



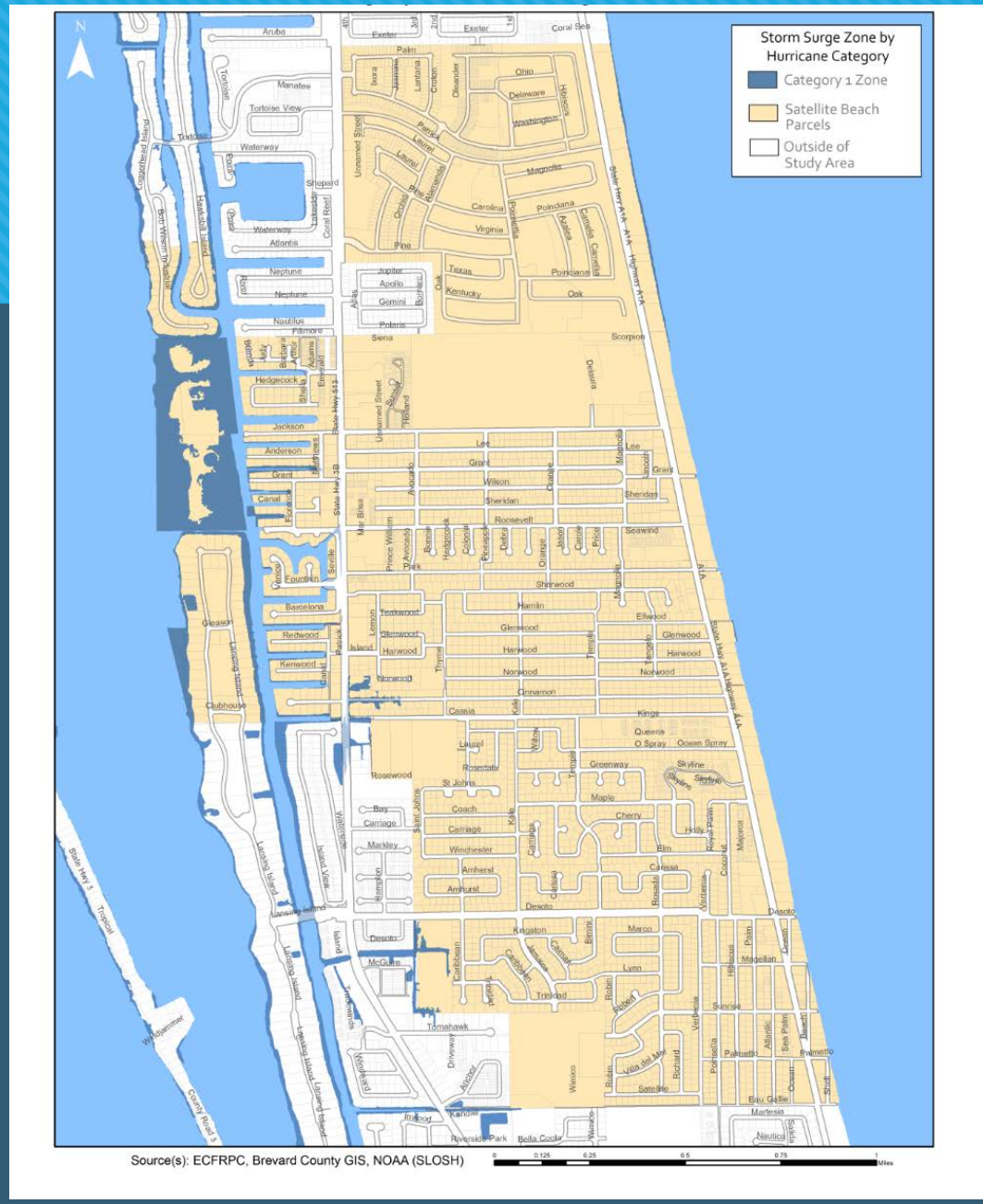
#ResiliencyinSatelliteBeach

Courtney H. Barker, AICP

City Manager, City of Satellite Beach

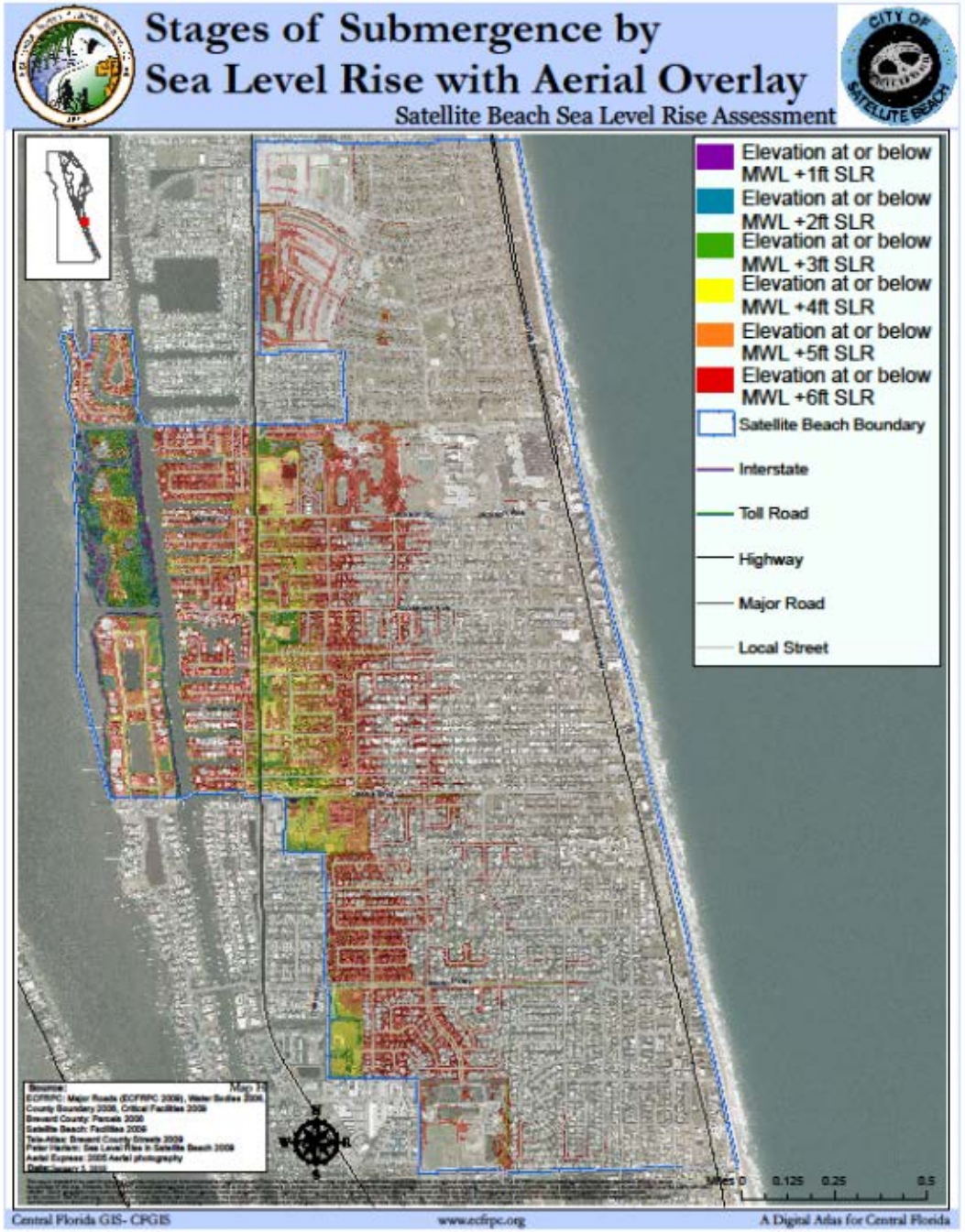
City of Satellite Beach Intro

- Situated on an barrier island between the Banana River and the Atlantic Ocean
- 15 miles south of Cape Canaveral Air Force Station and NASA
- Patrick Air Force Base is adjacent to our City
- Population is 10,300
- 3.8 square miles, with 617 acres of navigable canal system and Banana River

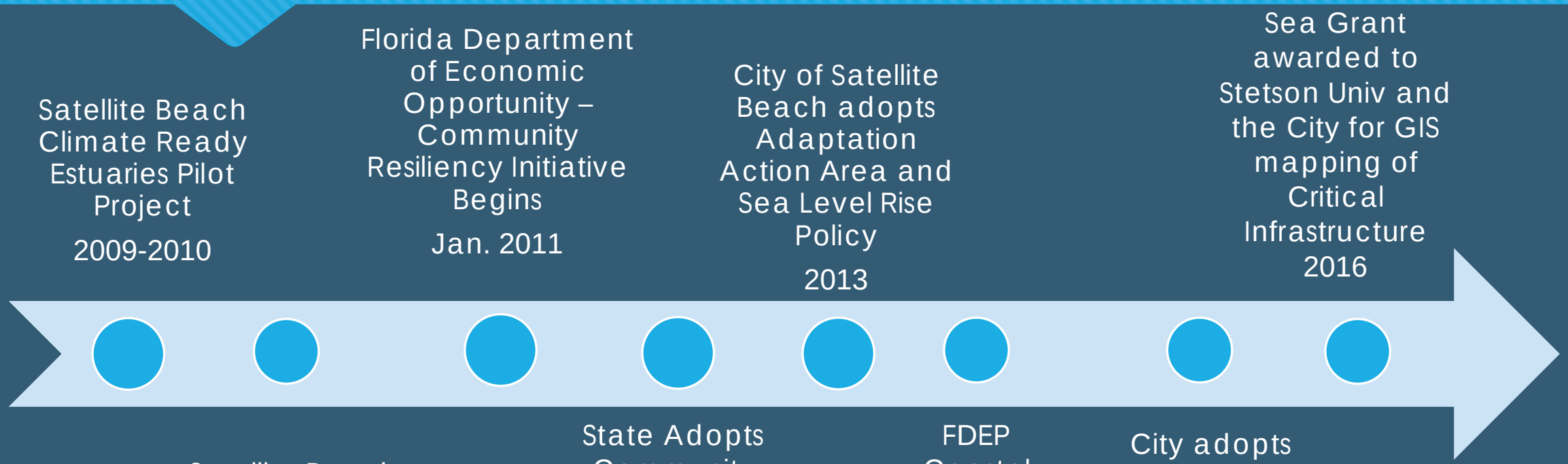


Sea Level Rise Study 2010

- City began looking at Sea Level Rise in 2010, with the Sea Level Rise Adaptation Report, conducted by RWParkinson, Inc.
- This report used a “bathtub” model to “assess municipal vulnerability and to initiate the planning process to mitigate impacts.”

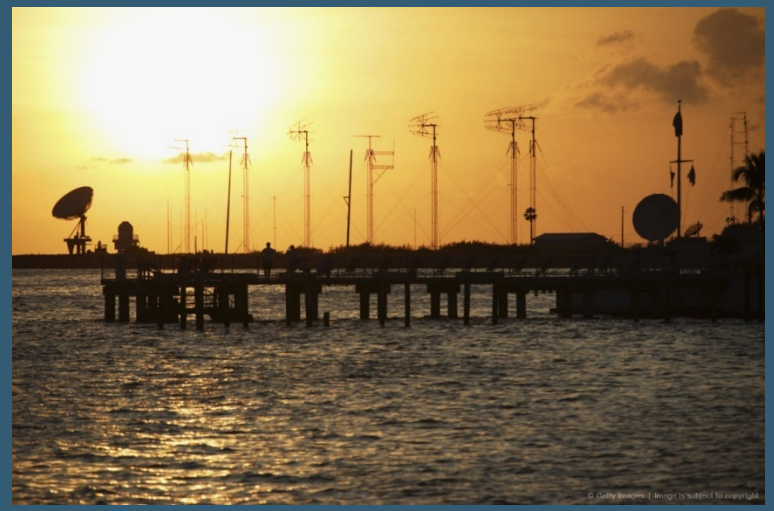


Where we have been...



Creating a Resilient Community Project Overview

- Florida Department of Protection Grant Program – Coastal Partnership Initiative
- Community Resiliency
- 1 Year (July 2014- June 2015)



DEPARTMENT OF ENVIRONMENTAL PROTECTION
FLORIDA

First Public Workshop

- Held on September 23, 2014
- Notice sent to each property address in the City
- Notice sent out on City Manager Facebook page, with NPR article of the City

Day before Community Workshop

Atlantic Coast

- Mean High High Water (NAVD88)
- USACE Low, Intermediate and High Projection Rate Curves
- Planning Horizon: 2040, 2070, 2100

Lagoon Side

- Mean Annual High Water (NAVD88)
- USACE Low, Intermediate and High Projection Rate Curves
- Planning Horizon: 2040, 2070, 2100

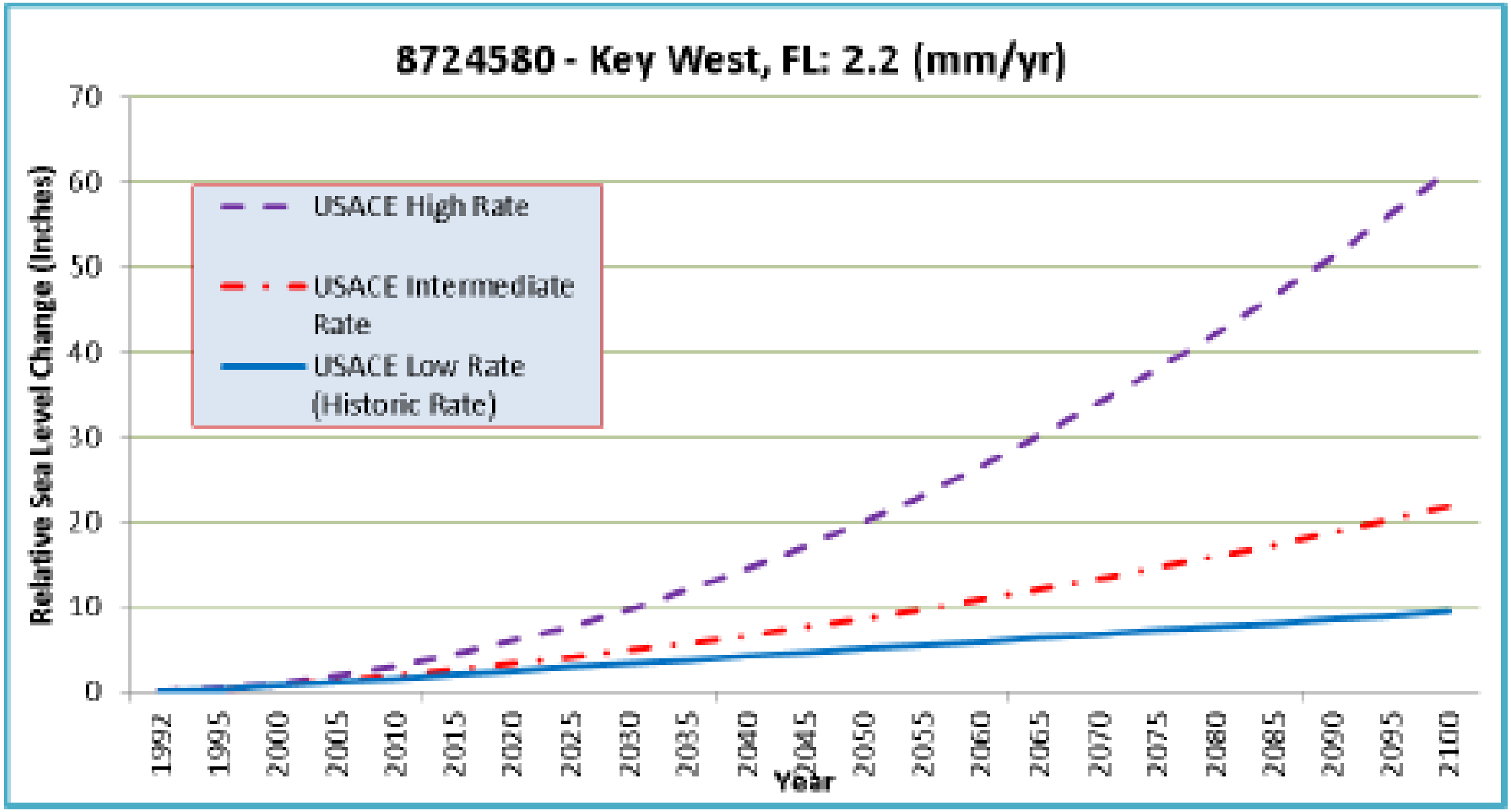
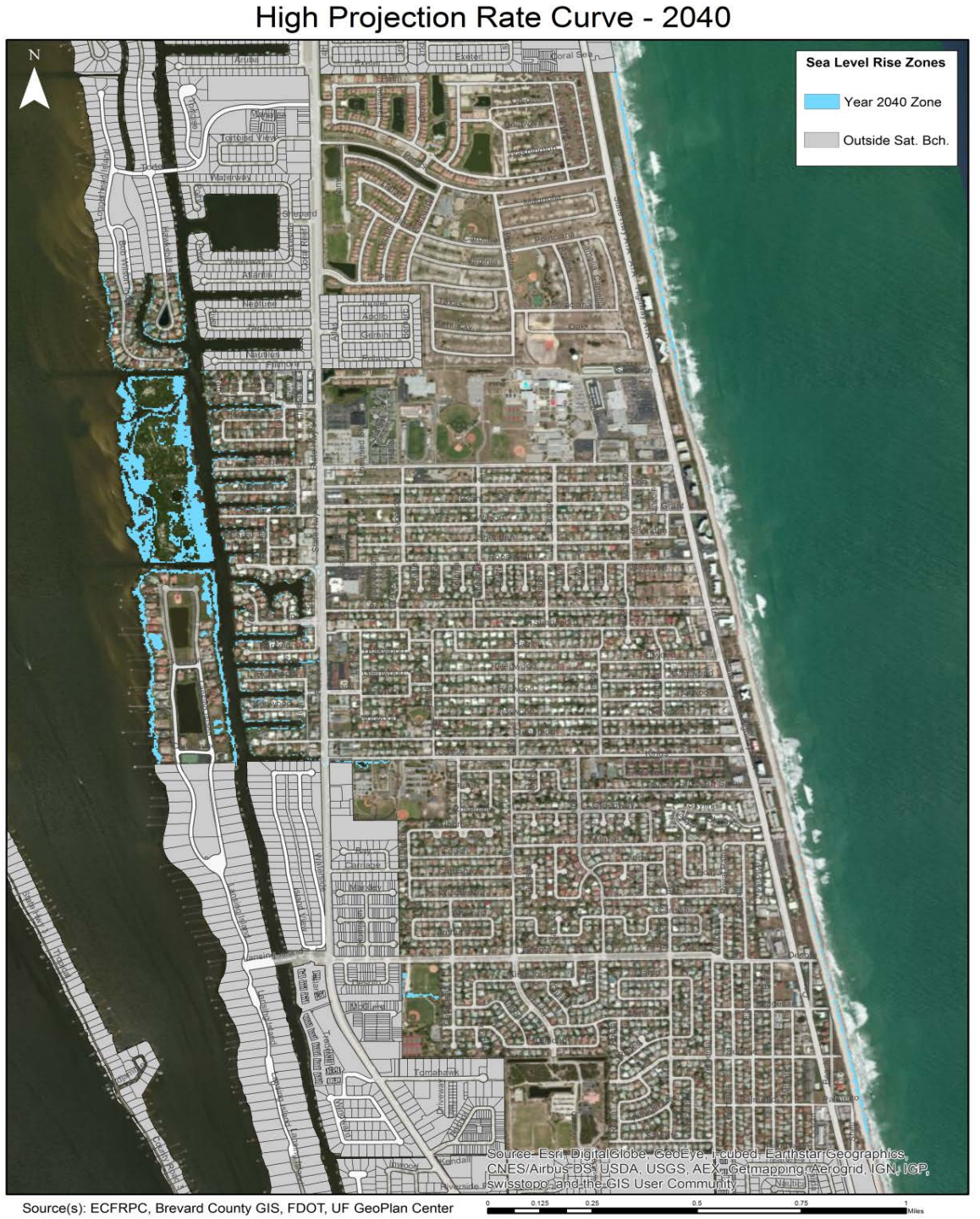


Figure 2 Projected Sea Level Change Curves (Source USACE, 2012)

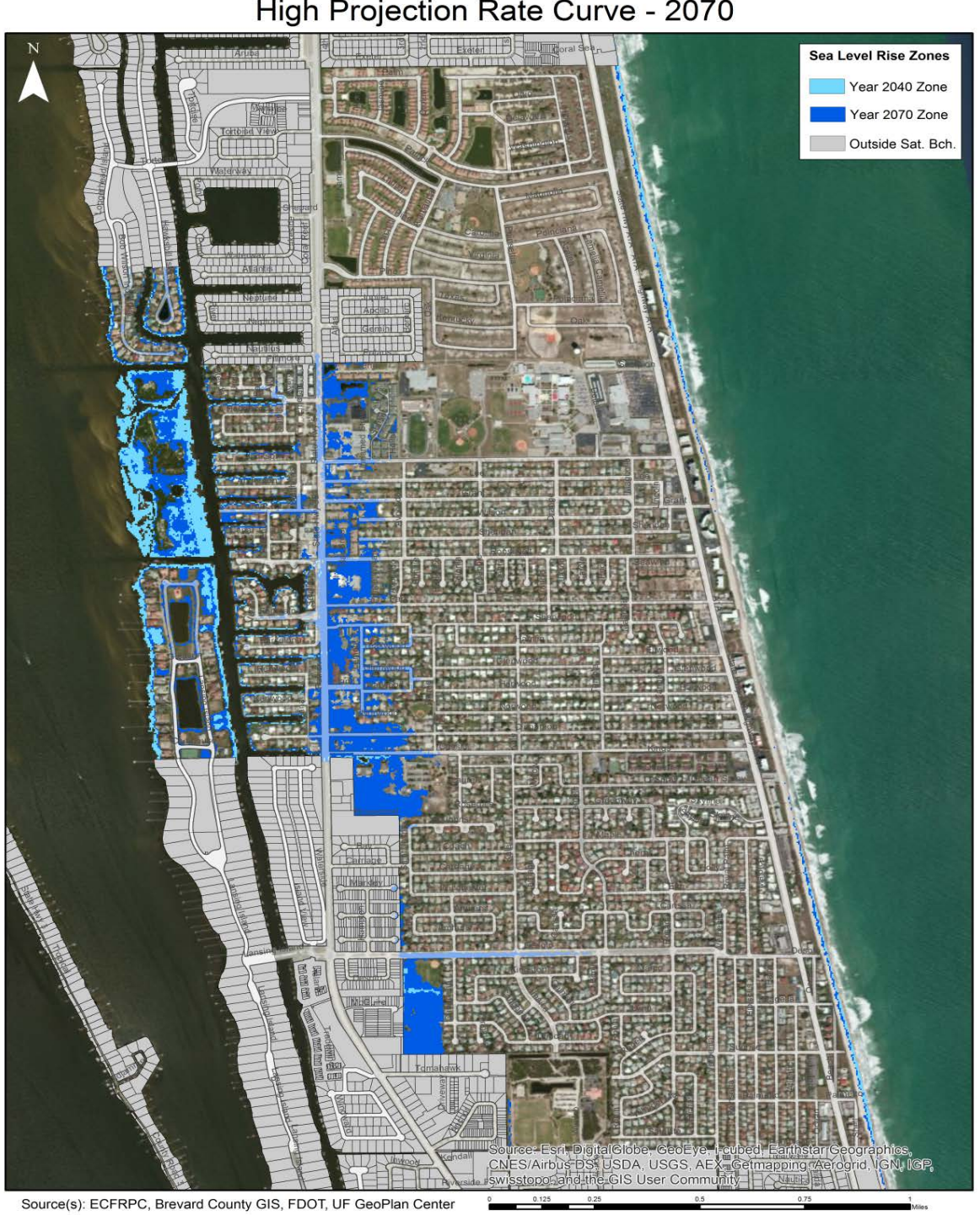
High USACE Projection Rate Curve 2040

- 2040:
  - 46 inch inundation using MHHW (Atlantic),
  - 19 inch inundation using MAHW (Lagoon)



