

Atlantic G&G

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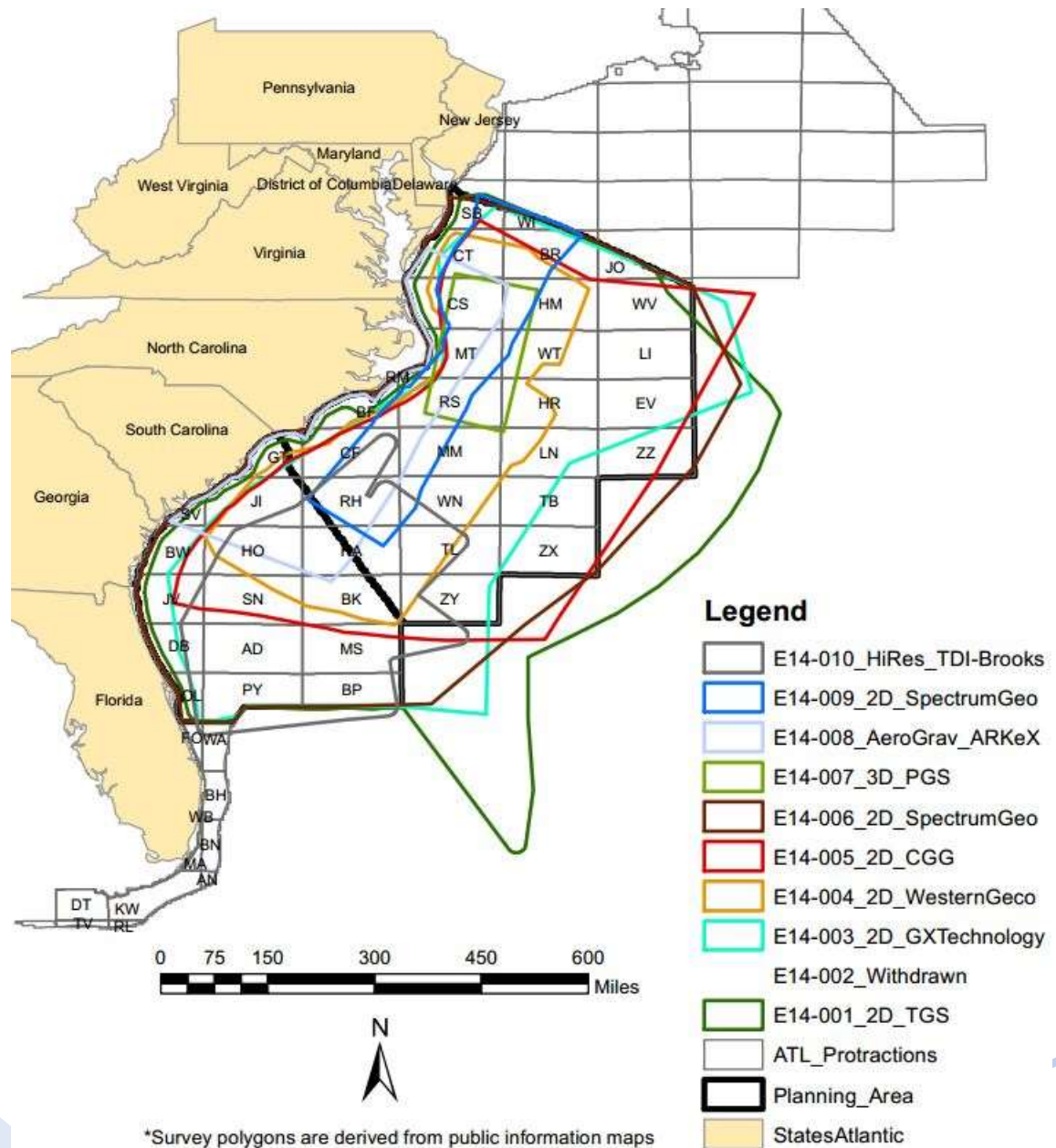
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Current Atlantic OCS Permit Applications

