NOAA Products and the Great Lakes Environment

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Habitat Solutions NA

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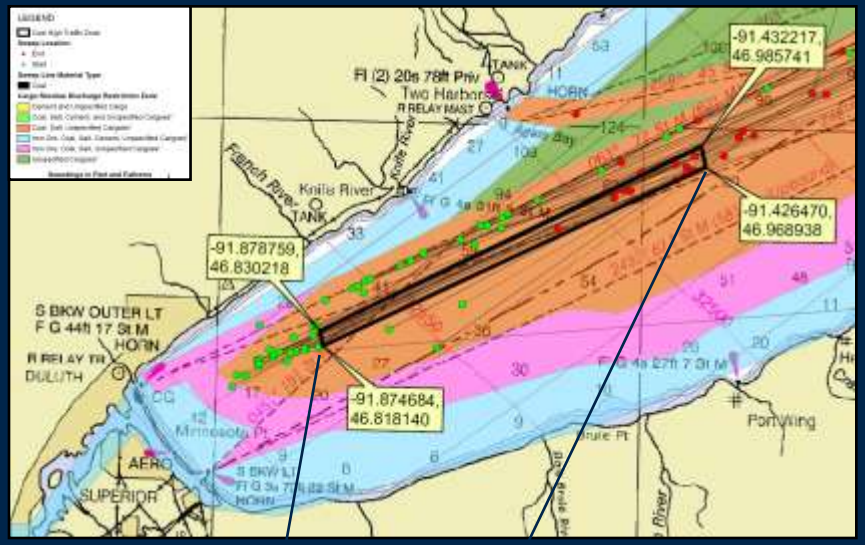
Some of what we do…

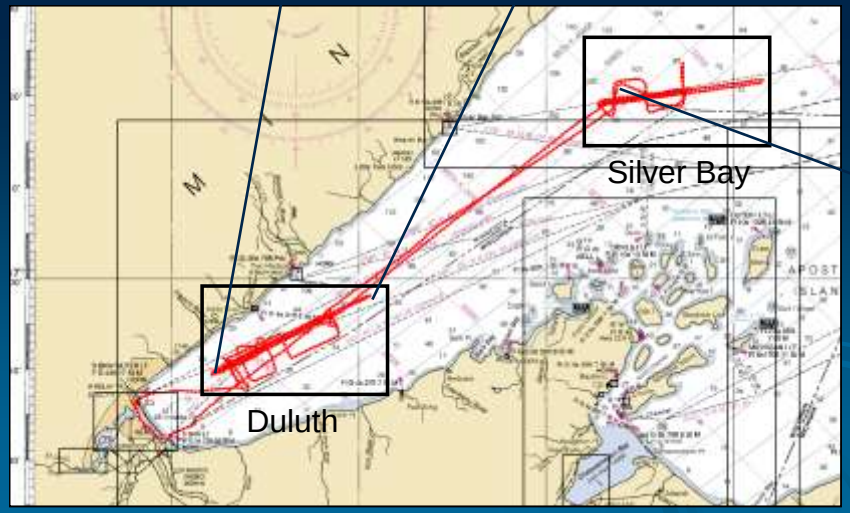
- Identify, map, and evaluate coastal margin and nearshore aquatic habitat in the Great Lakes (fisheries and wildlife)
  - Remote sensing and geophysical tools
    - Sidescan sonar
    - Hydroacoustics
  - GIS and statistical software to spatially and temporally evaluate habitat and fisheries data
  - Wetlands, hydraulic connectivity (water level dependent)
- Study physical processes, erosion, and sediment transport in coastal areas
  - Coastal Hazards
    - Erosion (USACE, State Coastal Programs)
    - Flooding (FEMA)
  - Changing water levels
    - Water levels and flows (IJC International Upper Great Lakes Study)
    - Climate change impacts
- Assess and protect Great Lakes water resources
  - Water Quality (Great Lakes Water Quality Agreement)
  - Water Quantity (Diversions)

