

ESRI-Based Digital Bathymetric Database, Variable Resolution (DBDB-V)

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Agenda

- Purpose
- Reasoning
- Background
- Proposed Methodology
- Desired Results
- Conclusions

Purpose

To design and develop an alternative implementation of the Digital Bathymetric Database Variable Resolution (*DBDB-V*) that will allow efficient ingestion of data into geospatial information system (GIS) applications that are designed by Environmental Systems Research Institute (ESRI).

Why Consider this Approach?

○ Technical Point of View

- Hierarchical Data Format, Version 5 (HDF5)
 - A simplistic data structure optimized for large scientific datasets.
 - Support for HDF5 datasets is limited in newer versions of ESRI products while older versions do not support it at all.
- Tools for extraction are command-line based and use a variety of third-party software.

Why Consider this Approach?

○ Opportunistic Point of View

- DBDB-V represents the best single source of US coastal bathymetry for:
 - Geological exploration
 - Ocean process modeling
 - Ocean resource management
- Increasing ESRI user base
 - U.S. Navy and other DOD affiliations
 - Academia
 - Public sector
- National efforts for mass data management
 - National Ocean Council objective to consolidate EEZ data holdings
 - National Data and Information Management System (NDIMS) - provide access to the data needed for ocean resource management

Background: DBDB-V

- DBDB-V is a digital database provided by the U.S. Naval Oceanographic Office (NAVOCEANO).
- DBDB-V stores:
 - Ocean depths
 - Vertical uncertainties
 - Horizontal uncertainties
- Variable levels of classification:
 - Level 0 – Unclassified/Public Release
 - Level 1 – Unclassified
 - Level 2 – Classified
 - Level 3 – Classified

The Public Release availability of the Level 0 classification makes DBDBV a logical solution to bathymetry requirements for not only Navy projects but those in academia and the public sector as well.

Background: DBDB-V

○ Spherical Coordinates

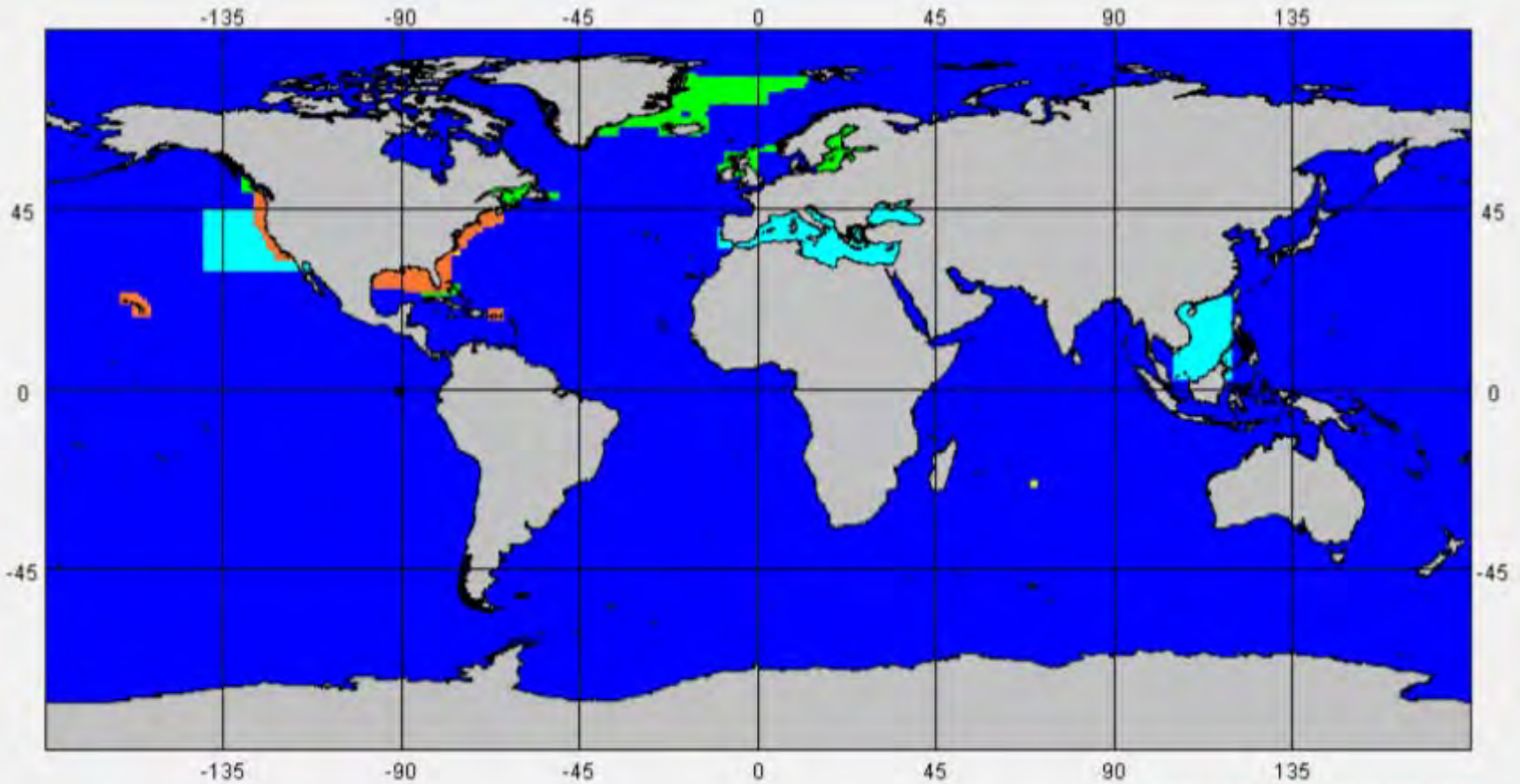
- Resolutions (arc-minutes):
 - 2 min.
 - 1 min.
 - 0.5 min
 - 0.1 min
 - 0.05 min
- Zones
 - North Polar Stereographic Zone (64N – 90N)
 - Equatorial/Geographic Zone (72S – 72N)
 - South Polar Stereographic Zone (90S – 64S).