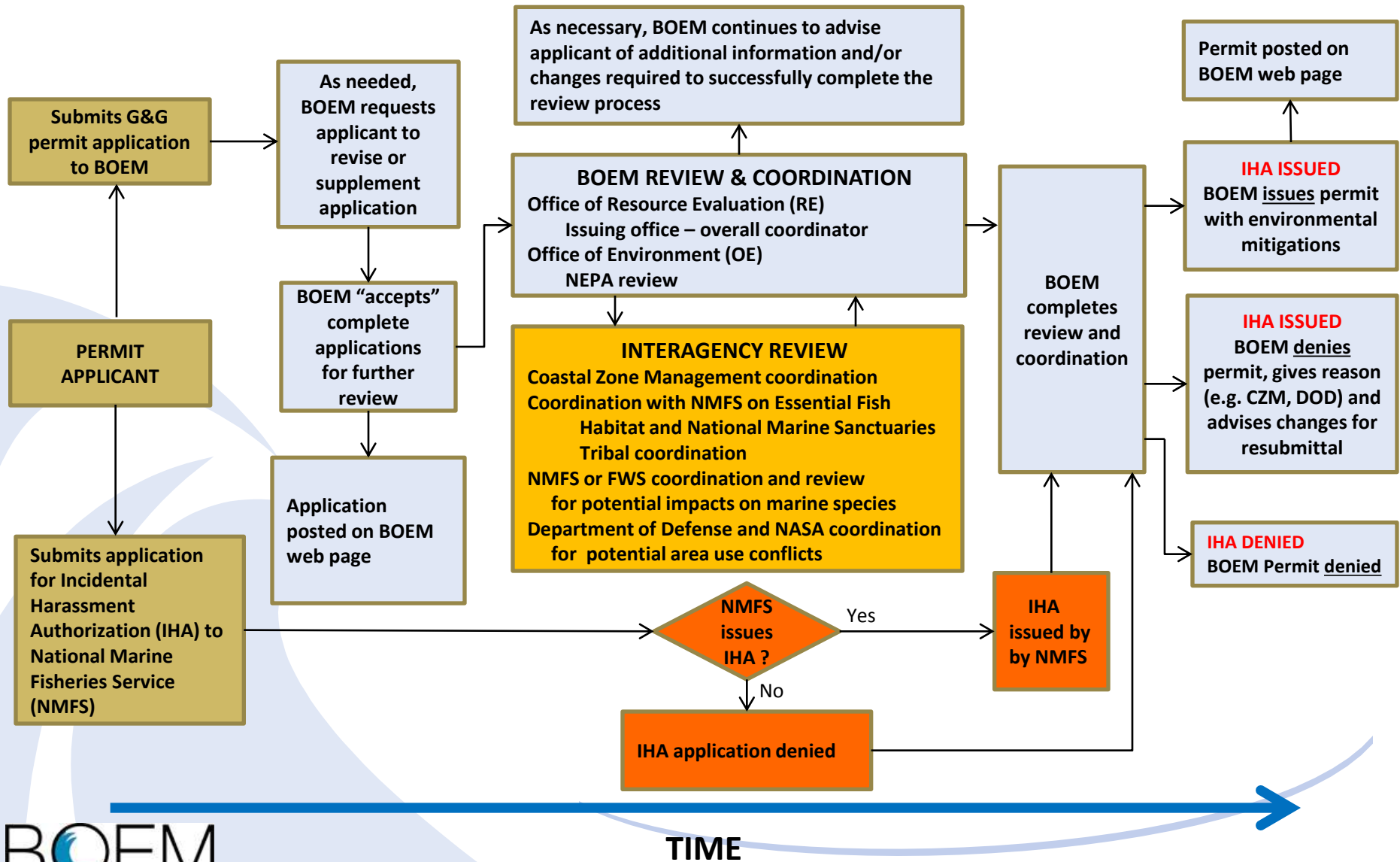


G&G Permitting

Permitted Activities: Geophysical Surveys

- **Gravity and Magnetics:** Hydrocarbon Exploration; Archeological Surveys
- **Side Scan Sonar (bottom mapping):** Archeological Surveys; Hazard Surveys
- **High Resolution Seismic (shallow penetration):** Sand surveys for beach replenishment; Hazard Surveys for Renewable Energy; Oil & Gas Exploration & Development
- **2D and 3D Seismic (deep penetration seismic):** Research; Oil & Gas Exploration; Reserves Estimates, Fair Market Value, National Assessment

Atlantic G&G Permitting Process



G&G Permitting (Completeness)

- Review Information Provided
 - Ensure application is complete
 - Accept Application
 - Post Application/Public Information Map to:
 - BOEM's Public Web Site
 - BOEM initiates the Coastal Zone Management (CZM); notify states the G&G application has been received
 - Initiate Department of Defense (DOD) coordination
 - Initiate NASA coordination
 - National Marine Fisheries Service (NMFS) Incidental Take Authorization (IHA) coordination begins
 - Permit applicant must apply to NMFS for an IHA

G&G Permitting (Processing)

- BOEM Office of Environment (OE) performs NEPA analysis and completes an Site-specific Environmental Analysis (SEA)
 - Review application
 - Request additional information as needed
 - Create a Site-specific EA, which includes conditions of approvals and mitigations received and agreed upon as part of the ESA BO, EFH and when appropriate NMFS Conservation Recommendations, CZMA review
 - The SEA reviewed by Subject Matter Experts (SME) to ensure environmental compliance and safety
 - Use the SEA as the basis for the permit application approval

G&G Permitting (Processing)

- EFH Consultation

- Create an EFH assessment: description of the activity to be permitted, analysis of potential adverse effects, conclusions of those effects, include applicable proposed mitigation
- Send the EFH assessment to NMFS (SERO; GARFO) for review
- If a Formal Consultation is Deemed Necessary, Receive NMFS' Conservation Recommendations
- Coordinate on the Conservation Recommendations and if applicable create mitigation which are included in the SEA
- ❖ A similar procedure would occur if we are in the area of a National Marine Sanctuary (NMS)

G&G Permitting (Processing)

- Issuing the Permit

- Ensure CZM approval from each affected state has been received
- Ensure DOD and NASA coordination is satisfactory
- Ensure NMFS has issued an Incidental Harassment Authorization (IHA) to the permittee and BOEM has included any additional NMFS mitigations to its SEA
- Review OE mitigations
- Cover Letter Includes permit specific mitigations
- Attach cover letter to permit and issue
- Publish Permit and Cover letter to BOEM Public Web Site
- Publish Site Specific Environmental Analysis to BOEM Public Web Site

Typical Mitigations:

