

The Ocean's Big Data Platform

marineOS: a platform for organizing, analyzing and distributing machine data



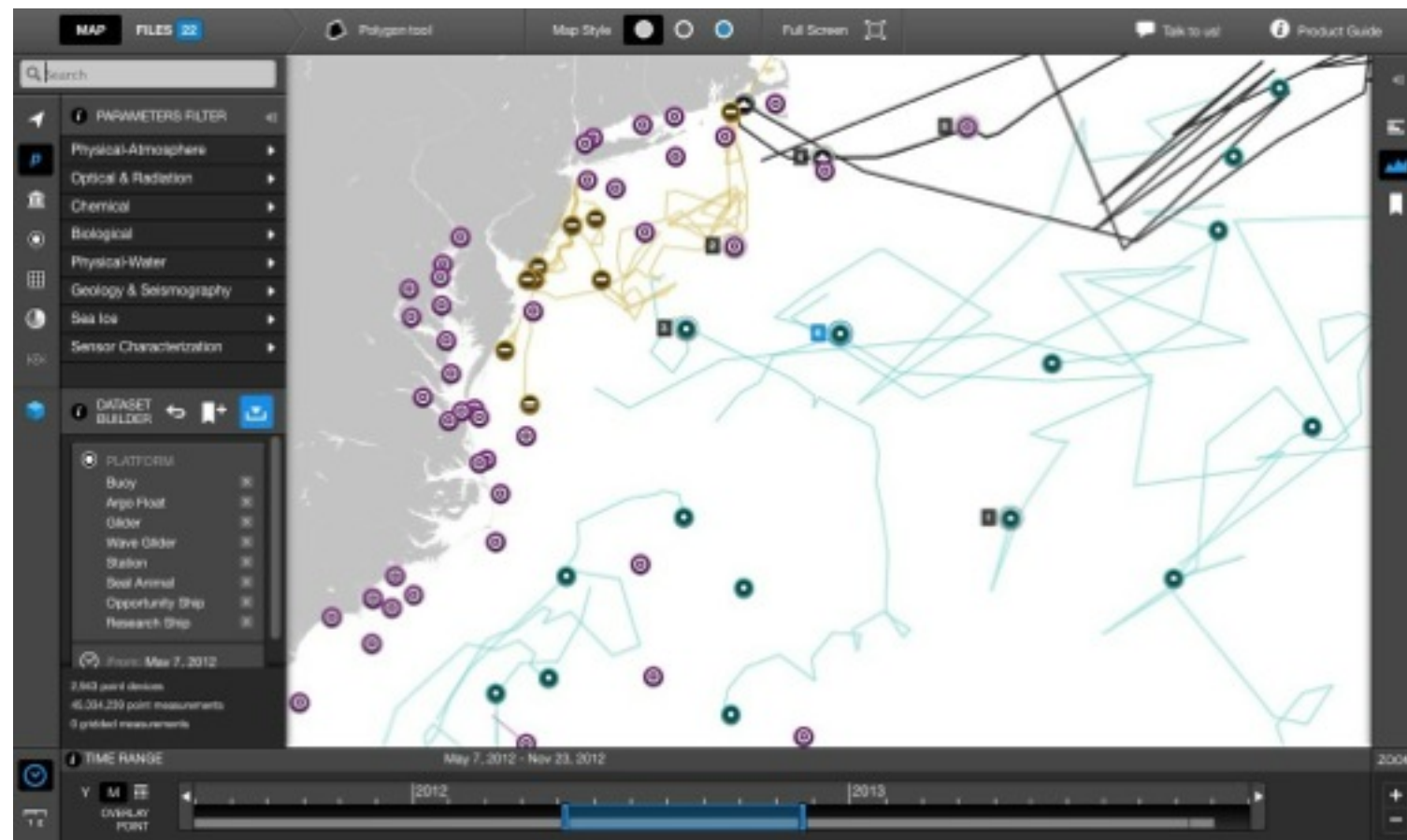
Platform Overview

Use Cases

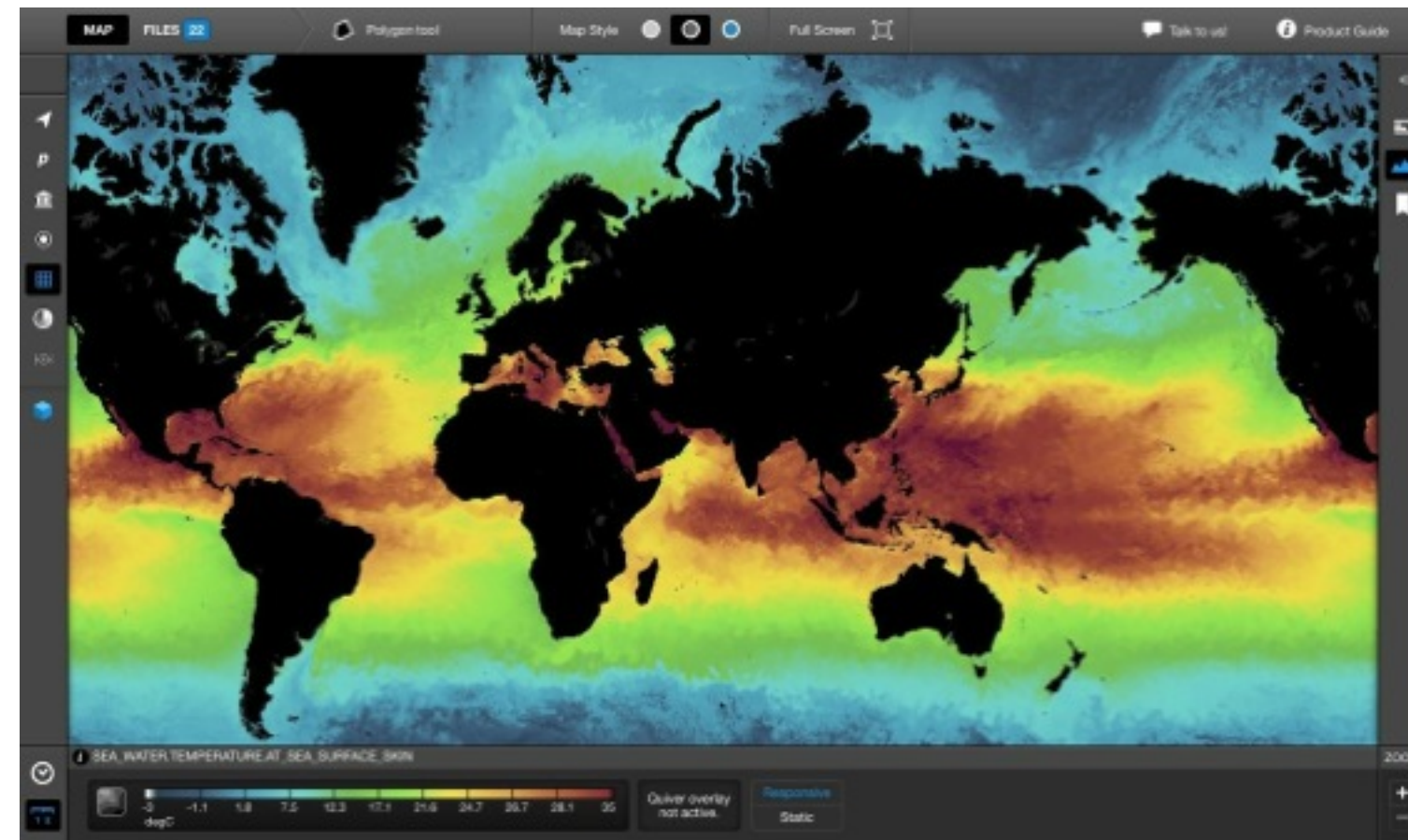
Value Proposition

Architecture