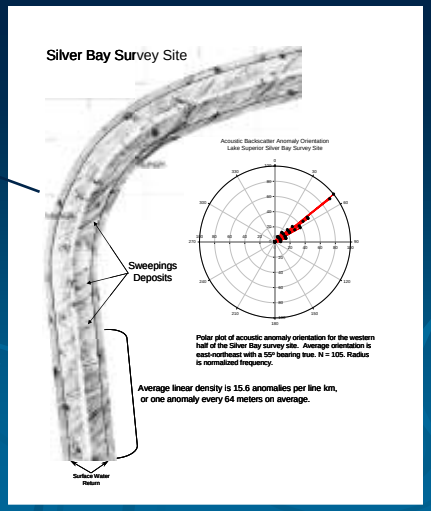
Some of NOAA's products…

- Navigation Charts – both paper and digital (MapTech, BSB charts)
  - Research vessels (large and small)
    - Water depth, shipping channels, coastal hazards, navigation aids, facilities
    - Digital charts used for real-time navigation, course plotting
    - Wrecks and other obstructions
  - Locate survey/sampling sites
    - USCG Sweepings study
    - Sidescan sonar surveys
  - Real-time data acquisition
    - Sidescan sonar surveys
    - Underwater video
- High-resolution shallow water bathymetry (LIDAR)
  - Physical processes, erosion and sediment transport studies
    - Lakebed downcutting (erosion of cohesive clays)
    - Littoral sediment supply (linear bars)
  - Benthic and shoreline habitat
    - Aquatic macrophytes (submergent vegetation)
    - Exposed shoreline during periods of lower lake levels (shorebirds)
  - Coastal margin habitat (wetlands)
    - Water levels and flows (IJC International Upper Great Lakes Study)
    - Climate change impacts
- Water level monitoring and regulation
  - Coastal benchmarks (IGLD)
  - Water level gages
    - Historic and real-time monitoring of water levels
    - Short-term flooding or drawdown events (seiches)