- Various mitigations for protected species
 - Time-area closures
 - Exclusion zones
- Protected Species Observers (PSO)
- Required use of Passive Acoustic Monitoring (PAM)
- Exclusion areas for protection of known benthic communities
- Protection of Archaeological Resources
 - Listing of known/potential resources in survey area, avoidance/reporting guidance

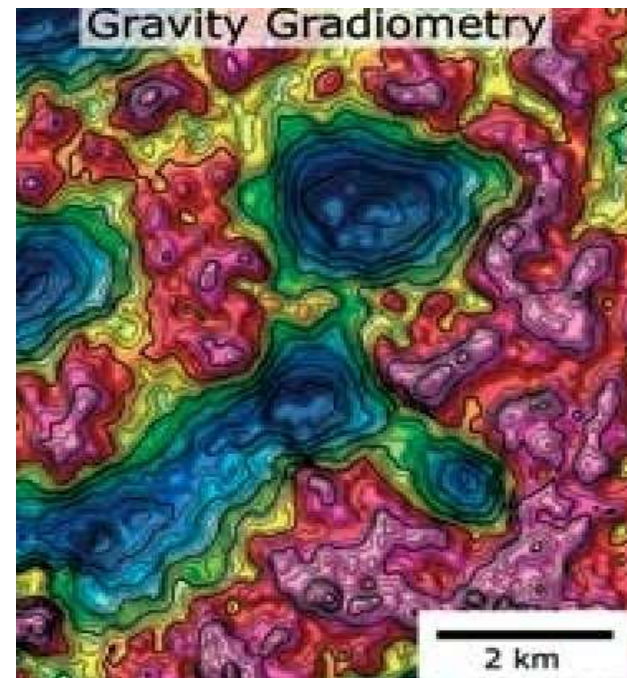
Gravity Survey

A gravity survey measures the changes in rock density by measuring changes in the Earth's gravity. These data are gathered by two methods:

- Marine Surveys
- Airborne Surveys

The Sensors and equipment are typically mounted inside the ship or airplane.

Map of a gravity Survey showing changes in the Earth's gravity resulting from differences in the subsurface deposits.

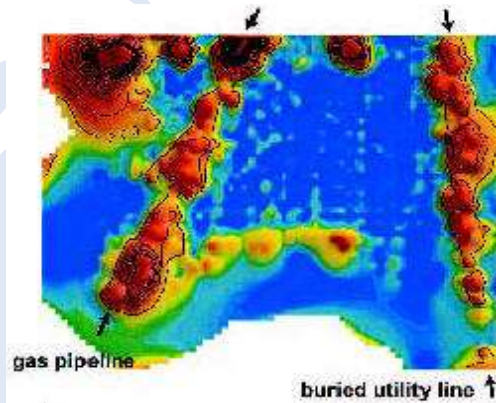


Magnetic Survey

A magnetic survey measure changes in the Earth's magnetic field to determine the structure and sedimentary properties of subsurface geology or the presence of iron based metals. This information is gathered by two methods:

- Marine Surveys
- Airborne Surveys

Magnetometer surveys are commonly also use to locate marine archaeological sites as well as buried pipelines or cables.



(Southwest Research Institute)



Airborne Magnetometer (USGS)

Example of a magnetic survey used to locate a gas pipeline and a utility line.

High Resolution Surveys

Multi-beam Echo Sounders

Depth/Echo Sounders: These come in two basic types:

- 1) Single beam, a typical depth recorder; and
- 2) Multi-beam echo sounders which can be used to map the sea floor.

Sensors are typically hull mounted.