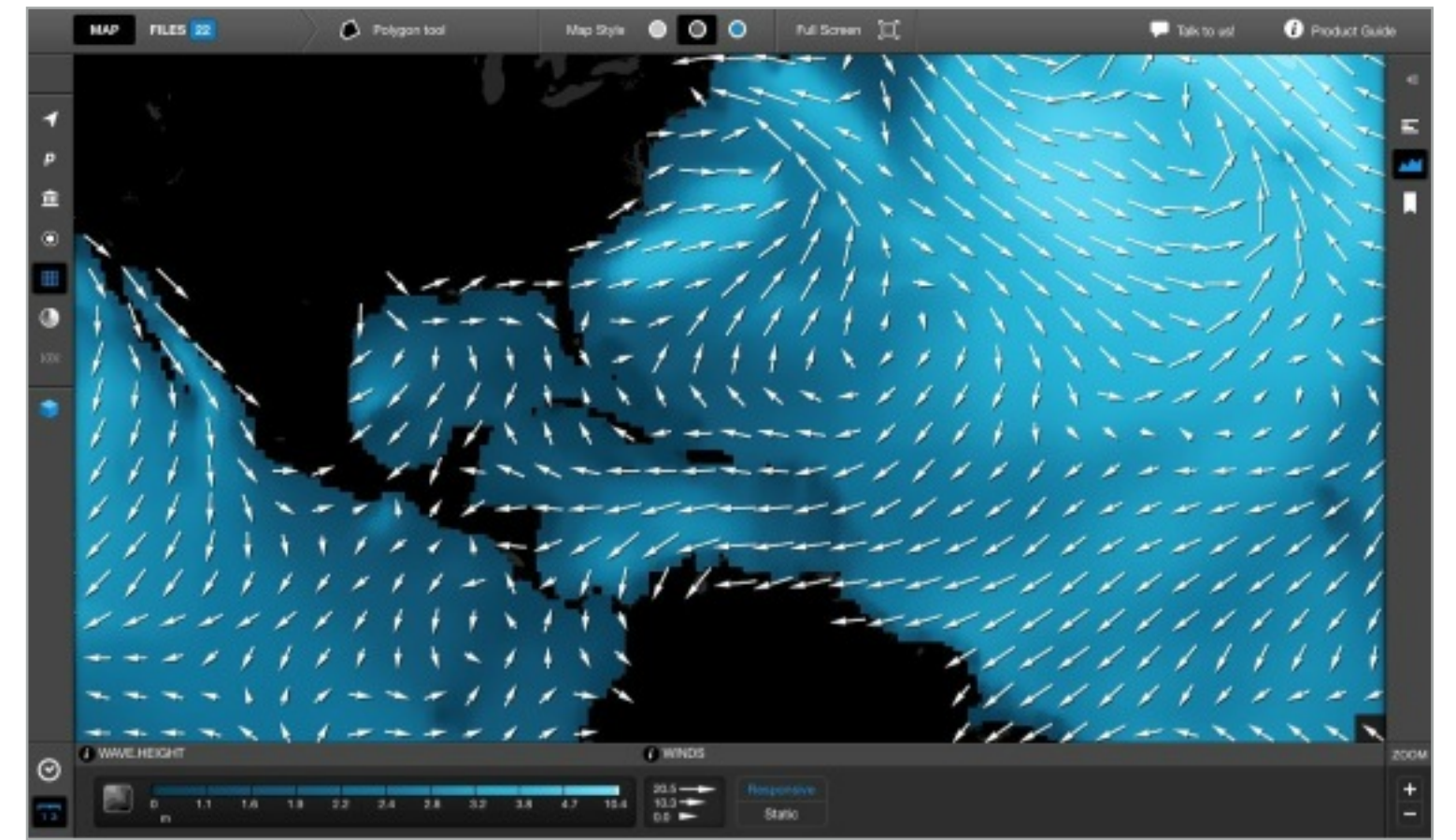
Fast insight without expensive software licenses



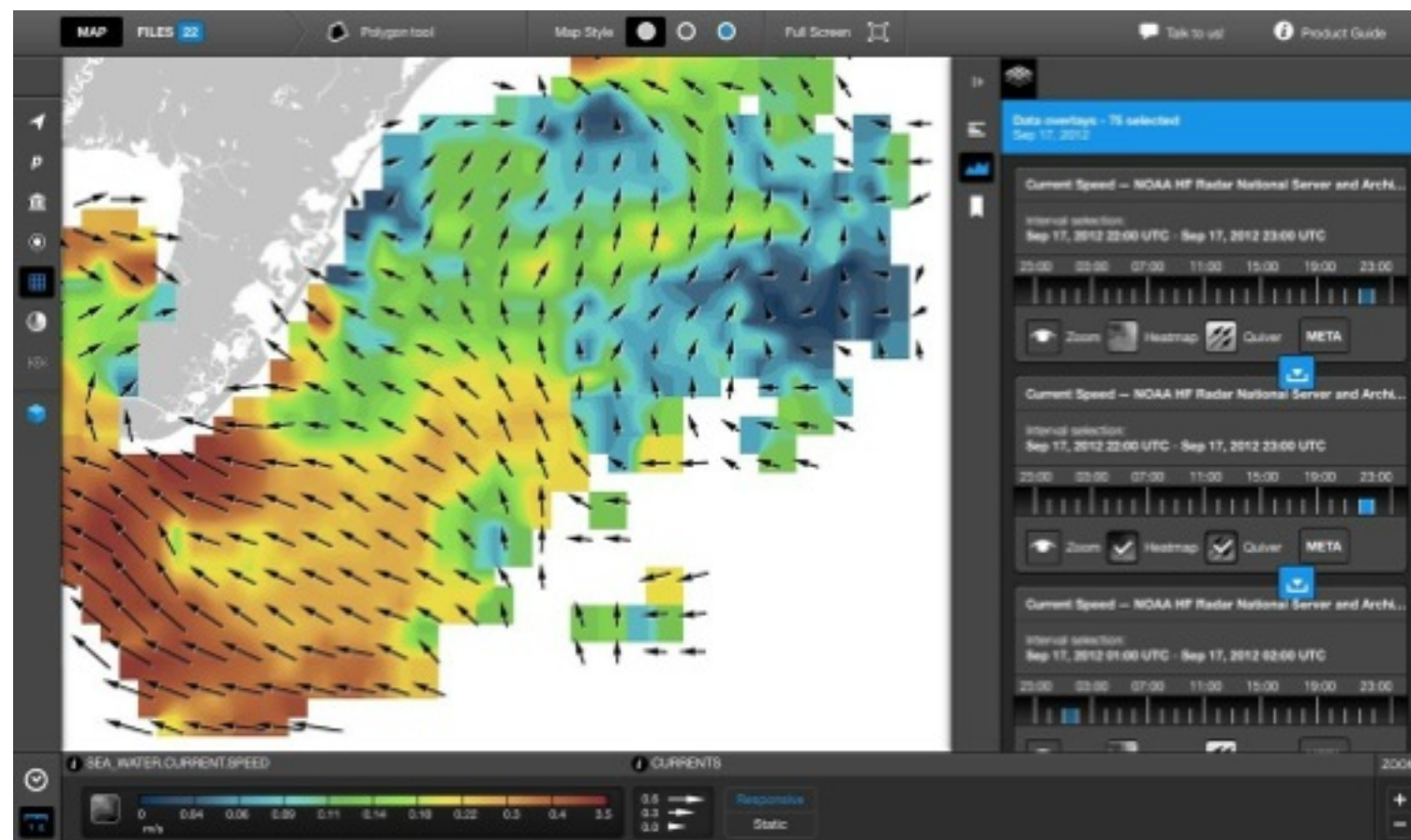
Visualize devices and trajectories



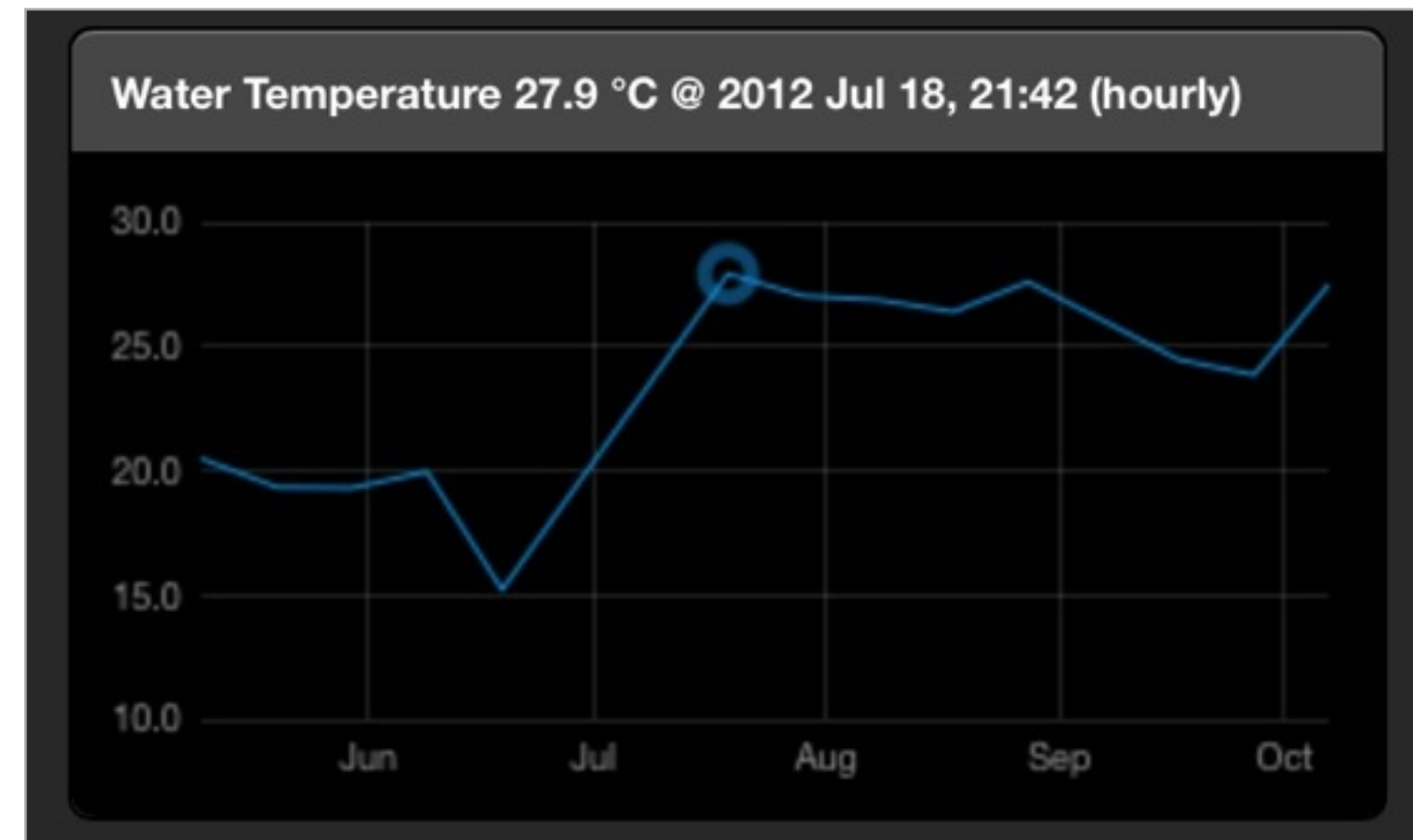
Heat map overlays (temp, sal, etc.)



