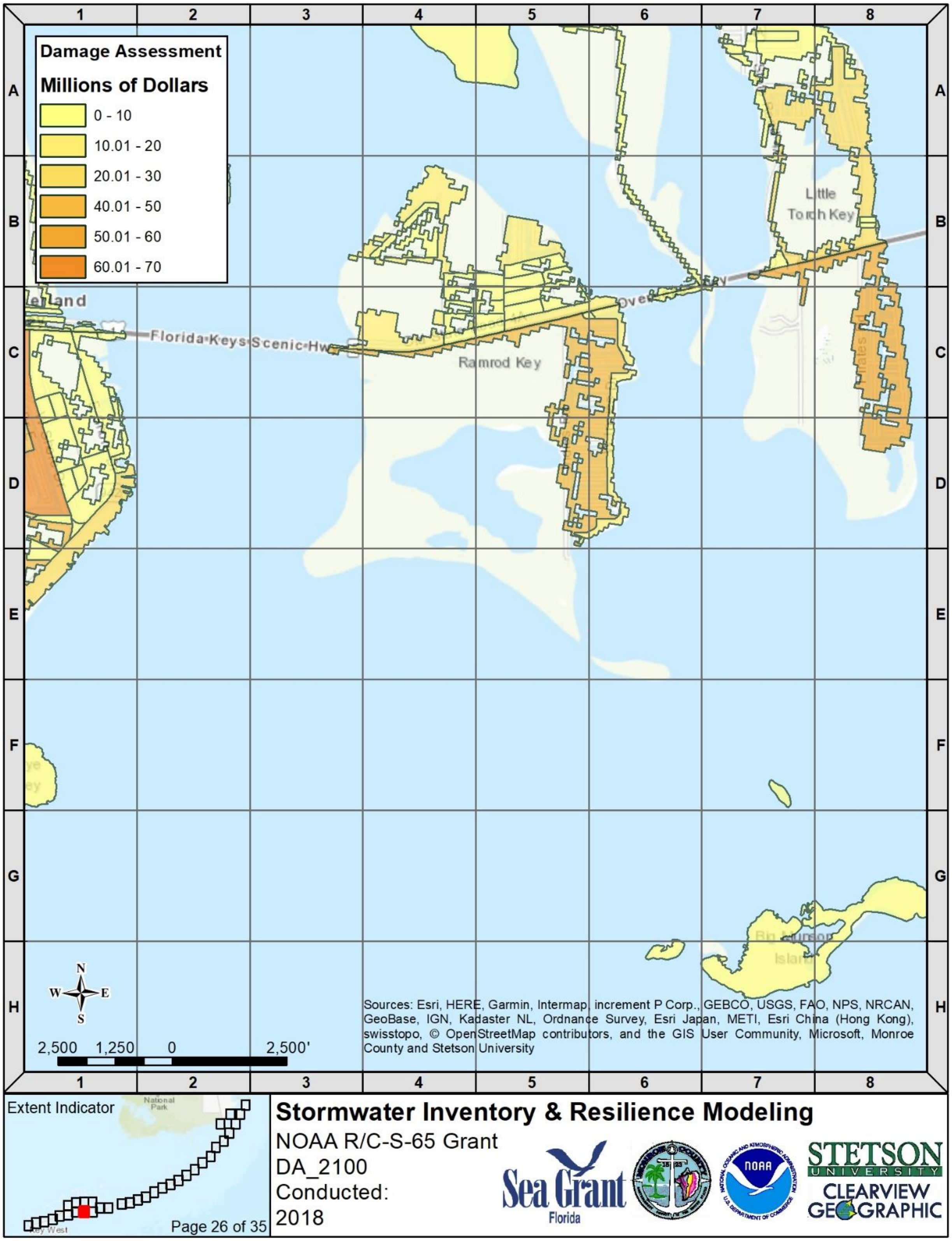

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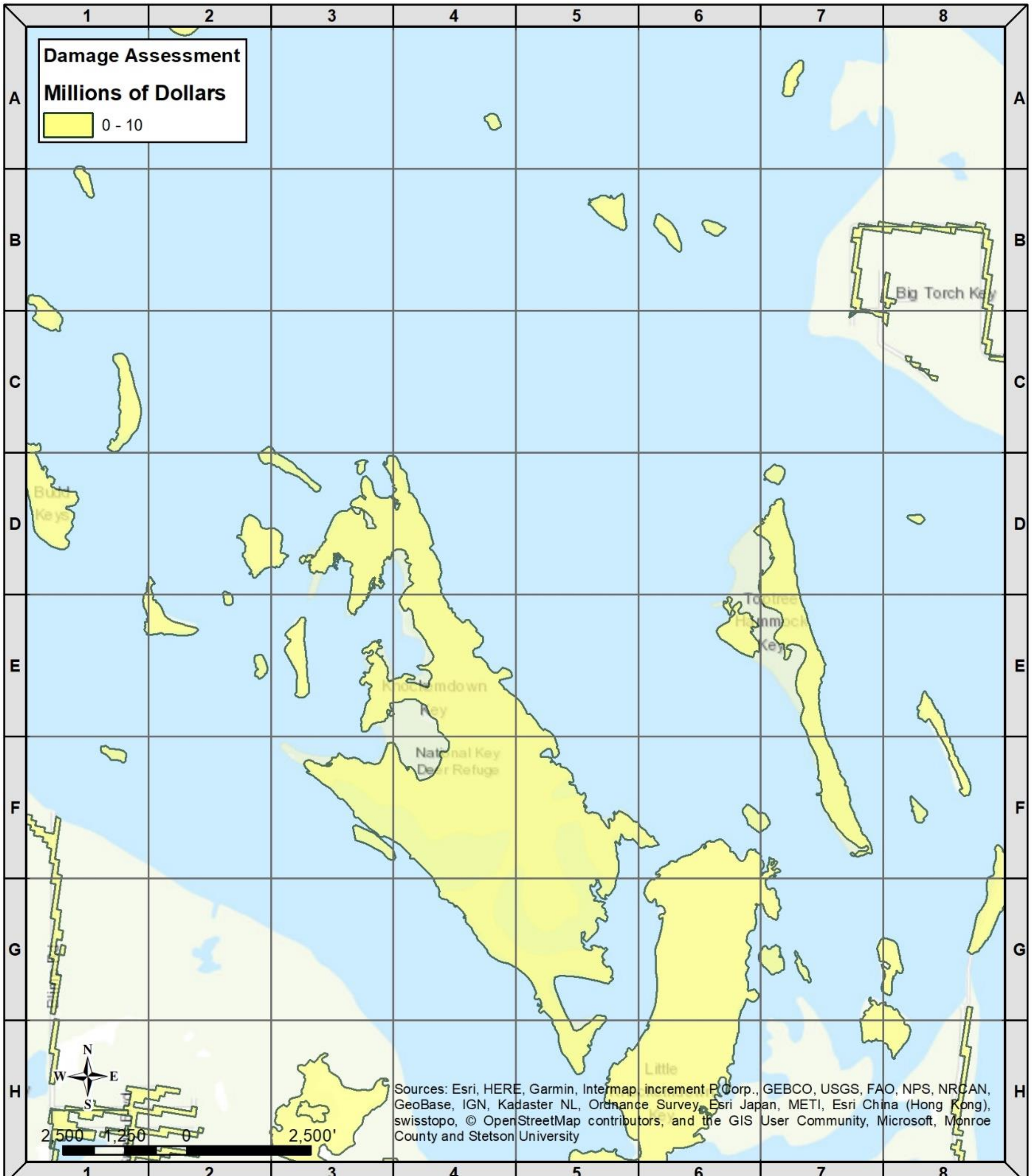