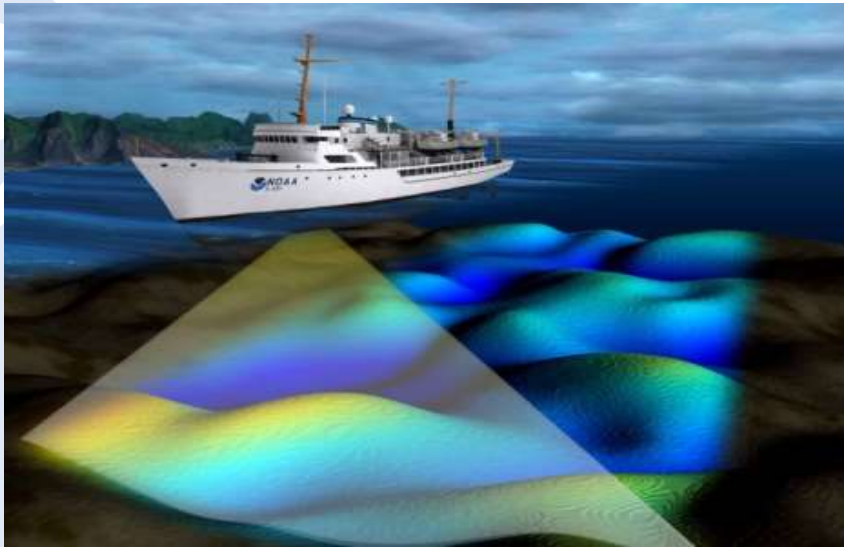
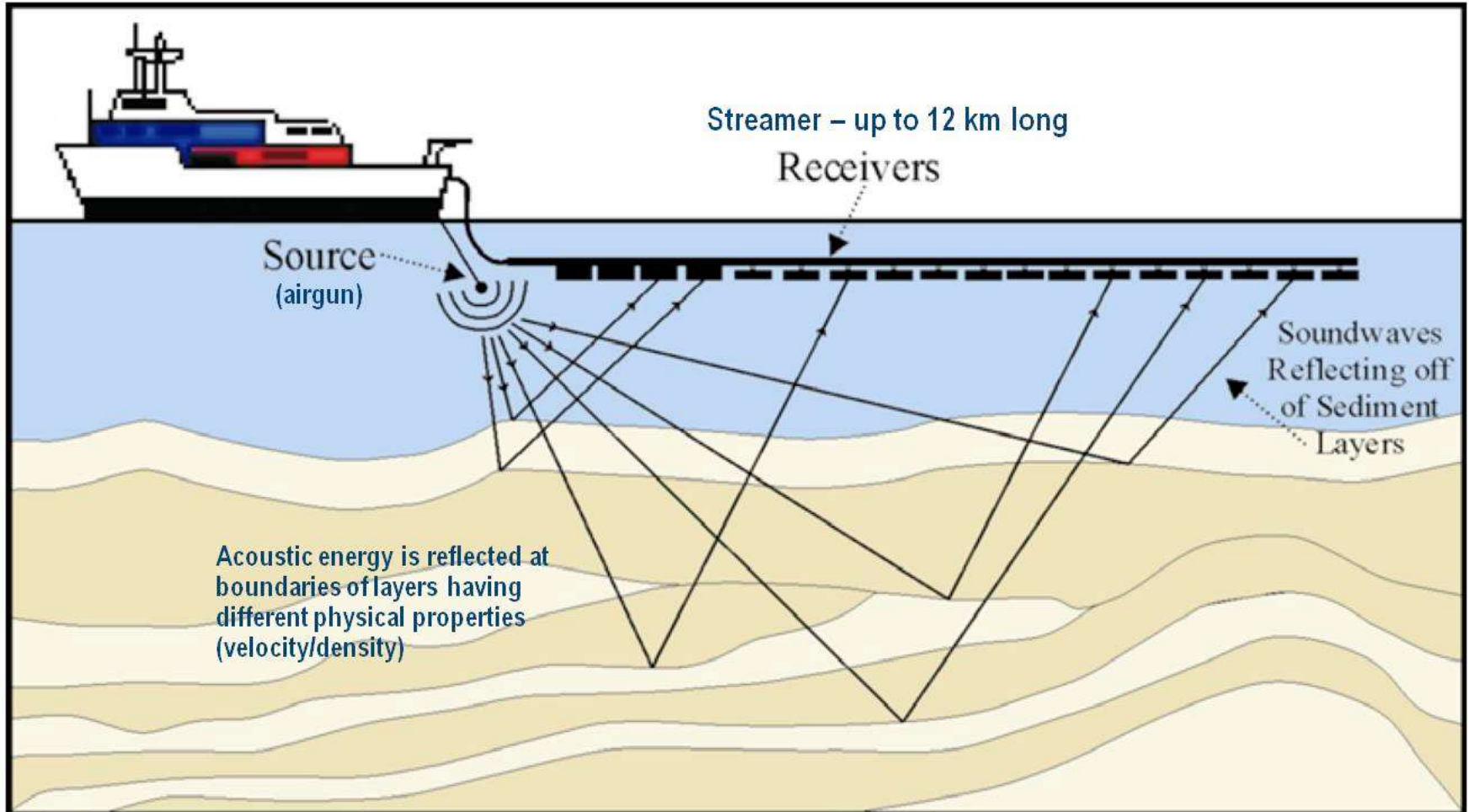