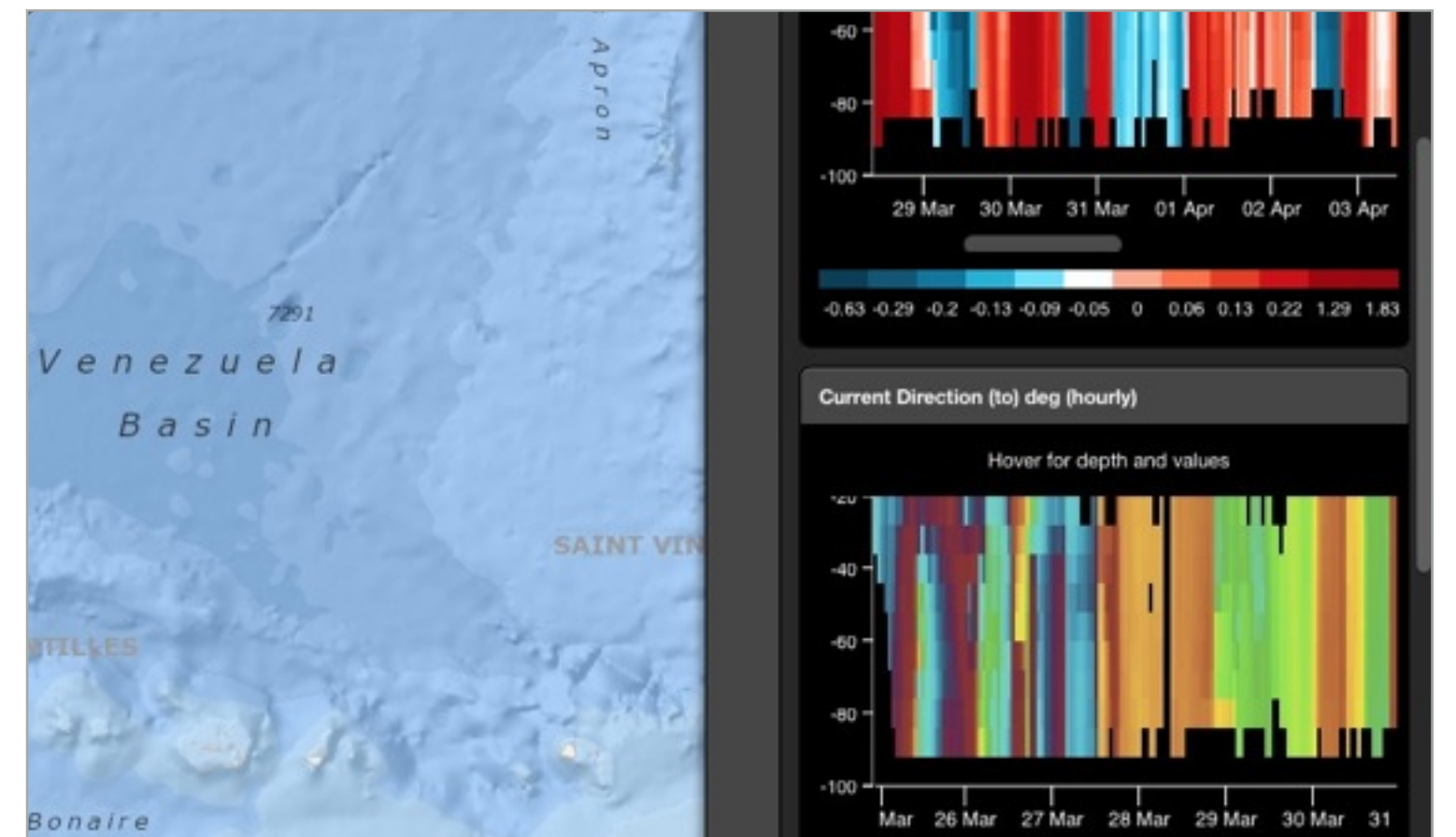
Quiver plots (winds, waves, currents)