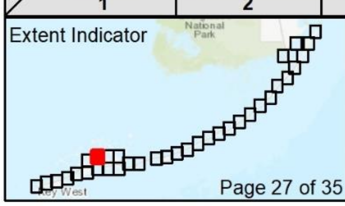

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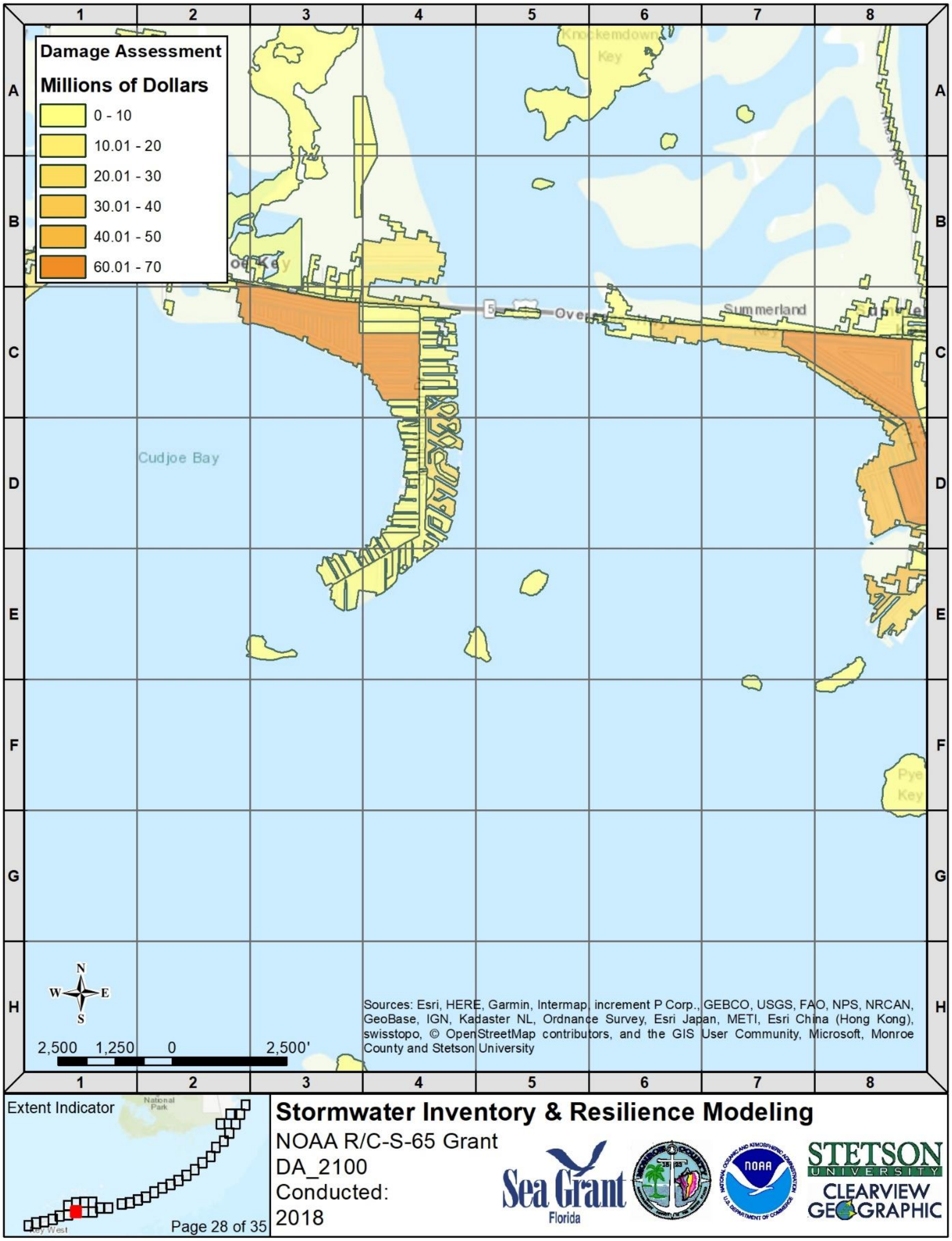

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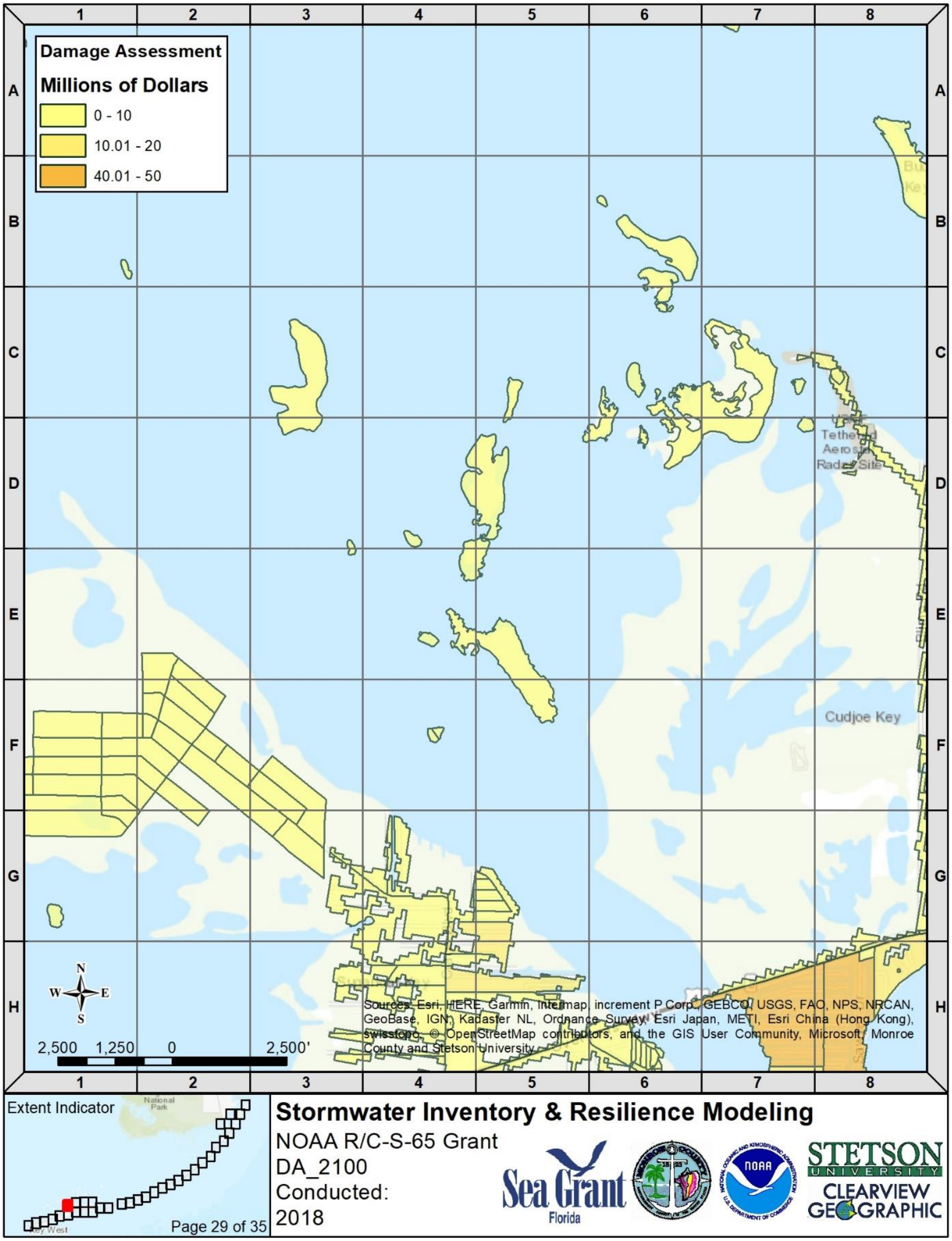

