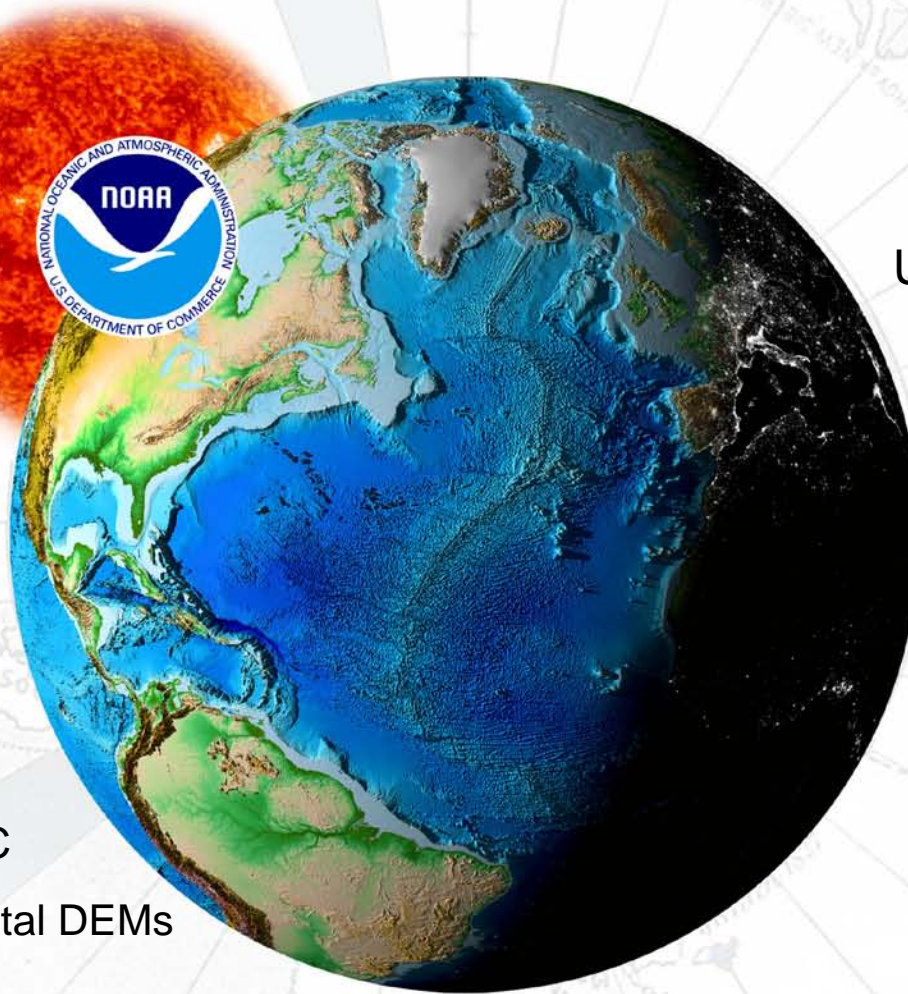# NOAA NGDC MGG

Lisa Taylor, NOAA NGDC

Barry Eakins, University of Colorado

- Source Data at NGDC

- Development of Coastal DEMs

The NOAA National Geophysical Data Center

Over 600 data types - from the core of the Earth to the surface of the Sun

NGDC/IHO Data Center for Digital Bathymetry

Long-term archive of and access to global marine geophysical data including bathymetric soundings, gridded compilations, digital contours and products

GEBCO Relevant Datasets:

- Marine trackline geophysics (global)

- Multibeam swath sonar (global)

- NOS hydrographic soundings (U.S)

- Coastal lidar (U.S.)

Assessing Data Quality

- Data provided to NGDC/IHO DCDB are reviewed and checked for obvious errors (e.g., suspect navigation, unrealistic ship speeds, impossible depths, etc.) and completeness of metadata.

- NGDC/IHO DCDB does not edit data values, but may provide information regarding identified errors back to data providers for possible correction and resolution of issues.