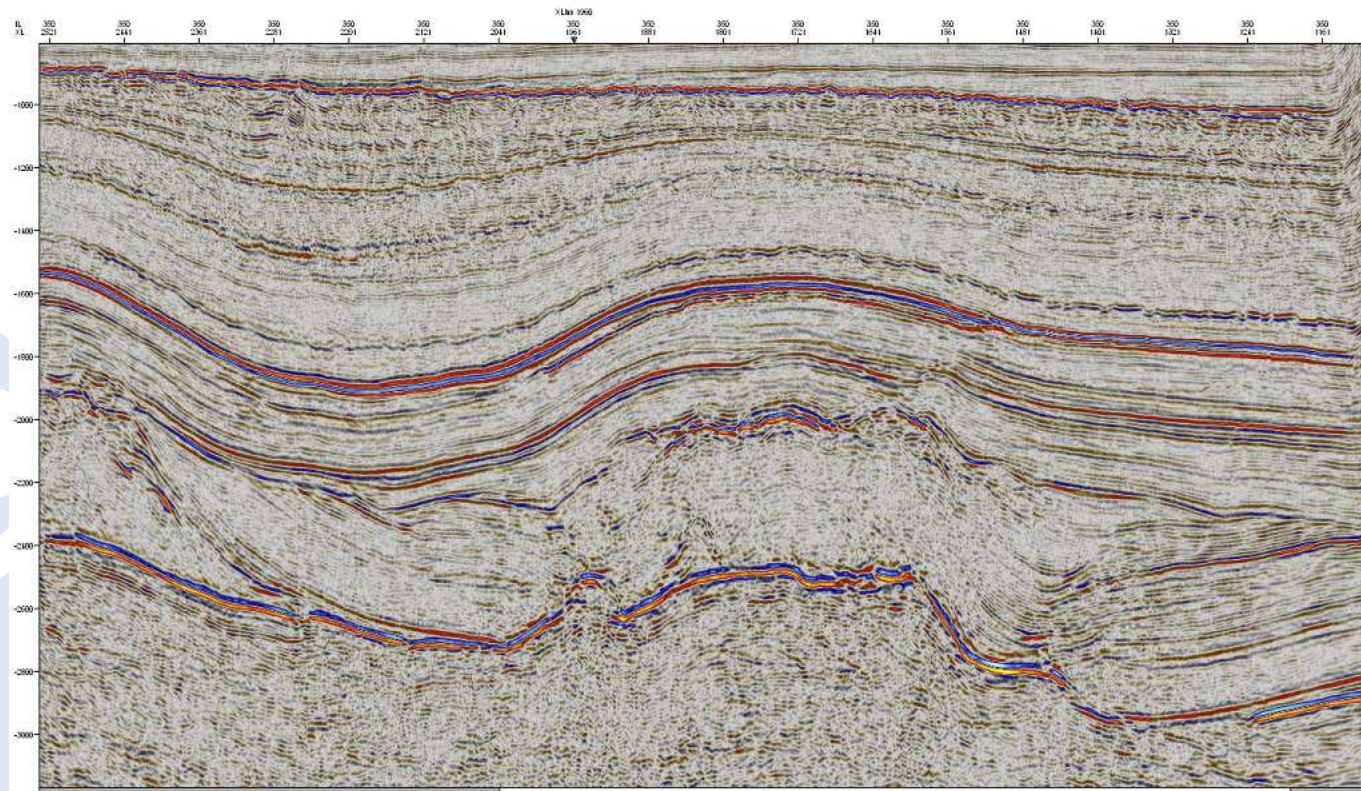
Image of a HRG multibeam echosounder survey (NOAA, 2014) Photograph credit from the National Office of Atmospheric Administration (NOAA), Coast Survey. 2014. Multibeam Survey Image. Accessed from website: <https://noaacoastsurvey.wordpress.com/about/>

2D Seismic Acquisition



(Geomatic Solutions)

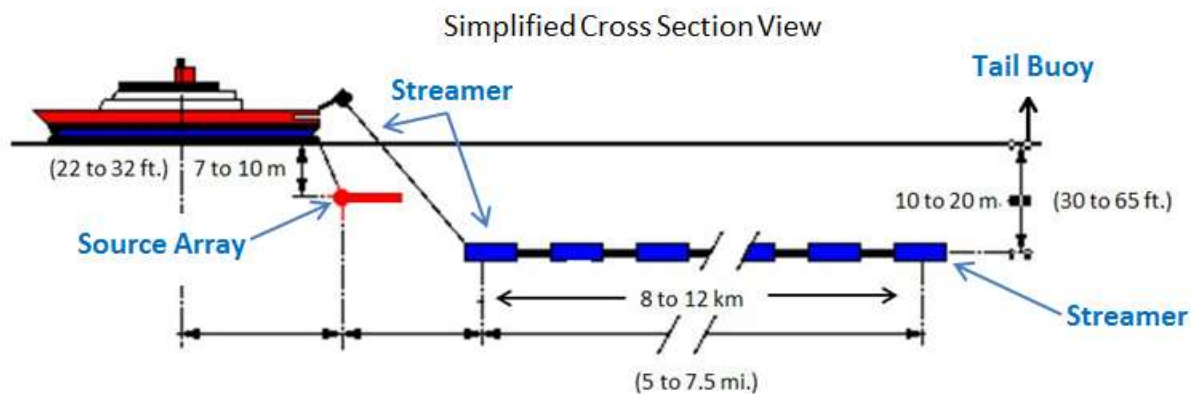
Processed 2D Seismic Data



(ThermoGIS)

TYPICAL MARINE 2D SEISMIC SURVEY

- Single survey vessel
- Survey vessel speed is approximately 5 knots
- Single Source Array: Typically composed of 3 or 4 subarrays
- Source Array usually covers an area of ~ 50' by 50'
- Typically One Streamer (cable with hydrophones)
- Streamer will usually be 8 to 12 km long
- Streamer is typically towed 10 to 20 meters deep with a tail buoy
- Source array will typically be towed 7 to 10 meters deep