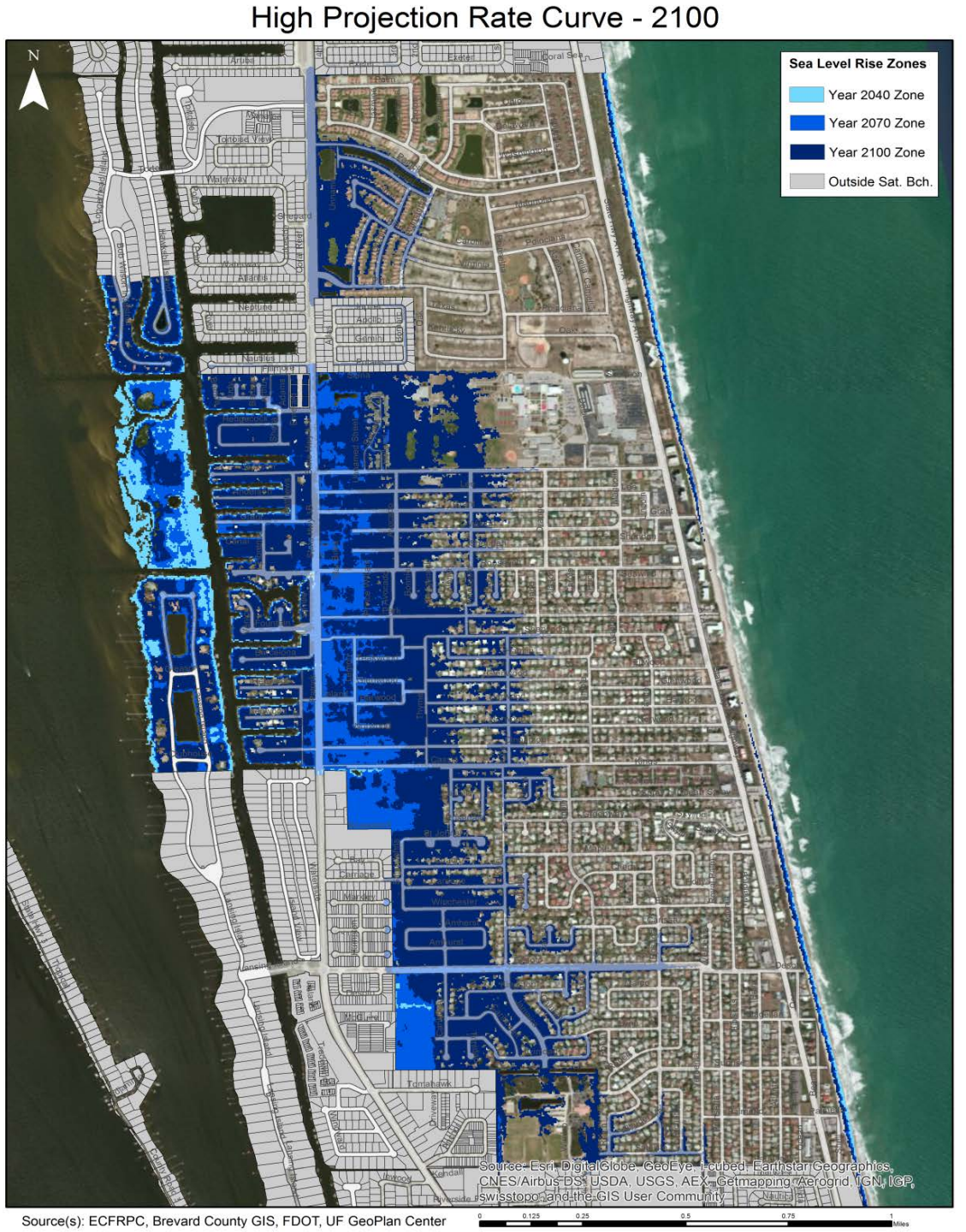
High USACE Projection Rate Curve 2070

- 2070:
  - 66 inch inundation using MHHW (Atlantic),
  - 39 inch inundation using MAHW (Lagoon)

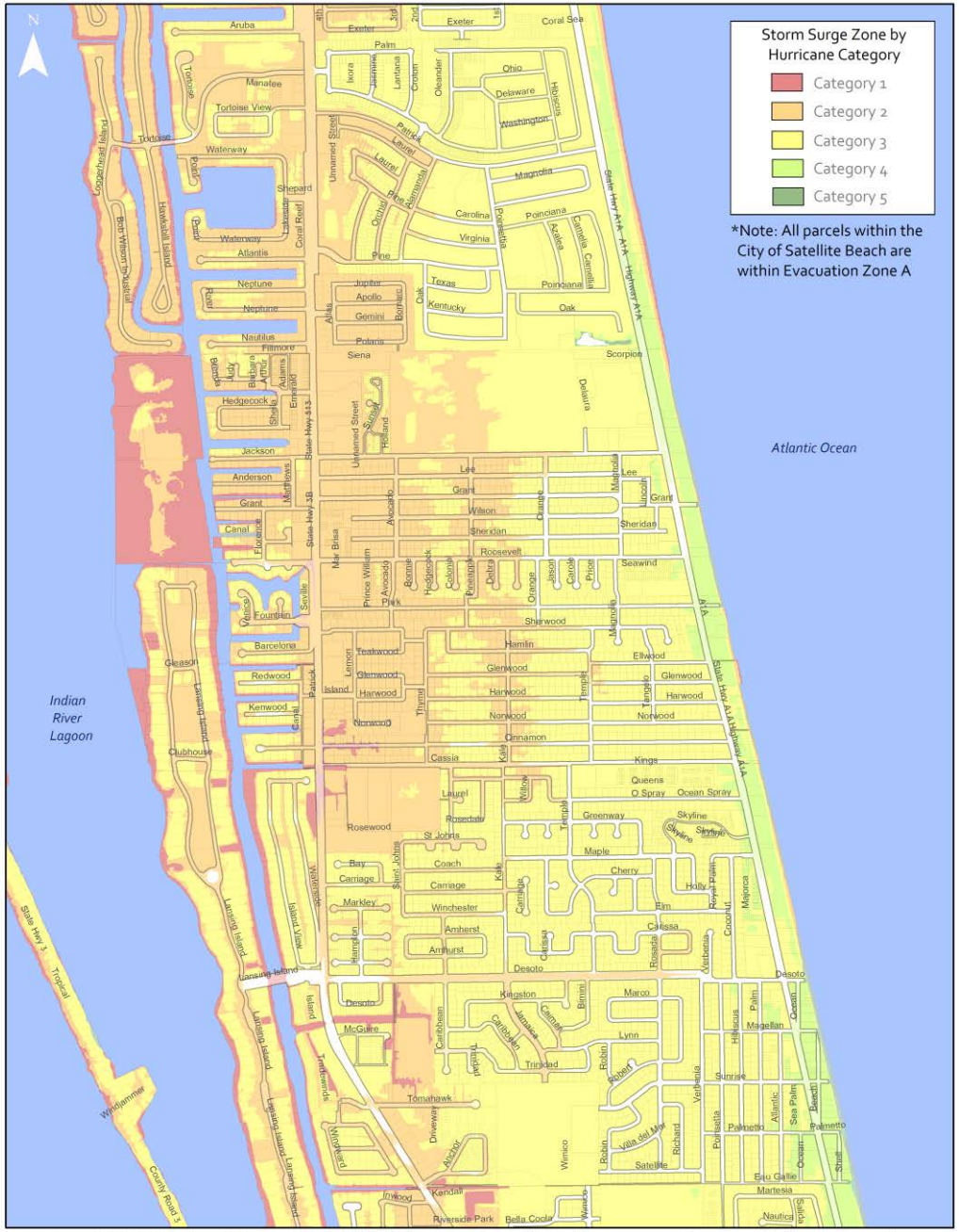


High USACE Projection Rate Curve 2100

- 2100:
  - 93 inch inundation using MHHW (Atlantic),
  - 66 inch inundation using MAHW (Lagoon)



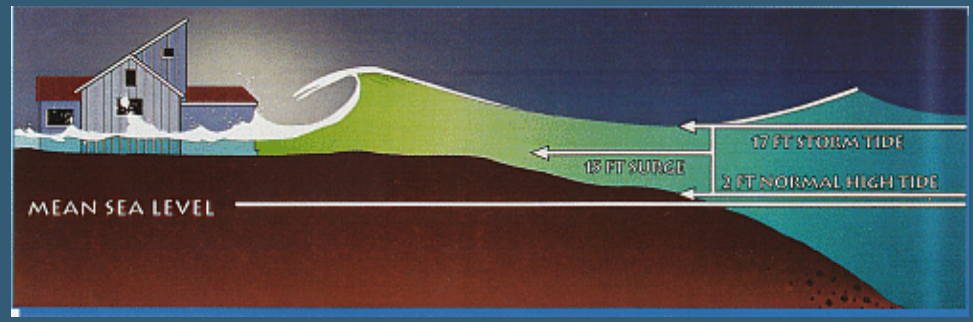
Satellite Beach, Florida - Storm Surge Zones by Hurricane Category



Storm Surge & Erosion

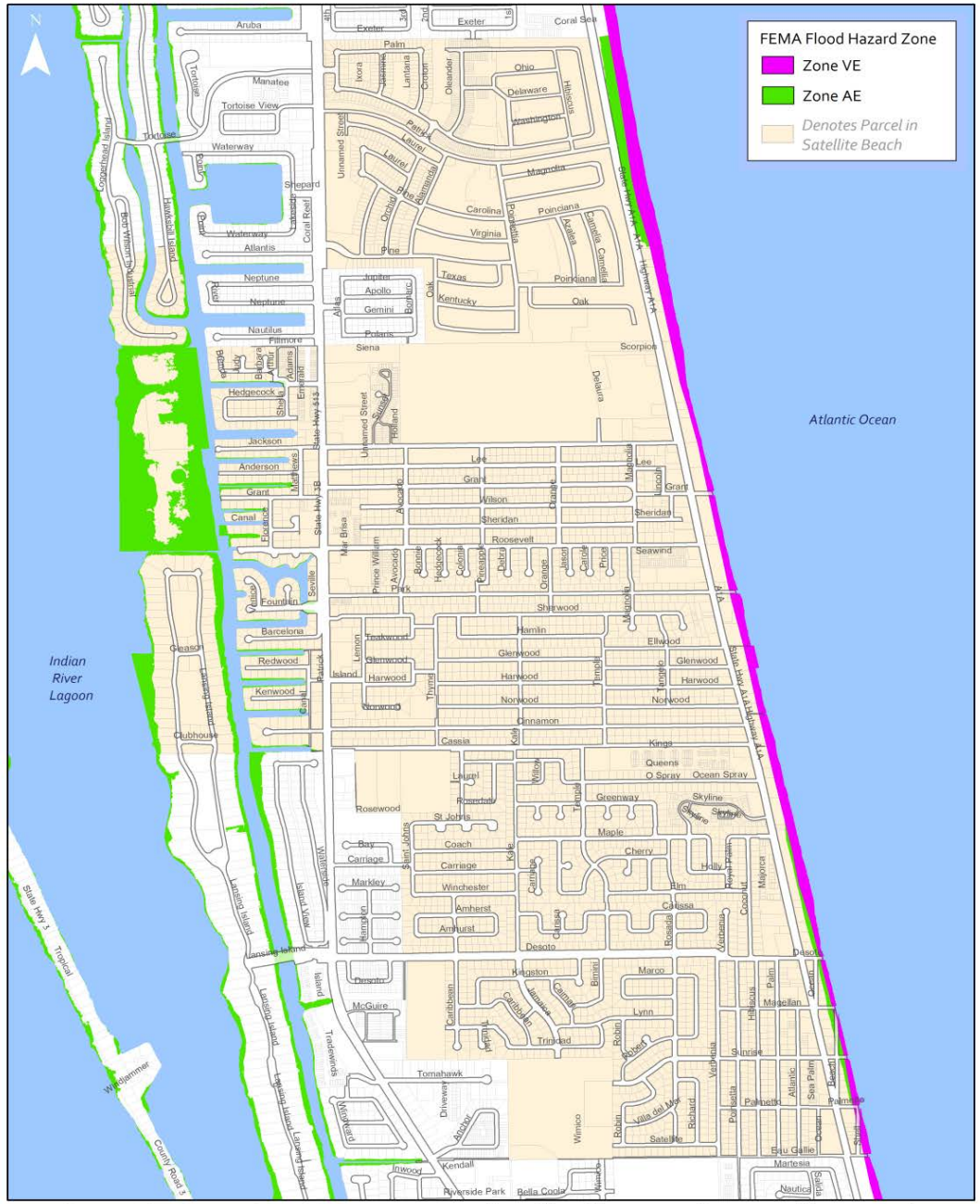
*Storm Strength	Brevard
Category 1	Up to 6’
Category 2	Up to 10’
Category 3	Up to 16’
Category 4	Up to 21’
Category 5	Up to 26’

*** Surge heights represent the maximum values from SLOSH MOMs*



Flood-zones

Flooding from Hurricane Fay
http://www.srh.noaa.gov/images/mlb/surveys/fay/Fay4sb.jpg

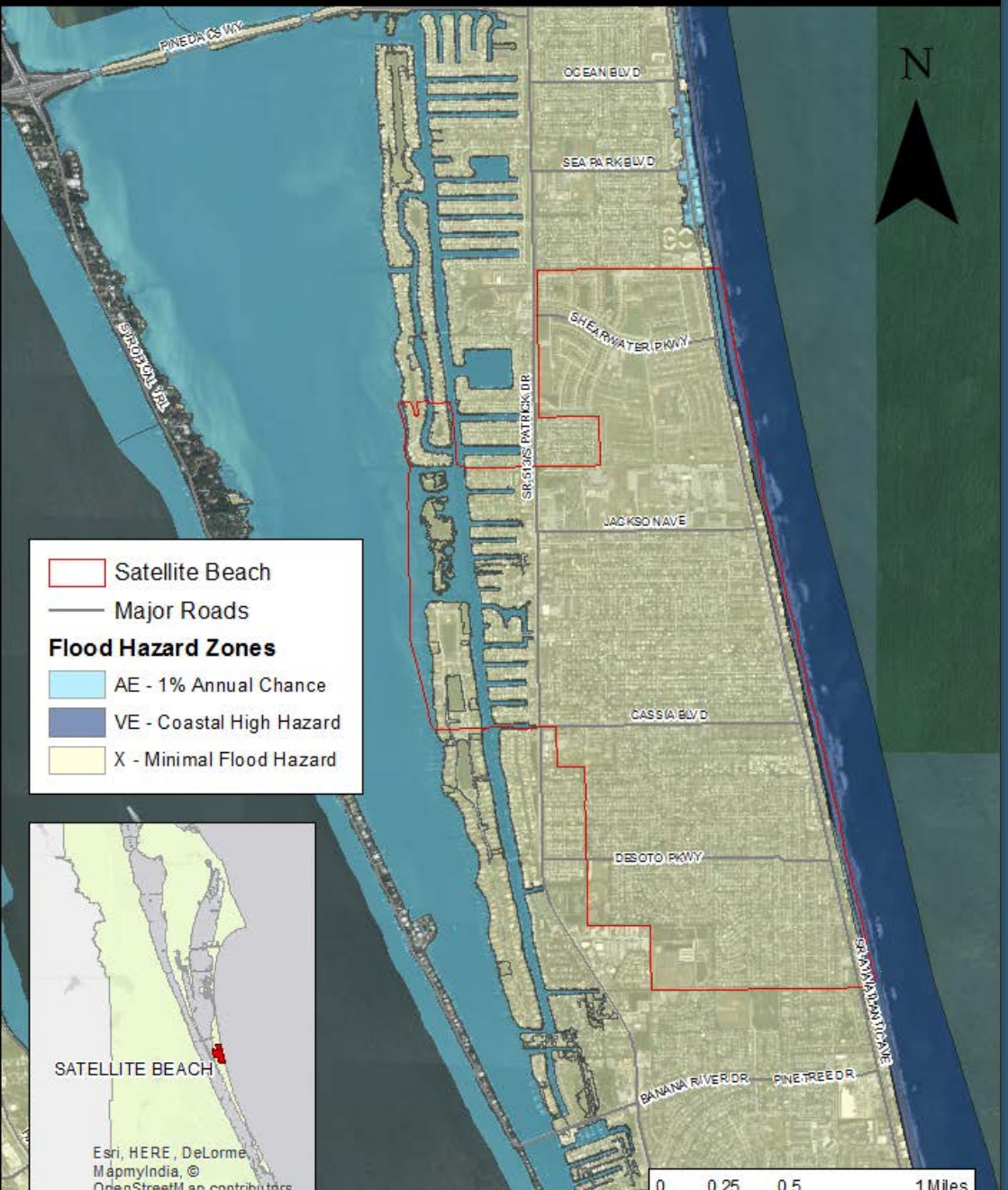


Increased Flooding outside of FEMA maps

- FEMA Maps often differ from the actual flooding that occurs during storms. Why?
  - They fail to take into account hazard modeling and sea level rise.
  - They include a political process
- Example: The City of Satellite Beach 67% of our PIF (policies in force) are located outside a FEMA flood zone.

