An Integrated Approach to Understanding the Physical and Chemical Characteristics of Great Salt Lake

A Cooperative Study between Utah Department of Natural Resources, Division of Wildlife Resources
and U.S. Geological Survey

USGS

Primary Objectives

- Define the physical constraints, circulation, and mixing rates of Great Salt Lake
- Determine the nutrient (nitrogen and phosphorus species) budget
- Quantify the occurrence and distribution of anthropogenic heavy metals, trace elements, and synthetic organic compounds

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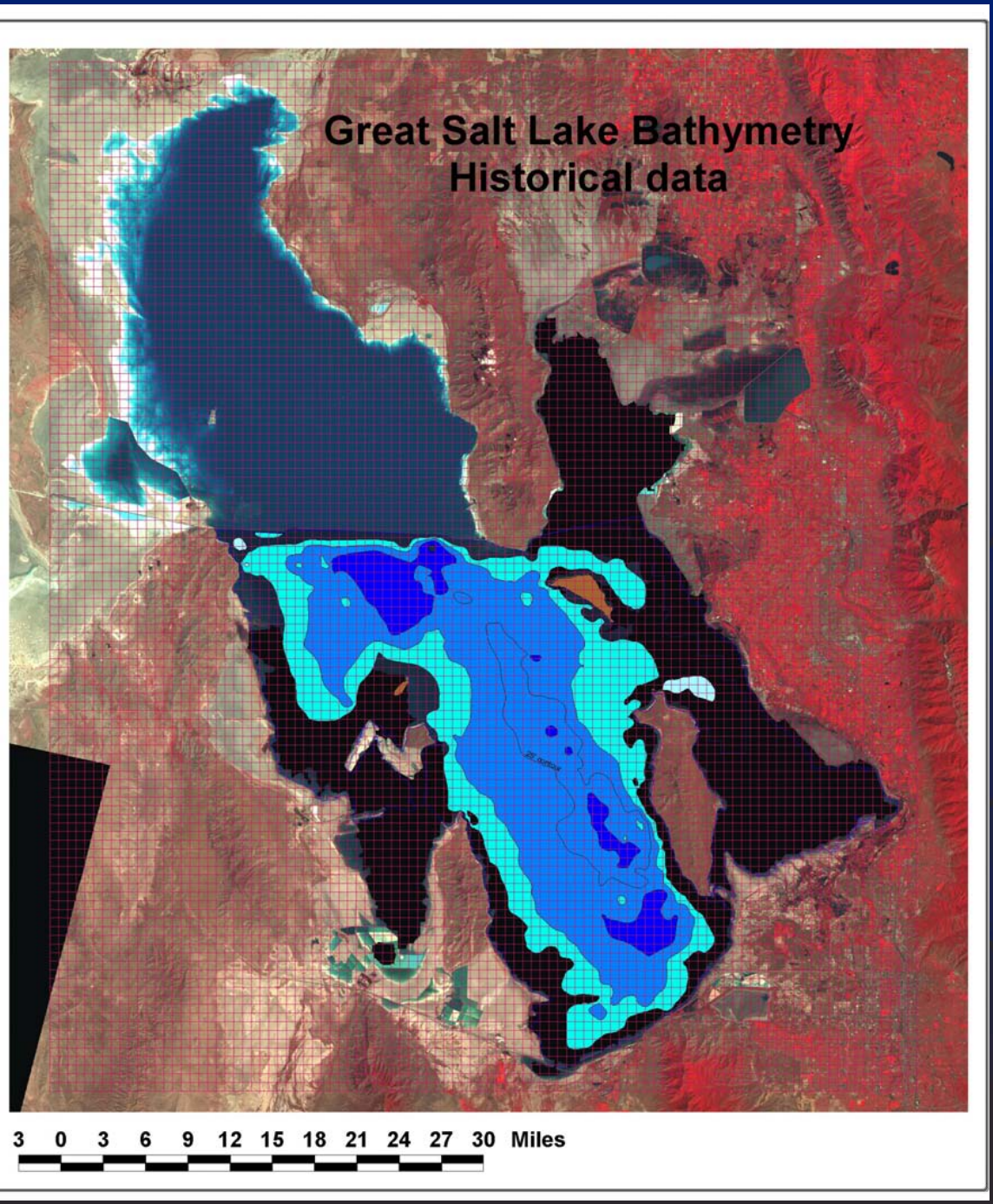
Great Salt Lake Bathymetry
Historical data
3 0 3 6 9 12 15 18 21 24 27 30 Miles

