



## SURVEILLANCE AND ENFORCEMENT OF FEDERAL FISHERIES IN THE SOUTHEASTERN US

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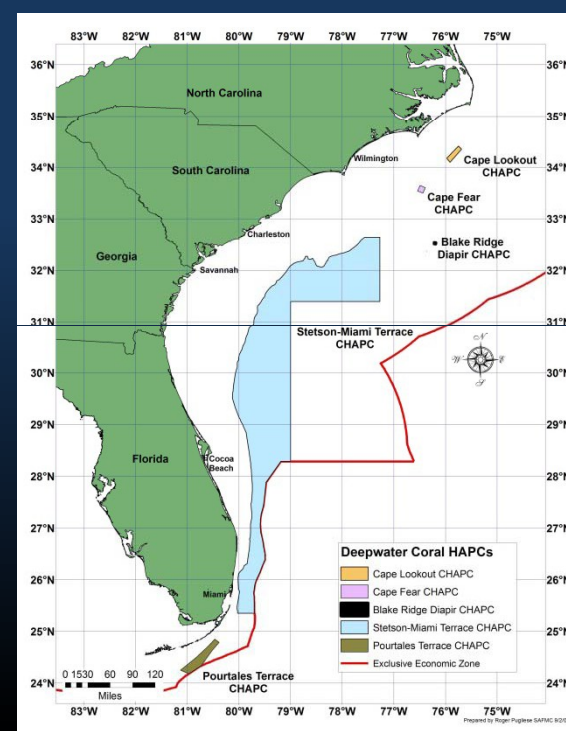
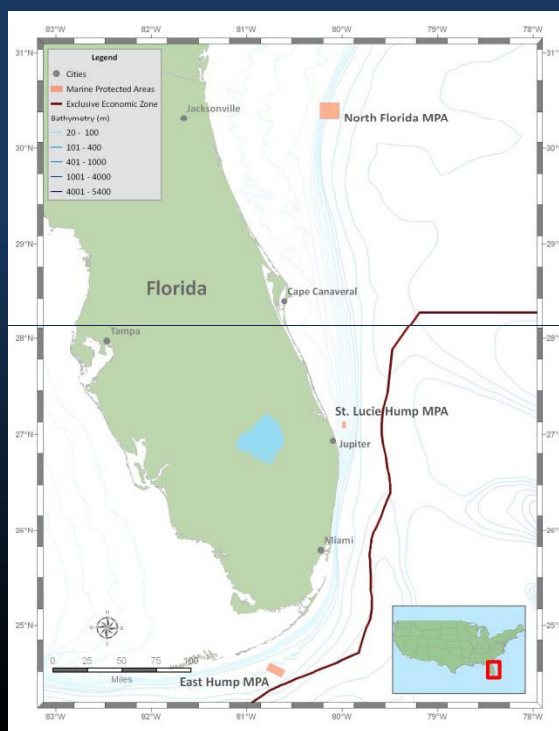
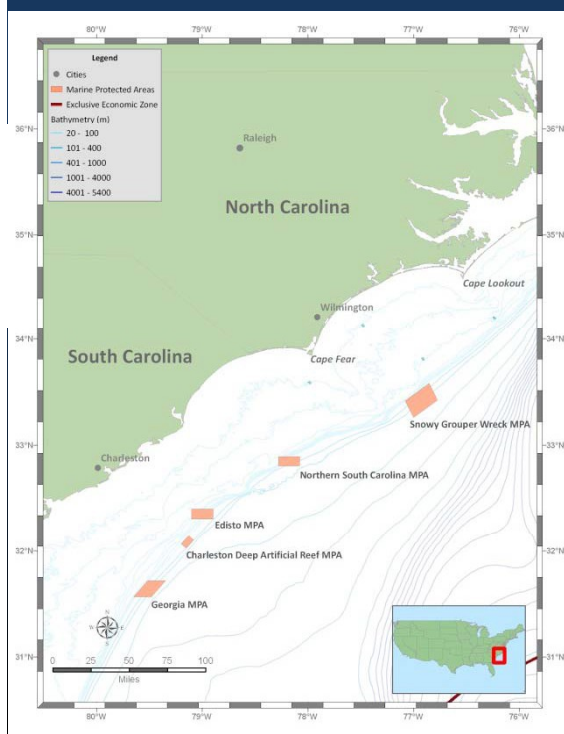
# PROJECT BACKGROUND