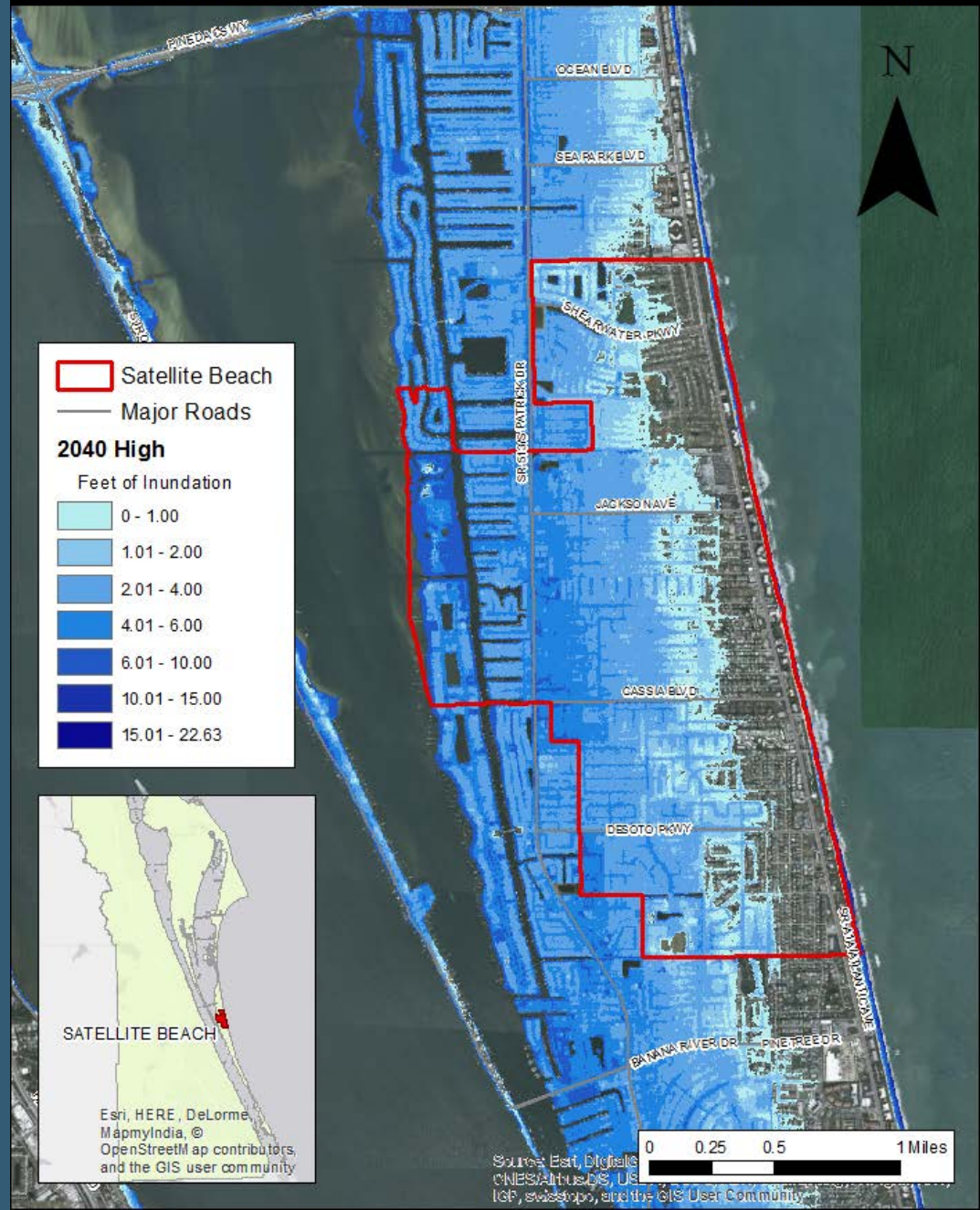
Satellite Beach Inundation Modeling

Flood Hazard Zones of the DFIRM - May 2016



Satellite Beach Inundation Modeling

Hazus Model - 100 Year Flood, 2040 High SWEL (1.22 ft SLR)

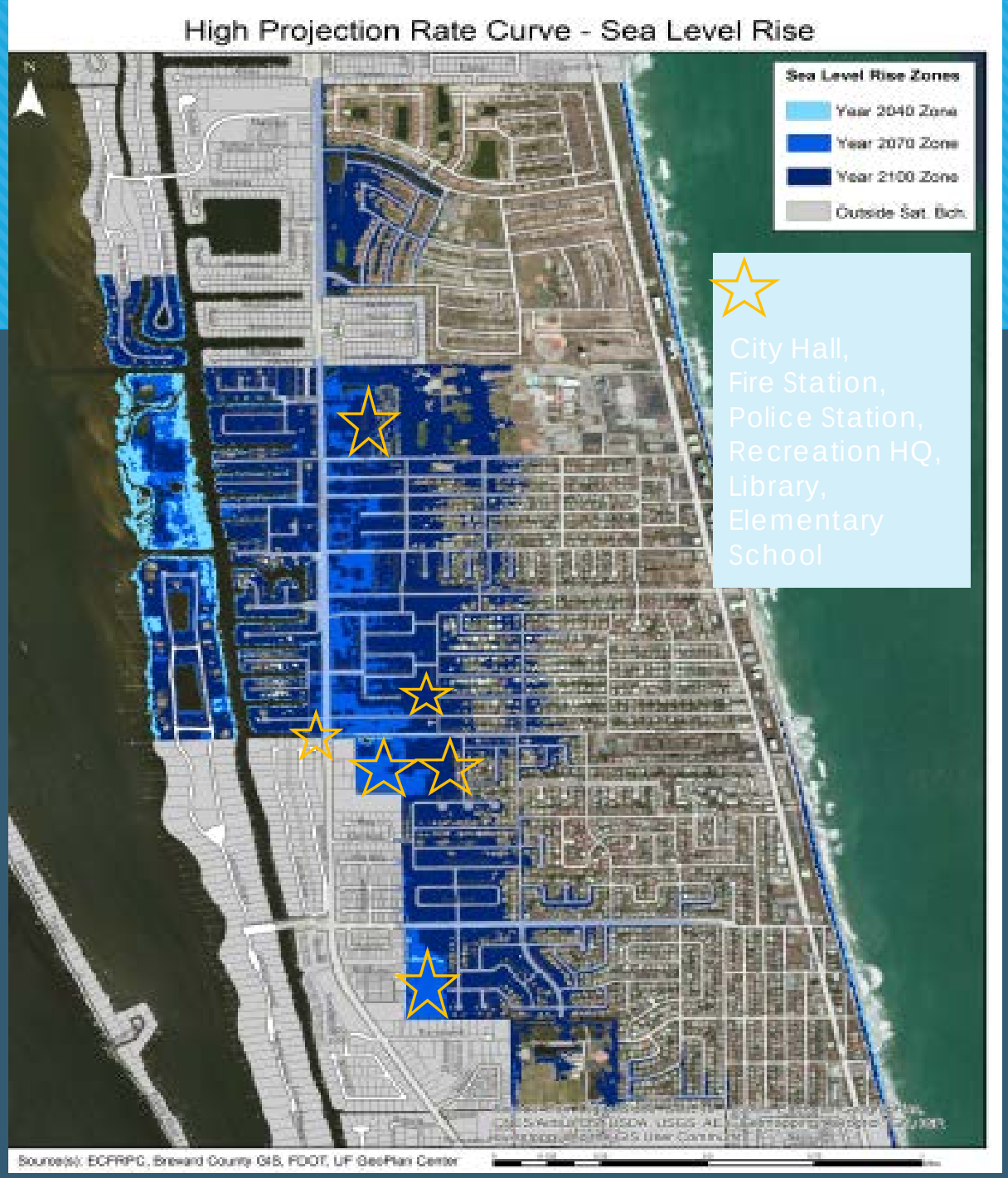


Updating our Stormwater Master Plan

- Must include Sea Level Rise in the Modeling
- Combined with aging infrastructure and possible new “life” spans for pipes with saltwater intrusion
- Must include Water Quality Standards
- The City will likely be doubling our Stormwater Utility Fee this fiscal year

City Facilities at Risk for Flooding

- Public Facilities in the City are all concentrated in flood zones
- City is currently relocating Public Works and the Fire Station
- Purchased property closer to SR A1A



Addressing Development in Known Flood Areas

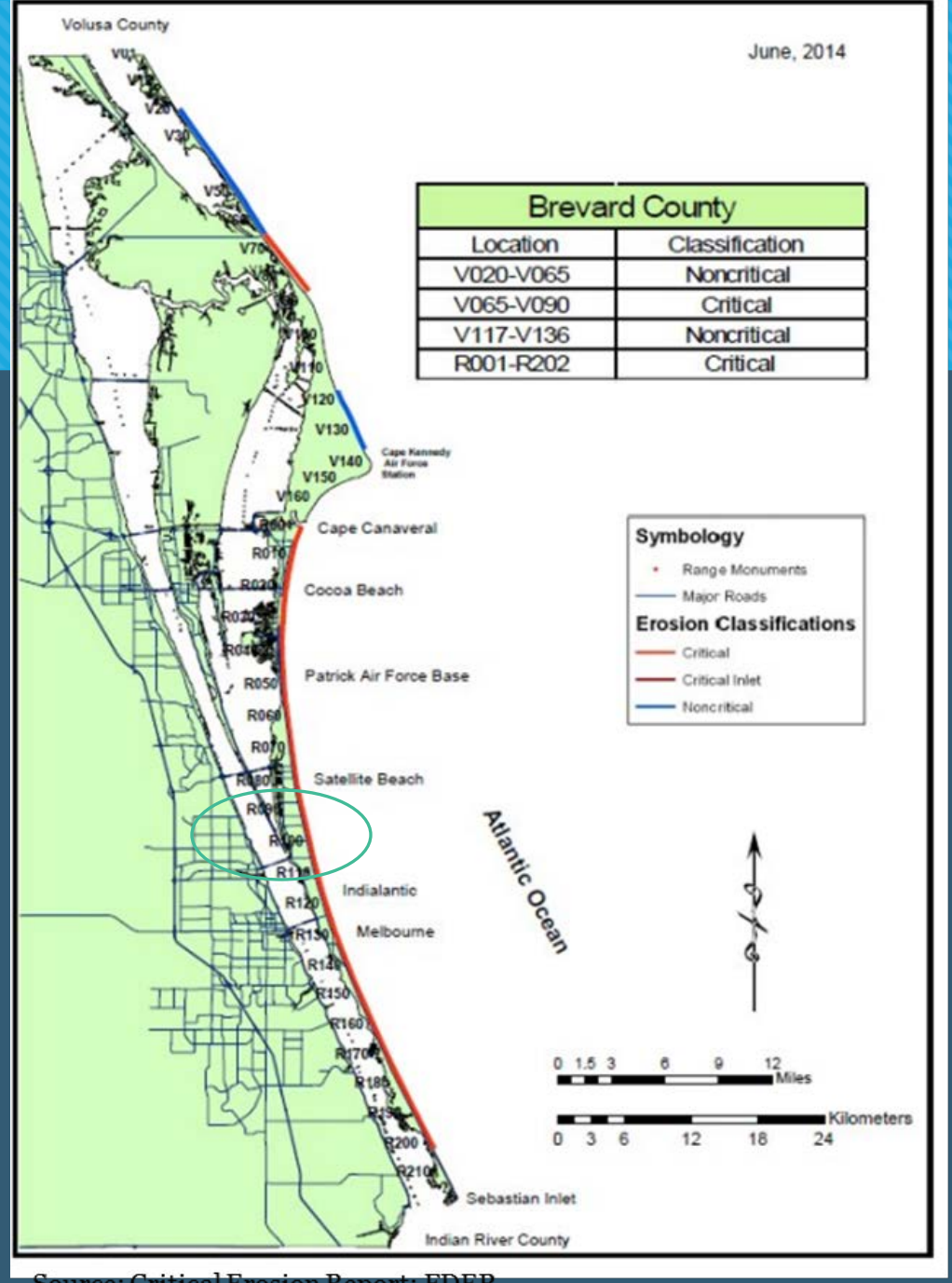
- Charter amendment for the November 2018 Ballot to direct densities away from areas of known flooding and replace potential density units in higher elevation areas.
- Provide incentives for redevelopment/development in non-flood zone areas.
- Adopt a policy for how access to these properties will be managed by the City/County when the flooding is too expensive to maintain. Roadway Abandonment Ordinance
- Provide information to property owners at the time of sale and permitting.
- Create building standards that allow property owners to protect their property.

Coastal Erosion

41.2 miles of Brevard County Beaches classified as Critically Eroded

Definition: erosion and recession of the beach or dune system threatens or caused loss of upland development, recreational interests, wildlife habitat, or important cultural resources

- 2005 Emergency Dune Stabilization Project from 2004
- 2014 Mid Reach Recovery Project
- 2107 Emergency Dune Stabilization Project



Source: Critical Erosion Report; FDEP
http://www.dep.state.fl.us/beaches/publications/pdf/CriticalErosionReport.pdf

Beach Erosion

- Working on a Statewide Policy with other environmental organizations and cities for coastal retreat in repeatedly compromised areas.

Sustainability

- The City created a Sustainability Board in 2015.
- The Board has created a Plan, with Green Achievement Targets.
- The City is placing Solar on City Hall this year.
- The City is transitioning our administrative fleet to electric vehicles.
- The City no longer uses synthetic fertilizers or pesticides.

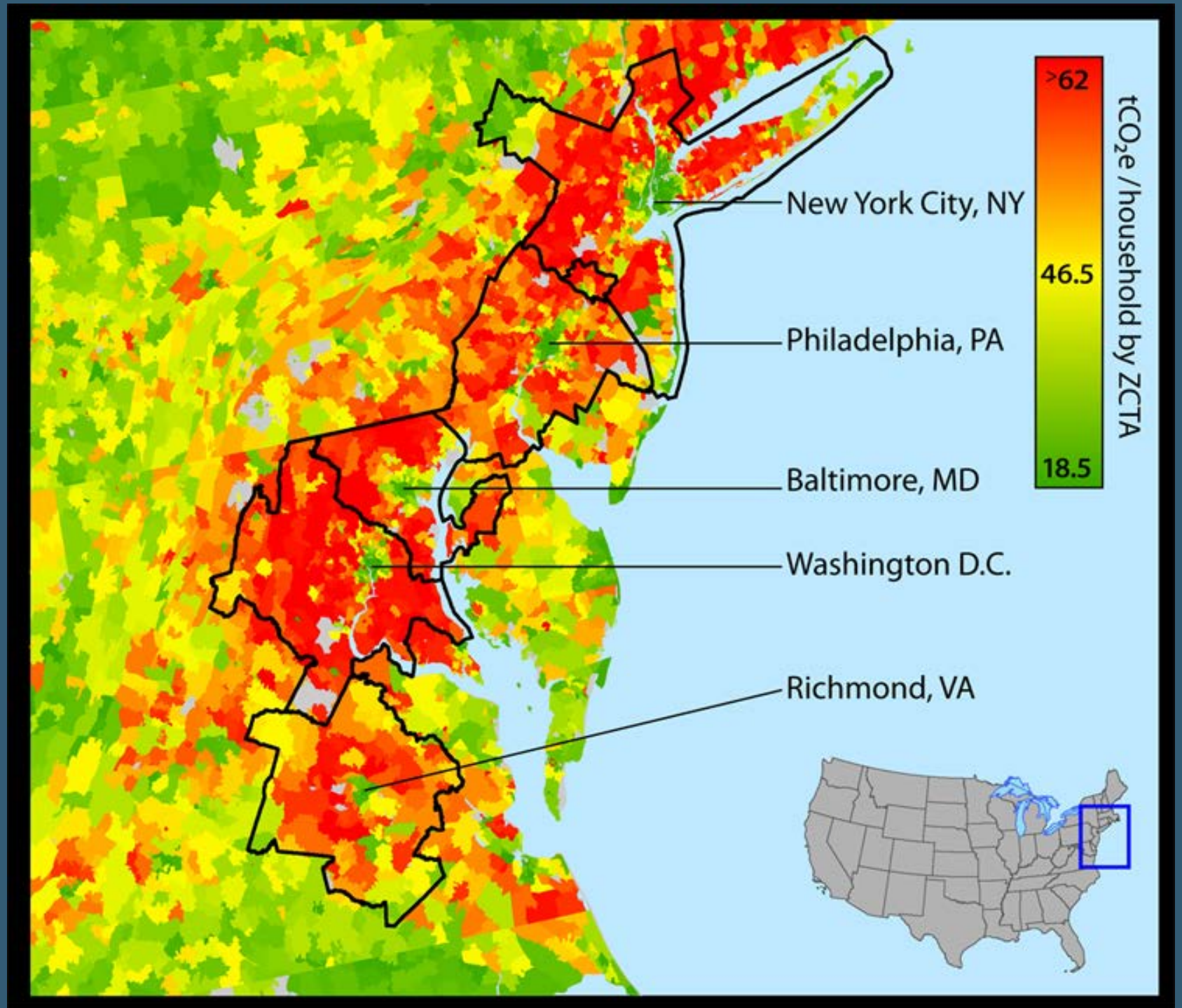
Issues in Land Use and Climate Vulnerability

- How do land use policies have an impact on climate emissions?

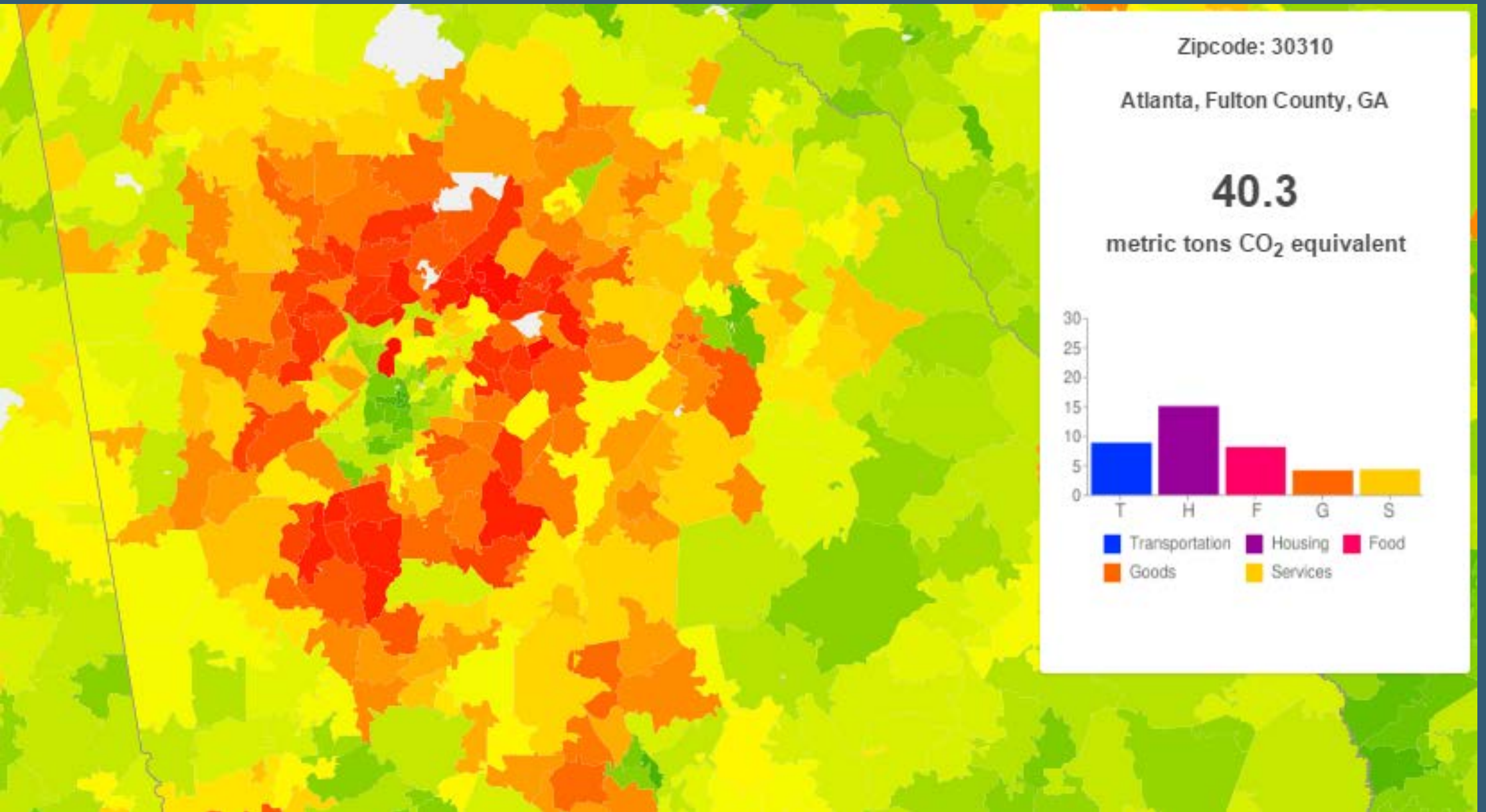
UC Berkeley Study

Title: Spatial Distribution of the U.S. Household Carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Development

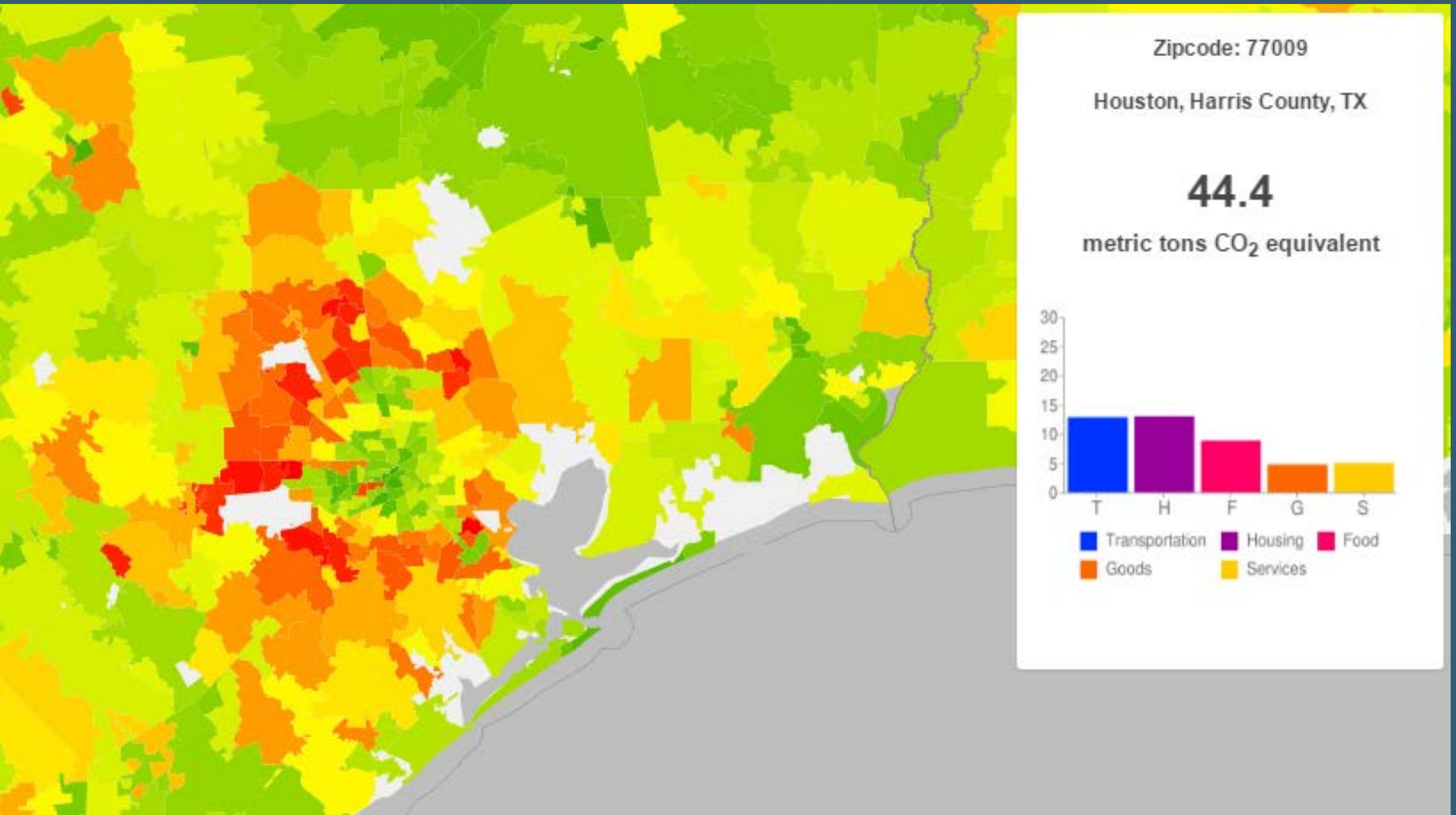
Abstract: Which municipalities and locations within the United States contribute the most to household greenhouse gas emissions, and what is the effect of population density and suburbanization on emissions? Using national household surveys, we developed econometric models of demand for energy, transportation, food, goods, and services that were used to derive average household carbon footprints (HCF) for U.S. zip codes, cities, counties, and metropolitan areas. We find **consistently lower HCF in urban core cities** (~40 tCO_2e) and **higher carbon footprints in outlying suburbs** (~50 tCO_2e), with a range from ~25 to >80 tCO_2e in the 50 largest metropolitan areas. **Population density exhibits a weak but positive correlation with HCF until a density threshold is met**, after which range, mean, and standard deviation of HCF decline. While **population density contributes to relatively low HCF in the central cities of large metropolitan areas, the more extensive suburbanization in these regions contributes to an overall net increase in HCF** compared to smaller metropolitan areas. **Suburbs alone account for ~50% of total U.S. HCF.** Differences in the size, composition, and location of household carbon footprints suggest the need for tailoring of greenhouse gas mitigation efforts to different populations.