High Frequency Radar surface currents

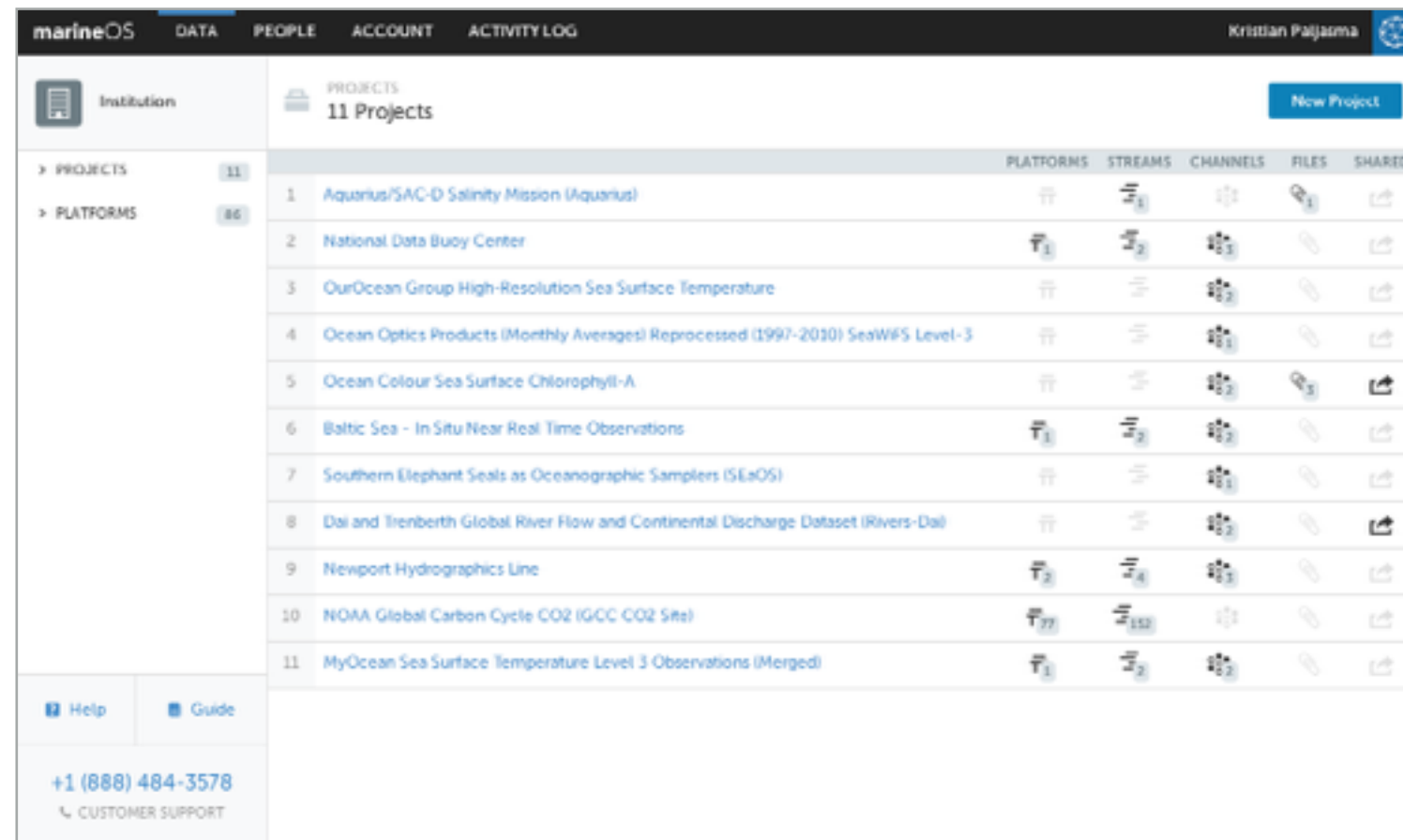


Graphs - track measurement values



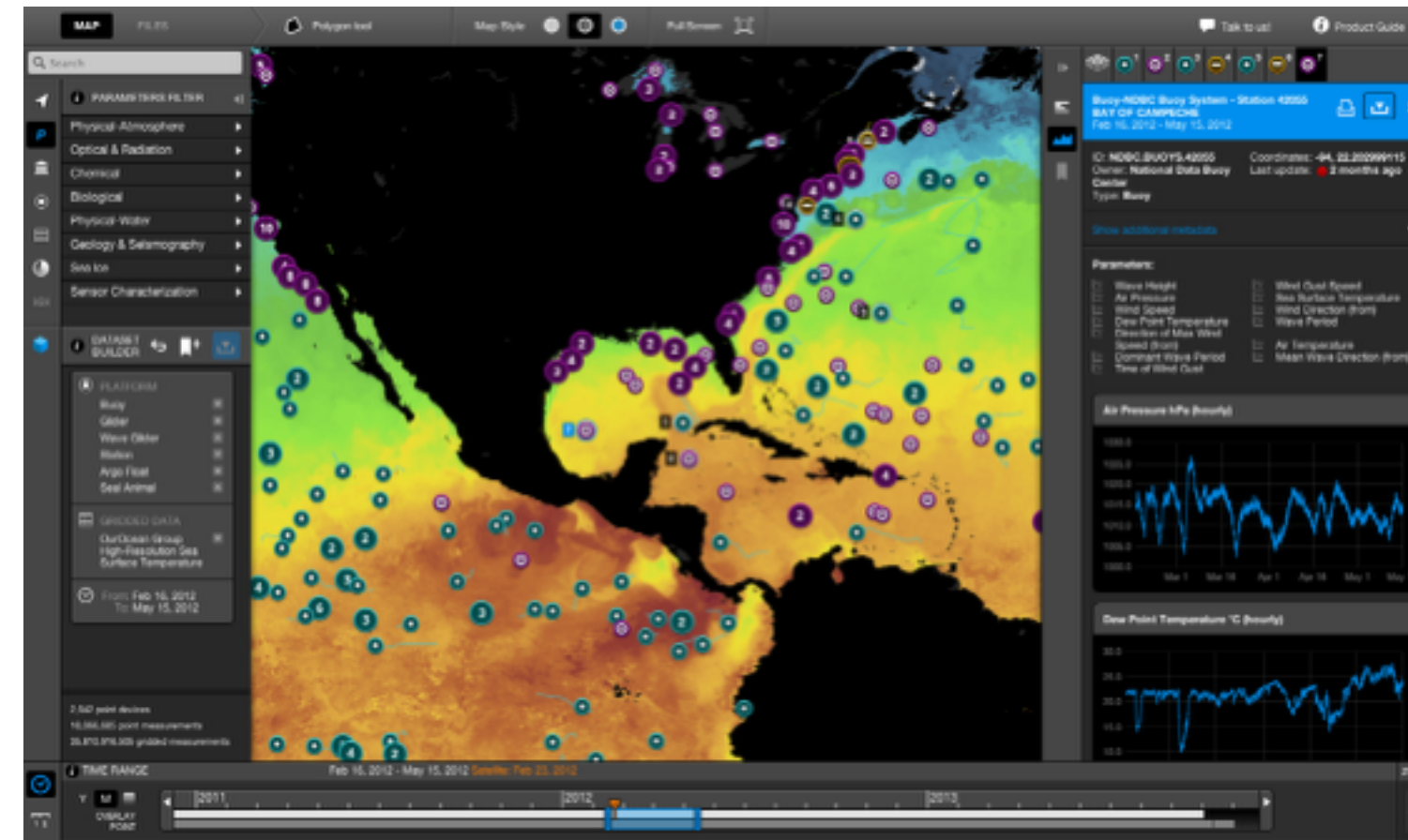
Interactive ADCP profiles

The Power of Integrated Web Tools



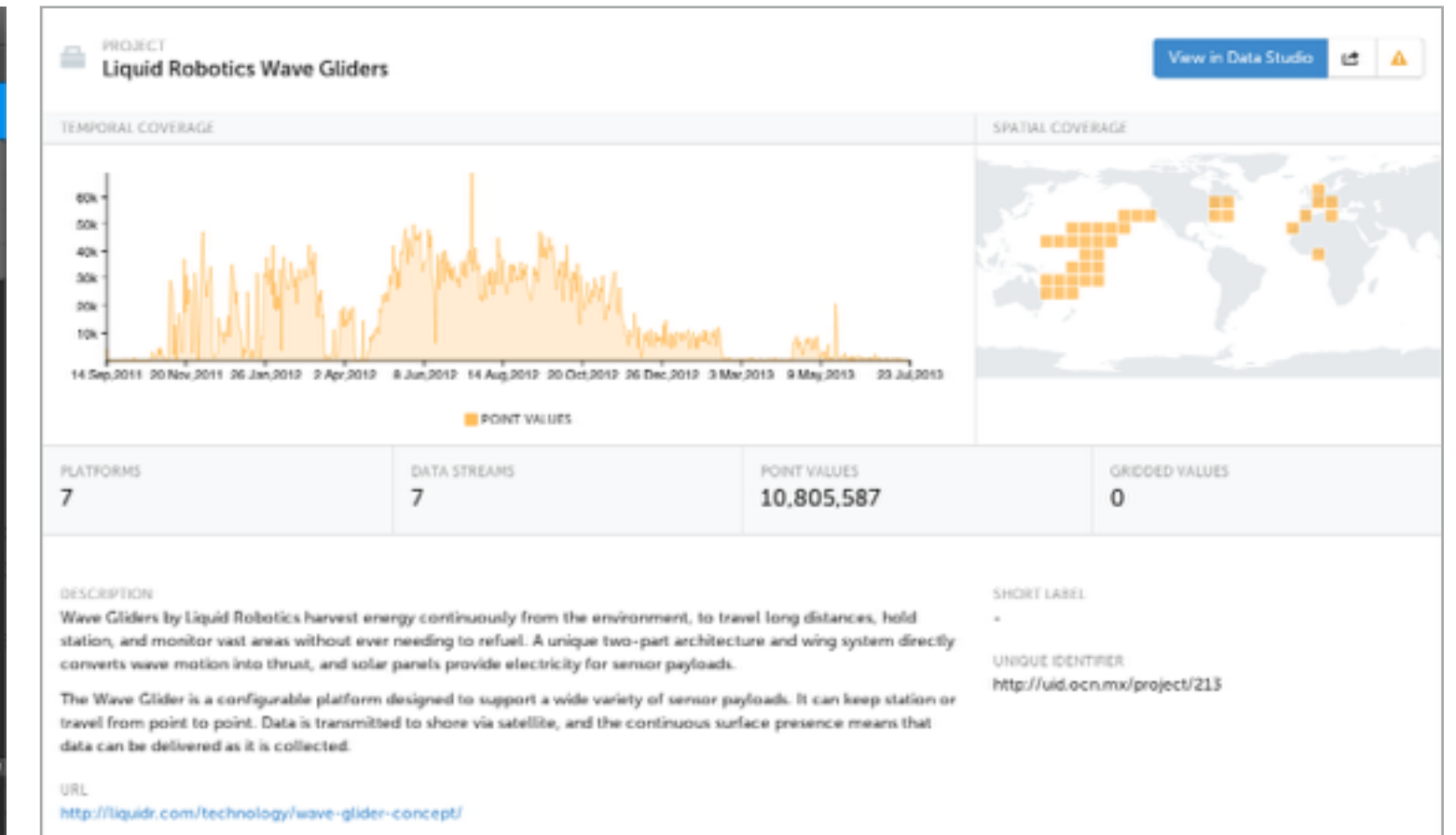
Data Manager

- Control and organize data
- Connect devices and models
- Manage projects and user rights
- Distribute projects and data
- Monitor key metrics



Data Studio

- Access public and private data
- Explore and visualize data
- Aggregate diverse data
- Build custom offline datasets
- Online access via API



Data Browser

- Fastest way to external ocean data
- Well-organized directory
- Input from 6000+ professionals
- 41,000+ data streams
- 31 institutions

Access API from 3rd Party Software



Interoperable architecture supporting major data protocols, formats, tools and integration with large numerical simulations.

Leverage existing investments into data infrastructure.



Platform Overview

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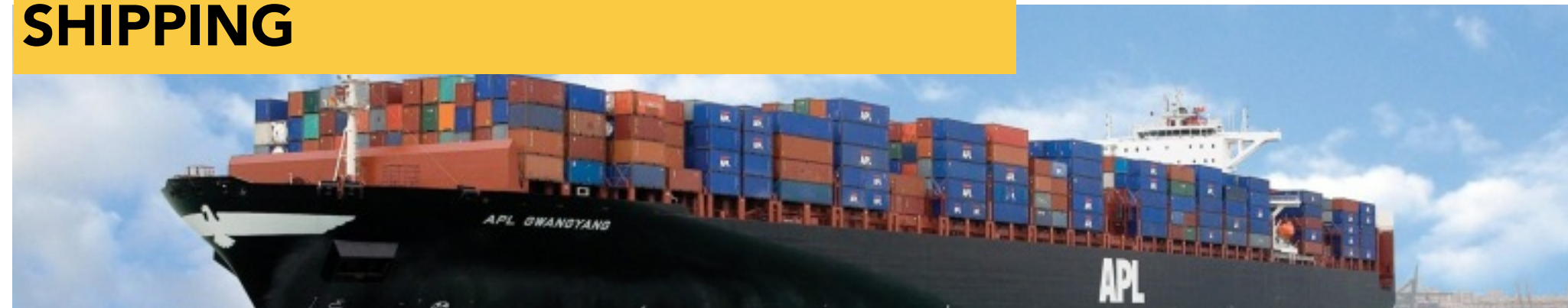
Value Proposition

Architecture

The ocean industry and governments rely on ocean data

Speed and quality of decision-making is critical

SHIPPING



Data collection, route planning, fuel efficiency, climatologies

OIL AND GAS



Env. impact assessment, incident response, spatial analysis

FISHERIES AND ENVIRONMENTAL



Event detection, volume assessment, traffic in marine areas

DEFENSE AND SECURITY



Strategic planning, fleet control, surveillance, CAPEX

FEDERAL GOVERNMENTS



Data collection, coast guard, weather and climatology, etc.