Actively adapting & applying community standards

- FGDC-compliant metadata

- Implementing ISO standards

- Marine XML (MML) collaboration

- NASA/Global Change Master Directory (GCMD) Theme & Place keywords

- Dublin Core metadata tags

Long –Term Archive

- Documented to FGDC/ISO standards

- Archived in original and processed forms

- Periodically migrated to new/approved media

Making data publicly available

- Provide raw and processed data, as well as integrated products

- Data are in the public domain and freely accessible unless restrictions are requested by the data contributor

  - Hold for a specified period of time

  - Agreement to use only for specific purposes

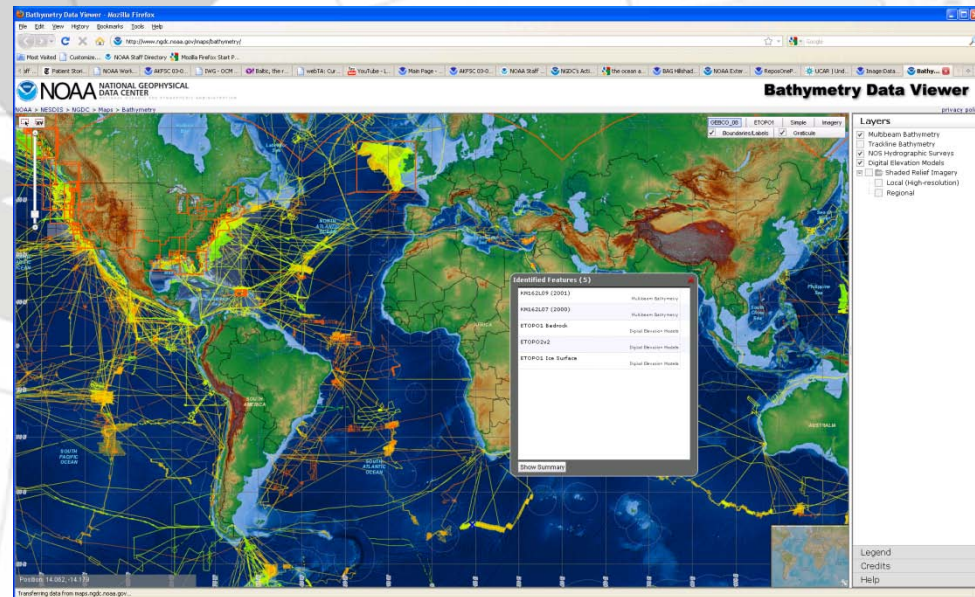- Data are online, searchable, and downloadable in multiple formats.

Making data publicly available

- Geospatially-enabled relational databases

- Interactive ArcGIS web maps

- Web Feature Services

- Web Map Services
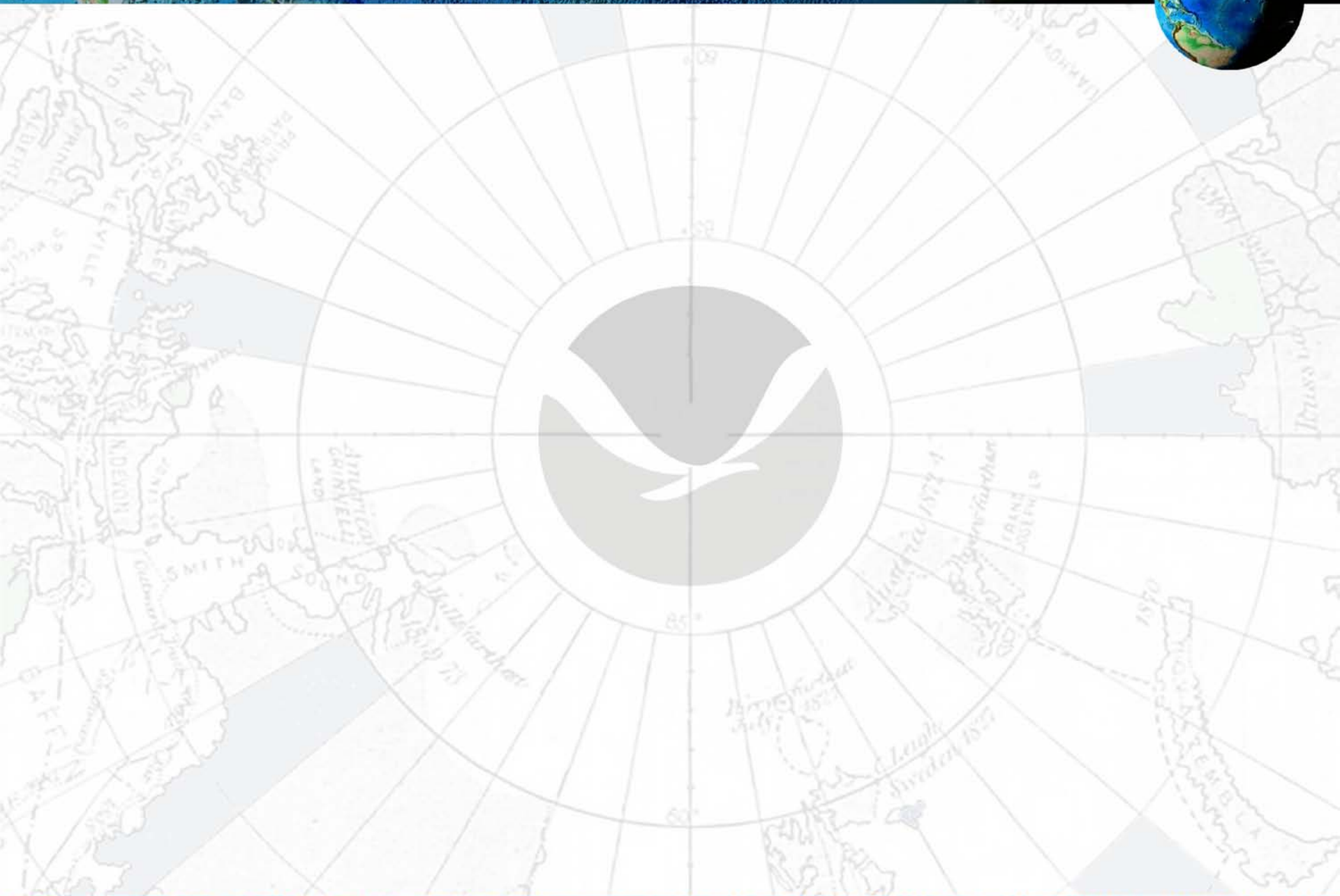
- File download in multiple forms