Background: DBDB-V

○ Planar Coordinates

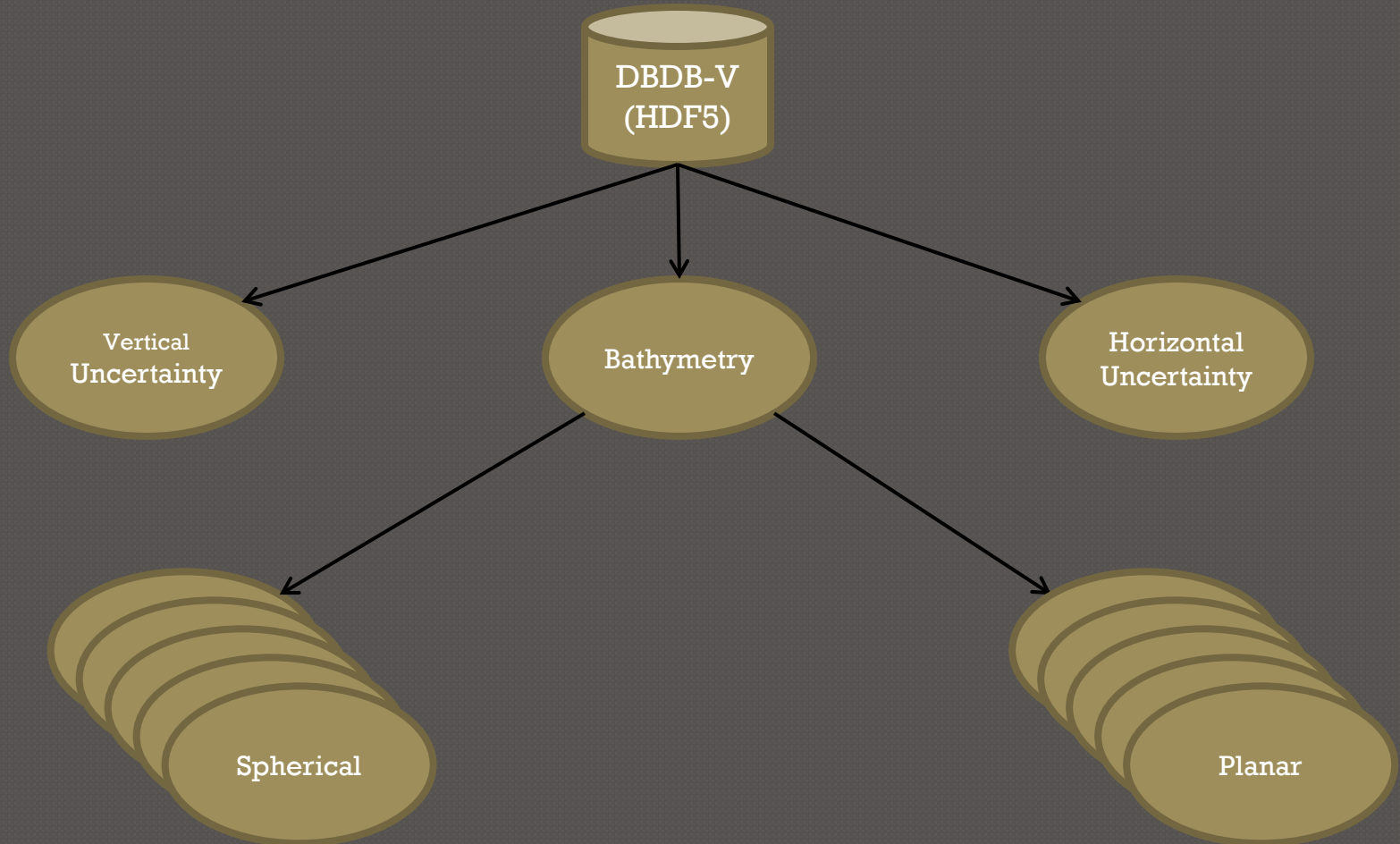
- Resolutions (meters):
 - 50 m
 - 20 m
 - 10 m
 - 5 m
 - 2 m
- Zones
 - Universal Transverse Mercator (80S – 84N)
 - Universal Polar Stereographic North(84N – 90N)
 - Universal Polar Stereographic South (90S – 80S)