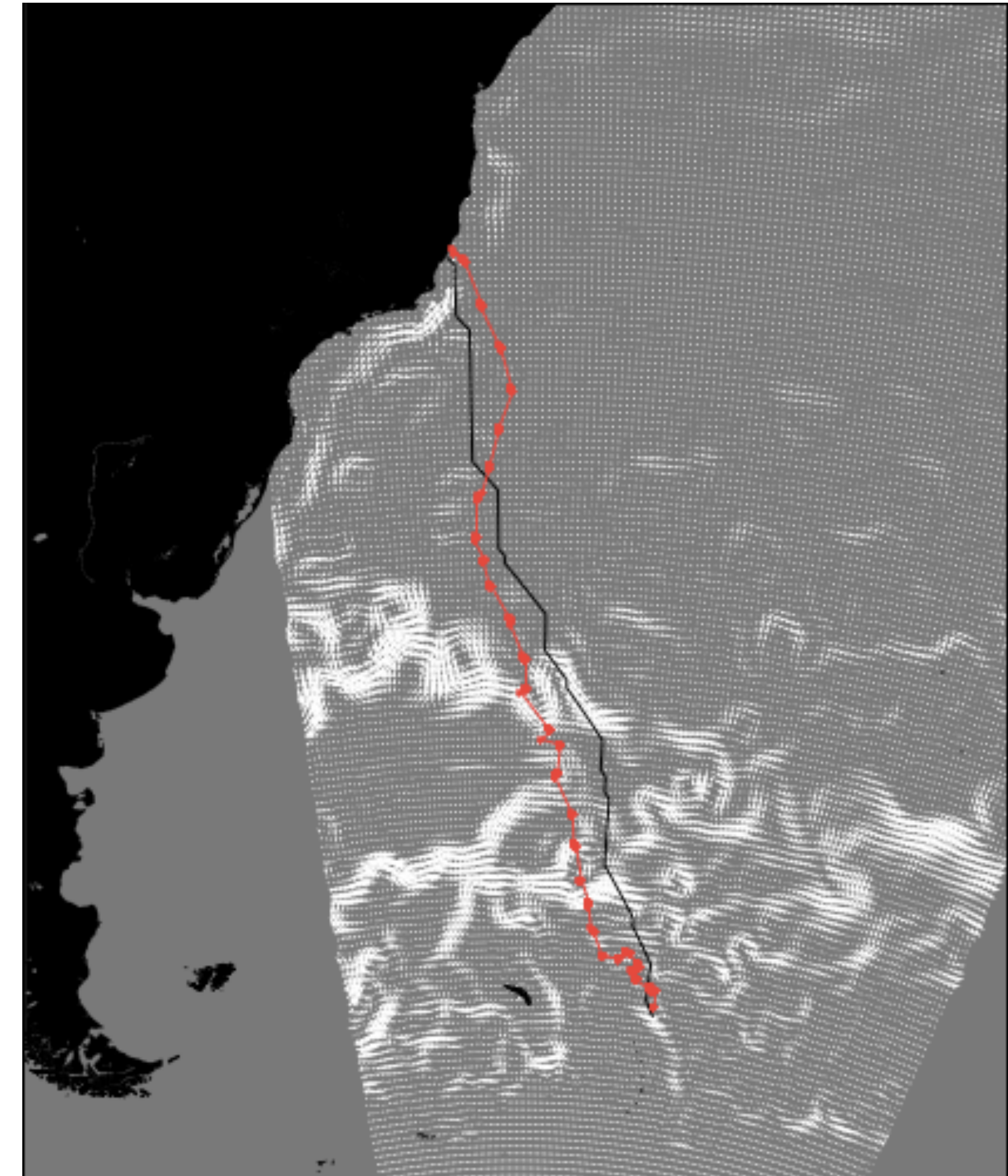
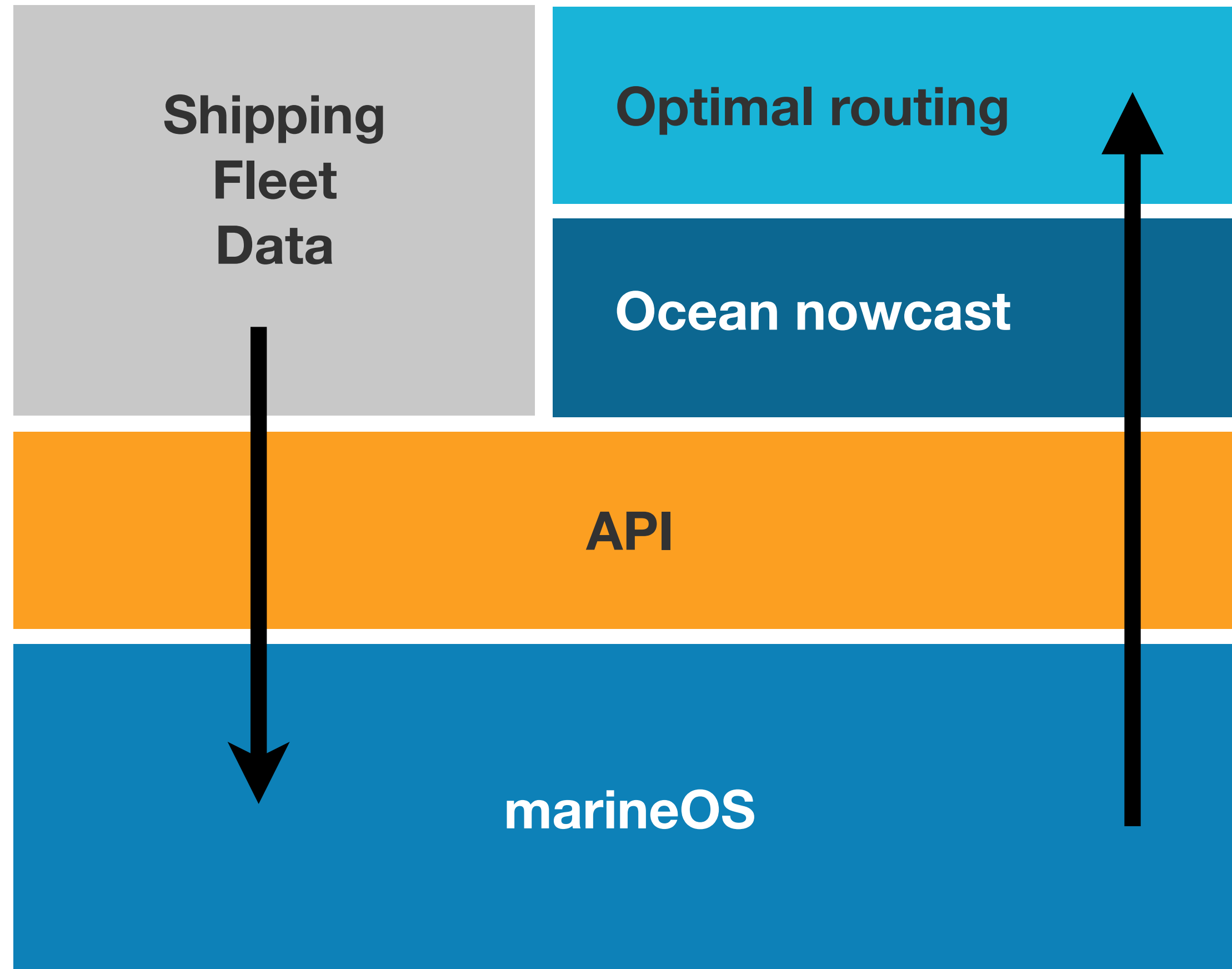
INSURANCE AND HEDGE FUNDS



Risk modeling, policy issuance, event analysis, targeting

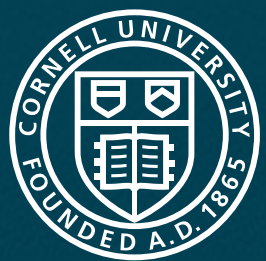
Example: Improving Ocean Operations.

Aggregating Metocean Data Improves Ship Routing



Example: Improving Ocean Operations. Avoiding ship collisions with the North Atlantic Right Whales