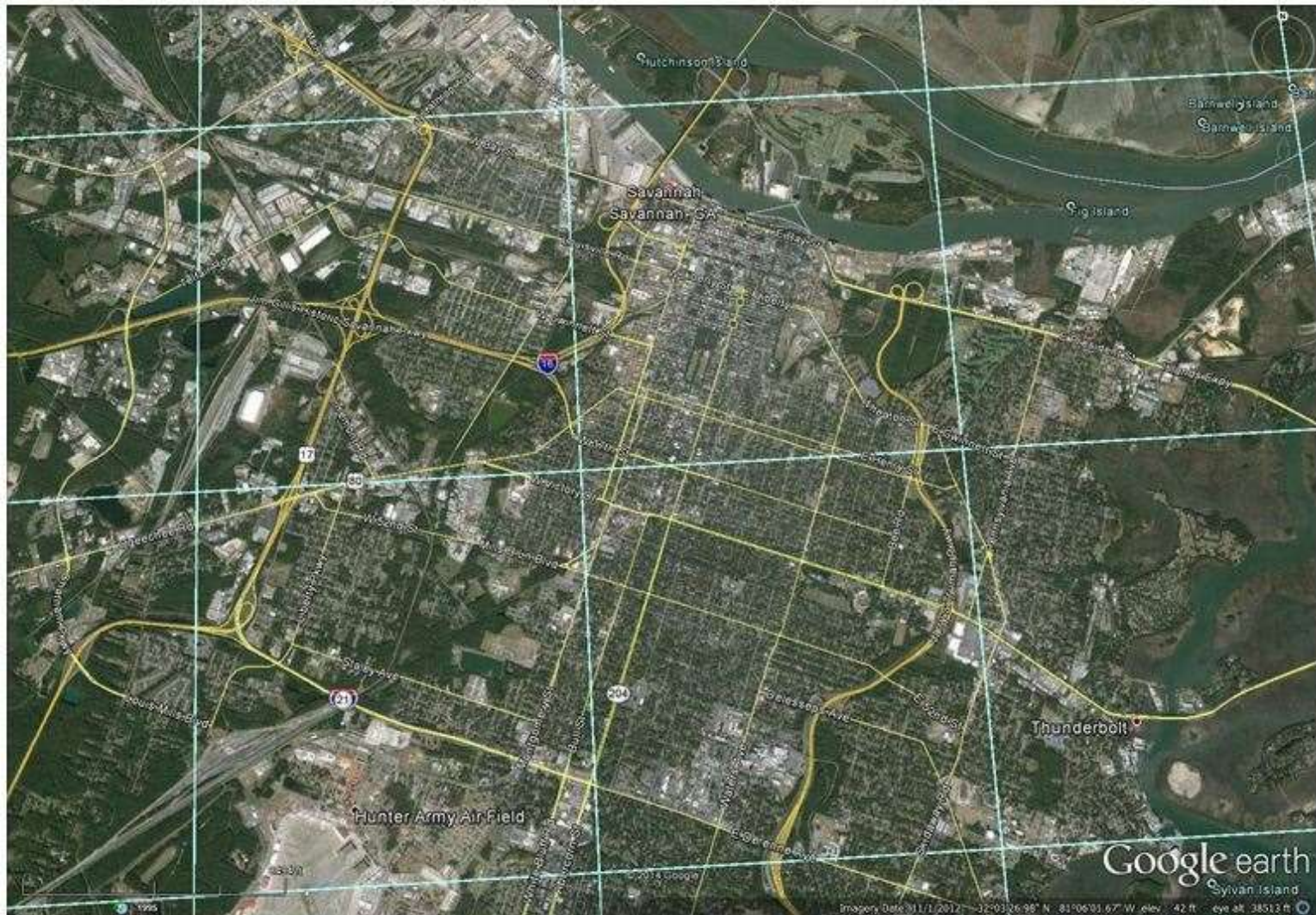
(modified after www.xsgeo.com; Marine Acquisition In Practice)

Dual Use Issues: Surveys & Commercial/Sport Fishing

- Notice to Mariners
- Real-time direct radio contact
- Guard vessels (typically in front and behind survey; attempt to speak face-to-face with vessels)
- Where necessary survey will go around and/or stop acquisition
- Can work with fishing communities/industry to minimize any potential impacts