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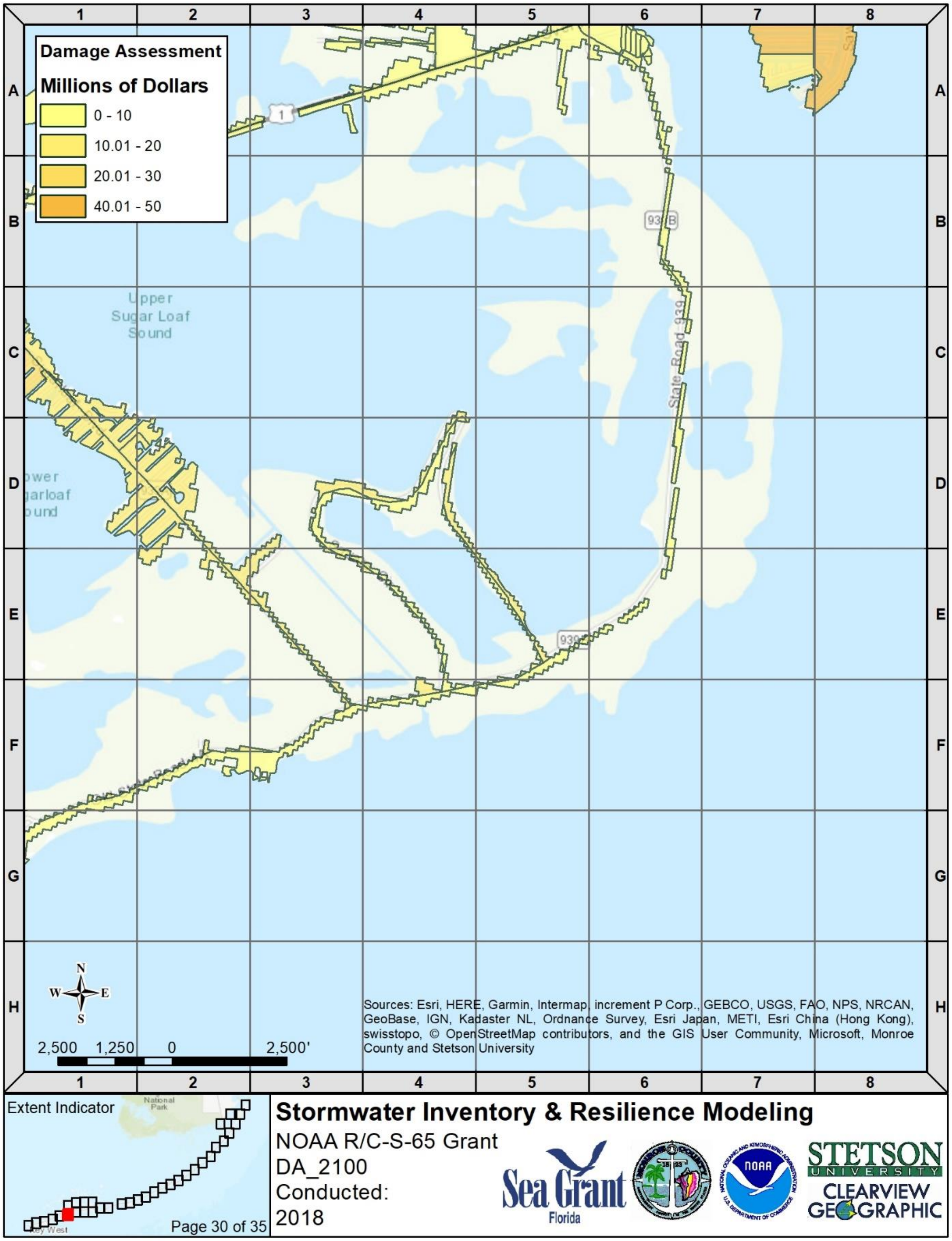

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