2009: Surveillance and enforcement of remote maritime areas (SERMA) workshop for high seas and domestic remote MPAs

2010: MCBI Technical document on surveillance technologies

2010: SAFMC implemented 5 CHAPCs and 8 MPAs

Other protected areas in the region include OHAPC, GRNMS, FKNMS



## PROJECT OBJECTIVES

- Review surveillance technologies for application to SAFMC protected areas
- Review surveillance and enforcement capacity for the SAFMC region
- Hold workshop of regional managers, state and federal LE and outreach
- Produce final report with options for improving S and E capacity and efficiency in the region
- Produce training documents for LE officers in the region

# Surveillance technologies for application to SAFMC protected areas

- Cooperative vs. non cooperative
- Classified vs. civilian
- Ground, sea, air or space-based
- Continuous vs. periodic
- Manned vs. unmanned



## Vessel monitoring systems (VMS)

- Device on vessel sends signal to satellite showing vessel location and speed
- Ground stations can alert enforcement about “interesting” tracks
- Enforcement can investigate
- Real-time data
- VMS in use for rock shrimp in SAFMC region



# Automatic identification systems (AIS)

- Shipboard VHF broadcasting system
- Designed for vessel tracking and identification, but additional channels for other data streams
- Limited range – 20nm (line of sight) only unless on towers or buoys
- Intended for vessel safety but increasingly used for Maritime Domain Awareness
- Not used for fisheries monitoring

## Why?

- AIS only required on vessels >19 m to enter US port
- Fishing vessels are exempt

## AIS potential expansion

- In 2008 USCG proposed a rule to include fishing and passenger vessels in AIS and are implementing NAIS system accessible to all LE
- AIS channels could be used to transmit information (eg MPA boundaries) to vessels
- Deployment from moored buoys and other platforms increase range
- Space based AIS expands to global coverage, but not real time

# Non Cooperative surveillance

## Platforms

- Space-based – satellites
- Aircraft – manned and unmanned
- Vessels - manned and unmanned
  - Land or buoy-based

## Sensors

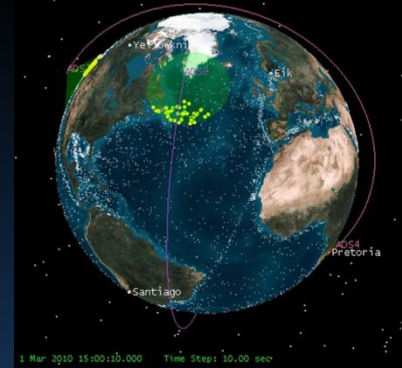
- Visual imaging systems
  - Radar systems
  - Acoustics

Surveillance systems use a combination of platforms and sensors to fulfill specific requirements



# Satellite-based surveillance

Satellite technologies capture information from a target on earth and relay data back to a control center



**Advantages:** large scale, high resolution images

**Disadvantages:** Surveillance not continuous, images expensive and some systems sensitive to weather and light

## Visual imaging

Optical and IR cameras

## Radar

Synthetic aperture radar

Space-based AIS





## Manned aircraft

Aircraft can be equipped with a great variety of sensors including radar, SAR, visual and/or IR cameras, and more specialized sensors for pollutants

Surveillance of RMAs often requires long range aircraft

Expensive to purchase and operate (agency cost-sharing)

Canada and UK use commercial contractor on per mission basis.