New York City, NY
Philadelphia, PA
Baltimore, MD
Washington D.C.
Richmond, VA
>62
46.5
18.5
tCO2e /household by ZCTA

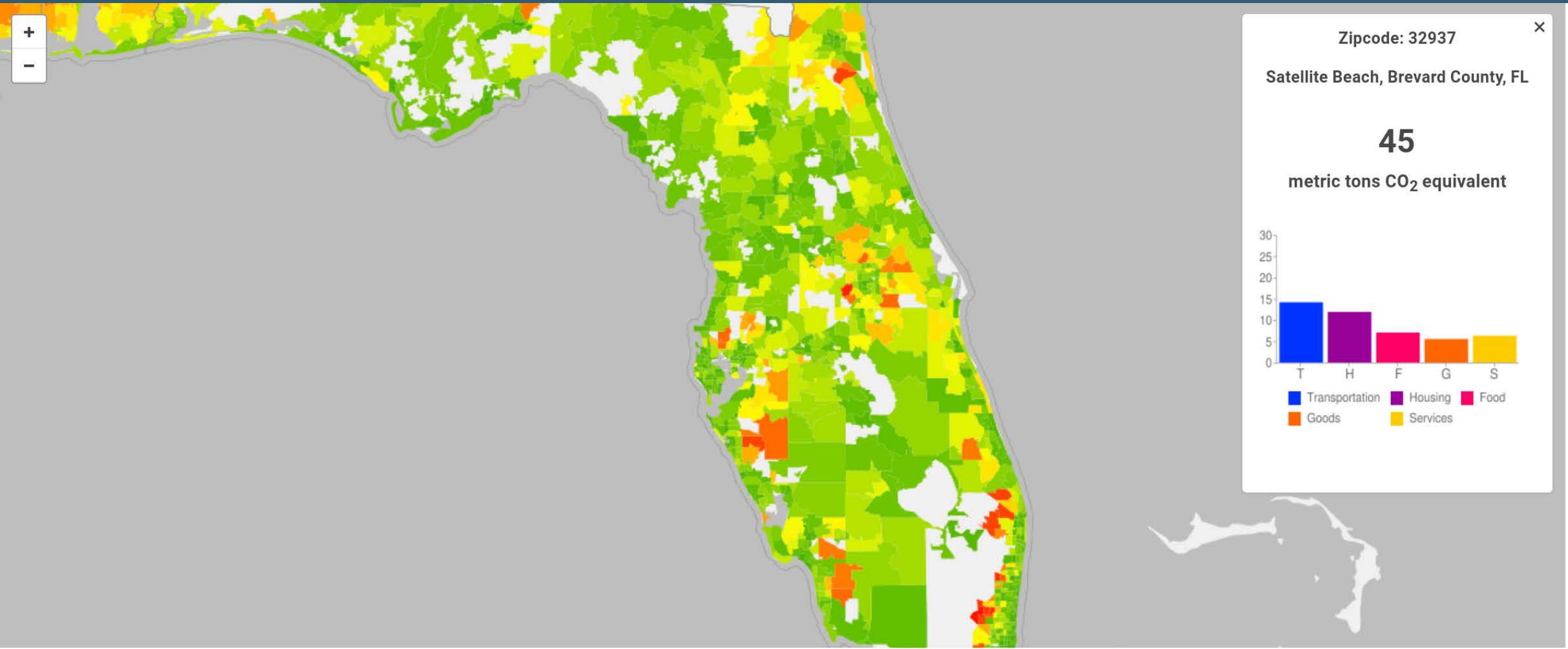
Atlanta, GA


Zipcode: 30310
Atlanta, Fulton County, GA
40.3
metric tons CO_2 equivalent
30
25
20
15
10
5
0
T
H
F
G
S
Transportation
Housing
Food
Goods
Services

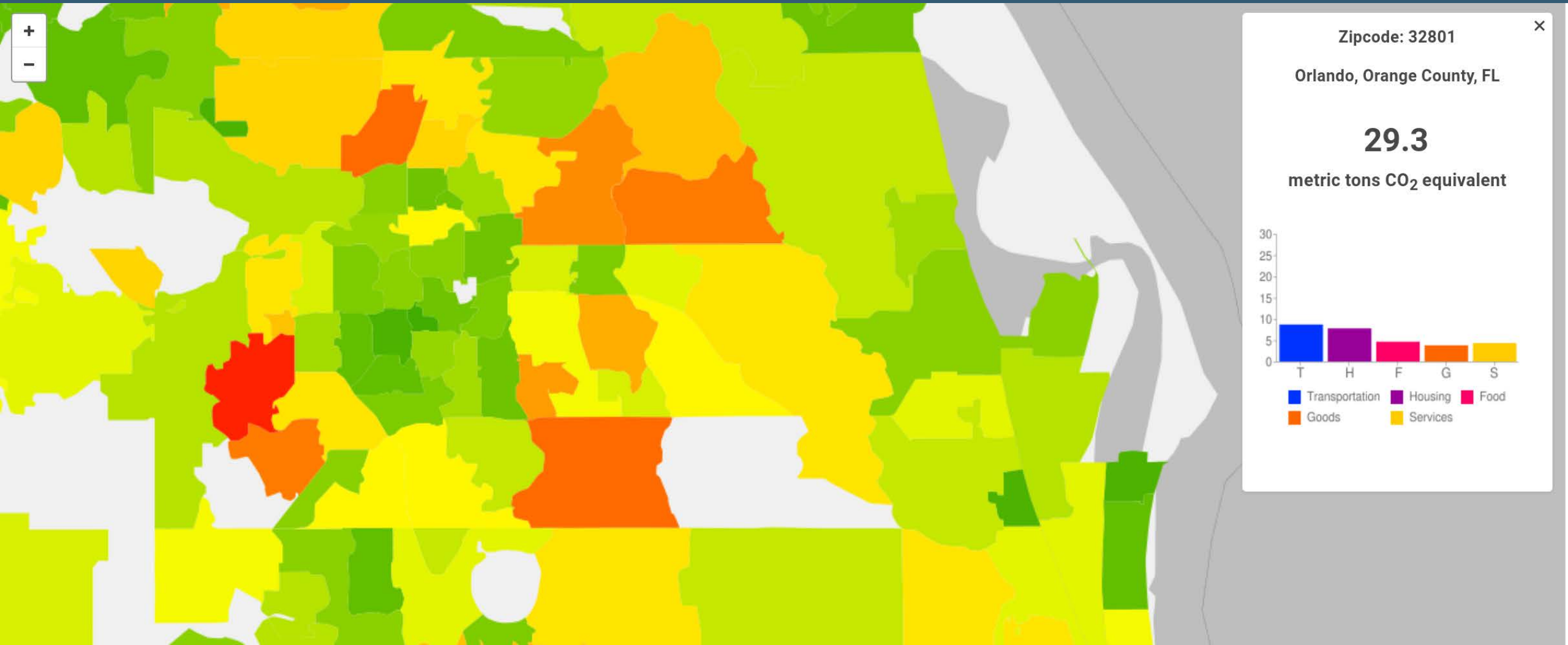
Houston, TX


Zipcode: 77009
Houston, Harris County, TX
44.4
metric tons CO_2 equivalent
30
25
20
15
10
5
0
T
H
F
G
S
Transportation
Housing
Food
Goods
Services

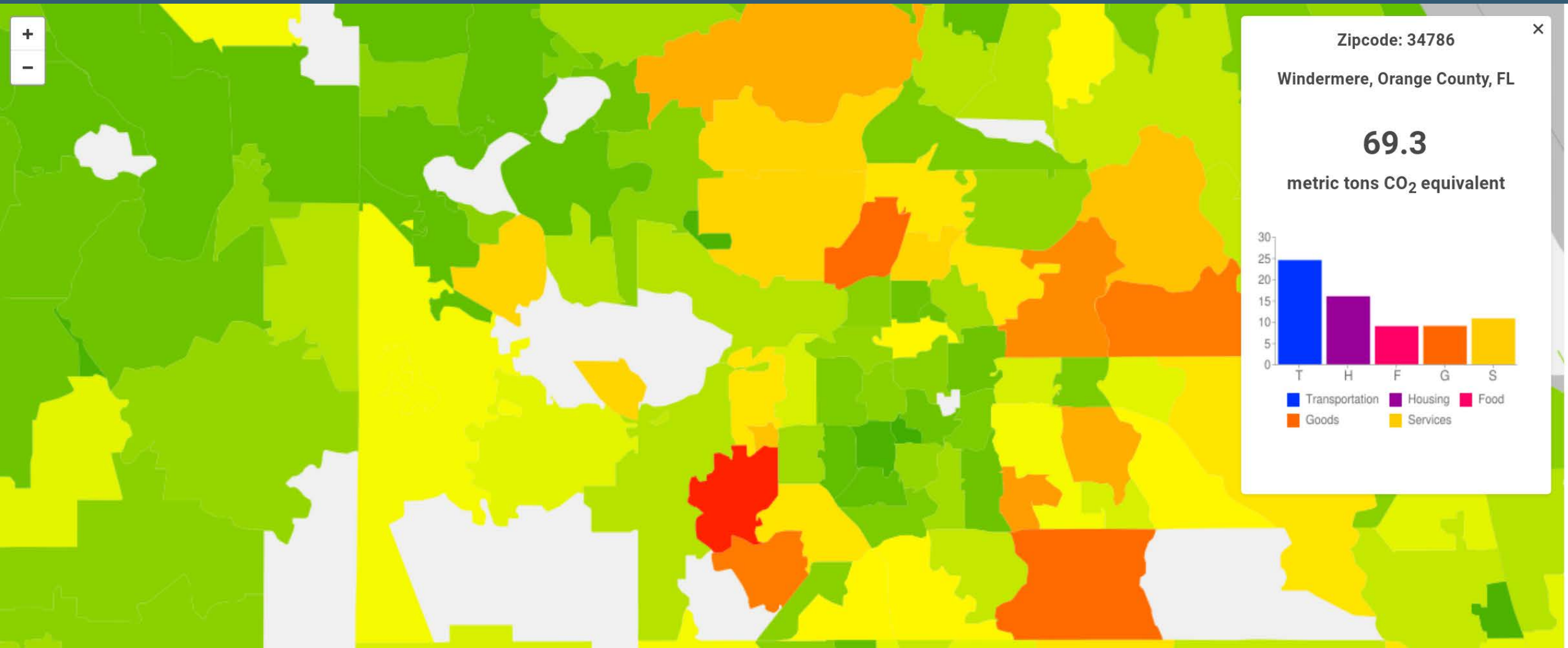
Florida, Satellite Beach Data



Orlando, Fl


+
−
Zipcode: 32801
Orlando, Orange County, FL
29.3
metric tons CO_2 equivalent
30
25
20
15
10
5
0
T
H
F
G
S
Transportation
Housing
Food
Goods
Services

Windemere, FL



So can do we do?

- Development patterns (urban form) and transportation have a profound effect on climate emissions.
- Be mindful of those development patterns!
- Less density is not necessarily better.
- Mixed-use development patterns and denser communities are more walkable and lend themselves to better transit use.

The “Take Away”….

- We need to address the lack of public transportation across the State.
- Stop developing non-urban wetlands.
- Balance the long range costs to the tax payers of developing in known hazard areas (high erosion areas, wetlands, etc.) with property rights.
- Promote mixed use urban centers.
- Continue to revitalize our downtowns.
- We must advocate for state and federal resources to help communities plan and prepare.
- Complete the necessary plans for our infrastructure and fund the improvements.
- Do the Assessment for your own community!

THANK YOU!

Courtney H. Barker, AICP
City of Satellite Beach
City Manager

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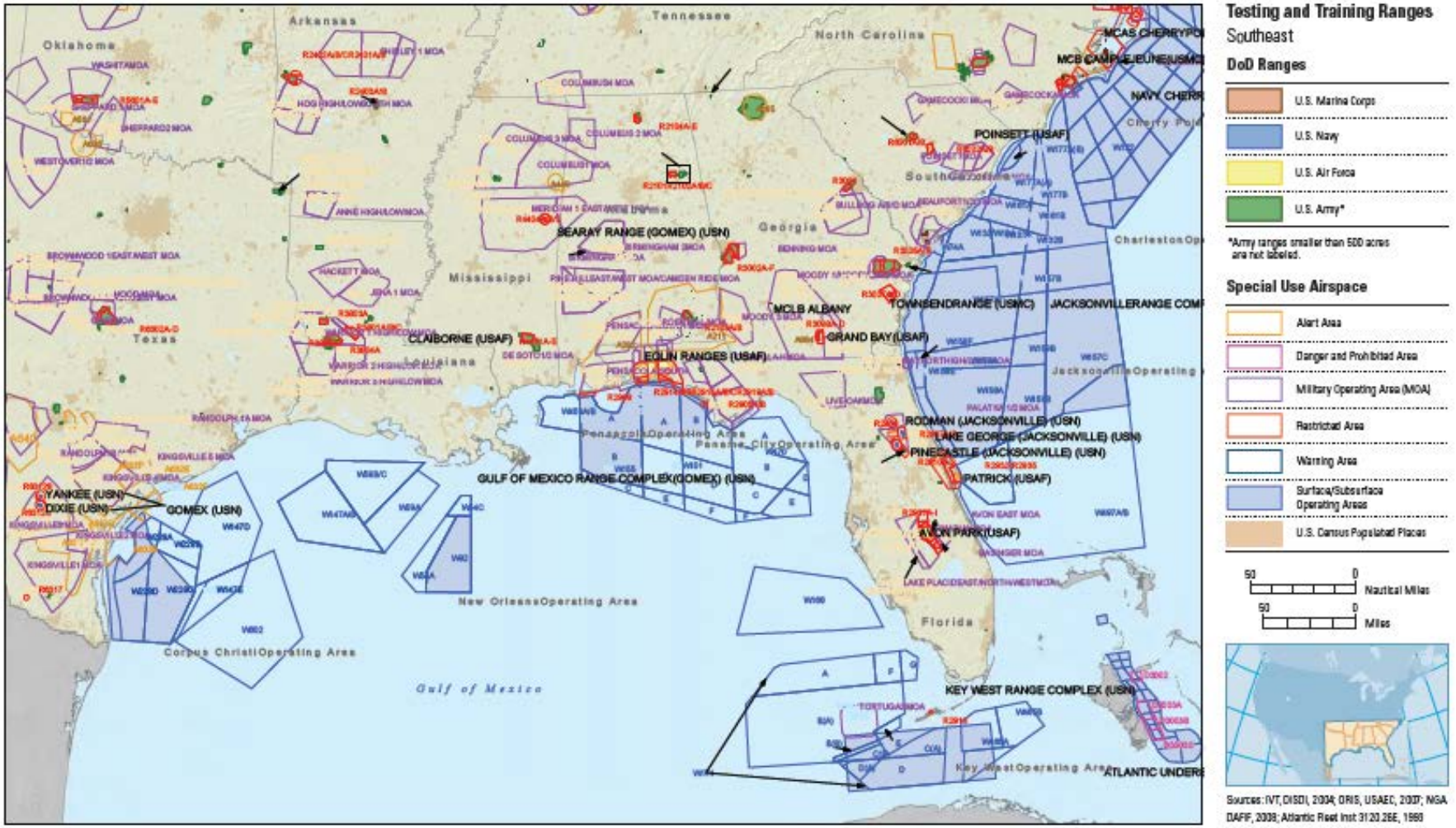
Southeast Ranges
We're all Connected

Figure C-3 DoD Regional Range Complexes: Southeast



Sources: IVT, DISDI, 2004; ORIS, USAEC, 2007; NGA DAFIF, 2008; Atlantic Fleet Inst 3120.2EE, 1999

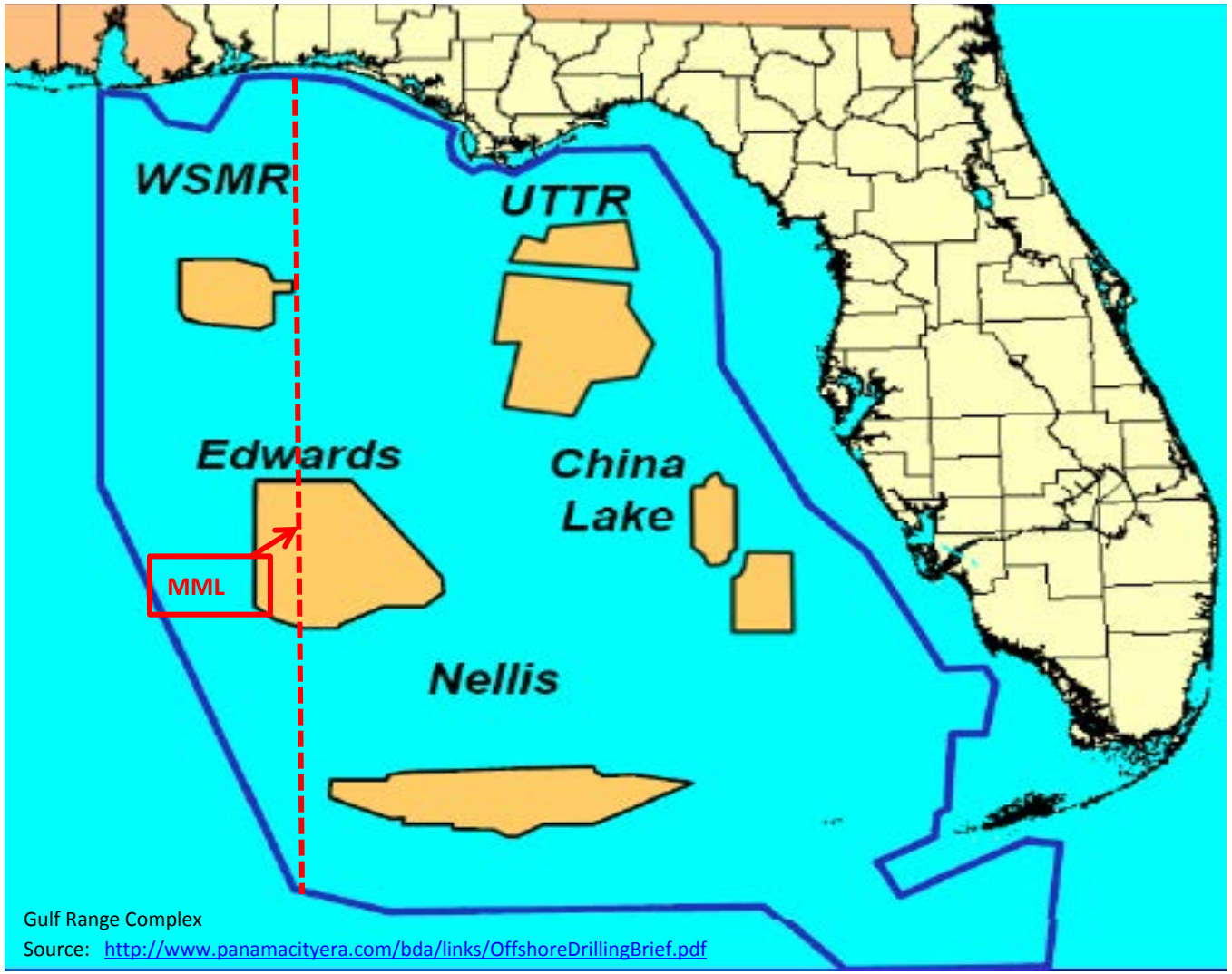
Southeast Ranges

- Florida is the anchor for **ALL** Southeast Ranges
- Due to Florida's unique panhandle and peninsular geography with a long coastline, the state offers multiple access lanes into vast air and sea spaces.
- A majority of Florida's bases are located here because of the good flying weather, gulf & deep water access, and proximity to test and training ranges.

