



Crowdsourced Bathymetry Data Pipeline Infrastructure Update

Data Centre for Digital Bathymetry
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December 5, 2017

CSBWG5



Objective

To enhance the IHO DCDB infrastructure and interface to allow the public to **upload**, **discover**, **display** and **download** CSB data via a web-based interface.

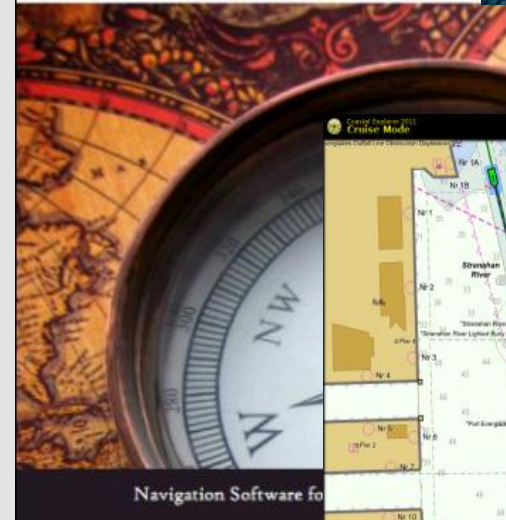


Rose Point Pilot Project

- NOAA and the DCDB teamed up with Rose Point Navigation Systems
- Mariners are given an option to enable CSB logging - allowing a modified electronic charting system log file to record *position, depth and time*.
- Mariners can choose to be anonymous or to submit metadata about vessel and equipment



www.pcmaritime.com



www.rosepointnav.com

CSB Pipeline Project Flow

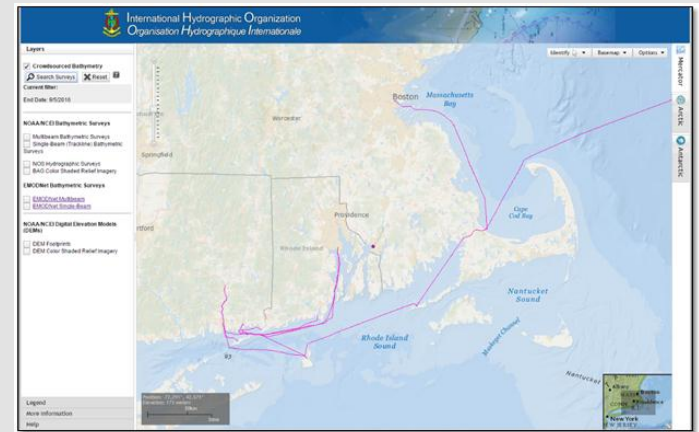
Data discovery and access via our map viewer.

Data delivered as a collection of files.

```
{  
  "platform":  
  {  
    "uniqueID": "ROSEP-e8c669f8-df38-16e5-b86d-9a79606e9478",  
    "type": "Ship",  
    "name": "SS Dinghy",  
    "length": 65,  
    "lengthUnitOfMeasure": "meters",  
    "IDType": "IMO",  
    "IDNumber": "1008140"  
  }  
}
```

lat,lon,depth,time
47.666520,-122.098525,21.49,20161017T234638Z
47.666518,-122.098525,11.98,20161017T234739Z
47.666517,-122.098527,14.63,20161017T234839Z
47.666515,-122.098527,17.16,20161017T234935Z
47.666490,-122.098472,19.72,20161017T235044Z
47.666505,-122.098522,20.18,20161017T235141Z
47.666477,-122.098507,20.42,20161017T235241Z
47.666512,-122.098432,20.63,20161017T235342Z
47.666497,-122.098417,20.33,20161017T235443Z
47.666512,-122.098470,20.33,20161017T235548Z
47.666507,-122.098490,20.57,20161017T235644Z
47.666533,-122.098453,20.33,20161017T235832Z
47.666575,-122.098445,20.33,20161018T000042Z
47.666585,-122.098460,20.21,20161018T000236Z
47.666417,-122.098443,18.32,20161018T000337Z
47.666417,-122.098443,15.27,20161018T000438Z
47.666433,-122.098473,12.68,20161018T000538Z
47.666490,-122.098562,10.06,20161018T000638Z
47.666490,-122.098560,12.65,20161018T000738Z
47.666492,-122.098552,15.88,20161018T000839Z
47.666487,-122.098527,18.32,20161018T000939Z
47.666398,-122.098182,20.12,20161018T001038Z
47.666393,-122.098185,20.30,20161018T001045Z
47.666388,-122.098182,20.42,20161018T001046Z
47.666375,-122.098180,20.70,20161018T001047Z