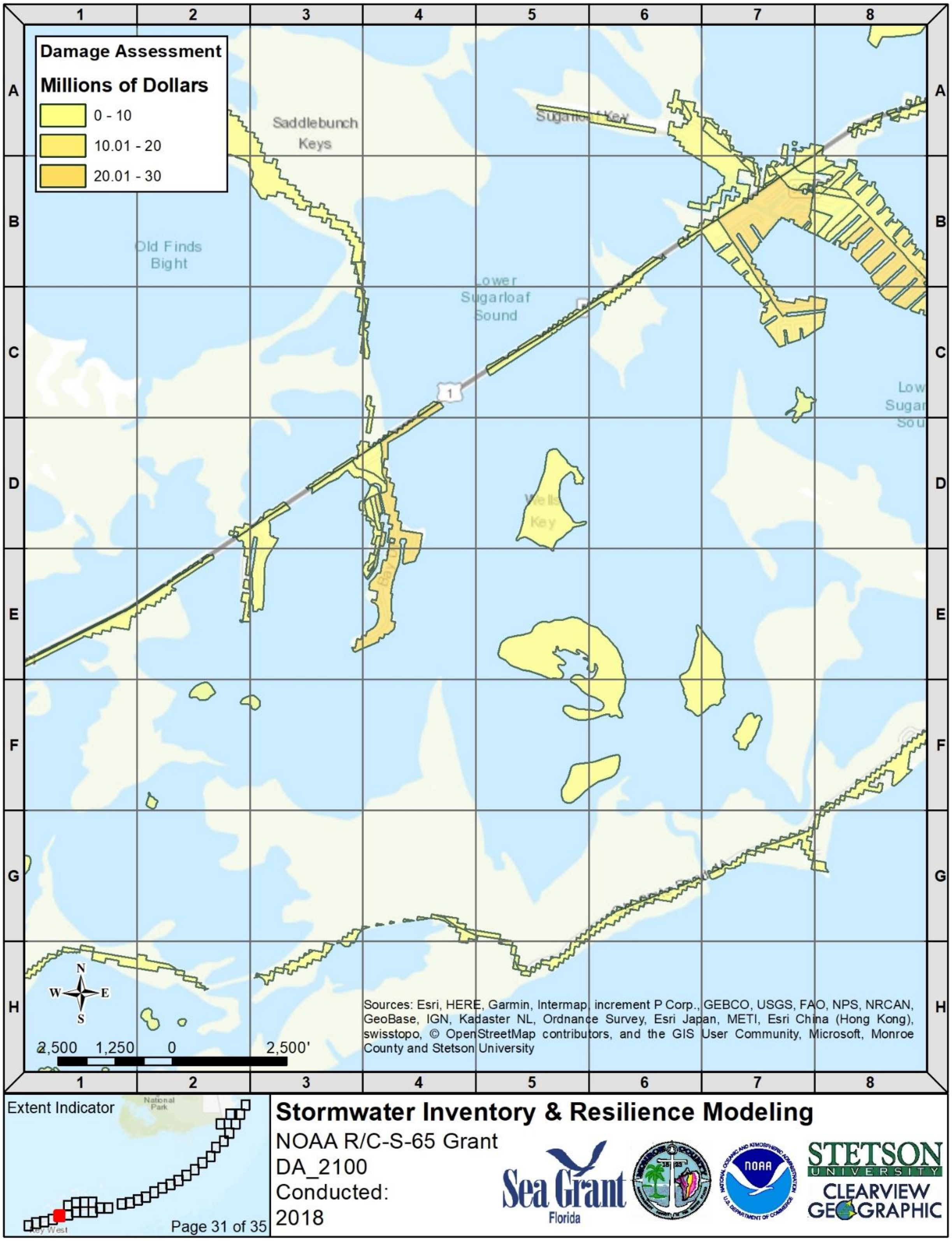

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