Gulf Range Complex

- Size Matters – The Gulf Range Complex is a unique national resource. The range is larger than all other training ranges inside the continental US combined.
- Test activities are considerably dependent on unconstrained access to the eastern Gulf of Mexico airspace and sea space.
- "The evaluation of future armament will require a vast area containing airspace restricted to military operations and low commercial air traffic." 2003 Joint Gulf Range Strategic Plan

Gulf Range Complex

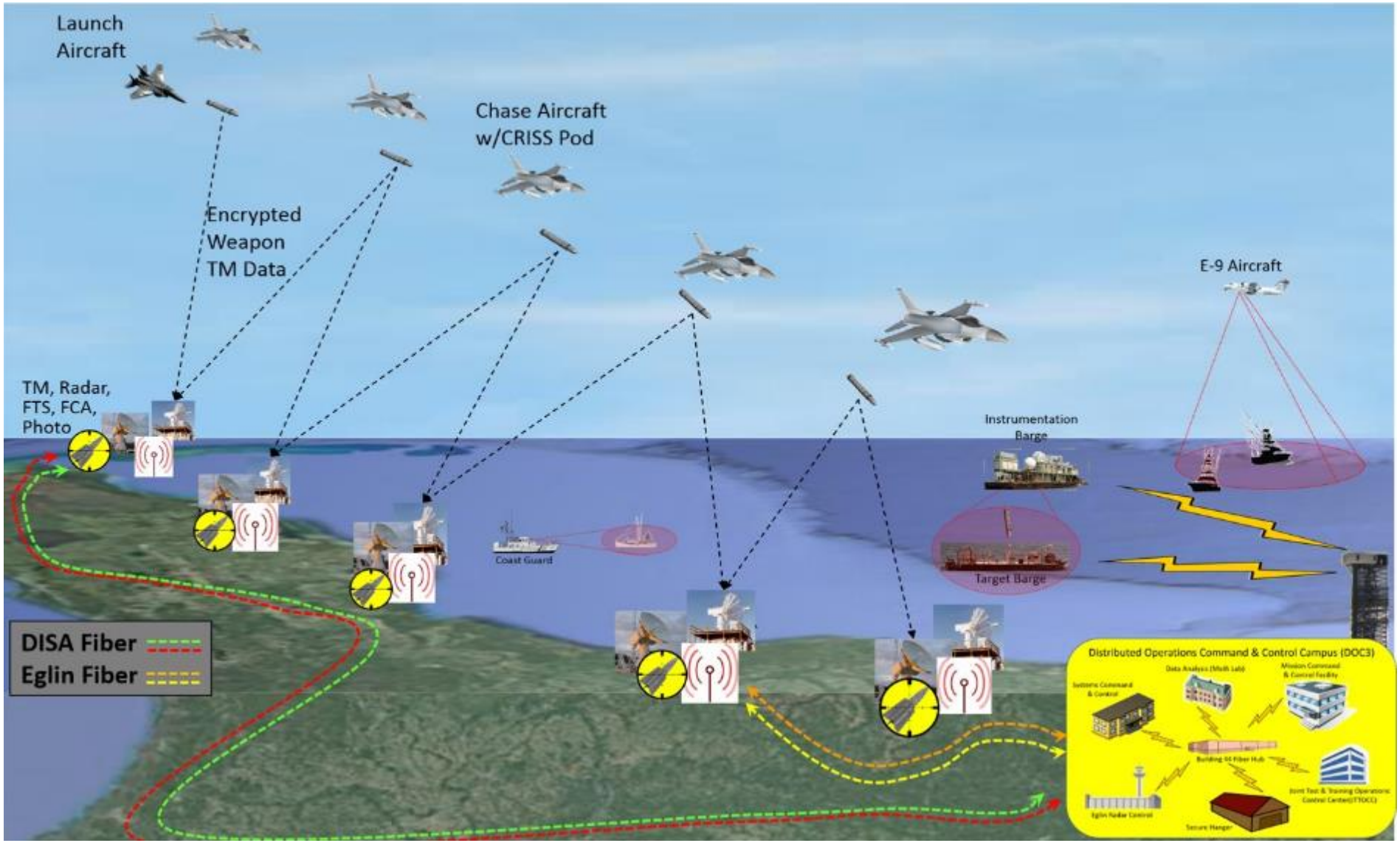


Gulf Range Complex
Source: http://www.panamacityera.com/bda/links/OffshoreDrillingBrief.pdf

Gulf Range Enhancement

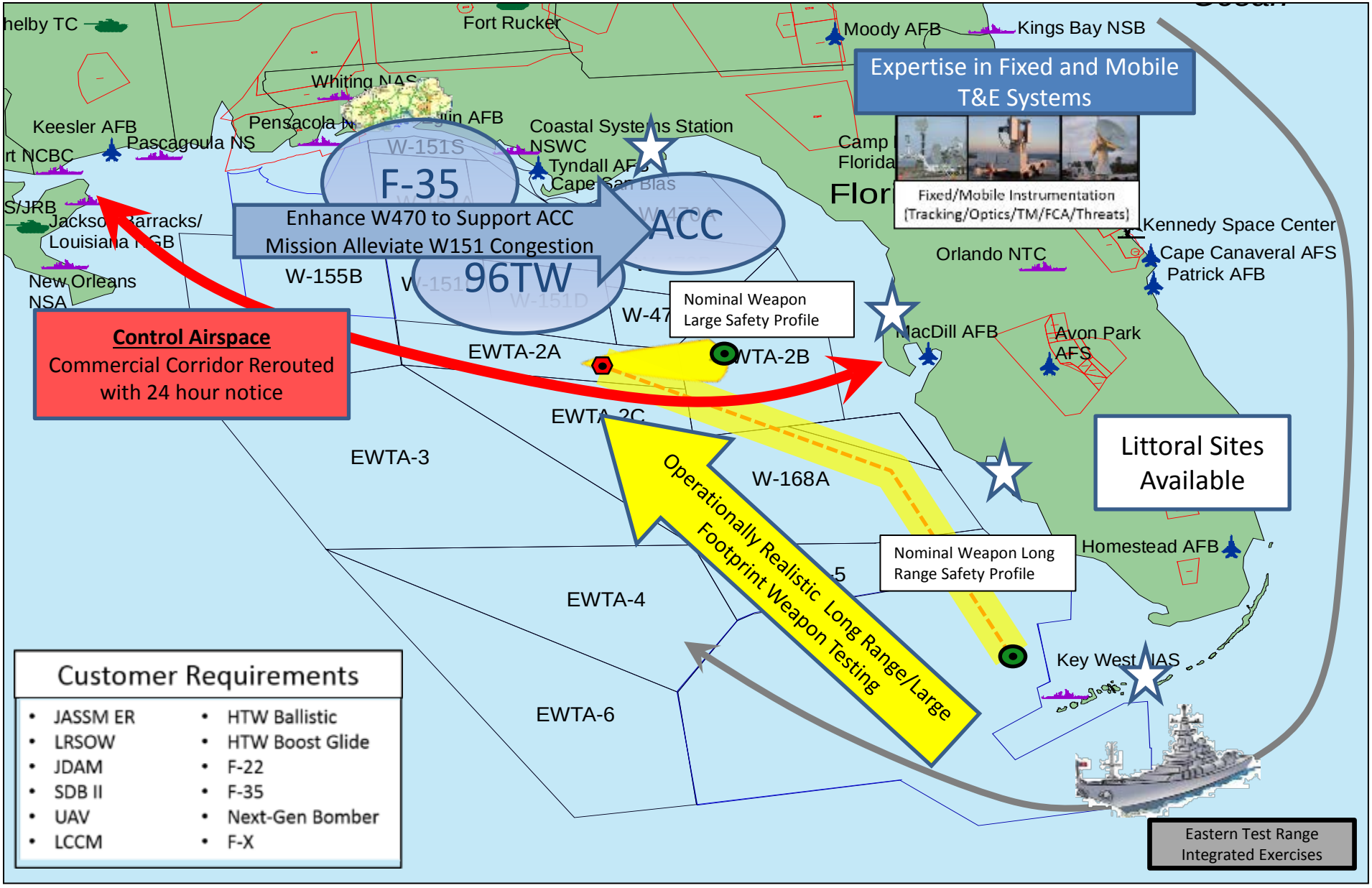
- Task Force seed money has primed the pump to enhance Gulf Range tracking capability for modern test and training activities.
  - Carrabelle Site Engineering Plan will help inform other sites
  - CM Dunn and Gaetz secured ~ $30M to support Phase 1 of the enhancement
- With MQ-9 at Tyndall, better tracking capability needed for Drone Control Ops

GRE Overview



Future Open Air Test/Training

Why GRE?


Fort Rucker
Moody AFB
Kings Bay NSB
Expertise in Fixed and Mobile T&E Systems
Fixed/Mobile Instrumentation (Tracking/Optics/TM/FCA/Threats)
Whiting NAS
Keesler AFB
Pascagoula NS
Pensacola
Coastal Systems Station
NSWC
Tyndall AFB
Cape San Blas
W-151S
F-35
Enhance W470 to Support ACC
Mission Alleviate W151 Congestion
ACC
96TW
W-155B
W-151D
W-470
Camp
Florida
Kennedy Space Center
Orlando NTC
Cape Canaveral AFS
Patrick AFB
New Orleans NSA
Nominal Weapon Large Safety Profile
MacDill AFB
Avon Park AFS
Control Airspace
Commercial Corridor Rerouted with 24 hour notice
EWTA-2A
EWTA-2B
EWTA-2C
EWTA-3
W-168A
Littoral Sites Available
Operationally Realistic Long Range/Large Footprint Weapon Testing
Nominal Weapon Long Range Safety Profile
Homestead AFB
EWTA-4
EWTA-5
Key West NAS
EWTA-6
Customer Requirements
JASSM ER
LRSOW
JDAM
SDB II
UAV
LCCM
HTW Ballistic
HTW Boost Glide
F-22
F-35
Next-Gen Bomber
F-X
Eastern Test Range Integrated Exercises

Summary

- GRE provides one-of-a-kind, National Test Asset
  - MRTFB range capacity designed for large footprint weapons and 5th and 6th Gen Weapon Systems mission engagement scenarios
- Instrumenting W-470 represents a 30% increase in total instrumented over-water test area
  - Greater flexibility in scheduling…immediate payoff for F-35 and all 96TW missions
- Potential partnering with NAWCAD, Atlantic Test Ranges, PAX, and Key West to support next generation weapon system
  - Initial discussions held to enable joint integration and interoperability from Eglin to PAX

Optimizes use of the Gulf of Mexico to meet 5th and 6th Gen Weapon Systems Test & Training requirements

Why the Moratorium Matters

- “Offshore drilling is ‘incompatible’ with military training and weapons testing in the Gulf of Mexico off Florida’s shores” -- Secretary of Defense Donald Rumsfeld (2005)
- “The Department of Defense (DOD) cannot overstate the vital importance of maintaining the moratorium” – Under SecDef Kurta (2017)
- “The moratorium is essential for developing and sustaining the Air Force’s future combat capabilities…Emerging technologies such as hypersonics, 5th generation fighters, and advanced sub-surface systems will require enlarged testing and training footprints, and increased Air Force reliance on the moratorium far beyond 2022.” -- Gen Goldfein (2017)
- Florida Senate and House Resolutions adopted support an indefinite extension of the GOMESA moratorium. (2018)

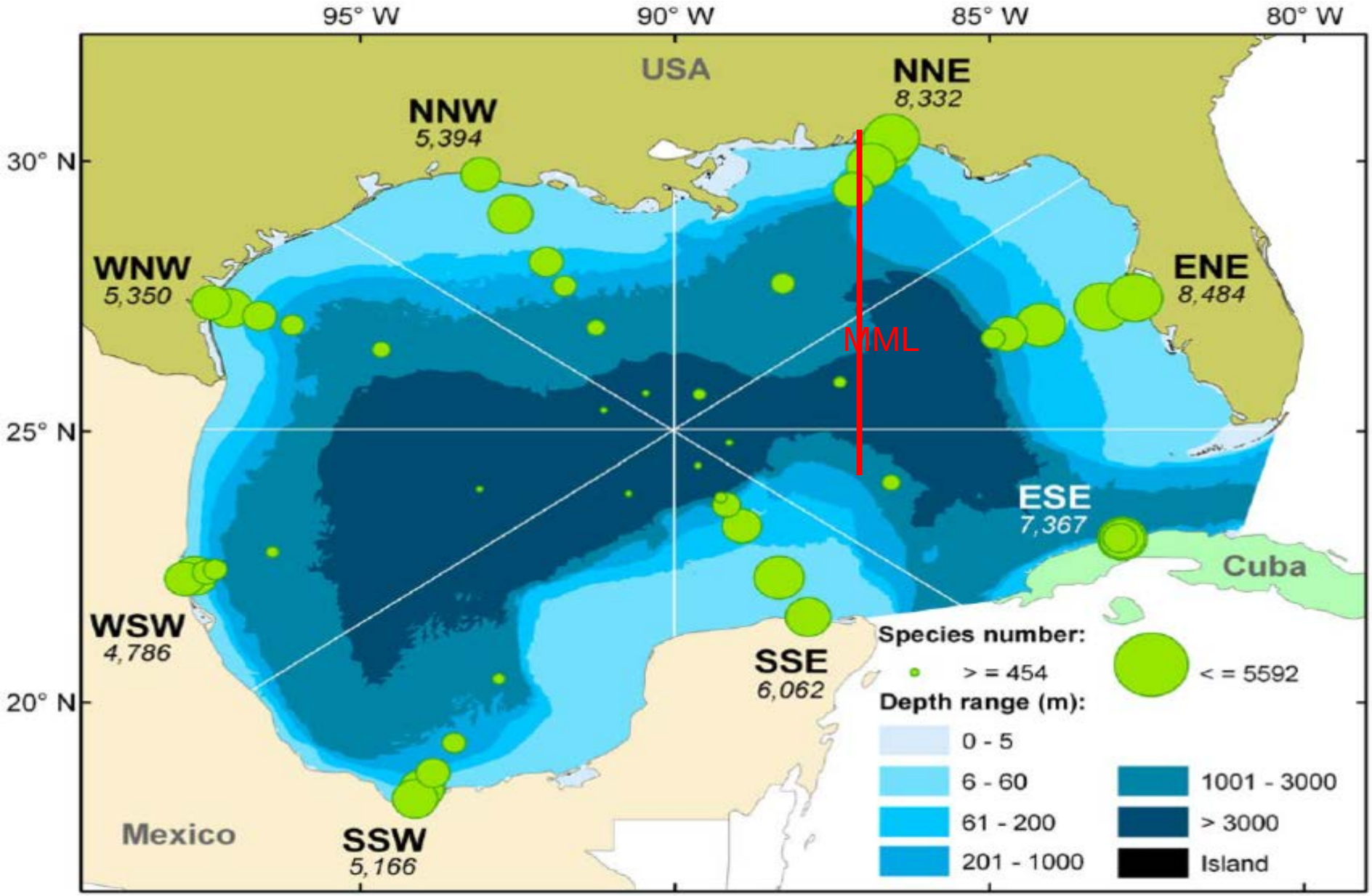
Why the Moratorium Matters

- Oil exploration and/or platforms placed in the eastern Gulf could jeopardize military missions and severely reduce Florida's appeal to keep military installations in the sunshine state; regardless of BRAC.
- IMPACT
  - Military and defense is the state's fourth largest industry accounting for more than 801,000 jobs and $85 Billion in economic impact including 65% of regional economy of NW Florida.

Gulf of Mexico Range Complex

Value/Potential for Autonomous/Unmanned/Manned Underwater Testing and Training

Hydrographic Overview of the GOMEX Range Complex with MML

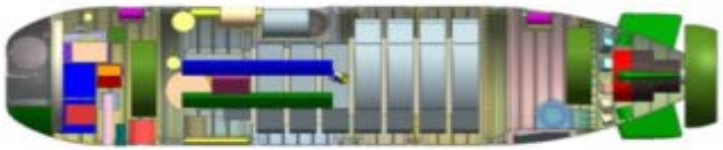


Airborne and Autonomous Mine Countermeasures Happening Now in the Gulf of Mexico

Underwater/Surface Unmanned Systems

Littoral Battlespace Sensing – Glider (LBS-G)

Surface Mine Countermeasures (SMCM) UUV Knifefish



Large Displacement Unmanned Undersea Vehicle (LDUUV)

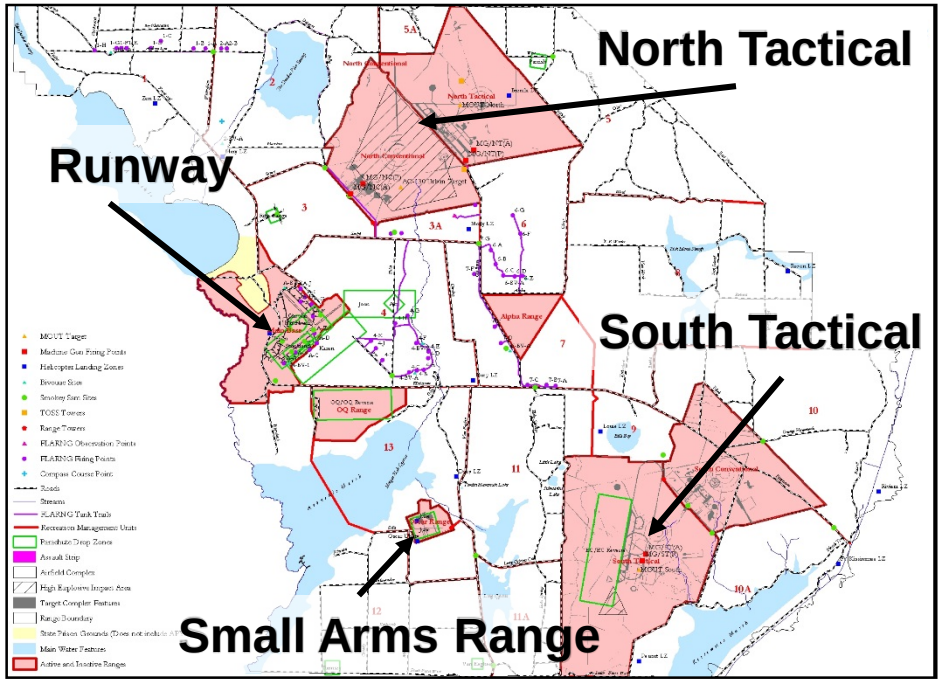
598th Range Squadron

Overview

- Avon Park AFR
- Connectivity
- Future
  - Integration
  - APAFR efforts
  - ACC ERP

Avon Park Range

- Train like you fight! 2x tactical impact areas
- Large enough for simultaneous operating areas
- Drop zones enable assault on runway/tactical areas
- Isolated range: large target areas with 360° run-ins
- Training and inert full-scale weapons authorized

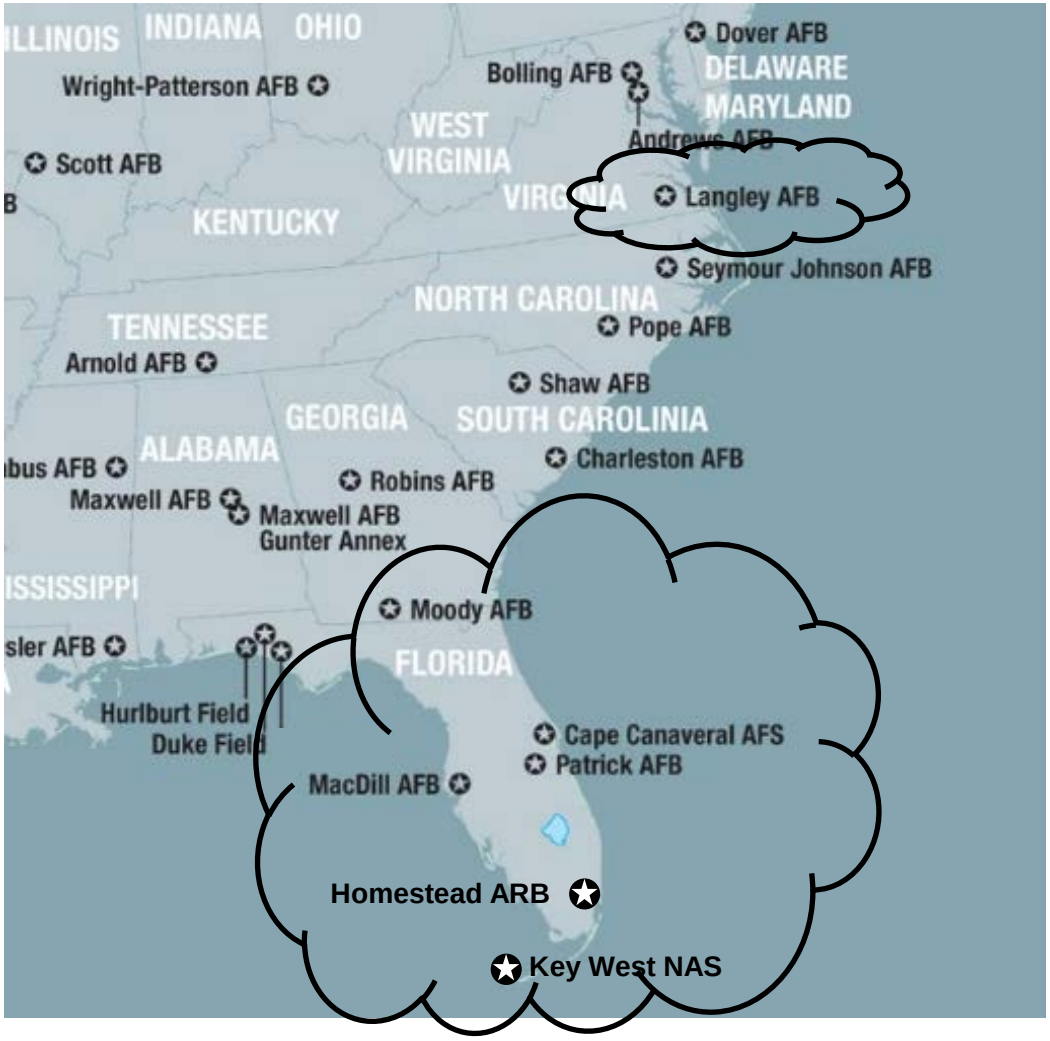


Installation Outreach

- **Heavy Involvement with the State, Counties, and Towns**
  - **Joint Land Use Study**
  - **ICEMAP**
  - **Sentinel Landscape**
  - **Florida Base Commanders Meetings**
  - **FDA/FDSTF**
  - **Rotary**
  - **Facebook**
  - **Military Sea Service Museum**
  - **JROTC and Civil Air Patrol**
  - **Highlands Youth Academy**