**CSB data log file (with
JSON metadata string)**

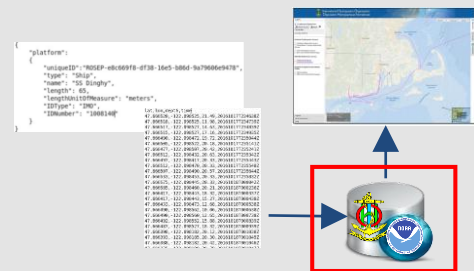
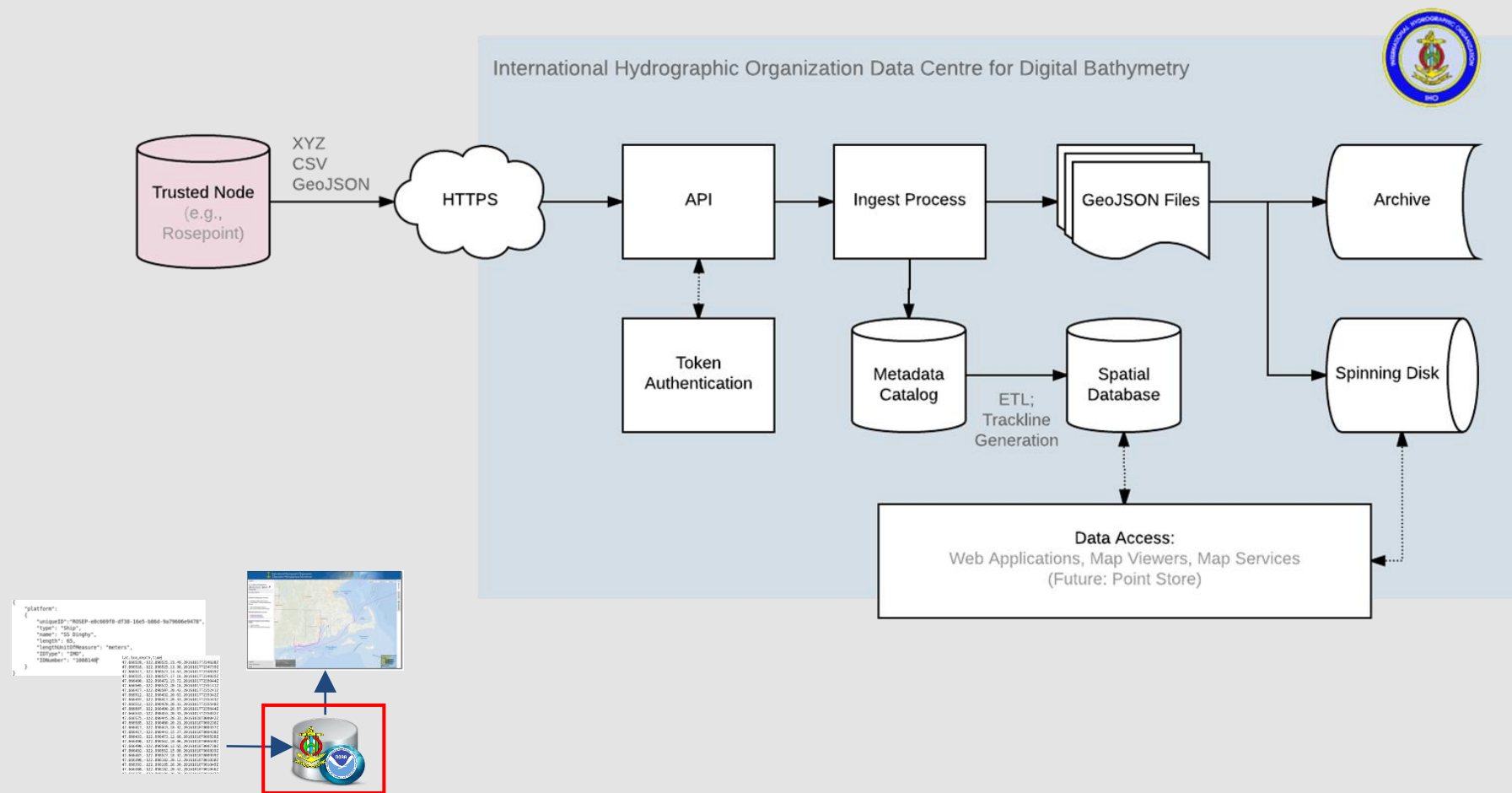


**Data submitted
to DCDB via
HTTP post**

**Frequent
update of
viewer**




Detailed Project Flow



```

{
  "type": "Feature",
  "geometry": {
    "type": "Point",
    "coordinates": [
      -122.3321,
      47.6062
    ]
  },
  "properties": {
    "depth": 10
  }
}
  