Wish List…..

- Enhanced IHO DCDB interface for data submission, display, search and retrieval

- Collaboration/coordination with IHO Member States for greater data submission to IHO DCDB

- ISO metadata for all data

- Detailed data assessment and cleaning

High-resolution DEMs of U.S. coastal communities to support inundation modeling (e.g., tsunami, hurricane storm-surge)

- integrated bathymetry and topography

- 1/3 arc-second (~10 m) to 1 arc-second (~30 m)

- common vertical datum (NAVD 88, MHW)

Data types

• pre-complied DEMs

• hydrographic soundings

• coastal lidar (bathy and topo), ifsar

• multibeam sonar, interferometric sonar

• satellite images

Obtained from

• NGDC

• other Federal, State and local govts (e.g., USGS, USACE, cities, counties)

• academia

• private sector

Data assessment

• internal (e.g, spikes, noise)

• inter-dataset consistency (e.g., overlap differences, edge offsets)

Data processing

• convert to common horizontal and vertical datums, and common file format

• remove vegetation, building, water-surface returns from lidar

• multibeam ping editing, sound velocity corrections

• clipping to pre-defined extents (e.g., footprint of overlapping dataset)

Gridding technique

• spline algorithm [GMT and MB-System]

• grid bathymetry first to interpolate into the coastal zone where data are sparse (avoid "topographic creep")

Grid assessment

• comparison with source data [FME, gdal, netCDF C-library]

• comparison with independent datasets (e.g., geodetic monuments, nautical charts, maps)

• visual inspection (e.g., color-hillshades, perspectives, slope) [ArcGIS]

Grid updating

• add new data to existing source data collection

• clean, resolve inter-dataset inconsistencies

• regrid

Technical reports

• documents:

  • data sources and problems

  • processing and gridding techniques

  • grid evaluation

• published as NOAA Technical Memoranda

Metadata

• FGDC-compliant record

• embedded with DEM zip download

Methodologies

• estimating cell uncertainty is qualitative, not quantitative

• gridding software can introduce gridding artifacts (e.g., north-south lineations, "pimples")

• constant-offset vertical-datum conversion necessary in some areas

Software

• inability to effectively handle large file sizes (e.g., millions of points in lidar)

Wish list

• use cell values from newer, high-resolution DEMs to update older, lower-resolution DEMs

Issues

• morphologic change (e.g., storm events or long-term that render data inaccurate)

• vertical datum conversion

Current and future efforts

• companion DEMs – structured square-cell and unstructured

• cell uncertainty due to gridding interpolation

The NOAA National Geophysical Data Center

325 Broadway, E/GC
Boulder, CO 80305-3328 USA

Phone: 303-497-6826
Email: ngdc.info@noaa.gov
Web: http://www.ngdc.noaa.gov/