USCG Sweepings Study





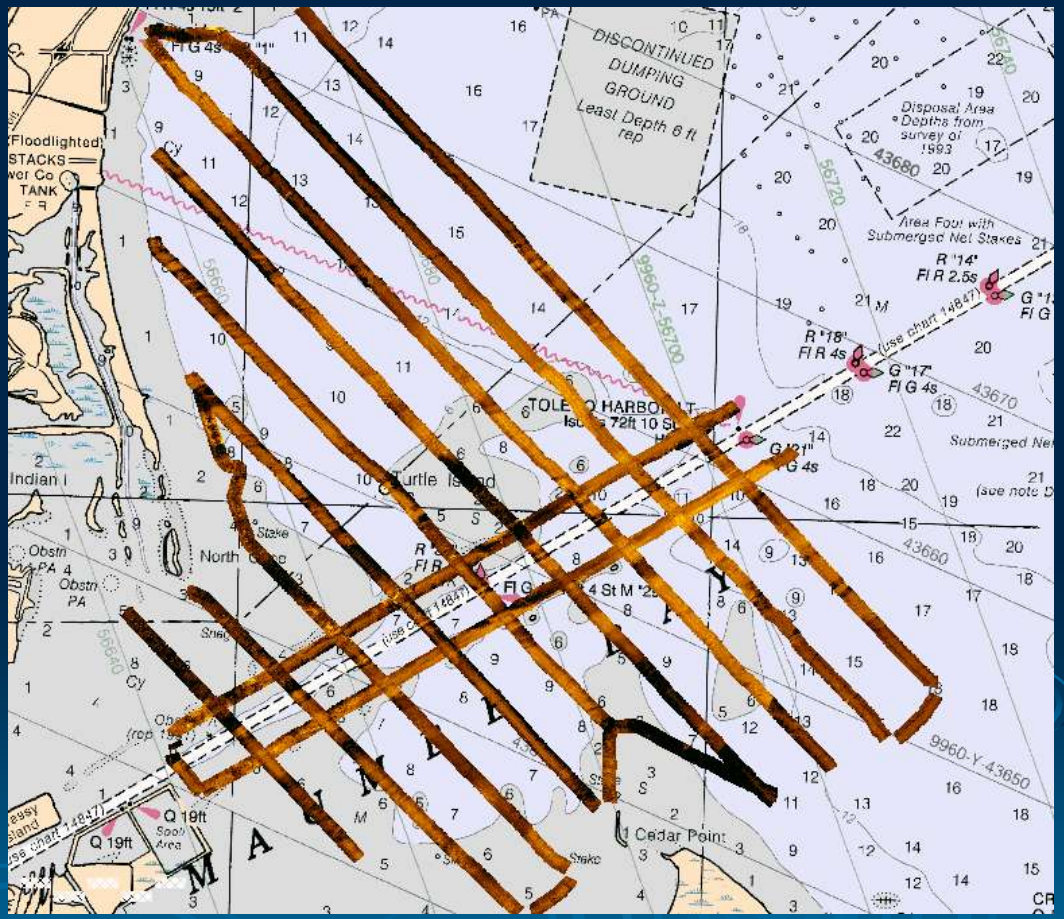


Maumee Bay Recon

1

2

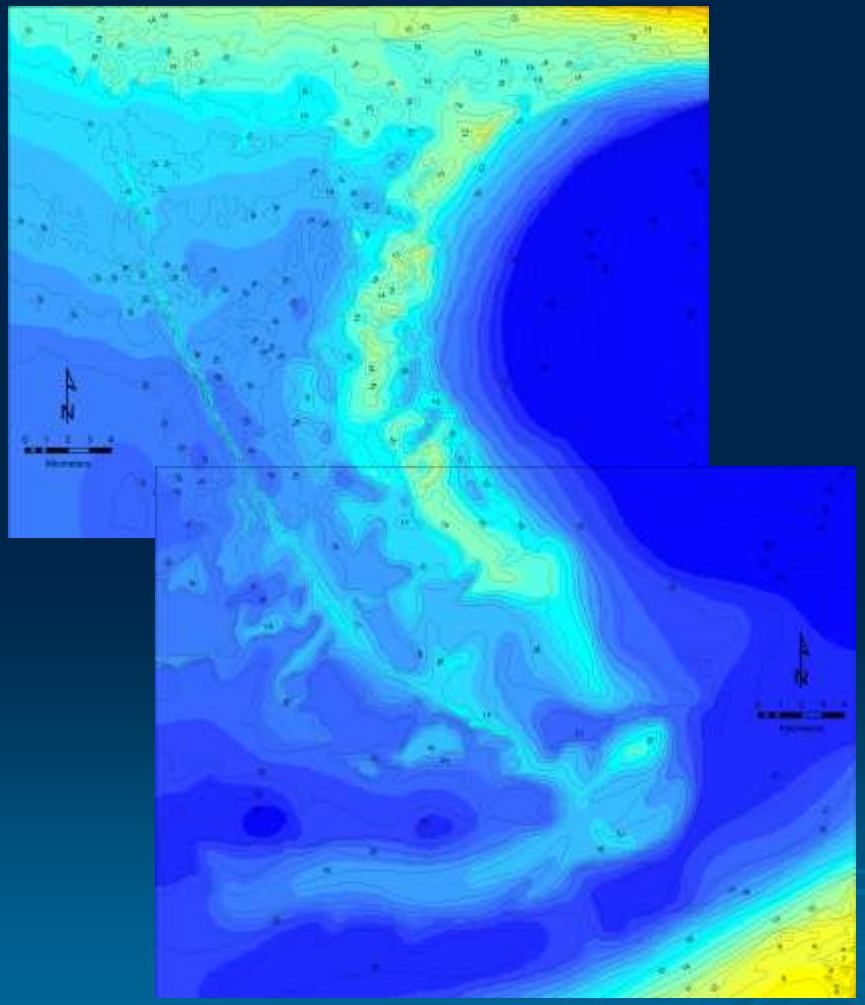
3