Background: DBDB-V



APPROVED FOR PUBLIC RELEASE

Background: DBDB-V



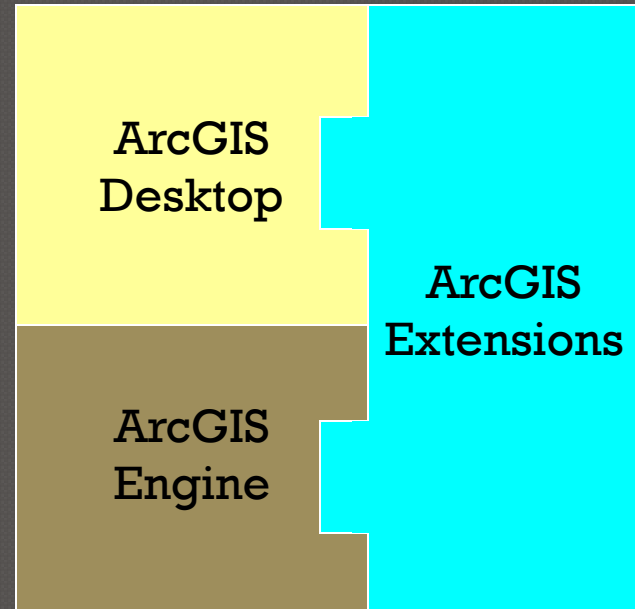
Background: ESRI

**Environmental Systems Research
Institute – ESRI**

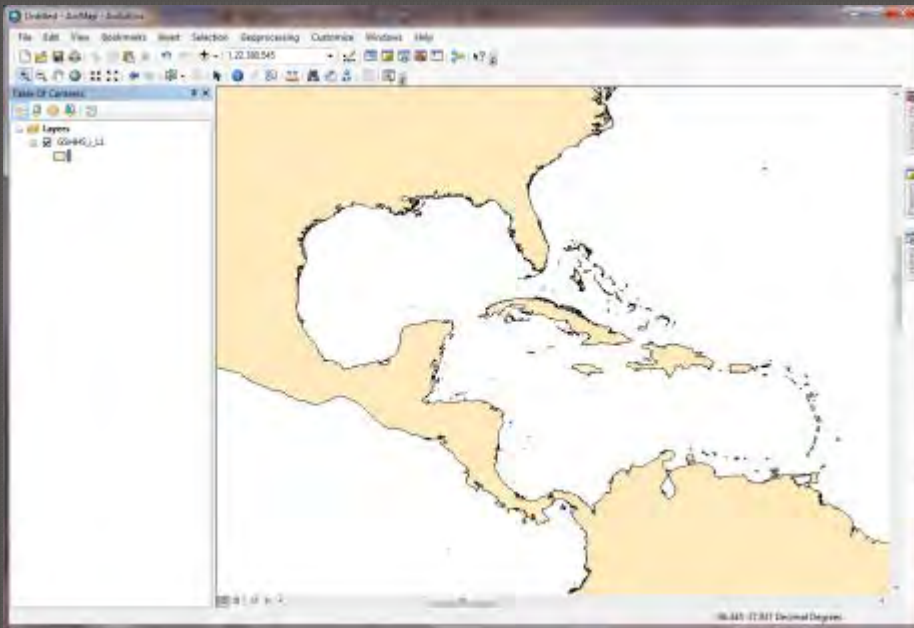
**ArcGIS Desktop – A suite of mapping
applications.**