The Avon Park World

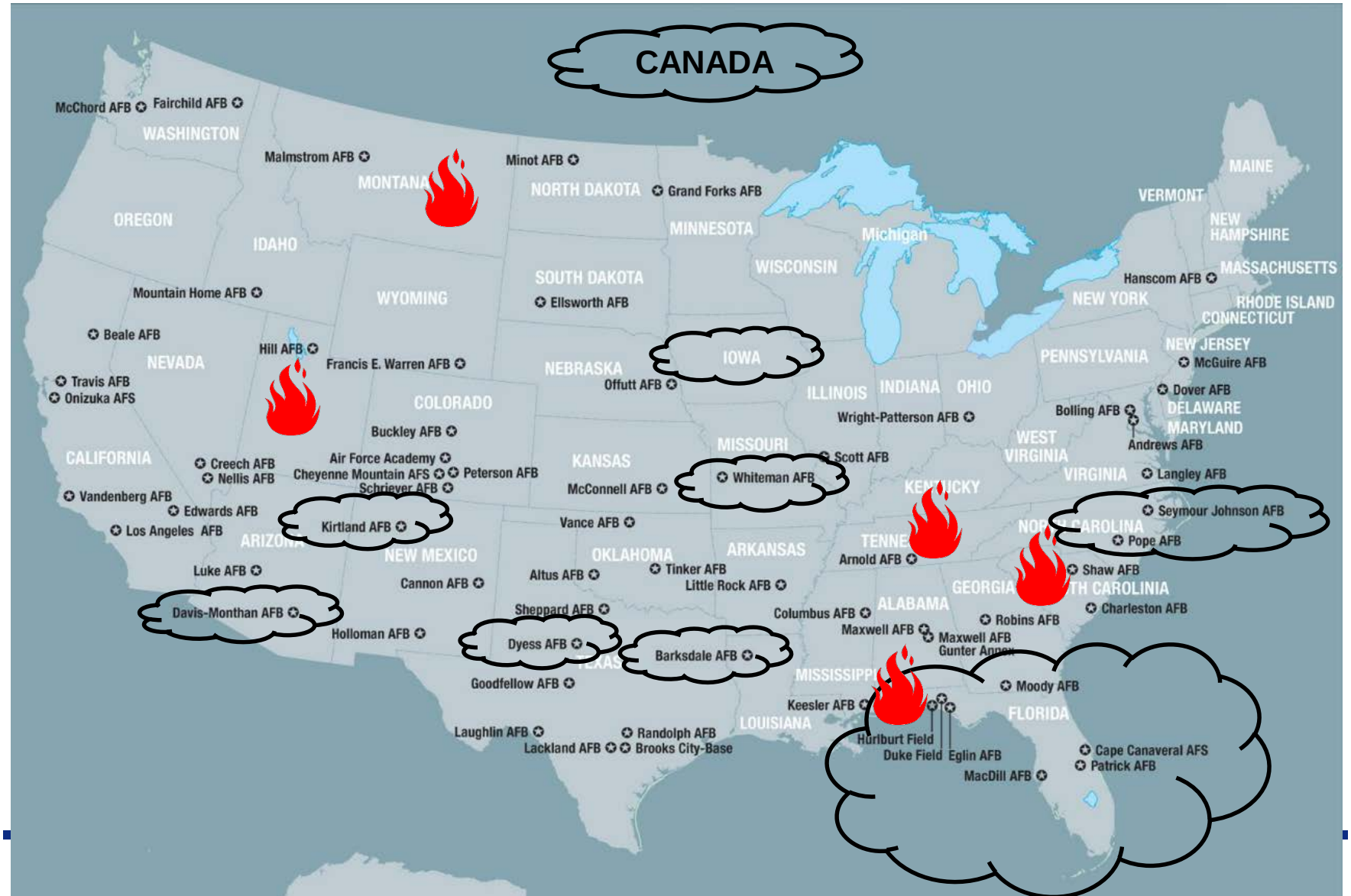
- GSU from Moody
- BSA with MacDill
- Also answer to / coord with ACC/A3AR
- MOU/MOA with Patrick and MacDill
- Primary range customers
  - Air = Homestead, Patrick, Moody
  - Ground = STS at Hurlburt/Pope, BDG



Exercise Schedule

	South Conventional/South Tactical					North Conventional/North Tactical					Airfield		
Time	C	T	Unit	No/Type	CX	C	T	Unit	No/Type	CX	Unit	No/Type	CX
0800 - 0830											NOAA	UAV	
0830 - 0900											NOAA	UAV	
0900 - 0930	X	X	23STS/93FS	F16		X	X	23STS/93FS	F16		NOAA	UAV	
0930 - 1000	X	X	23STS/93FS	F16		X	X	23STS/93FS	F16		NOAA	UAV	
1000 - 1030	X	X	23STS/93FS	F16		X	X	23STS/93FS	F16		NOAA	UAV	
1030 - 1100	X	X	23STS/93FS	F16		X	X	23STS/93FS	F16		NOAA	UAV	
1100 - 1130	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1130 - 1200	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1200 - 1230	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1230 - 1300	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1300 -1330	X	X	23STS/93FS	F16		X	X	23STS/93FS	F16		NOAA	UAV	
1330 - 1400	X	X	23STS/93FS	F16		X	X	23STS/93FS	F16		NOAA	UAV	
1400 - 1430	X	X	23STS/93FS	F16		X	X	23STS/93FS	F16		NOAA	UAV	
1430 - 1500	X	X	23STS/93FS	F16		X	X	23STS/93FS	F16		NOAA	UAV	
1500 - 1530	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1530 - 1600	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1600 - 1630	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1630 - 1700	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1700 - 1730	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1730 - 1800	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1800 - 1830	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1830 - 1900	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1900 - 1930	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
1930 - 2000	X	X	23STS/Blue Air	Gnd / BAK-167		X	X	23STS/Blue Air	Gnd / BAK-167		NOAA	UAV	
2000 - 2030						X	X	39RQS	C130		39RQS	C130	
2030 - 2100						X	X	39RQS	C130		39RQS	C130	
2100 - 2130	X	X	301RQS	H60		X	X	39RQS	C130		39RQS	C130	
2130 - 2200	X	X	301RQS	H60		X	X	39RQS	C130		39RQS	C130	
2200 - 2230	X	X	301RQS	H60		X	X	39RQS	C130		39RQS	C130	
2230 - 2300	X	X	301RQS	H60									

Beyond Avon Park

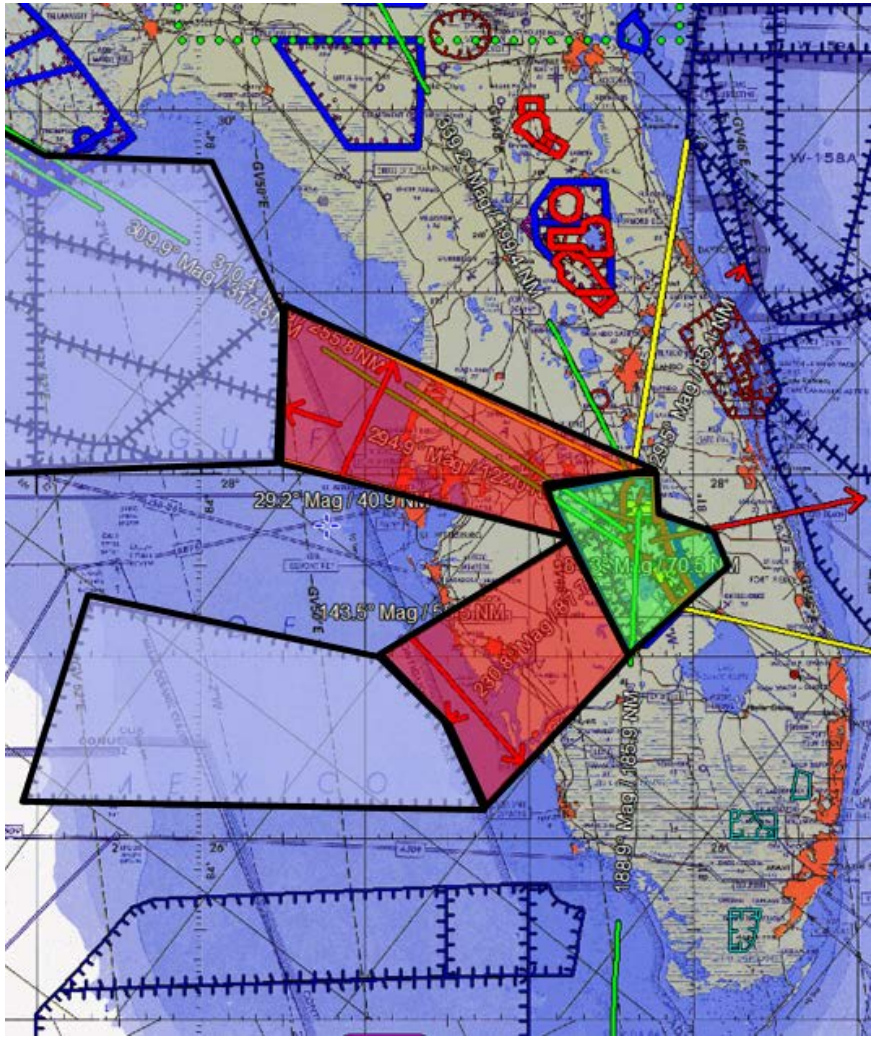


Conservation Connectivity

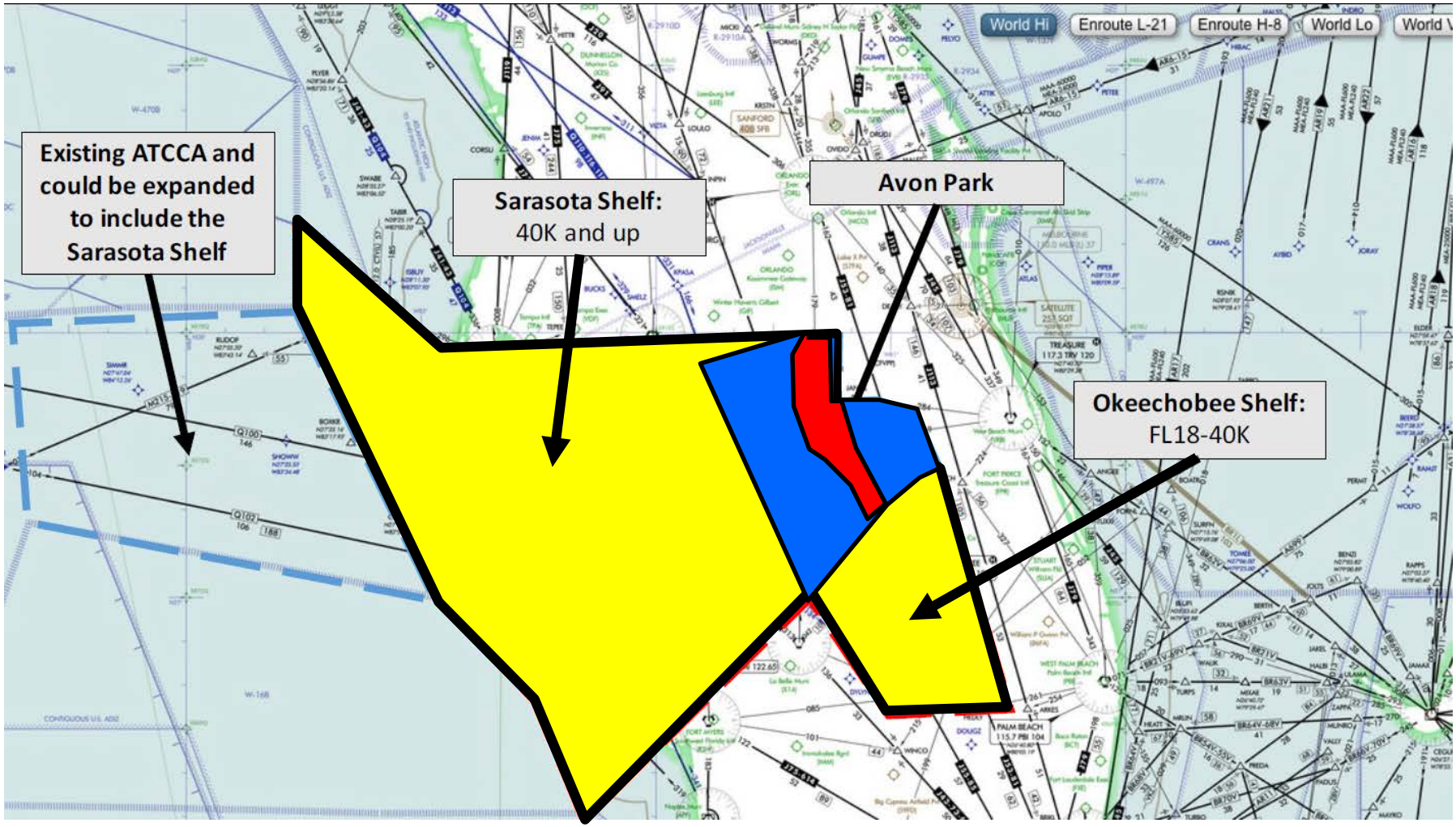
- Wildland Fire
- Threatened and Endangered Species
- Cultural Resources
- Environmental Compliance
- Outdoor Recreation
- Biodiversity/Wetlands
- Forestry Management
- Invasive Species Management
- NEPA
- Regional Conservation
- Cattle Leases
- Conservation Law Enforcement
- Environmental Restoration

Future

- Integrate available Air and Ground Spaces
  - GRE
  - South East Range Concept
  - ACC Enterprise Range Plan (ERP)



FAA Coordination



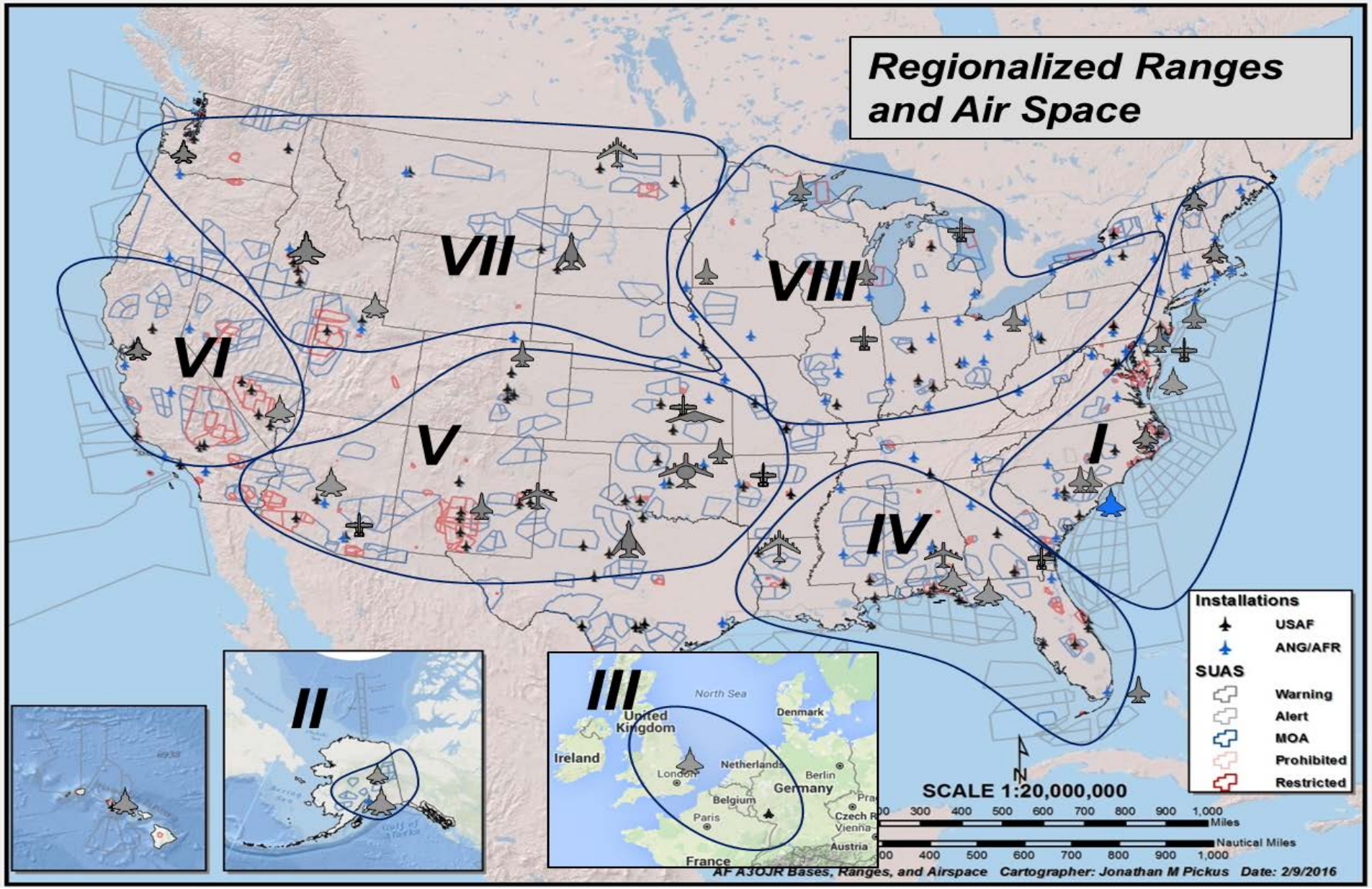
Enterprise Range Plan

- **Develop an enterprise approach to range investment that:**
  - ***Supports 5th Gen and beyond Training***
  - ***Integrates Live with Virtual and Constructive entities***
  - ***Improves Contested, Degraded, Operationally Limited (CDO) Training - increased realism and threat density***
  - ***Integrates Live Training with Space, Cyber Space***
  - ***Supports Special Ops range training requirements***
  - ***Provides stable, ten year, investment and planning horizon***

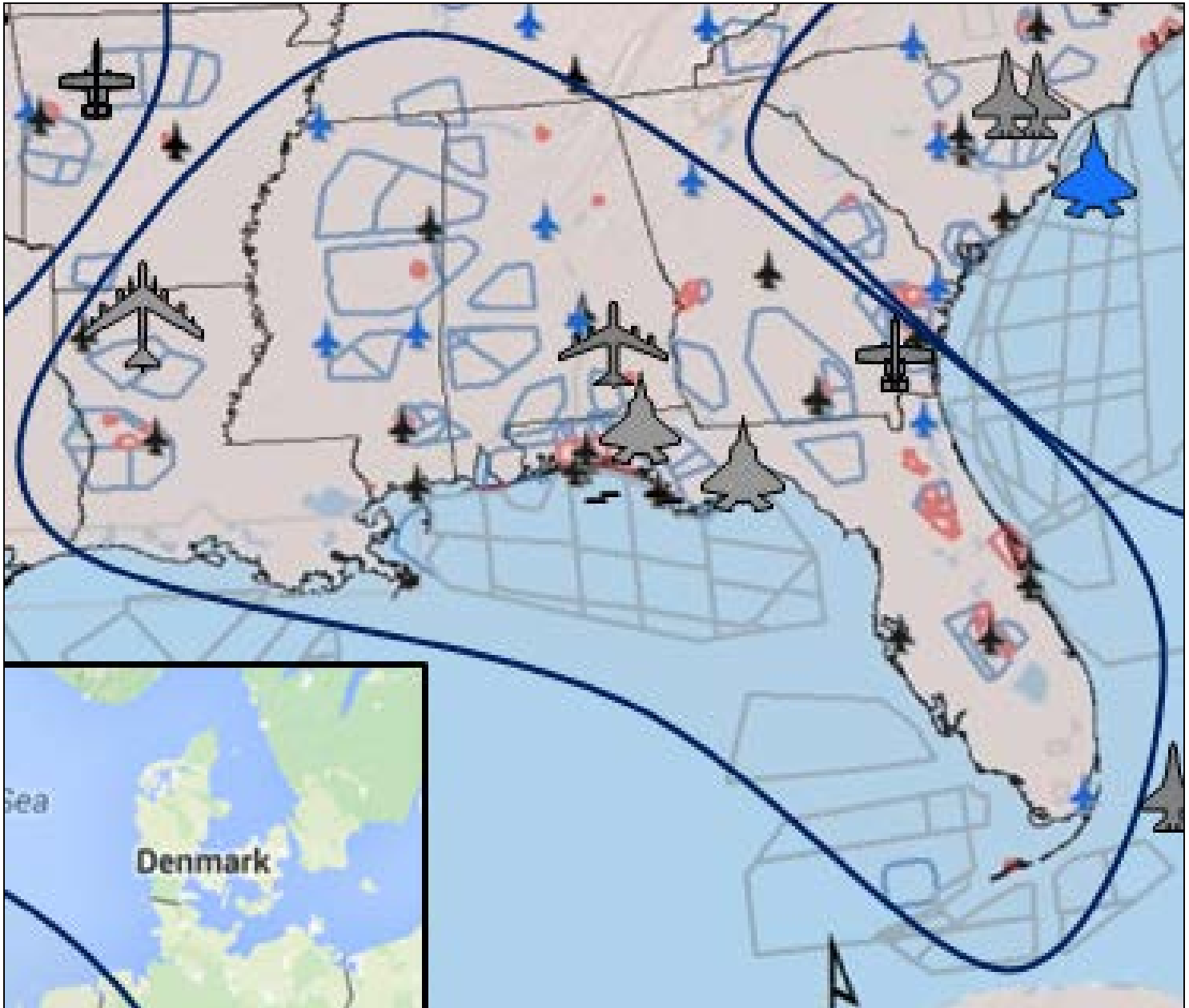
Concepts

- ***Regionalize Ranges and Airspace***
  - ***Training systems allocated to meet broader regional requirements***
- ***Integrate Virtual & Constructive entities to improve Live***
  - ***Exploit interdependency between Live and Virtual Training***
- ***Capitalize on the link between Training and Test investments***
- ***Build on Joint Training Capabilities and Partnerships***

6 CONUS, 2 OCONUS Regions



South East Region



Questions?

Florida Defense Support Task Force

Update to Florida Defense Alliance
March 21, 2018

TF Member Update

- Senator Doug Broxson – Chair – Senate
- Tom Neubauer – Vice Chair – Senate
- Maj Gen (ret) Richard Haddad – Senate
- Lt Col (ret) Bill Dudley – Senate
- Representative Clay Ingram – House (Nov 6, 2018)
- Representative Jay Trumbull – House (Nov 6, 2018)
- Brig Gen (ret) Chip Diehl – House
- Vacant – House (CW5 Fritts Resigned – 10 Mar)
- Admiral (ret) Mark Fitzgerald – Governor
- Representative Holly Raschein – Governor (Nov 6, 2018)
- Commissioner Barbara Stewart – Governor
- Amy Gowder – Governor
- MG Michael Calhoun – Governor's Personal Rep.

Note: Chair rotates on July 1st annually between Senate and House

Task Force Items of Interest

- Oil Drilling / Military Mission Line (MML)
  - Continue to push for extending MML moratorium
  - FL Senate and House Resolutions Passed
  - BOEM Process Ongoing
- New Economic Impact Study – Defense Factbook
- 2018 Strategic Plan – thanks for your inputs, should be approved at tomorrow's Task Force Meeting

FY 17 - 18 Task Force Grants

Awarded

• Tampa Bay Defense Alliance	$135,000
• Gulf Coast State College	$ 30,000
• InDyne – Gulf Range Instrumentation	$235,000
Total	**$400,000**

Possible additional Grant Awards	**Amount Req**
• South Florida Defense Alliance	$152,500
• Greater Pensacola Chamber	$ 73,000

- **FY18-19 Awards to be Considered in May**

FY 18 - 19 Task Force Grants

- Eleven applications received for FY18-19 cycle worth ~ $3.5 Million (two being considered for FY18 funding tomorrow – others to be evaluated in May by invite)

- Expecting to have about $850K available for next years' Grant Program

Florida Defense Support Task Force

Questions ?