Improved rate of whale detection model



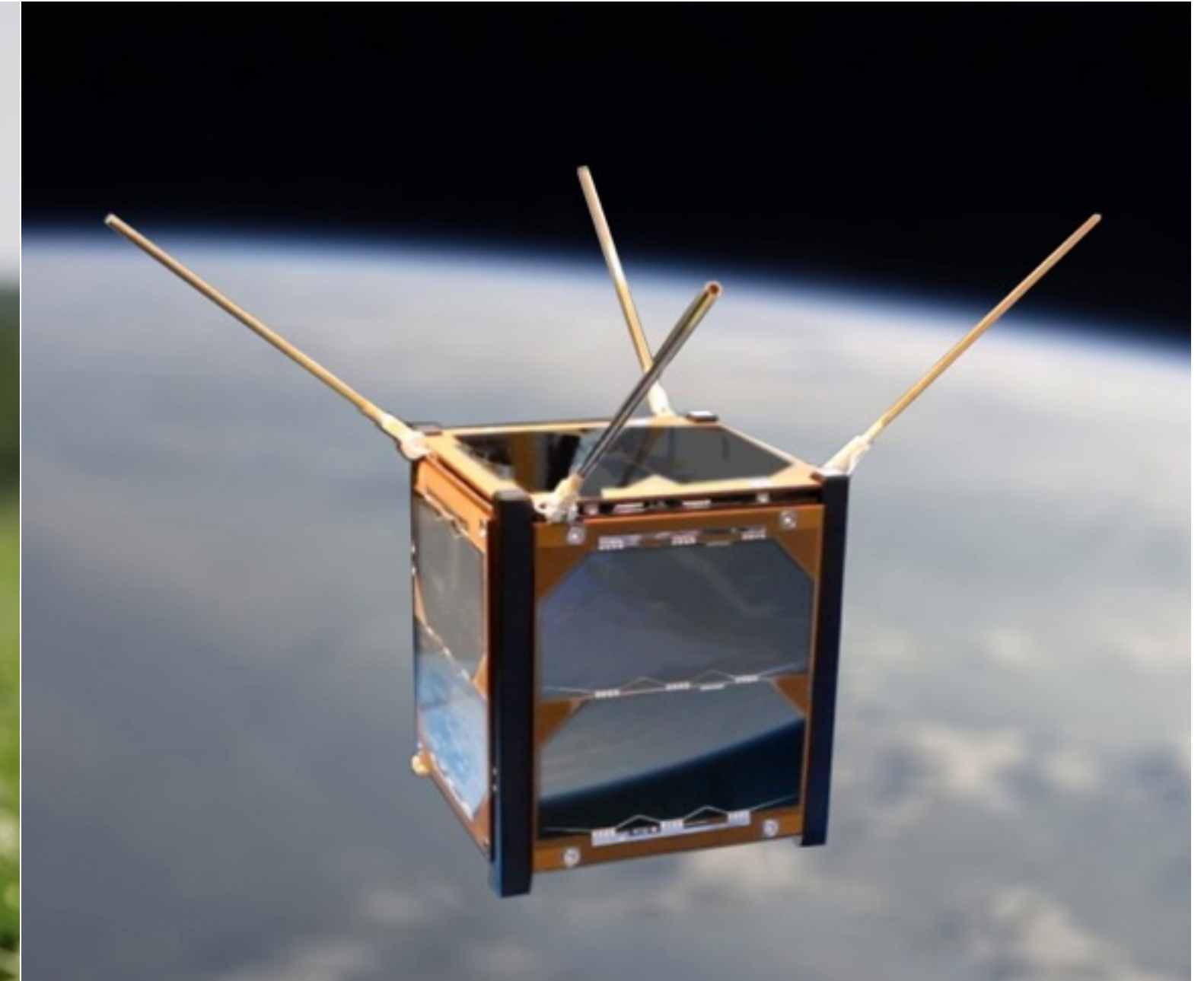
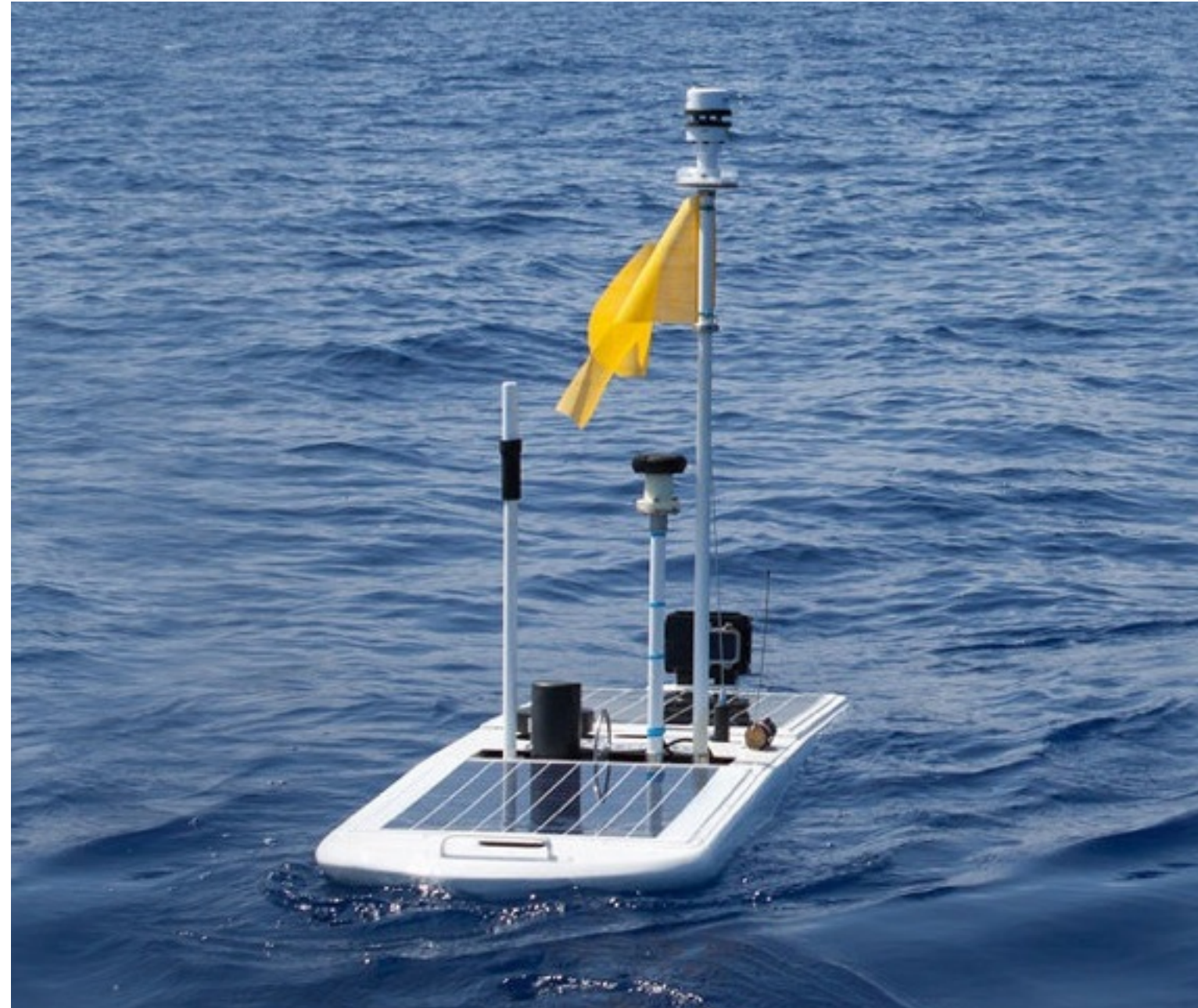
Cornell University

kaggle

MARINEXPLORE

Growth of Diverse, Machine-Generated Spatio-Temporal Data

Buildup across diverse industries on land, sea, air and space



Weather

Hyperlocal real-time predictions

Climate

Accuracy of extreme events

Agriculture

Yield assessment & planning

Oil & Gas

Incident monitoring & response

Space

Private satellite constellations

Telecom

Mobility and remote access

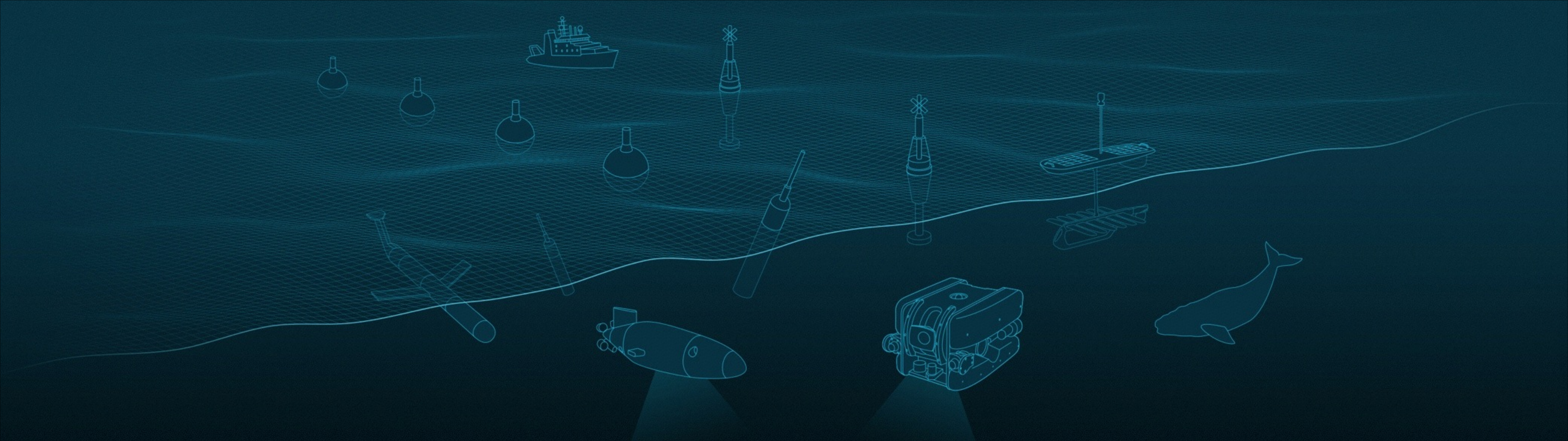


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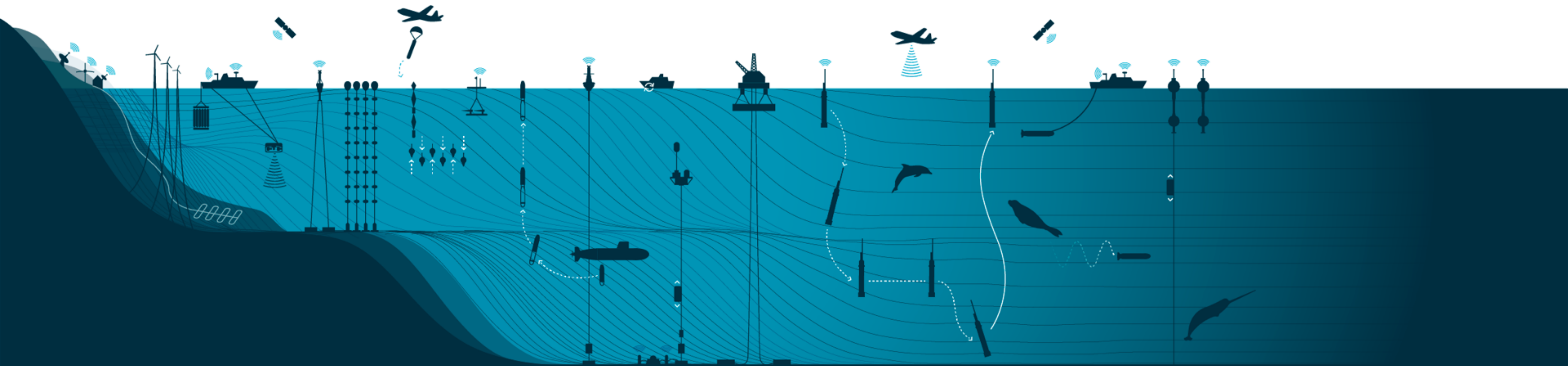
Architecture

An illustration of an underwater scene with various pieces of marine technology. At the top, a large offshore supply vessel is visible. Below it, several spherical buoys are scattered. In the center, there are two vertical sensors with star-shaped tops. To the right, a platform with a vertical mast and a sensor is shown. In the foreground, a submersible and a larger, more complex underwater vehicle are depicted, both emitting light beams downwards. A whale is swimming on the right side of the scene. The background is a dark blue gradient with wavy lines representing the ocean surface.