**ArcGIS Engine – An interface to
creating custom applications and a
runtime to run them on a different
machine.**

**ArcGIS Extensions – Provide
additional, specific functionality to
the GIS applications.**

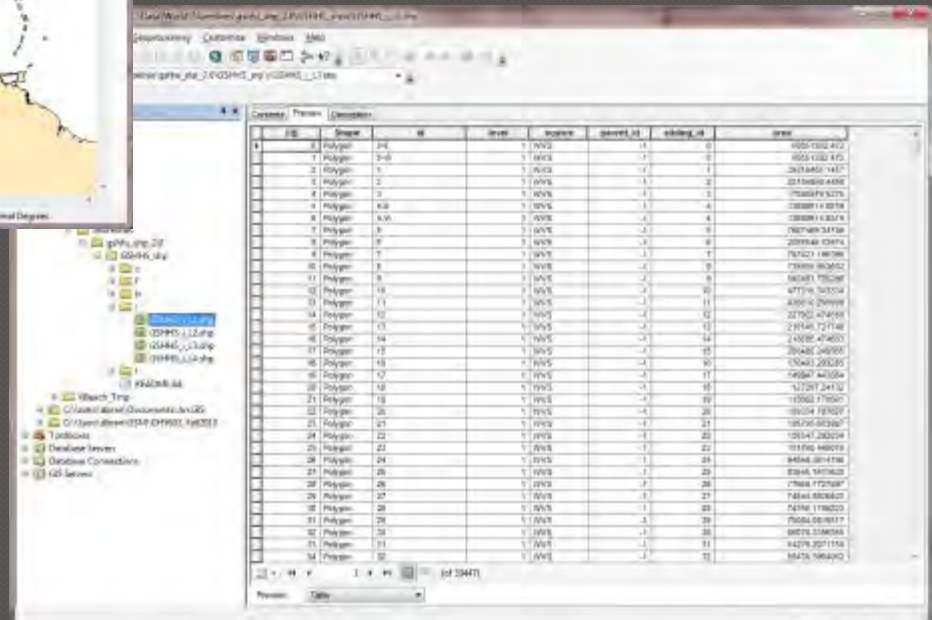


Background: ESRI



ArcMap

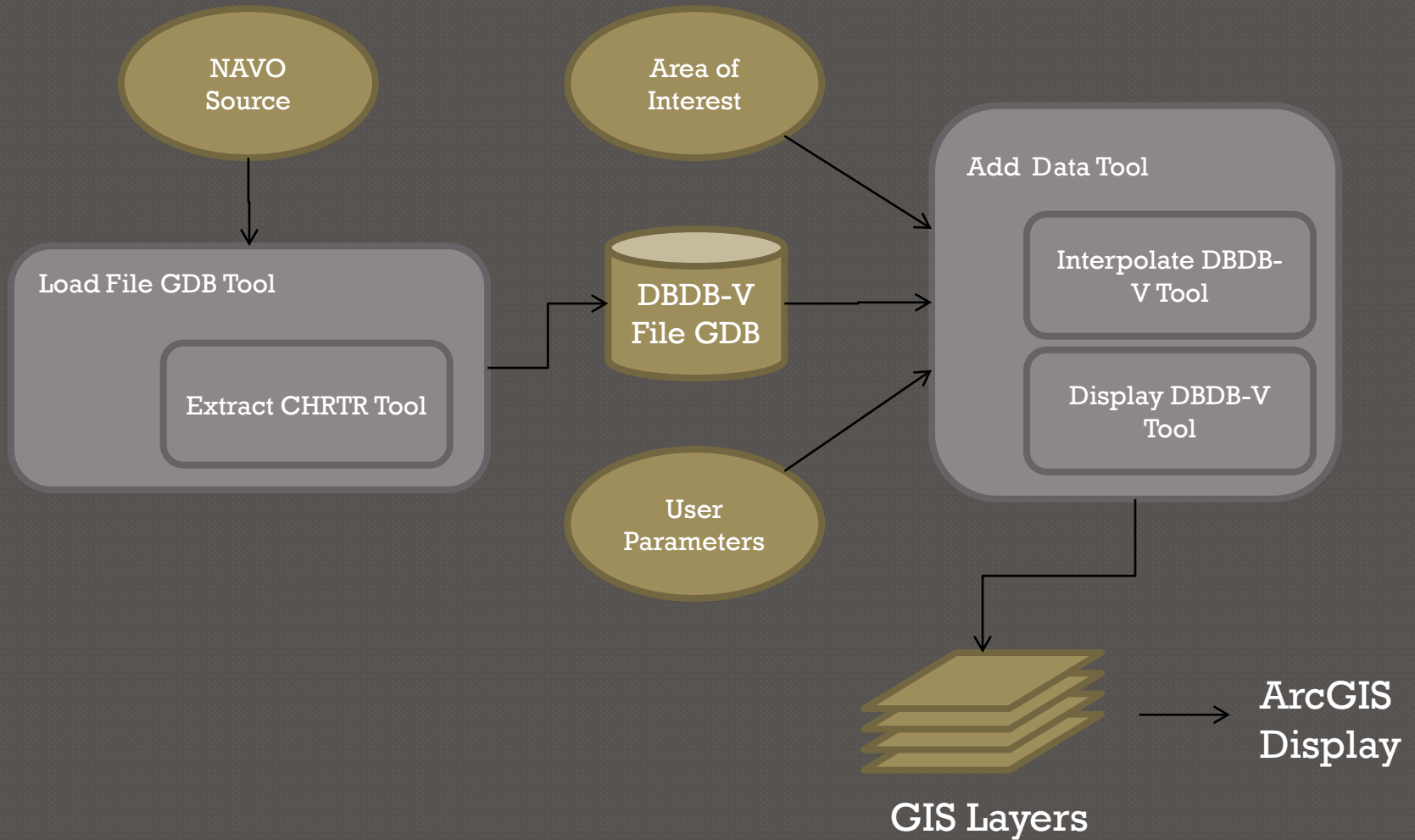
- Database Interaction
 - Display
 - Extraction
 - Updates
 - Deletion



ArcCatalog

- Database Creation
- Database Loading

Methodology



Expected Results

- A functional DBDB-V database based on ESRI's file geodatabase data structure that can be used for a wide variety of modeling applications within the oceanic community.
- A set of tools that can be used to create, populate, and modify the DBDB-V geodatabase.
- A set of tools that can be used to display, generate subsets, and export the data from the DBDB-V geodatabase.

Conclusions

- There seems to be no other effort that considers a storage facility for DBDB-V that is native to ESRI systems.
- This effort can support projects involving oceanic modeling, mission planning and monitoring in all sectors of the industry.
- Potential follow-on work with DOD community and possible collaboration with academic facilities.

Questions?

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