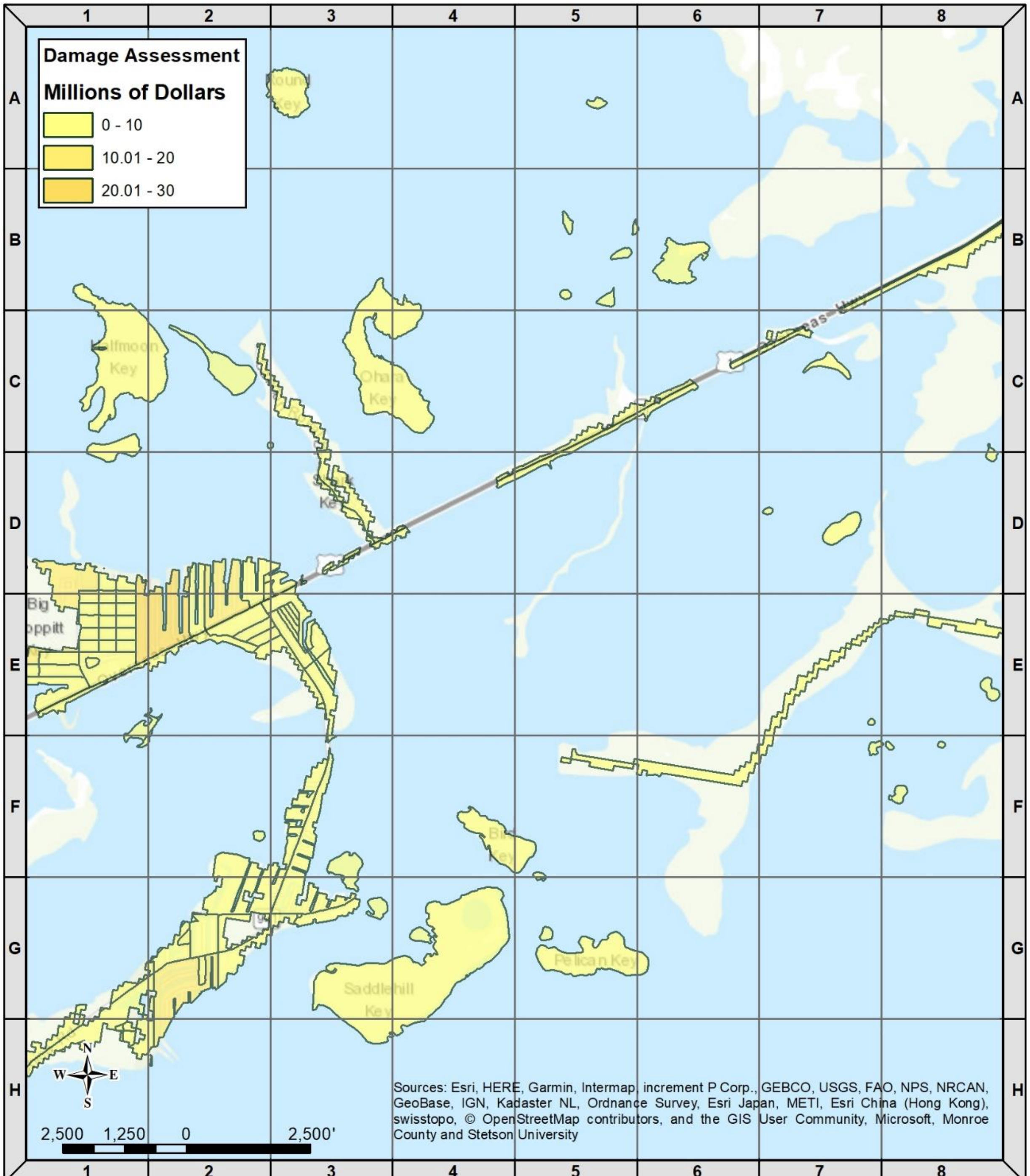

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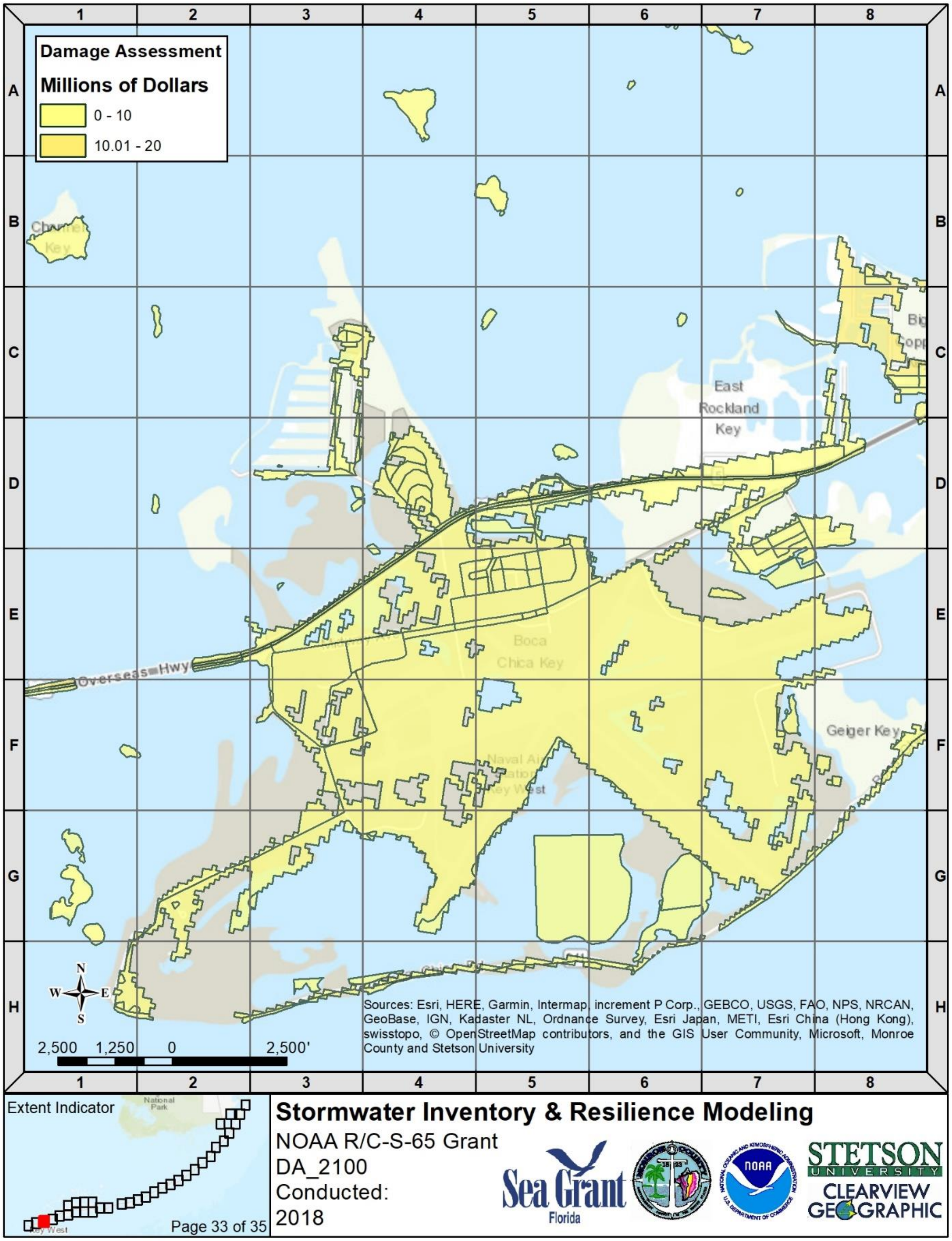