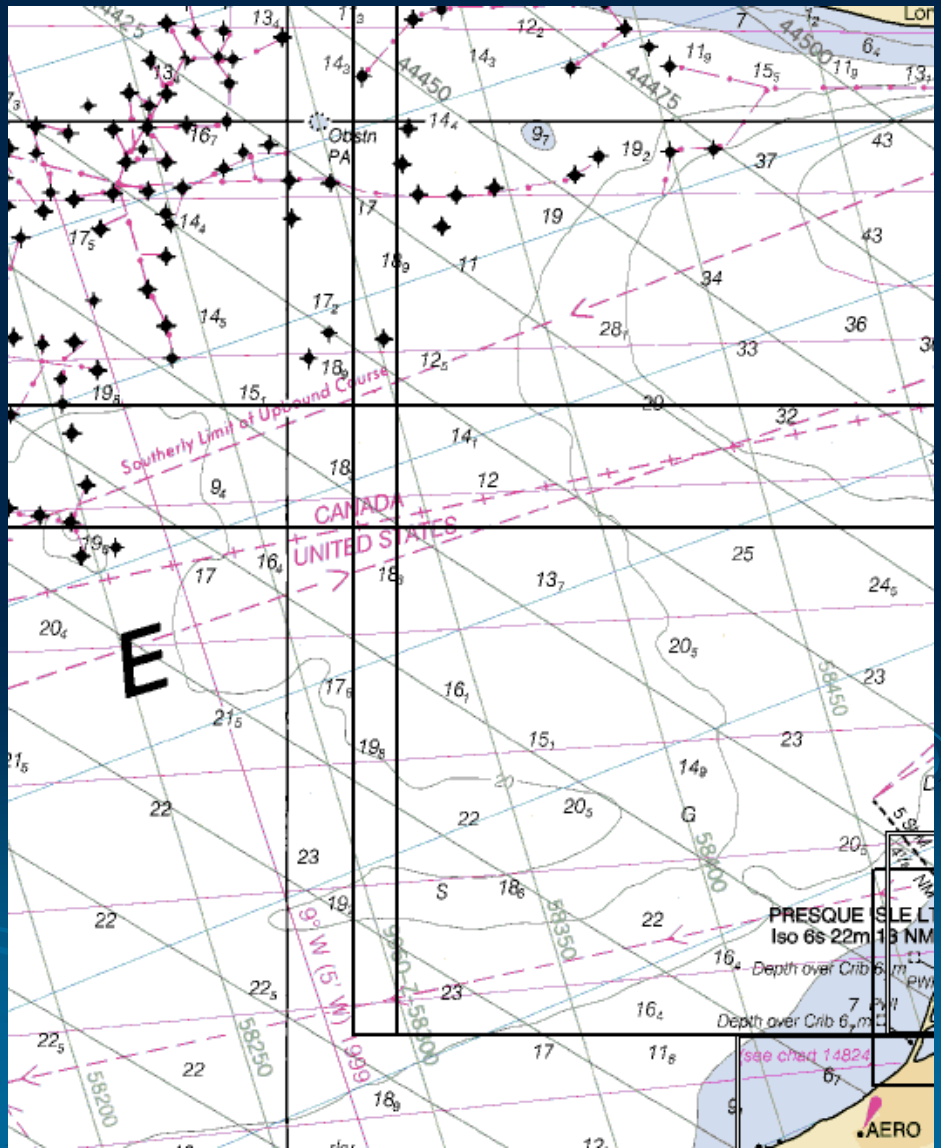
Sidescan sonar coverage

Need Higher Resolution Bathymetry

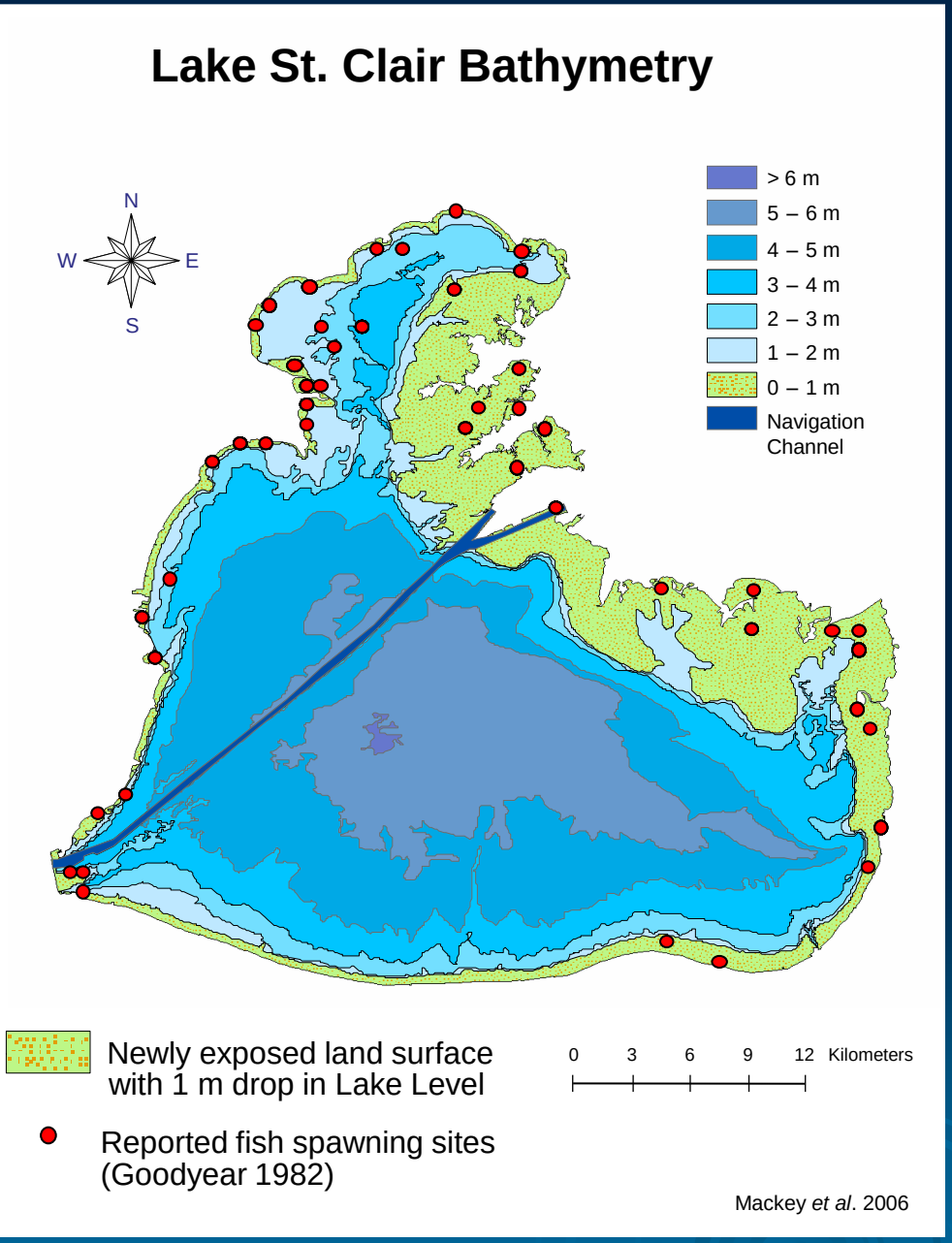
NOAA 1-meter contour interval



Taylor et al. (1998)



Lake St. Clair Connecting Channels



- Up to 1 m drop in lake level by 2050 (worst-case scenario)
- 22,000 ha (54,000 Ac) exposed