Offshore and maritime companies collect petabytes of ocean data to make planning and operational decisions.

2+ Million oceanic sensors and growing

Thousands of different data sources in a variety of locations and formats.



#1 footprint of public ocean data on the Web (marinexplore.org)
40,000+ data streams with 1 trillion data values by 31 institutions
100+ organizations and 6,000+ ocean data professionals



80%

80% of the time related to decision-making is spent on finding, accessing, cleaning, visualizing and distributing ocean data.

MAP FILES 23

Polygon tool

Map Style

Full Screen

Talk to us! Product Guide

Search

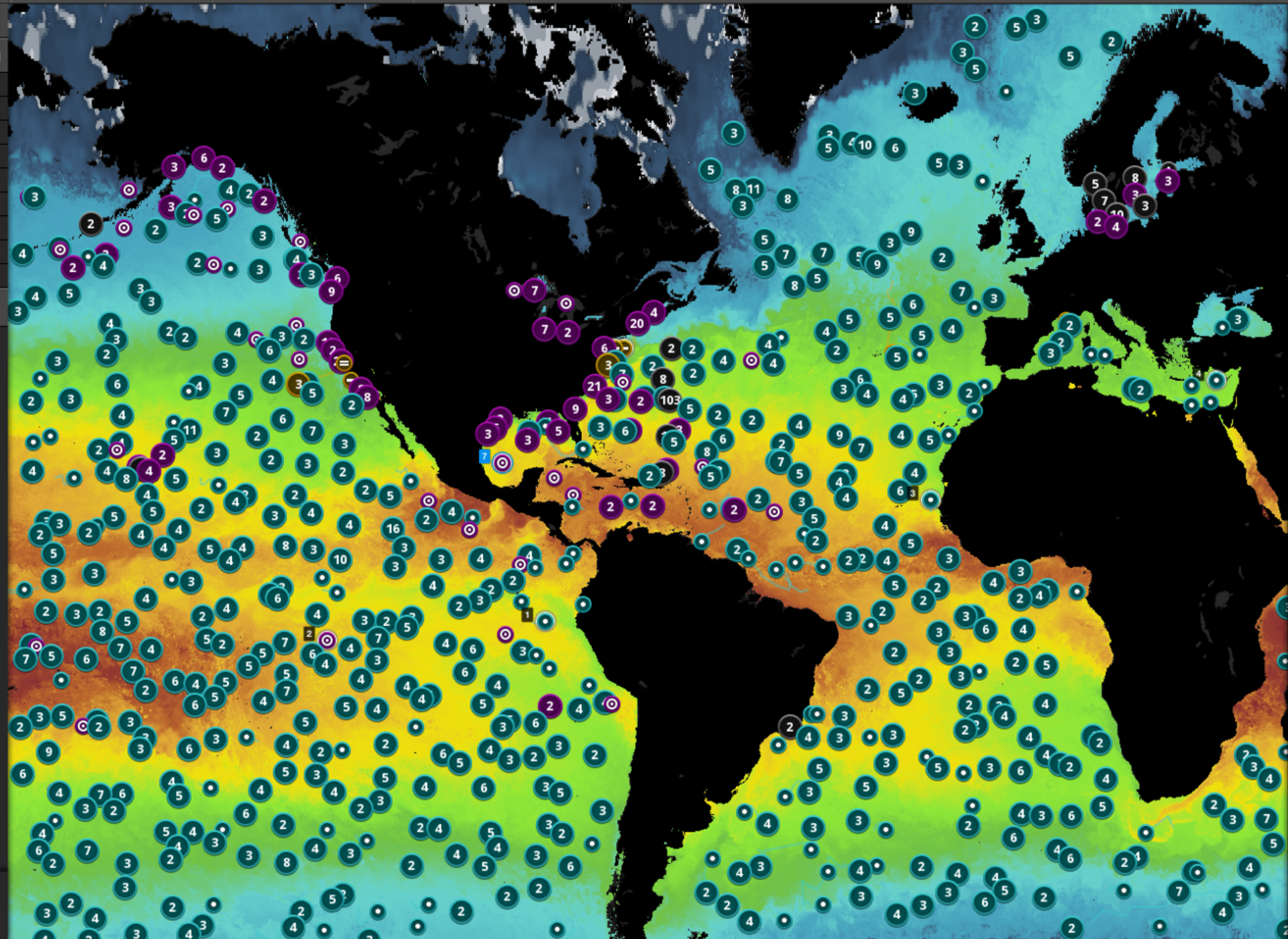
- PARAMETERS FILTER
- Biological
- Physical-Atmosphere
- Chemical
- Optical & Radiation
- Physical-Water
- Geology & Seismography
- Sea Ice
- Sensor Characterization

DATASET BUILDER

- PLATFORM
- Buoy
- Glider
- Wave Glider
- Argo Float
- Station
- Seal Animal
- Research Ship
- Opportunity Ship