Headquarters U.S. Air Force

Integrity - Service - Excellence

Energy Assurance for Air Force Installations

14 NOV 2018

Mr. Robert Hughes

OFFICE OF ENERGY ASSURANCE UNITED STATES AIR FORCE

Energy Threats Compromise Missions

Mission Assurance through Energy Assurance

Strategic Energy Goals

- Improve Resiliency
- Optimize Demand
- Assure Supply

ENERGY ASSURANCE involves activities across the operational and installation spectrums designed to ensure the Air Force has the energy when and where it is needed to ensure it can accomplish its mission.

Air Force Office of Energy Assurance (OEA)

ENERGY STOREFRONT

MISSION

Deliver creative installation energy resiliency solutions to meet 21st century threats

VISION

The recognized leader for implementing innovative energy assurance solutions that provide the Air Force with mission-ready installations

OBJECTIVE

Oversee Air Force facilities energy program by consolidating requirements, leveraging partnerships & monitoring execution of facilities energy projects

OEA Goals & Approach

GOALS

Serve as single point of entry for all facilities energy requirements

Act as facilitator / integrator to maximize energy assurance and track execution with appropriate Air Force organizations

Integrate energy assurance into Air Force facilities energy project portfolio by leveraging public, private & community partnerships

APPROACH

Develop partnerships with leading innovators to leverage resources & enable best resilient technologies

Standardize intake & execution of Air Force energy projects

Increase momentum of projects outside the standard government schedule

OEA Partnerships

Installation

Community

Industry

- Apply lessons learned & best practices
- Gain better understanding of current business environment
- Build mutually beneficial relationships
- Accomplish more, faster

Air Force Energy Toolbox

Third Party Agreements

- Land Outgrants
- Power Purchase Agreement
- ESPCs / UESCs
- Leveraging Utility Privatization
- Utility Service Contract

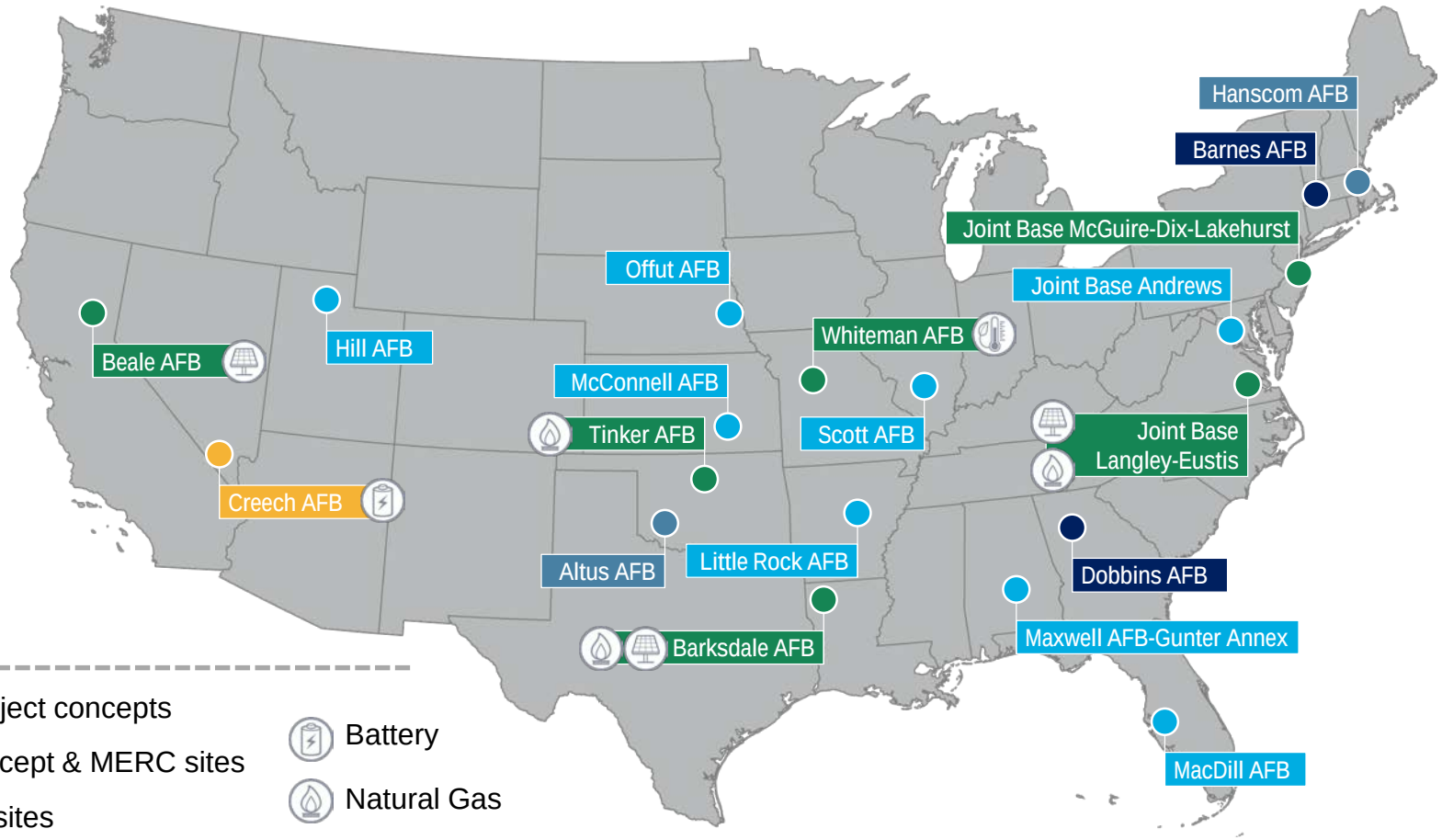
Partnerships

- Communities
- Installation tenants
- State & local gov't
- Federal

Programmed Funding

- Research & Development
- MILCON / SRM Funds
- Energy Resilience & Conservation Investment Program

OEA Project Concepts and Opportunities



KEY

- Current project concepts
- Project concept & MERC sites
- EaaS pilot sites
- Engaged sites
- Engaged MERC sites

- Battery
- Natural Gas
- Combined Heat and Power
- Solar

Map is current as of June 2018. Project concepts and opportunities may change during the project lifecycle.

OEA Engagement at Joint Base McGuire-Dix-Lakehurst

Resilience Need: Only DoD base home to Air Force, Army and Navy missions

PROJECT BENEFITS

Support critical missions with uninterrupted power during grid outage

Resilient investment opportunities

Regional power stability

ENHANCED USE LEASE PROJECT DETAILS

New on-site asset: Natural Gas Power Plant	In-kind / cash consideration for resilience investments on Dix portion of base	Completed RFI and Industry Exchange in March 2018

POWER PURCHASE AGREEMENT PROJECT DETAILS

Technology agnostic asset: 16,000,000+ kWh of locally-generated power	Non-interruptible primary power & 6-12 MW islanding capability during grid outage	Completed RFI in June 2018

Contact OEA

Mr. Robert Hughes
Director
Air Force Office of Energy Assurance
2530 Crystal Drive, 8th Floor
Arlington, VA 22202

Stay Connected!

- Visit the OEA Website: WWW.SAFIE.HQ.AF.MIL/PROGRAMS/ENERGY/OEA
- Reply to the RFI: http://go.usa.gov/xUebU, solicitation # W912DY-18-U-OEA1
- Subscribe to OEA Updates: HTTP://WWW.SAFIE.HQ.AF.MIL/PROGRAMS/ENERGY/OEA/OEA-UPDATES/
- Continue the conversation on Social Media: Air Force Energy Program @AFEnergy

November 14, 2018

Florida Defense Alliance

Space Florida Partnerships

Jim Kuzma
Senior Vice President
Chief Operating Officer
General Manager , Cape Canaveral Spaceport
jkuzma@spaceflorida.gov

SPACE FLORIDA

Space Florida Structure & Role

Public Corporation & Independent Special District

•Spaceport Authority

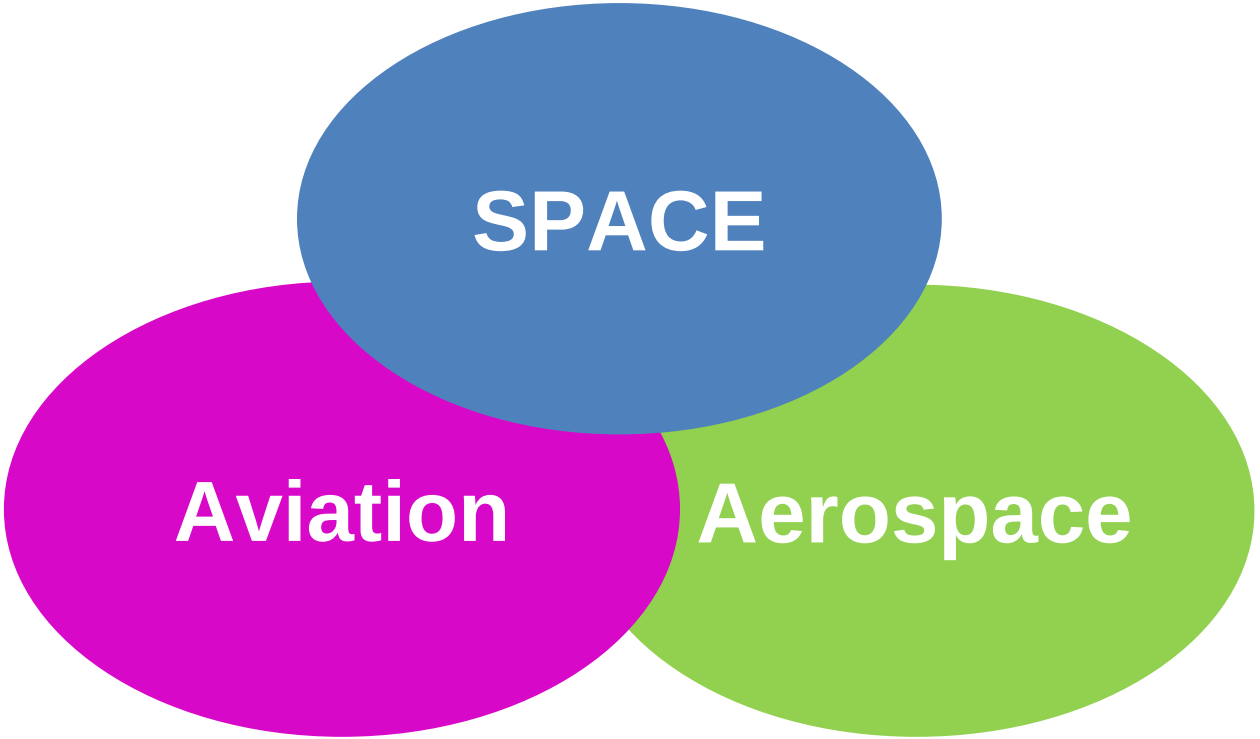
- Develop Infrastructure
- •Statewide Planning
- Build, Own, Lease, Bond & Operate
- SLC-46
  Exploration Park
  Launch & Landing Facility

Mission … …
“Build a World Leading Aerospace / Space Industry”

•Economic Development Role

- Unique Financial & Infrastructure Tools
- •Conduit Lease Financing
- Access to Capital Markets
- Tax Efficiencies
- Move-in Ready Facilities

Future of Space & Innovation



Highly Integrated – Interdependent – Enabling Technology Advances
Affecting every aspect of everyday life!

Economic Development Assistance for Aerospace & Aviation Companies

Florida's Aerospace Industry Ecosystem

- Reduced cost financing
- Facility construction
- Machinery & equipment acquisition

SPACE FLORIDA

- Project coordination
- Tax refunds & credits
- Site/building database

ENTERPRISE FLORIDA®

CareerSource FLORIDA

Local Economic Development Agency (County or City)

- Quick Response Training
- Incumbent Worker Training
- Recruiting assistance

- Site/building tours
- Permitting assistance
- Property tax abatements

Space Florida's Financing Capabilities

CONDUIT FINANCING

- Unique financing allows business to access assets quickly and cost effectively
- Flexible terms create opportunities to leverage existing capital strategically

SYNTHETIC LEASING

- New contracts can effectively shift liabilities to expenses
- Variable options can improve cash flow by deferring large capital expenditures

SECURING PROPERTY

- Innovative programs simplify property acquisition from government sources
- Impressive "commercial islands" synergize business activities on government land

BUSINESS INFRASTRUCTURE AND FACILITIES

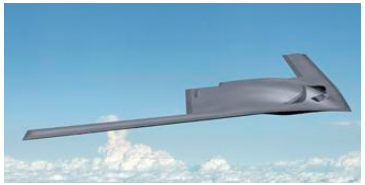
- Nearly $2 billion in aerospace assets funded
- Streamline communication with NASA and the U.S. Air Force
- Provide step-by-step support throughout project and beyond

Florida's Growing Aerospace Industry

… … Aviation, Space and Aerospace Manufacturing

OneWeb

NORTHROP GRUMMAN

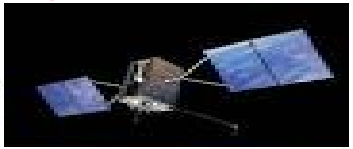


EMBRAER

HARRIS

RUAG

Honeywell



ULA
nited Launch Alliance

AEROJET ROCKETDYNE

BOEING

MADE IN SPACE

LOCKHEED MARTIN

BLUE ORIGIN

AIRBUS GROUP

SPACEX

Raytheon

www.spaceflorida.gov

SPACE FLORIDA

SPACE FLORIDA

1. Spaceport Authority

SPACE POLICY CONSULTING AND SUPPORT CONTRACTS

National Space Council … Changing the Policy Dialogue

Department of Commerce … Policy Initiatives

- Policy Evolution for Future Space Commerce and Airspace Traffic Management

FAA Aviation Rulemaking Committees (ARC's)

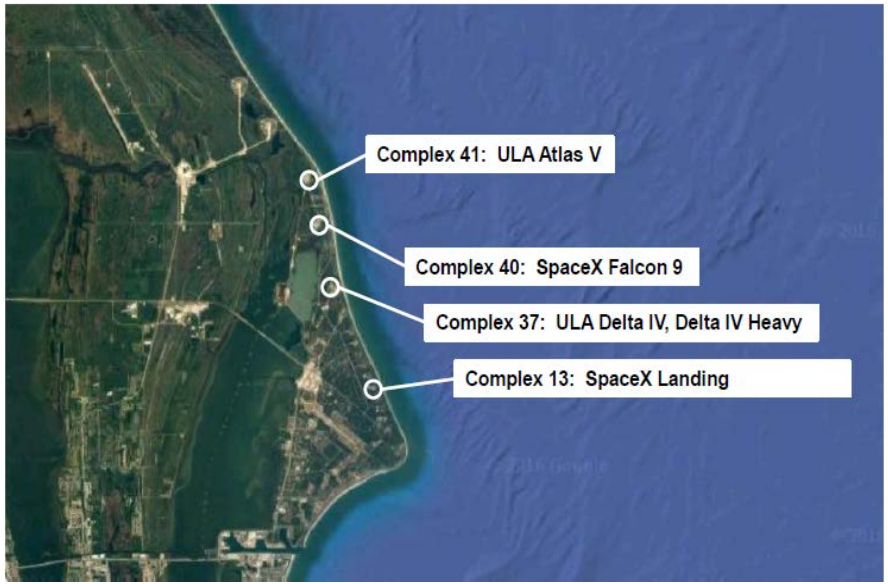
- Spaceport Categorization
- Streamlined Launch & Reentry Licensing Requirements
- Airspace Access

FAA Spaceport / Spaceflight Standards Development

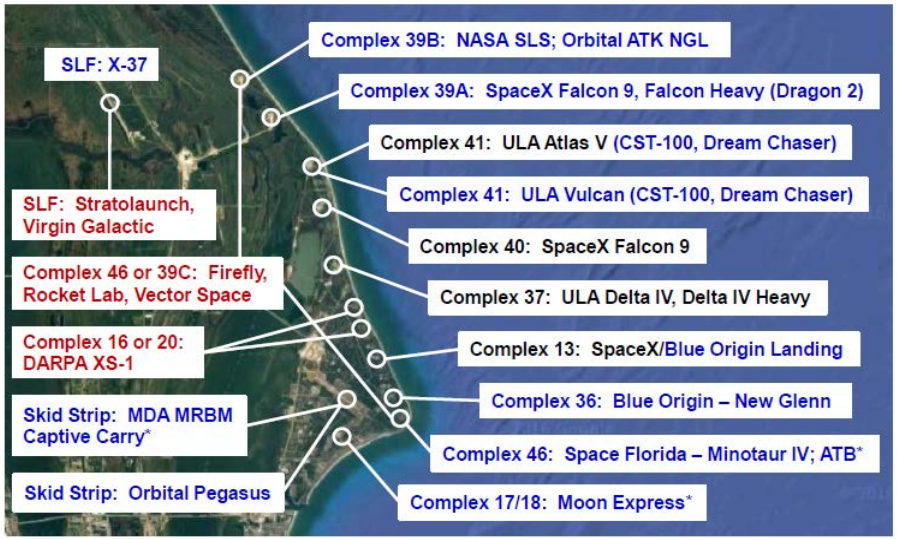
Federal Asset Management and Disposition Issues

Cape Canaveral Spaceport Epic Growth

Spaceport: 2016



Spaceport: 2016-2021



Black text – 2016 programs; Blue text – in work; Red text – potential customers; * – sub-orbital

45th Space Wing's "Drive for 48" Launches

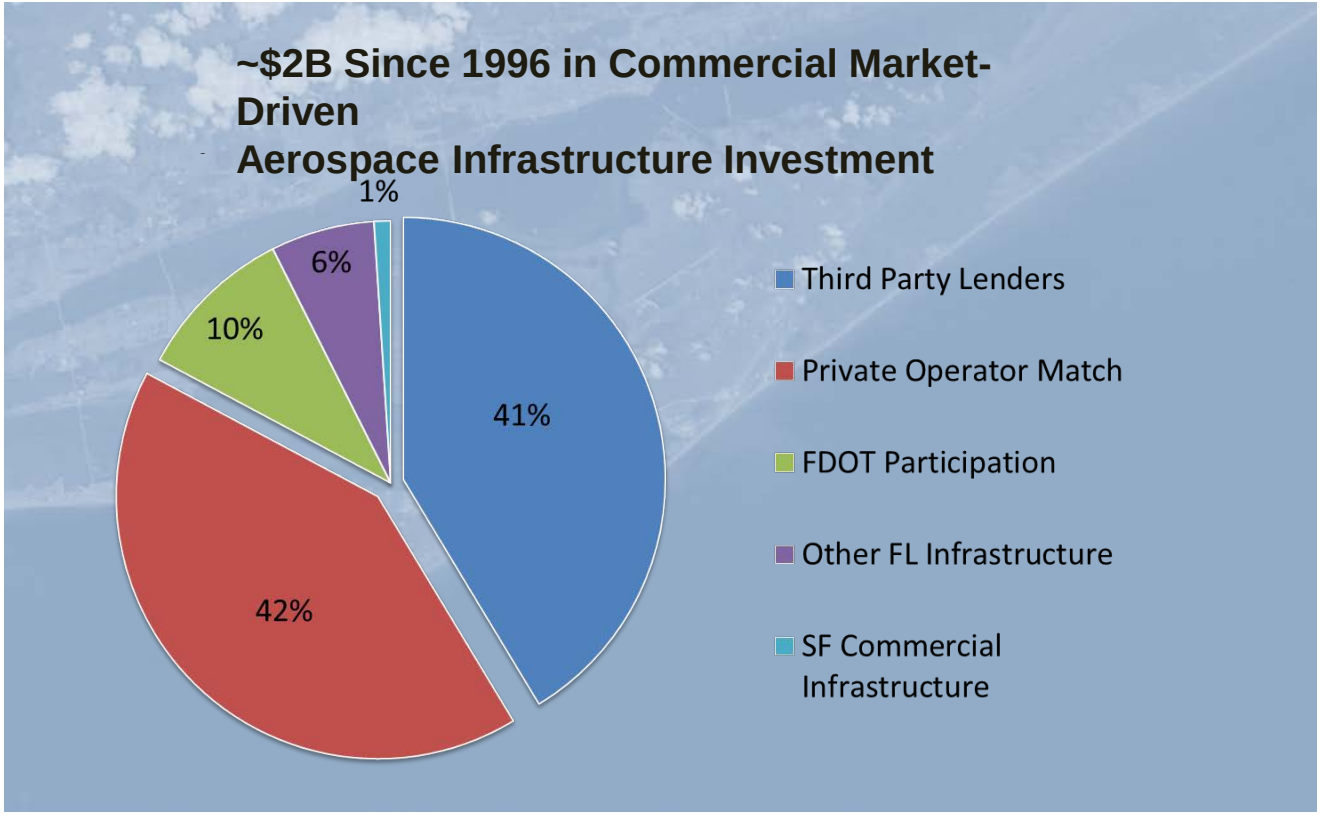
Why not 100 – 200 launches?