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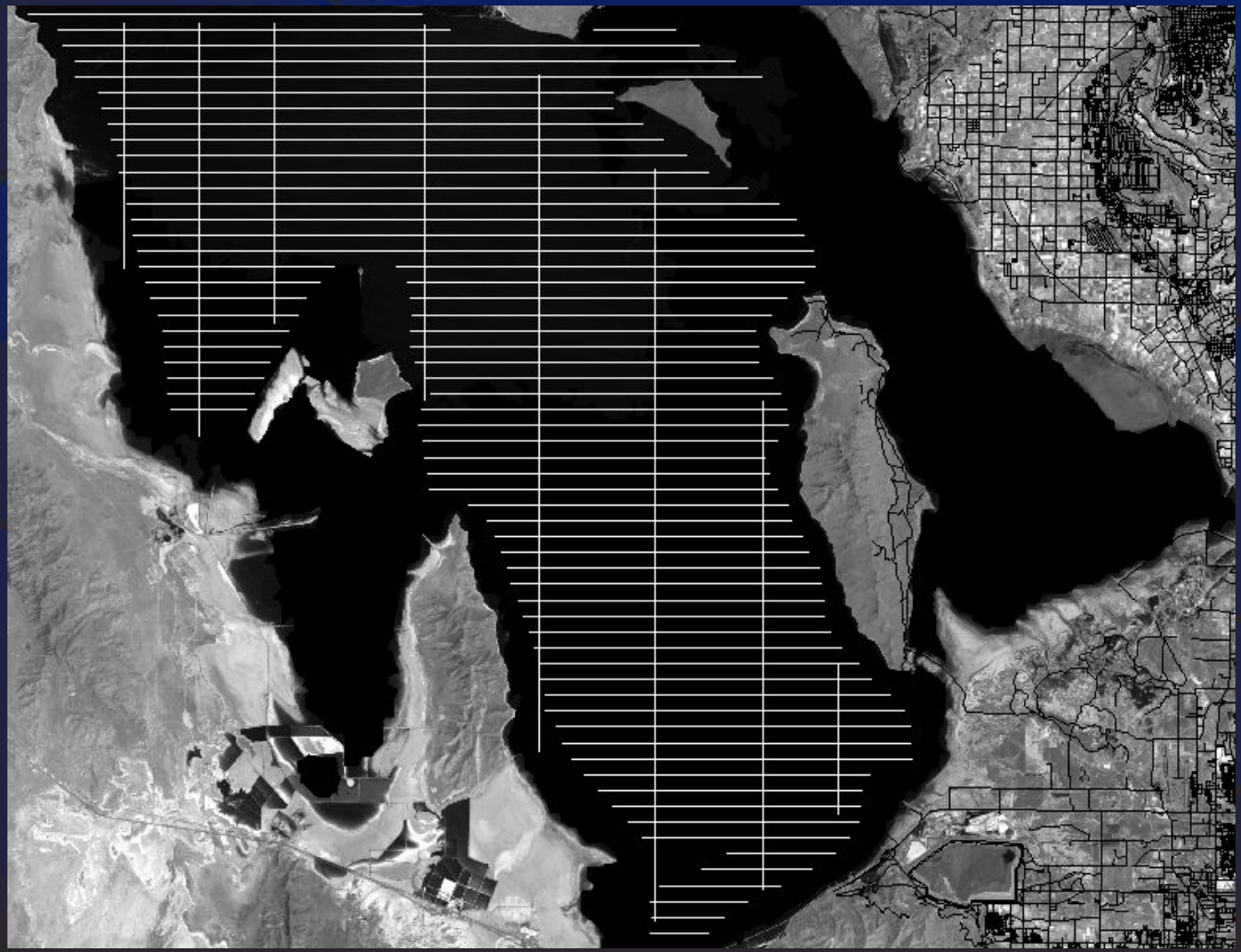
Great Salt Lake Bathymetry



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Great Salt Lake Bathymetry

- Physical Parameters of the lake/water
  - High density brine (9-26+ percent NaCl)
    - High sound velocities
    - High coefficient of friction
    - Electrically conductive
  - Shallow Water
    - Access limitations
    - Short timing intervals
    - “Surf’s up”

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Great Salt Lake Bathymetry

- Equipment Issues
  - Most equipment not designed for GSL Conditions
    - Shallow/high speed depths
    - High density water (physical issues)
    - Speed of sound corrections
    - Boat engine issues
    - Needed to keep it as simple as possible (corrosion problem)

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Global Positioning System

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Depth Finder

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Computer Navigation/Logging

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Data Collection

- 1,690 km of data
- 7,600,000 original points
- 2,040,000 after cleanup
- 381,000 after filter and average

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Great Salt Lake Bathymetry

- Data products
  - Bathymetric map of South part of Great Salt Lake
  - Bottom materials available (map?)
  - Structures (faults, mounds, etc.) map
    - Assists in U. of U. work
  - Area/Volume/Elevation table
  - Digital data for future use
    - Visualization/modeling/circulation control/etc.