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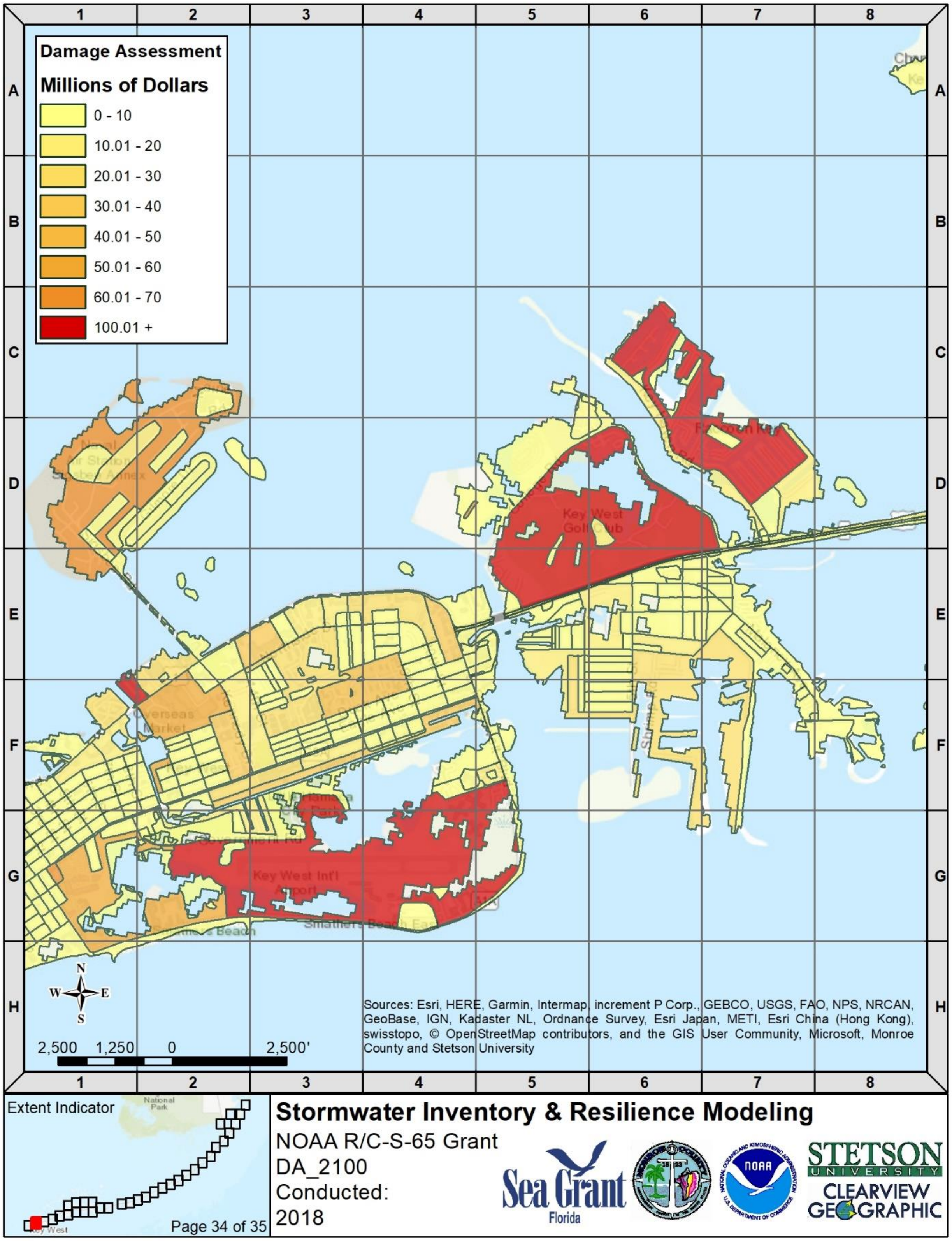