# Unmanned aerial vehicles (UAVs)



US Navy MQ-8B  
fire scout rotorcraft



US Coast Guard  
Bell Eagle



MQ-9 used by US and  
British armed forces

Payloads can include visual and/or IR cameras, biological or chemical sensors, and radar/SAR

UAVs can fly extended missions (8 to >48 hours)

Most are currently operated by military

Flights limited by FAA regulations

## Other platforms



### Airships, aerostats and helikites

Can be deployed from land, ships or vehicles

Can be tethered or untethered, very small or very large

Used for visual sensors and transceivers

### Moorings (sub-surface)

Platforms for acoustic packages

Only useful when systems relay data in near real-time

Cannot identify individual vessels

May be able to identify activity

### Buoys (surface)

Platforms can be used to extend AIS and radar capabilities

## SURVEILLANCE AND ENFORCEMENT WORKSHOP

28 participants from SAFMC, GRNMS, FKNMS, FL, GA, SC, NC state LE, NOAA OLE, USCG

### Presentations:

- SAFMC Protected areas, management challenges and outreach (A Martin, M Brouwer, K Iverson)
- Surveillance and enforcement challenges in National Marine Sanctuaries the southeast region (B Causey)
- Surveillance, enforcement and compliance challenges in Grays Reef National Marine Sanctuary (G Sedberry)
- Southeast vessel monitoring system (VMS) overview (P O'Shaunessy)
- Surveillance and enforcement of remote maritime areas (S Brooke)

## Breakout sessions

- Surveillance and enforcement operations: Challenges, technologies, assets, response capabilities, critical needs, improvements
- Interagency collaboration (includes management): current status, JEA, challenges, improvements
- Education and outreach: Current status, public perception, officer-public interaction, improvements

## Outcomes

### Surveillance and enforcement operations:

- Insufficient assets, officers and funding. More officers = more patrol time, interceptions and public interactions. NOAA OLE critically undercapacity
- Need for increased remote surveillance technologies to target limited enforcement assets.
- More funding needed for JEA program - critical to supplement limited federal LE
- Lack of criminal provisions in MSA places total burden of prosecution on civil GC attorneys and judges
- GC attorneys understaffed and overwhelmed with caseload.
- VMS best surveillance option for commercial fisheries monitoring
- Recreational sector biggest challenge to enforce

## Interagency collaboration

- Management agencies should consult LE during development of regulations.
- JEA is critical to enforcing federal fisheries, however ongoing training of state LE is often inadequate as federal regulations are complex and change frequently
- Too few NOAA OLE field officers - leads to lack of State LE commitment to JEA
- Need more interagency training, sharing of patrol time and information
- Too little feedback on federal cases made by state LE
- Need more multi-agency 'details'
- USCG has high turnover and multiple responsibilities, fisheries not high priority
- Interpersonal relationships most important to interagency collaboration



## Education and outreach

- No reliable or consistent metrics of compliance
- No readily accessible location where all protected areas and regulations can be found
- More public outreach on new and existing regulations – explain purpose of protective measures
- GMFMC uses cell phone application to disseminate information
- Protected area boundaries should be easy to chart with square borders - coordinates should be readily available
- Publicize successful case outcomes - shames offender, increases compliance, raises LE morale.

# Selected recommendations

## Surveillance and Enforcement

Investigate potential effect and capability of changing civil provisions in MSA to criminal

Increase the number of GC to prosecute resource laws

Implement VMS in snapper-grouper fishery for SAFMC region (would require additional VMS tech staff)

Introduce use of AIS for monitoring fishing vessel activity

Use towers, buoys, aerostats to increase range of radar and cameras

Address boundary placement - how much of an enforcement challenge are the irregular boundaries

## Interagency collaboration

Increase training of state LE by NOAA OLE by scheduling regular classroom and at sea sessions

Facilitate interpersonal relationships between agency LE through informal meetings or joint training programs (eg USCG has open training sessions annually)

Increase the frequency of multi-agency details

Create a joint LE forum for sharing information and coordinating enforcement actions

## Education and outreach

Create centralized database for regulation information (SAFMC)

- user friendly (google earth) mapping of protected areas
- all regulations in one place (SAFMC, NMS, FMPs)

Use social media to disseminate information

Enforcement representatives attend and make presentations at fishing clubs and meetings

Use NMS and SAFMC public meetings to increase outreach efforts

Make sure new regulations are distributed quickly and are clear and enforceable

A large school of fish swimming in clear blue water above a coral reef. The fish are silhouetted against the bright blue background, and the coral reef is visible at the bottom of the frame.

**Questions?**