```

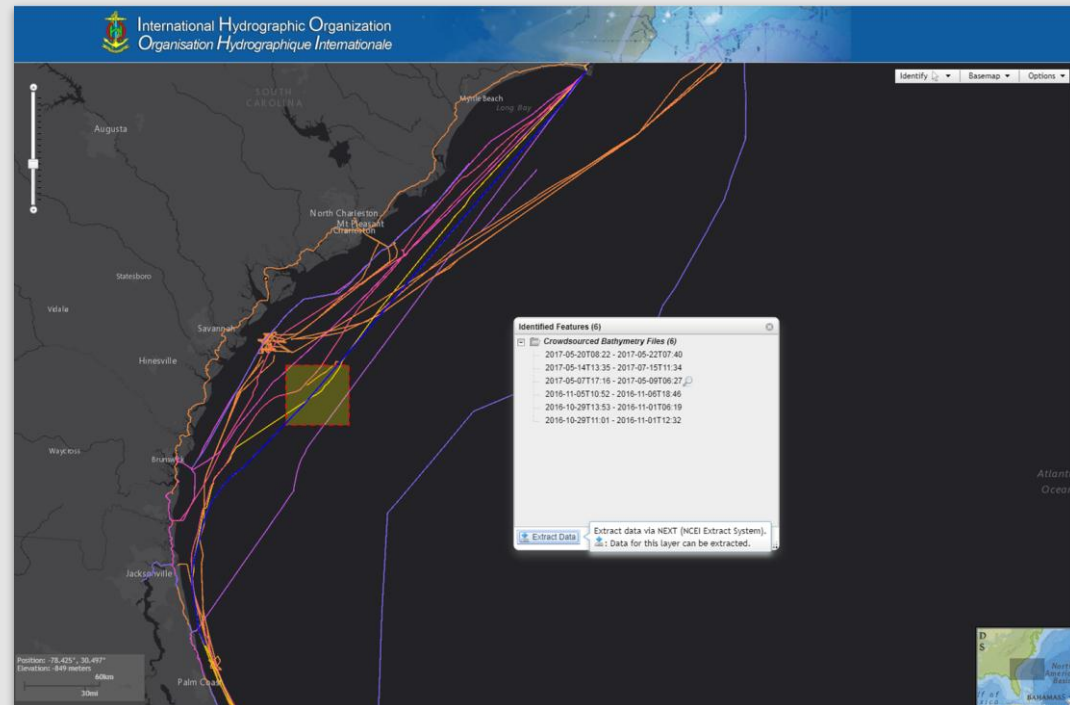


“If we got 1% of all seagoing vessels logging data, and on average they spent half their time at sea, then that’s about 5 billion data points a day.”