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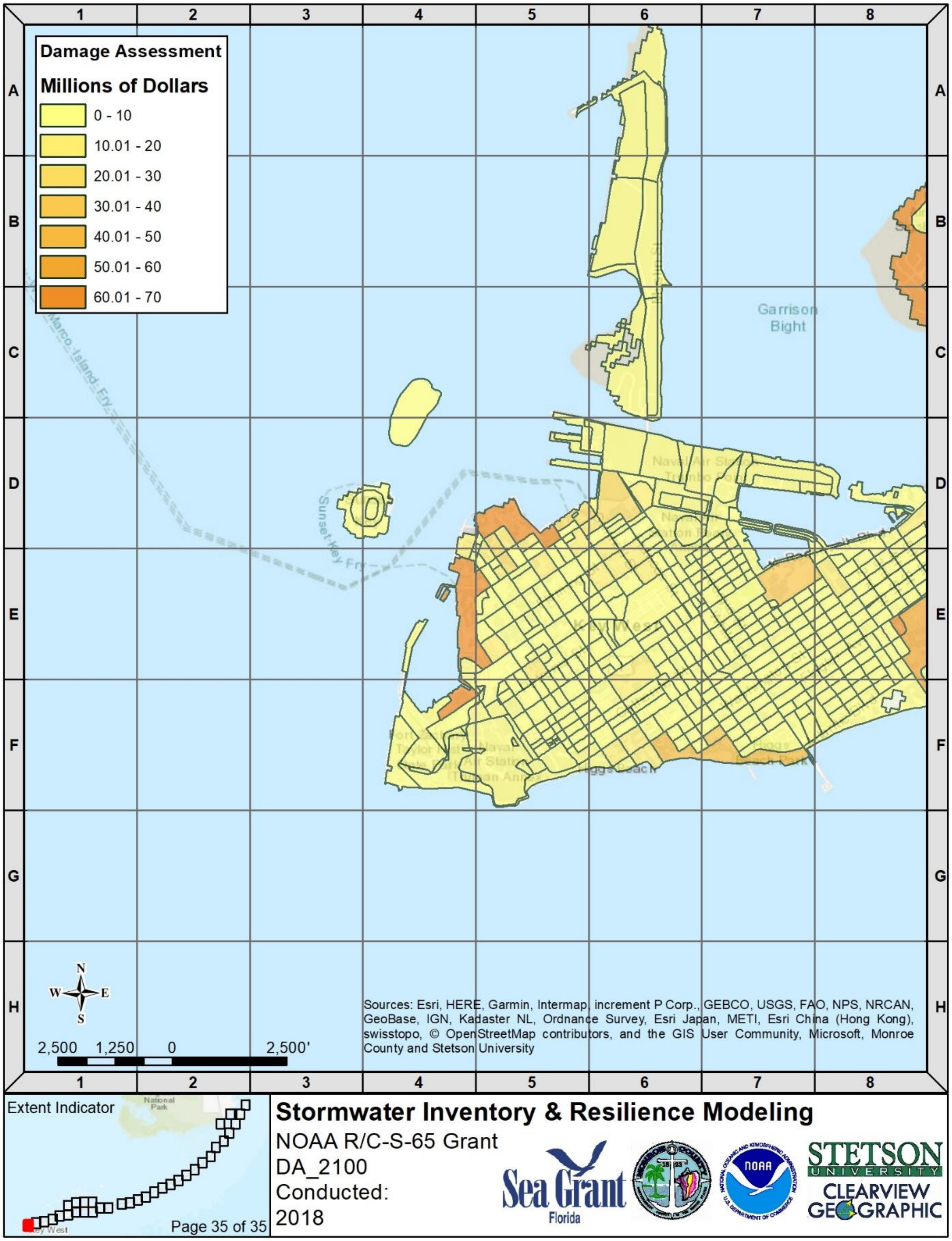

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