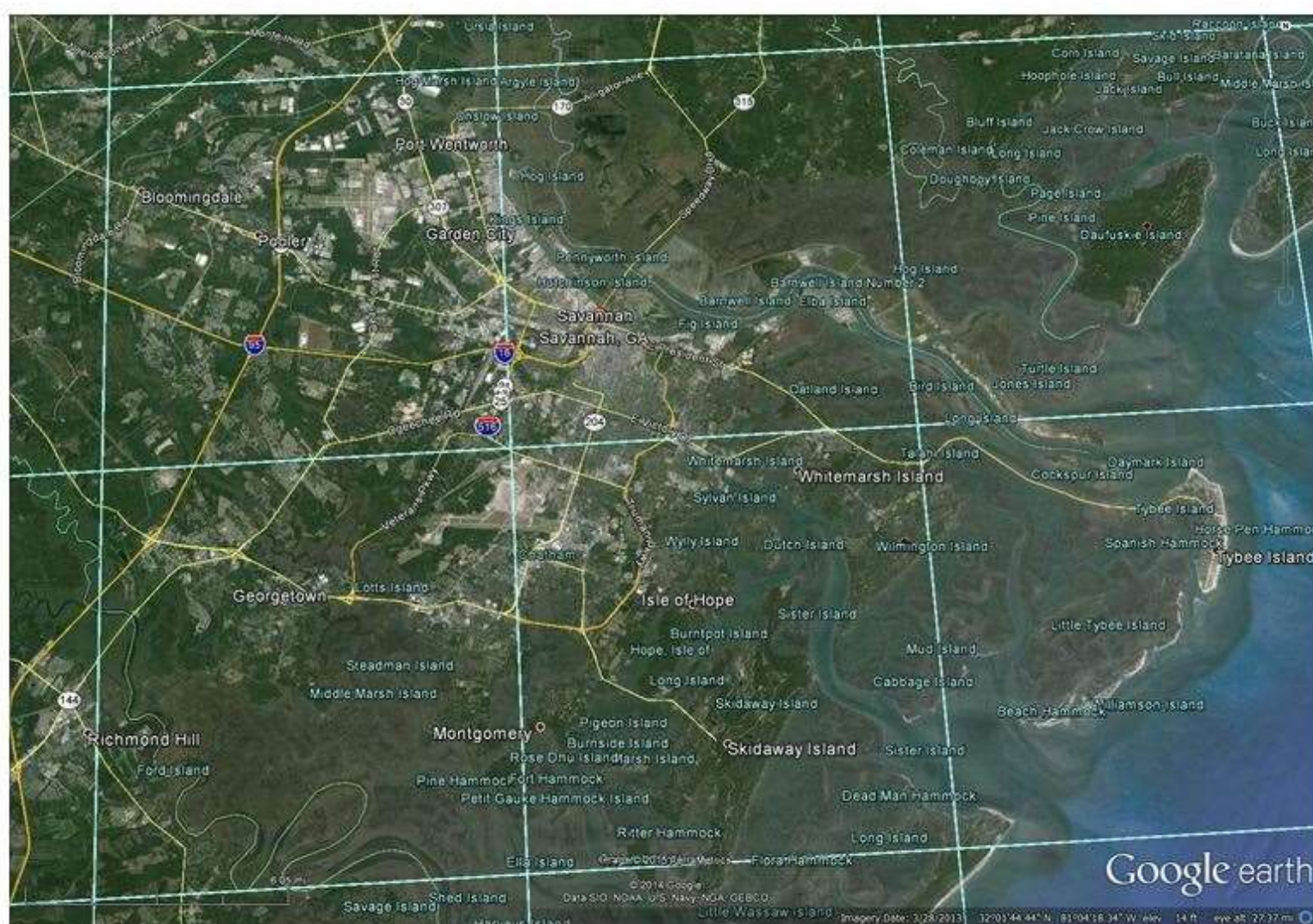
2.5 mile by 2.5 mile 2D Seismic Grid

View of Savannah, GA



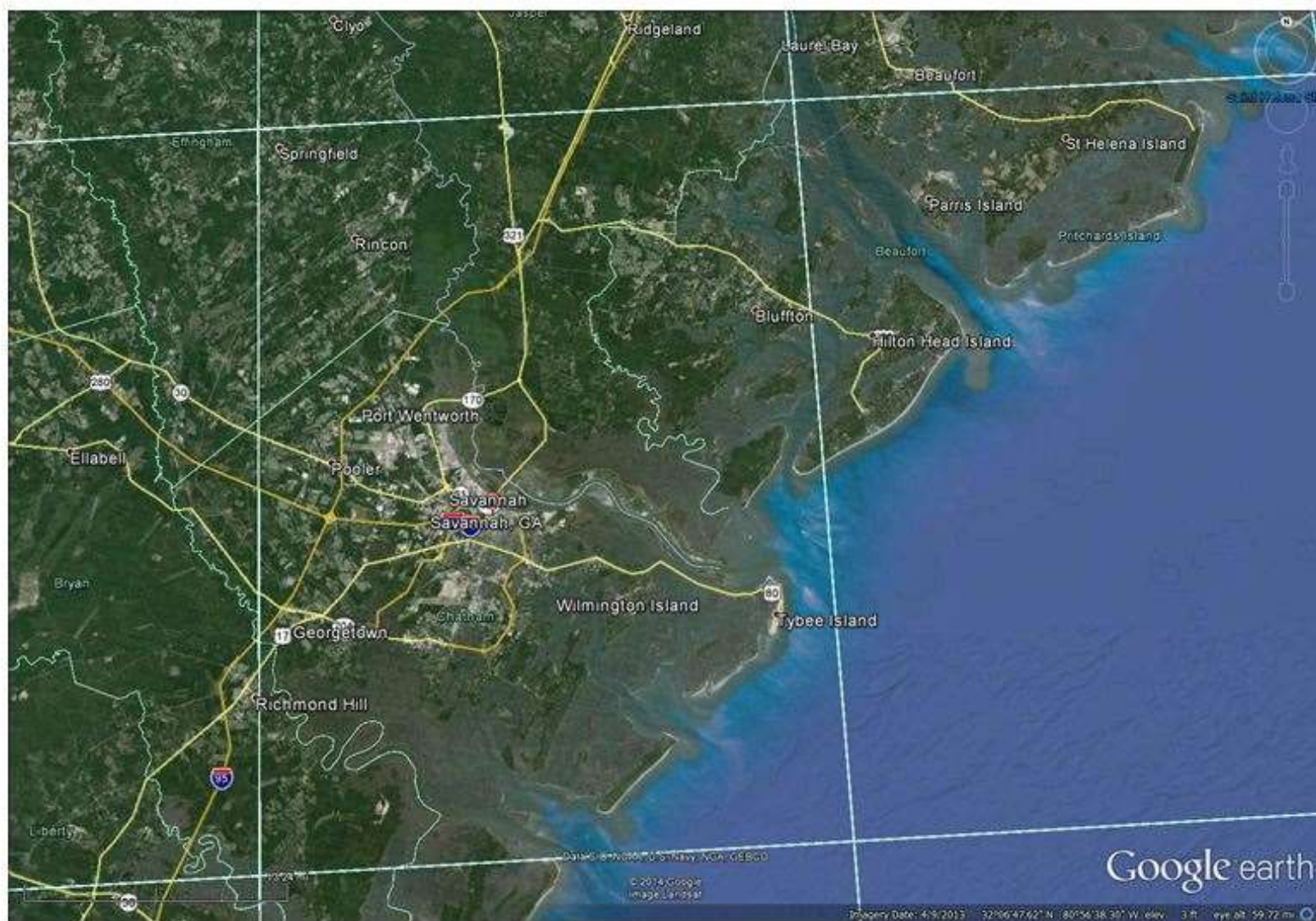
10 mile by 10 mile 2D Seismic Grid

View of Savannah, GA



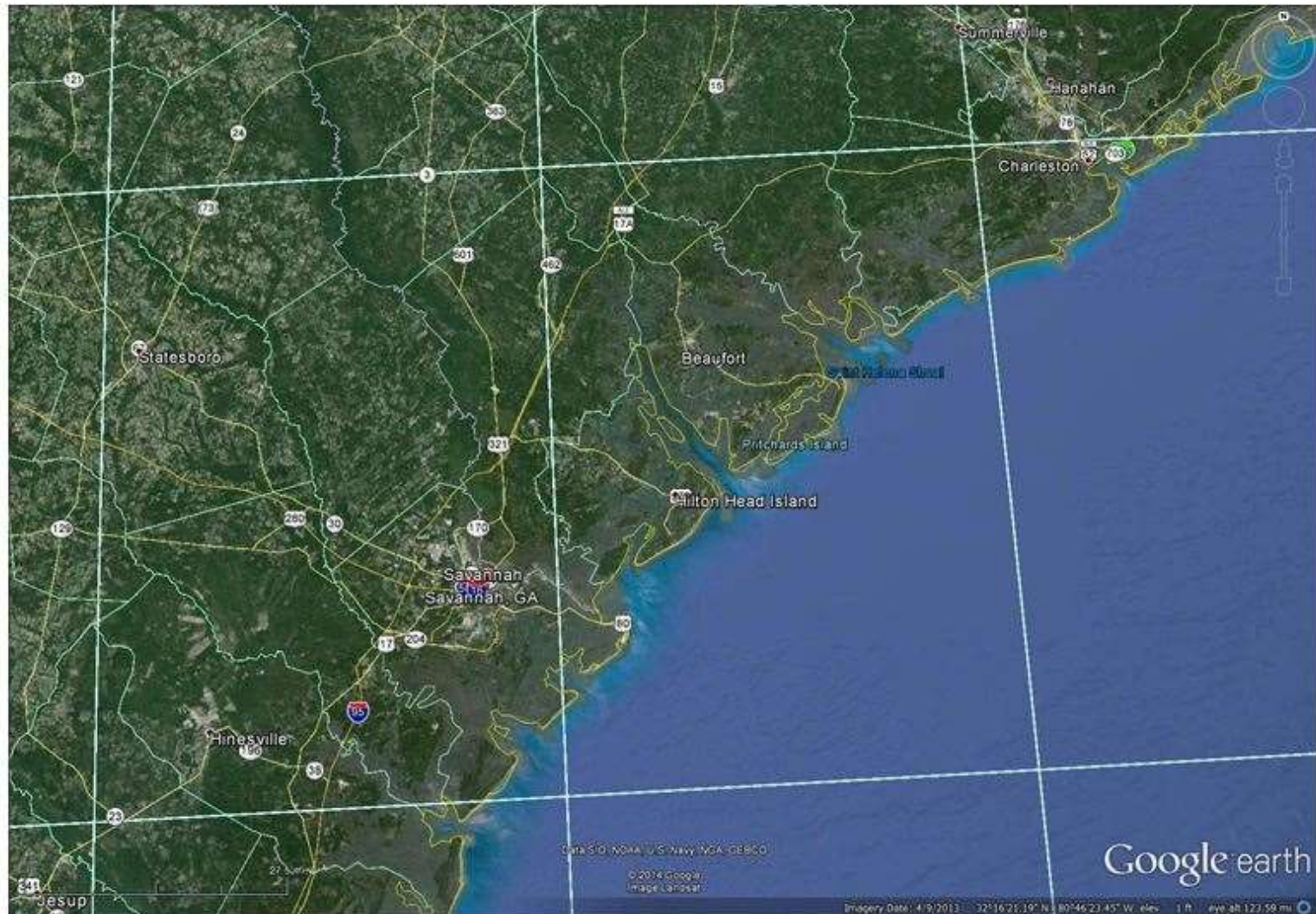
30 mile by 40 mile 2D Seismic Grid

View of Savannah, GA



50 mile by 70 mile 2D Seismic Grid

View of Savannah, GA and Charleston, SC



BOEM Web Pages of Interest

- BOEM Atlantic OCS Region Page: <http://www.boem.gov/Atlantic-Region/>
- Atlantic Oil and Gas Information: <http://www.boem.gov/Atlantic-Oil-and-Gas-Information/>
- Atlantic G&G Permitting: <http://www.boem.gov/Atlantic-G-and-G-Permitting/>
- Currently submitted Atlantic OCS Region Permit Applications: <http://www.boem.gov/Currently-submitted-Atlantic-OCS-Region-Permits/>
- Public Information Query for G&G permits (including SEAs): https://www.data.boem.gov/homepg/data_center/other/WebStore/pima ster.asp?appid=5%20
- Environmental Studies Program Information System: http://www.data.boem.gov/homepg/data_center/other/espis/espisfront. asp