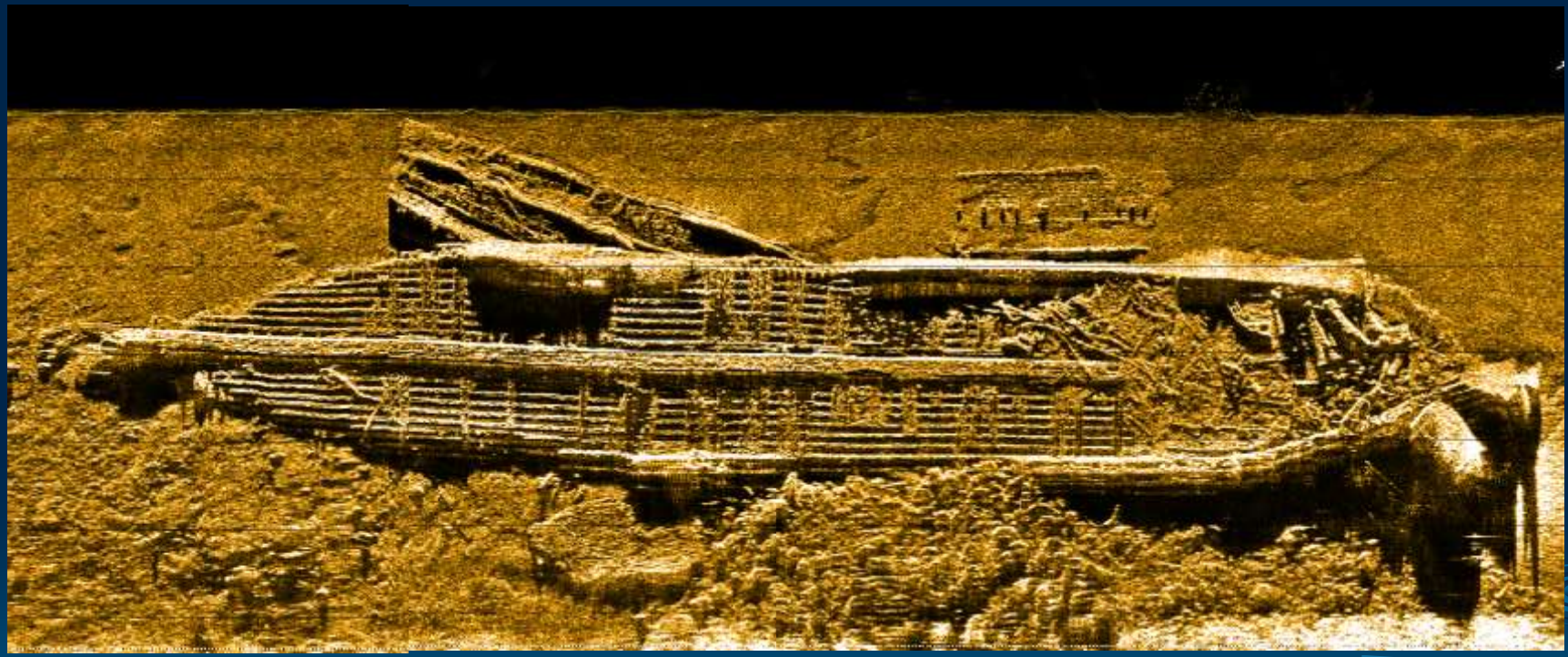
- Change in shoreline location
- Shallow-water areas will be exposed
- Littoral sand trapped onshore
- Wetland complexes will be hydraulically isolated and disconnected
- 43 spawning sites, 33 species
- 28 sites high and dry
- More than 60 % of shallow-water habit (< 1 meter) will be lost

Needed Improvements

Most significant and common complaint is “lack of high resolution bathymetry where we need it”

- Higher resolution bathymetry (1 meter or less), particularly in nearshore and shallow water areas
  - 15 to 20 cm resolution ideal
- More accurate coastlines – coastal change mapping lags in the Great Lakes
- Shallow water LIDAR coverages are spatially limited and difficult to access/ obtain
  - Access and quality control issues
  - “Vaporware”
  - Critical data for climate change impact assessments
- More accessible charts (multiple digital formats)
- Digital corrections and updates

Comments or Questions?



George Stone, 282 feet
Sunk 1909 on Grubb Reef
Lake Erie