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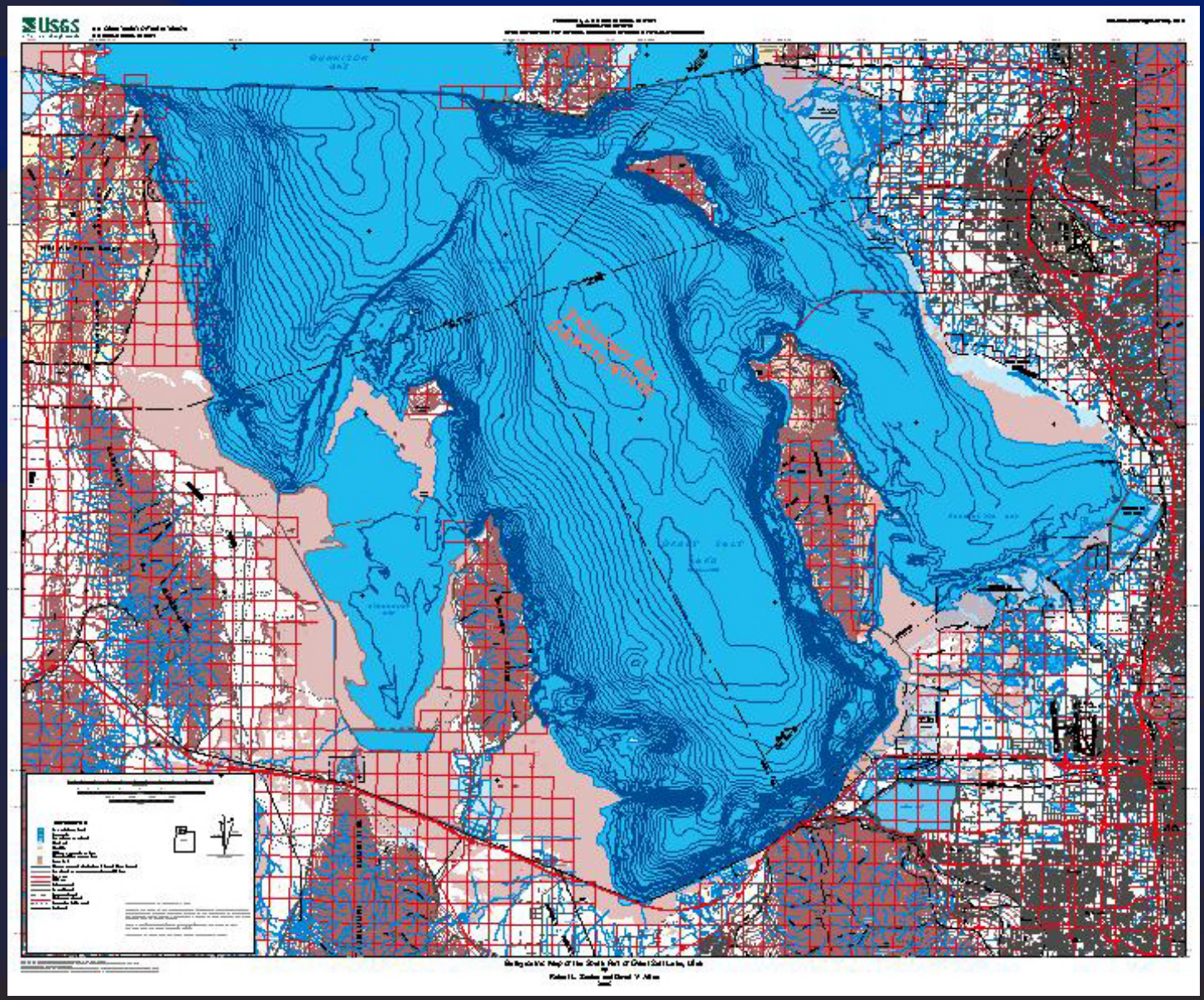

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