CAPE CANAVERAL SPACEPORT

Florida Investments In CSS Infrastructure

FACILITY	FUNDING/FINANCING	PROGRAM/PROJECT
CCS Roadway Improvements	$2,500,000 funded	Blue Origin Transportation Improvements
CCAFS Electrical Capacity Improvements	$10,000,000 funded	Common Use Electrical Infrastructure
SLC-17/SLC-18	$1,850,000 funded	Moon Express Facility Improvements
SLC-39A	$10,000,000 financed	SpaceX Orbital Launch Site
SLC-41	$294,000,000 financed	EELV/Atlas V
SLC-41	$6,150,000 funded	ULA Commercial
SLC-40/Hangar AO	$12,500,000 funded	COTS/SpaceX Falcon9
SLC-37 HIF	$24,000,000 financed	EELV/Delta IV
SLC-36	$1,200,000 funded	CCS Med-Large Commercialization
SLC-36 & SLC-11	$43,000,000 funded	Blue Origin Orbital Launch Site
SLC-46	$6,800,000 funded	Space Florida Small-Med LV Tenants
Neil Armstrong Operations & Checkout Building (O & C)	$35,000,000 funded	High Bay Modifications NASA MPCV (Orion)
Space Life Sciences Lab	$30,000,000 funded	ISS Payload / Cargo Processing
Space Commerce Way	$5,000,000 funded	KSC Commercialization
RLV Hangar SLF	$5,500,000 funded	Horizontal Launch & Landing Facility
C3PF Re-Purposing	$20,000,000 funded	Boeing Starliner Processing Facility
Exploration Park Phase 1	$7,500,000 funded	Site Improvements
Exploration Park Phase 1	$17,500,000 funded	Airbus/OneWeb Satellite Manufacturing Facility
Exploration Park Phase 2	$10,000,000 funded	Blue Origin LV Manufacturing Facility
Apollo/Saturn V Center Shuttle Atlantis Exhibit	$25,000,000 financed	KSC Public Visitor Program
Apollo/Saturn V Center Shuttle Atlantis Exhibit	$62,500,000 financed	KSC Public Visitor Program
OPF 1 & 2	$9,000,000 funded	Boeing X-37B
TOTAL CCS	**$639,000,000**	**Commercial, USAF, NASA**

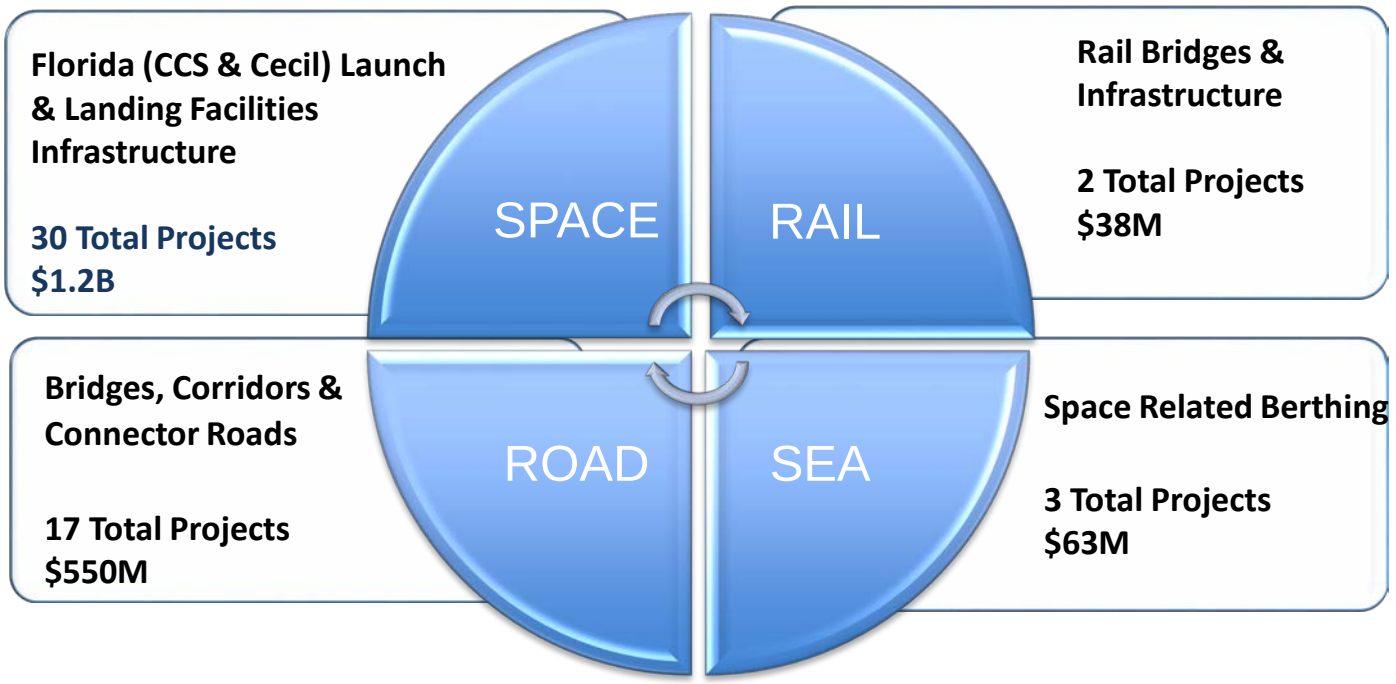
State Investment in Aerospace Infrastructure



Over 83% of Space Florida's Infrastructure Investment is from Private Sector Investment Sources

SPACE FLORIDA

Five Year Spaceport Infrastructure Work Plan



Preparing Florida's Spaceport Ecosystem for the Future

SPACE FLORIDA

2. Economic Development & Financial

Florida Spaceport Improvement Program

LC39A Commercial Heavy Lift Complex $10M

LC41 Crew & Cargo Access Tower $6M

Comm. Crew & Cargo Processing Facility $20M

LC40 Launch Capacity $10M

Orbital Processing Facility 1 $9M

LC36 Commercial Orbital Launch Site $43M

SLF

KSC

KSC

CCAFS

Exploration Park $10M

LC-46 $5M

Funds (FY12-18):

1,200+ Direct Jobs

$150M+ State Investment

$500M+ Total Investment

SPACE FLORIDA

Space Florida … New Financing Initiatives

- **New Fund Tools and Sources for Infrastructure**
  - Fund Discussions as Pre-Committed Partners
  - Funds on Capital Call … “by-Project”
  - New Trading - Partner Relationships
- **New Venture Capital Sources / Fund Assessment**
  - Growth Capital Funding
  - Focus on Space Industry Technologies / Satellite Applications
- **Increased Use of Bonding Authority**
- **Public Private Partnerships for new Infrastructure**

SPACE FLORIDA

Space Florida - Israel Innovation Partnership

SUPPORTING RESEARCH, DEVELOPMENT AND COMMERCIALIZATION OF AEROSPACE AND RELATED TECHNOLOGY PROJECTS.

Florida-Israel Innovation Partnership

- In October 2013, Florida and Israel created a $2 million recurring joint fund to support research, development and technology projects
- Partners include – NASA, European Space Agency & Israel Space Agency

STEMRAD

LOCKHEED MARTIN

SPACE FLORIDA

Space Florida, Florida Venture Forum
Capital Acceleration

To date, Space Florida-supported capital accelerators have attracted nearly $164+ million in funding and investments for participating companies.

2018 Florida Venture Capital Conference
January 2018 – Fort Lauderdale

Emerging Technologies & Business Showcase
November 2015 – Coral Gables

SPACE FLORIDA


ONLY ONE PLACE
CAN SIMPLIFY SPACE

FDA Legislative Discussion

November 14, 2018

Military Friendly Legislation

Limits the amount of security deposit and advance rent to the equivalent of 2 months rent rather than 3 months.

Adds public-private government housing to existing protections for service members in their ability to break private leases.

Protects state-purchased military buffering lands from future tax deed sales.

Protects state-purchased conservation easements on rural lands from incompatible development.

Military Friendly Legislation (cont.)

Adds 2 installations – NSA Orlando and USSOUTHCOM -- for Military Base Protection planning.

Protects in-state tuition rates for Florida military service members who receive orders to move out of state after their family members have been accepted (but before they are enrolled) to Florida colleges and universities.

Allows military children to be enrolled in Florida Schools based on military orders.

Adds marketing, advocacy, sponsorships outreach and military related community support events to the approved list of activities for Defense Reinvestment Grants.

Military Friendly Legislation w/ Fiscal

Provides transportation relief for service members by establishing a pilot military discount program in Miami to exempt certain service members in grades E-6 and below from tolls to and from their military duty station.

Allows unexpended funds previously provided to DEP for 3 specific non-conservation properties to be applied to other Tier 1 properties as designated by DEO and approved by the Florida Defense Support Task Force.

Provides recurring funding for Military Base Protection Program in order to acquire military buffering land/easements on non-conservation lands.

Questions/ Discussion

FDA Legislative Discussion

November 14, 2018

Florida Defense Support Task Force

Update to Florida Defense Alliance
November 14, 2018

TF Member Update

- Representative Jay Trumbull – Chair – House
- Admiral (ret) Mark Fitzgerald – Governor
- Commissioner Barbara Stewart – Governor
- Amy Gowder – Governor
- MG Michael Calhoun – Governor's Personal Rep.
- Senator Doug Broxson – Senate
- Tom Neubauer – Vice Chair – Senate
- Maj Gen (ret) Richard Haddad – Senate
- Lt Col (ret) Bill Dudley – Senate
- Brig Gen (ret) Chip Diehl – House
- Col (ret) Jim Heald – House
- Representative Holly Raschein – Governor (Nov 6, 2018)
- Vacant – House (Rep Ingram term expired)

Note: Chair rotates on July 1st annually between Senate and House

Task Force Items of Interest

- Strategic Planning Workshop conducted in September
  - TF wants to adjust focus
  - May pursue some structural changes
- Advocacy RFP was released in October
  - Three firms answer RFQ
  - Selected firms present in January 2019
  - New contract expected in March 2019
- Task Force Approved 2019 Meeting Schedule, is posted on our website
  - Anticipate combined meetings with FDA in May (Tallahassee) and November (Tampa)
- Task Force is developing 2019 session Legislative slate
- Task Force visited Tyndall AFB – VP Pence promises a full rebuild

FY 19 - 20 Task Force Grants

- Entertaining emergency grants from Bay County due to Hurricane Michael that could support Tyndall or NSA Panama City

- Received six applications worth $1.6 million during our Aug 2018 cycle for FY 19-20 funding
  - None time critical
  - Available funding for next year is TBD

Florida Defense Support Task Force

Questions ?

Small Modular Reactors

Florida Defense Alliance

14 November 2018

1

Originally built in 1960's – this is not new

2

Greenland

- Medium missile deployment site
- SMR powered facility
- Ice shelf movement stopped program

3

SMR concept went to Army warehouse where they store the StarGate- never heard from again…

History Note

2018 National Defense Authorization Act (NDAA)

Ensure the readiness of the armed forces for their military missions by pursuing energy security and energy resilience

2019 NDAA Section 327

Requires the Secretary of Energy to develop a report to describe requirements for a pilot program for micro-reactors

Why Now

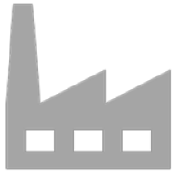
“DoD installations rely almost entirely on the grid, which is highly vulnerable to prolonged outage from a variety of threats, placing critical missions at unacceptably high risk of extended disruption. Backup power is often based on diesel generator sets with limited on-site fuel storage, undersized for new Homeland defense missions, not prioritized to critical loads and inadequate in duration and reliability.” Defense Science Board Task Force

DoD and Energy

DoD is the single largest energy consumer in U.S.

Accounts for 21% of total Federal energy consumption

2016 cost about $3.7B at 201, 410 Billion Btu



Current energy make-up

Electricity 53%

Natural gas 32%

Fuel oil and coal 15%

Want resilience and security

NOTE: this is Installation energy and not Operational energy

What is a SMR

Very small nuclear reactor

Less than 300 MW

DoD looking at 2-10 MW

Source of resilient energy

Capable of operating independently

Will operate for many years without refueling

HOW DO SMRS **WORK?**

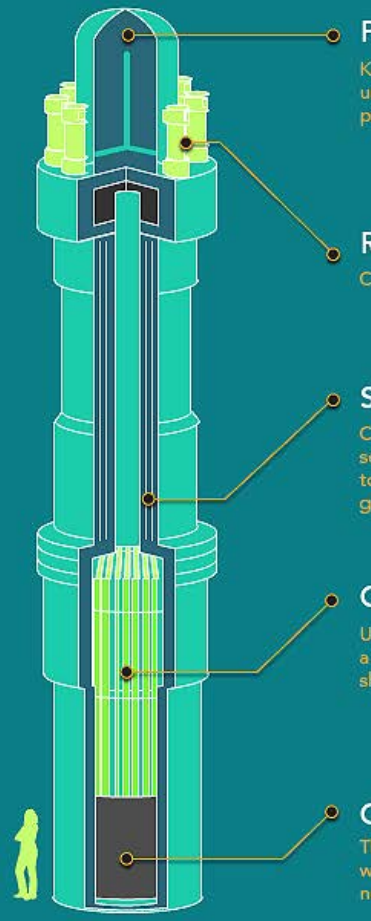
1. **Nuclear power plants generate heat through nuclear fission.** The process begins in the reactor core. Atoms are split apart – releasing energy and producing heat as they separate into smaller atoms. The process repeats again and again through a fully controlled chain reaction.

2. **Control rods made of neutron-absorbing material are inserted into the core to regulate the amount of heat generated by the chain reaction.**

3. **Reactor coolant water picks up heat from the reactor core.** Reactor coolant pumps circulate this hot water through a steam generator, which converts water in a secondary loop into steam.

4. **The steam is used to drive a turbine,** which generates electricity.

5. Throughout the process, **the pressurizer keeps the reactor coolant water under high pressure** to prevent it from boiling.



Pressurizer
Keeps reactor coolant water under high pressure to prevent it from boiling.

Reactor Coolant Pumps
Circulate the reactor's coolant.

Steam Generator
Converts water in a secondary loop into steam to drive a turbine that generates electricity.

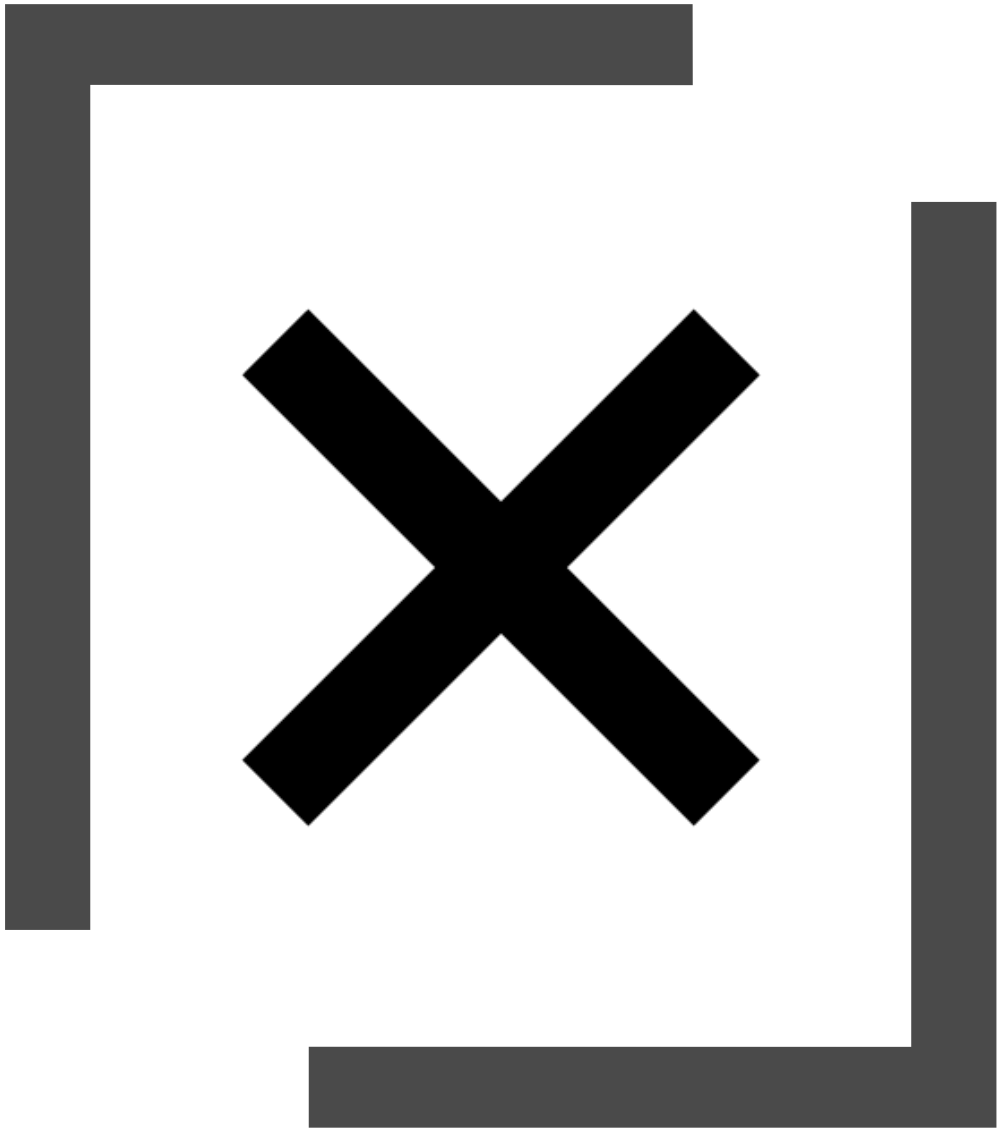
Control Rods
Used to control the power of a nuclear reactor, including shutting down the reaction.

Core
The "heart" of the reactor -- where heat is generated by nuclear fission.

www.energy.gov/ne

What Problems Can a SMR Solve

- 90% of DoD installation energy needs can be met by 40 MW SMR's
- Small size - Most installations should initially look at using 2-10 MW SMR's
  - Land availability
  - Timeframe for licensing and regulatory issues
- Operate as an island without tying to grid
- Clean- no carbon emissions
- Not interrupted by natural disaster
- Always available



Potential Issues

- Cost
  - New, so cost are higher at first
- Approvals, License and Regulatory
  - Years and not months for approvals by NRC and DOE
  - Requires authorized/trained employees
  - Use of High Assay Low Enriched Uranium 235 (HALEU)
    - Transportation
    - DOE is only one with access at this time

Problems Solved

Energy availability/resilience

Security

Can be on closed (island) system for installation connectivity

No carbon footprint

Minimize required land mass

Wind farms and Solar thermal farms require lots of land

Conclusion

NDAA directed/authorized

Need to identify an installation for first SMR

Resilient and Secure

Other countries working on this now

China, Russia (even a floating solution), S Korea, Australia (interesting since they do not presently allow nuclear power)

DoD will have first SMR in 5-10 years

Northwest Florida Sentinel Landscape

Florida Defense Alliance
Mission Sustainment
Working Group

14 Nov 2018

Sentinel Landscape Program

Significant Federal Programs involved in Sentinel Landscapes

Sentinel Landscape Benefits

- Provide **greater access to funding** and **assistance**
- Provide **recognition and monetary incentives** to **willing landowners** who chose to participate
- Encourage **compatible land use** to protect **training routes** and **airspace** and provide **noise** and **safety buffers**
- Protect prime **soils,** improve **forest health** & **water quality**
- Strengthen **wildlife populations** and create **wildlife corridors** and preserve **open space and wildlands**

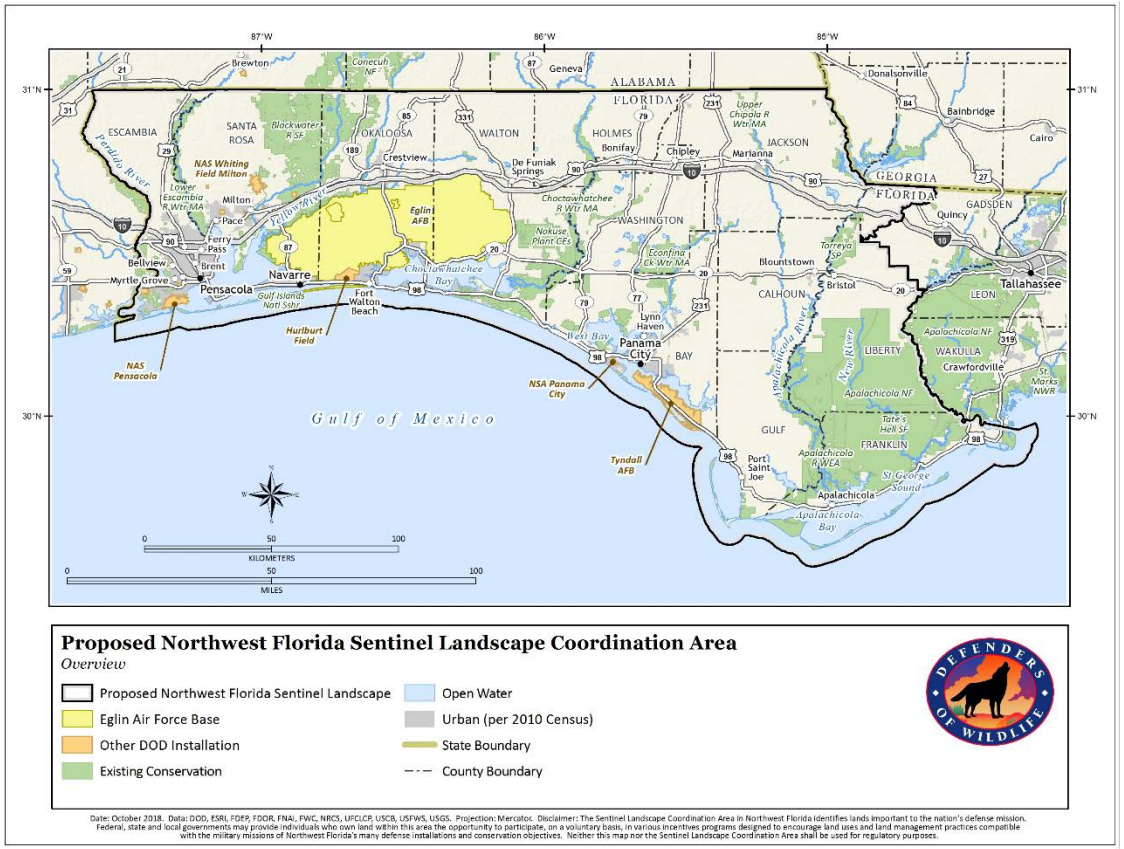
Where Are We?

1. **Eglin Air Force Base** is the anchor military installation.

2. **A defined landscape.** Web-mapping application has been developed.

3. **Coordinated** and collaborative **implementation strategy/plan** providing **incentives**.

Proposed Boundary
Northwest Florida Sentinel Landscape



Where Are We Going?

Share the Northwest Florida Sentinel Landscape proposal with potential partners to:

- Identify partner opportunities, challenges, objectives, desired outcomes including those for existing priority and focus areas
- Leverage existing work groups, information and analysis
- Identify quantifiable goals and desired outcomes and develop a compelling case
- Identify programs, tools and resources and use tools beyond land acquisition and easements

What You Can Do to Become a Sentinel Landscape Partner

1. Formally commit to supporting and contributing to the goals of the Northwest Florida Sentinel Landscape.

2. Introduce the NWFLSL to potential partners and supporters so we can ask for their commitment of support (See the NWFLSL factsheet).

Key Contacts for Northwest Florida Sentinel Landscape

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