- Tim Thornton, TeamSurv

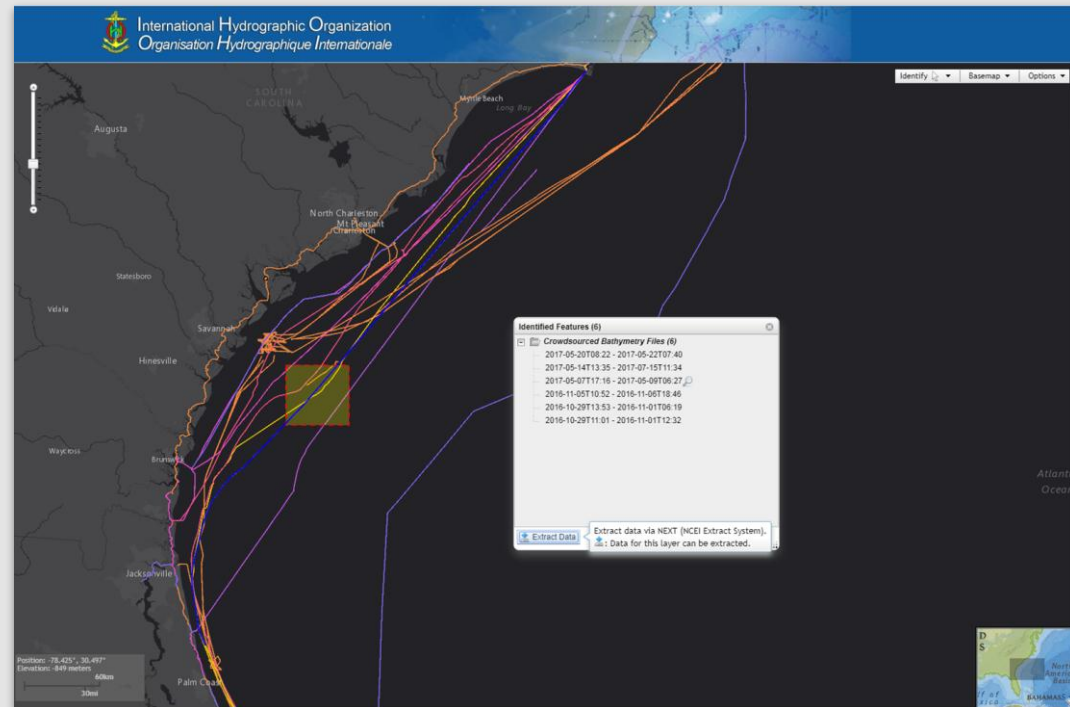
Next Steps

- Continue to ingest, archive, create tracklines of where data was collected to visualize on map, and provide individual file-based delivery of data
- Harden system to prepare for expansion beyond our current pilot data providers.
- Implement option for user to choose delivery format(s) - CSV, Shapefile, S57, KML
- Investigate and (possibly) implement charting-related requirements.
- Investigate point storage technology so we can dynamically generate point data results



Limitations

- Without additional investment, DCDB's current hardware capability will limit it to managing the data as a series of individual files.
- Data aggregation, processing, and grid generation will remain the responsibility of the end user.



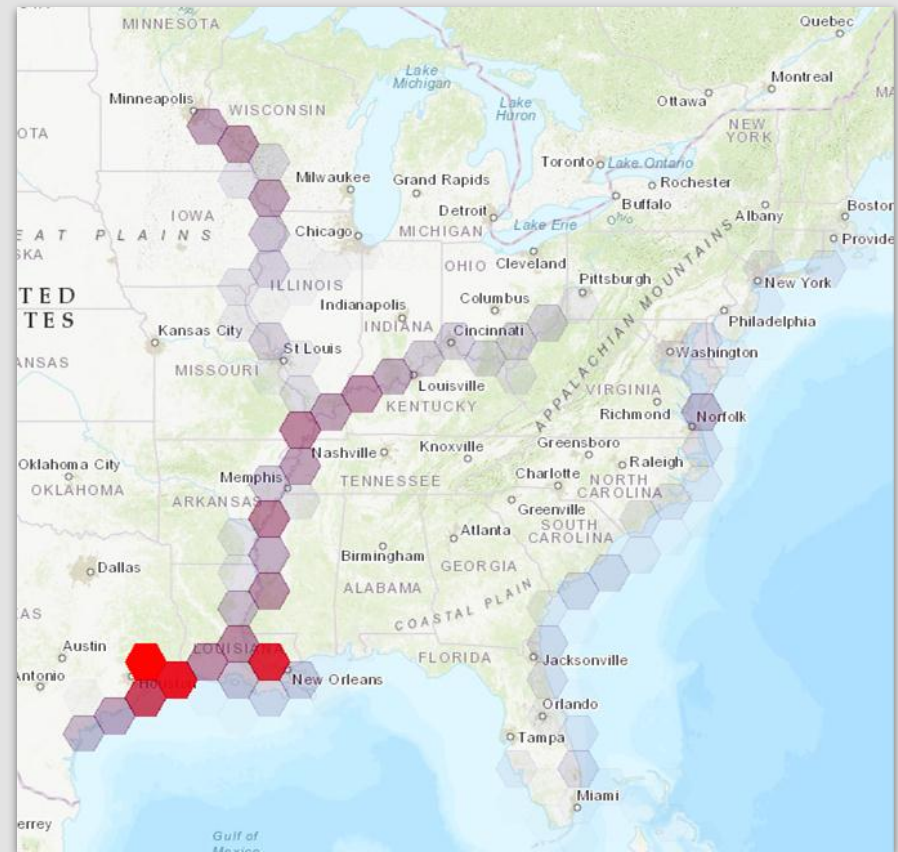
Vision

Store **ALL** bathymetric data as a seamless collection of points

- This includes CSB, multibeam, singlebeam and hydrographic data

Provide services to:

- Generate bathymetric grids of a given area using user-specified resolution
- Show the data density, guiding future data collection efforts
- Query the data collection, providing statistics on the bathymetric measurements surrounding the given location
- Allow the user to extract the raw data from a given area and download in a user-specified format





Potential Contributors

Currently in discussions

- [Association of Arctic Expedition Cruise Operators \(AECO\)](#)
- CARIS
- Crystal Cruises
- Garmin/Active Captain
- International Seakeepers
- NWS Voluntary Observing Ship Program
- Olex
- SevenCs



Thank you to our partners

International Hydrographic Organization

NOAA National Centers for Environmental Information

NOAA Office of Coast Survey

National Geospatial Intelligence Agency

Rose Point Navigation Systems

Sea ID

Professional Yachting Association

General Bathymetric Chart of the Oceans (GEBCO)