- GRIDDED DATA
- OurOcean Group
- High-Resolution Sea Surface Temperature

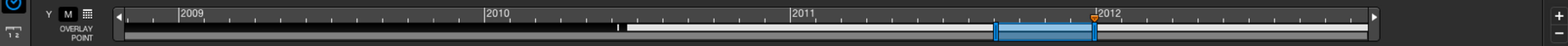
From: Sep 3, 2011 To: Dec 30, 2011



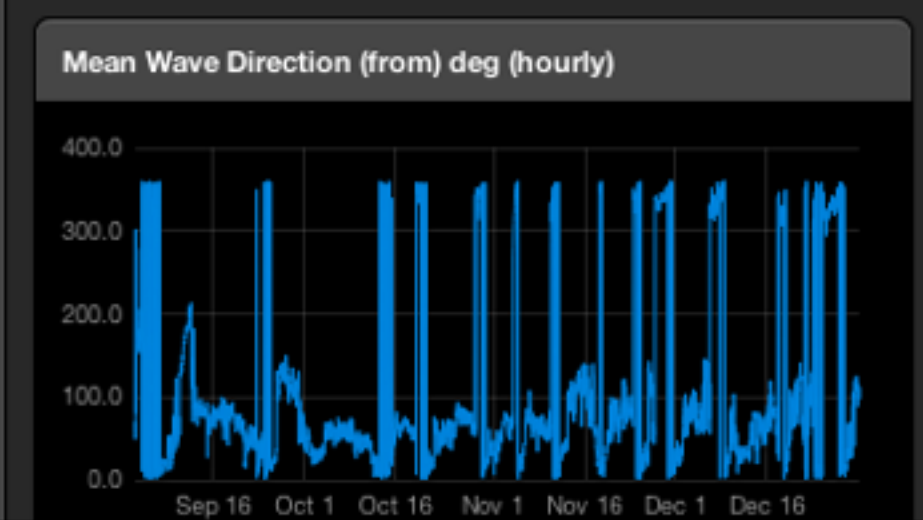
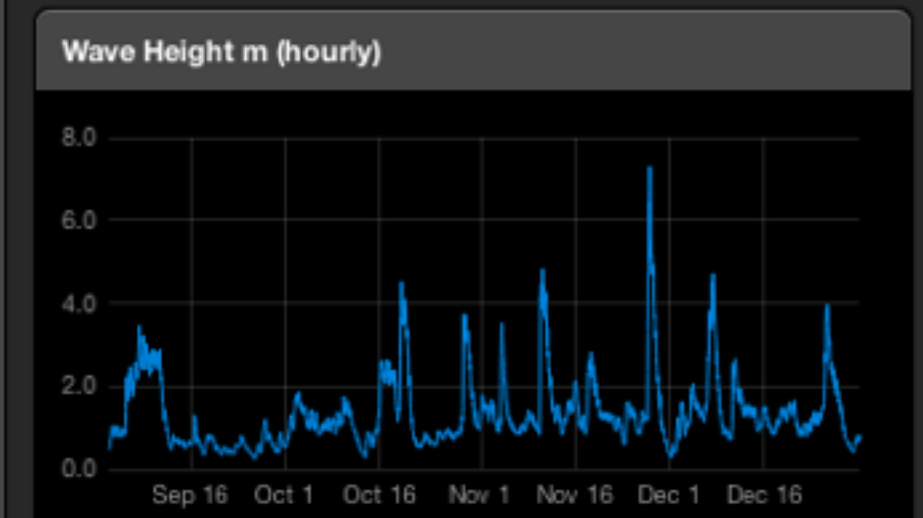
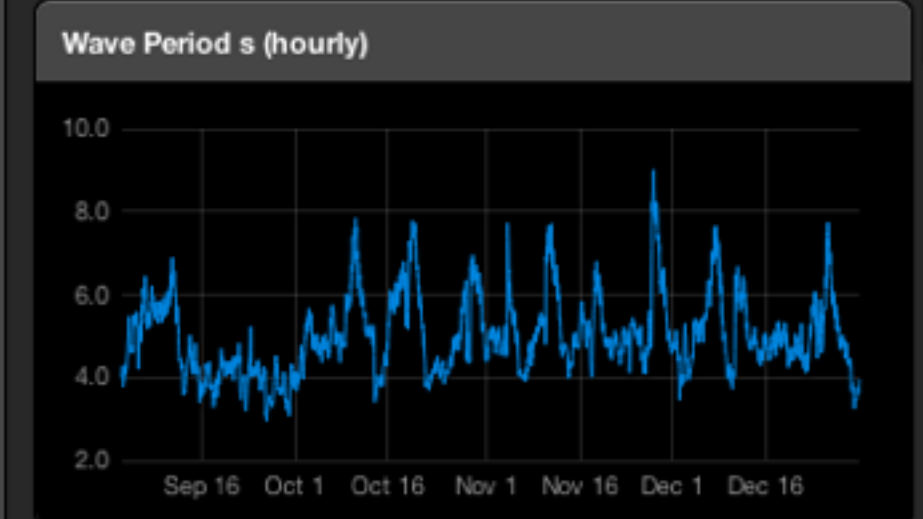
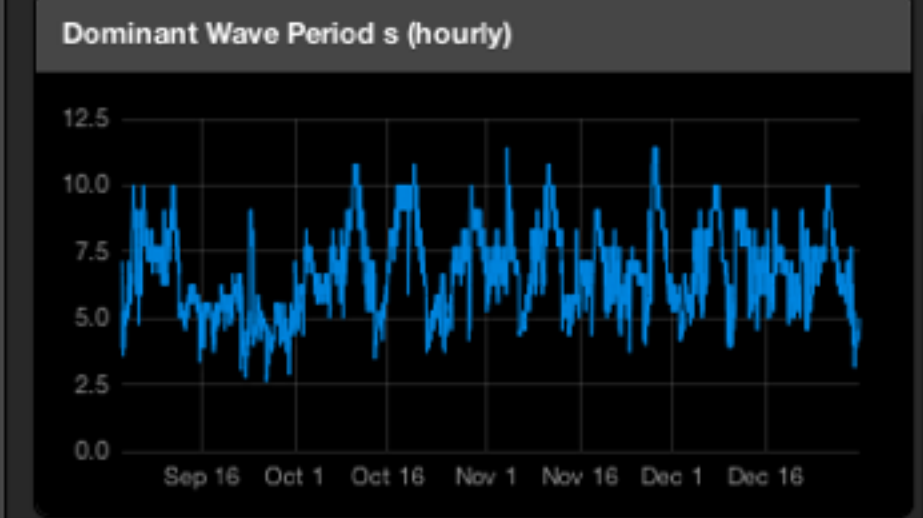
3,819 point devices
 30,233,920 point measurements
 47,226,862,560 gridded measurements

TIME RANGE

Sep 3, 2011 - Dec 30, 2011 Satellite: Dec 30, 2011



Buoy-NDBC Buoy System - Station 42055
 BAY OF CAMPECHE
 Sep 3, 2011 - Dec 30, 2011



ZOOM

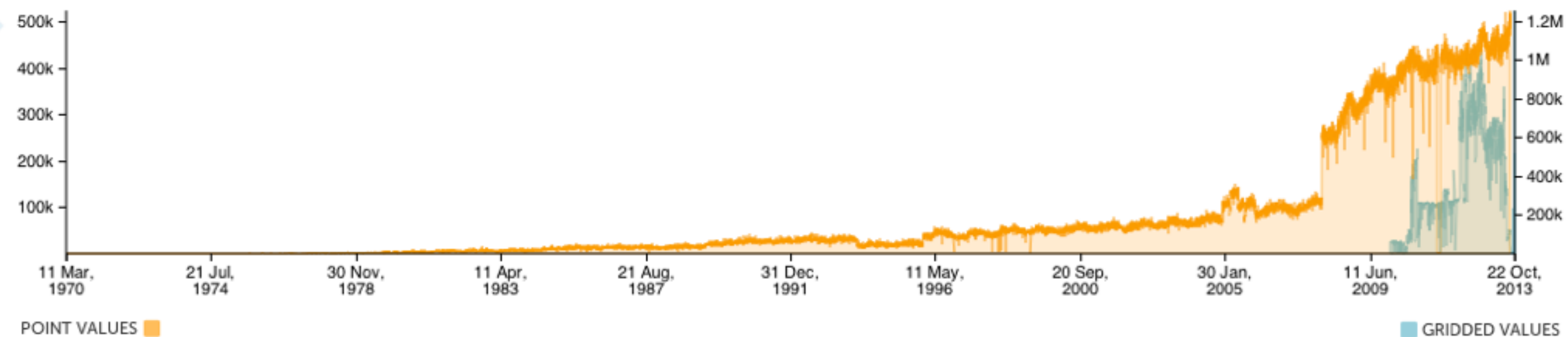
- Index
- Institutions
- Projects
- Platforms
- Data Streams

All Entities ▾ Search

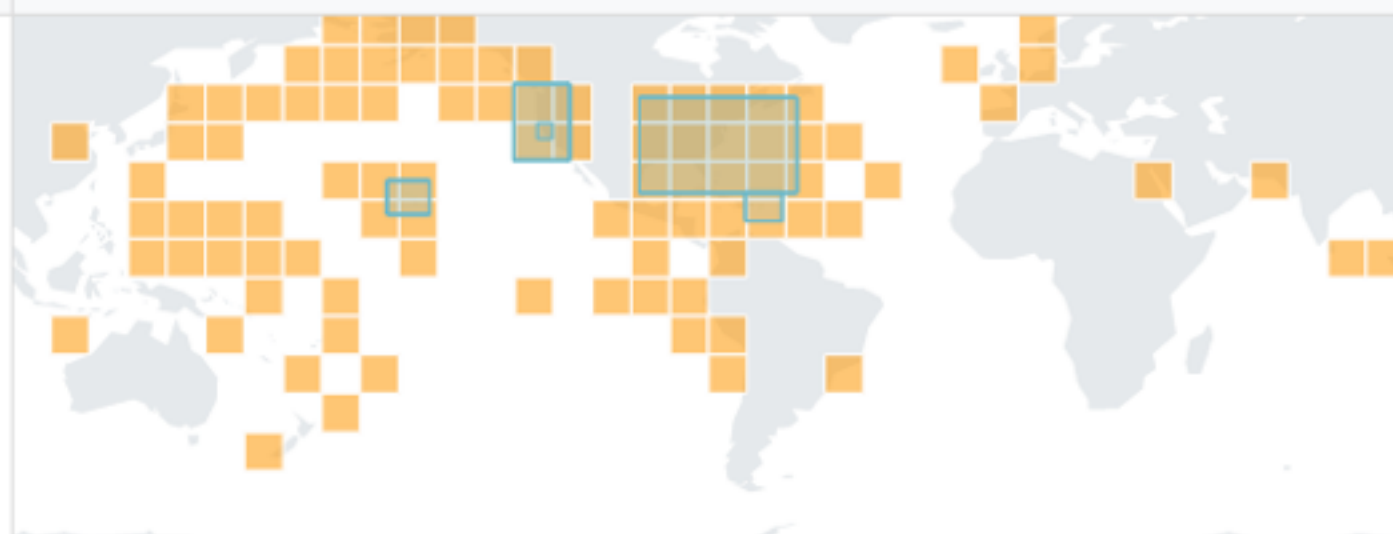
INSTITUTION
NOAA National Data Buoy Center (NDBC)

[View in Data Studio](#)  

TEMPORAL COVERAGE



SPATIAL COVERAGE



PROJECTS
2

PLATFORMS
956

DATA STREAMS
1,762

POINT VALUES
1,162,956,468

GRIDDED VALUES
497,274,055

DESCRIPTION

The National Data Buoy Center (NDBC) provides comprehensive, reliable systems and marine observations to support the missions of the National Weather Service (NWS) and NOAA, promote public safety, and satisfy the future needs of our customers.

NDBC manages the development, operations, and maintenance of the national data buoy network, serves as NOAA's focal point for data buoy and associated meteorological and environmental monitoring technology, provides high quality meteorological/environmental data in real time from automated observing systems in the open ocean and coastal zone surrounding the United States, manages the Volunteer Observing Ship (VOS) program to acquire additional meteorological and oceanographic observations supporting NWS mission requirements, operates the NWS test center for all surface sensor systems, and supports operational and research programs of NOAA and other national and international organizations.

URL

<http://www.ndbc.noaa.gov/>

SHORT LABEL

NDBC

ADDRESS

Bldg. 3205 Stennis Space Center
MS 39529
USA

UNIQUE IDENTIFIER

<http://uid.ocn.mx/institution/22>

ID	UUID	BUSINESS KEY
2	22	NOAA.NDBC

2 Projects

NAME	INSTITUTION	PLATFORMS
National Data Buoy Center	NOAA National Data Buoy Center	956



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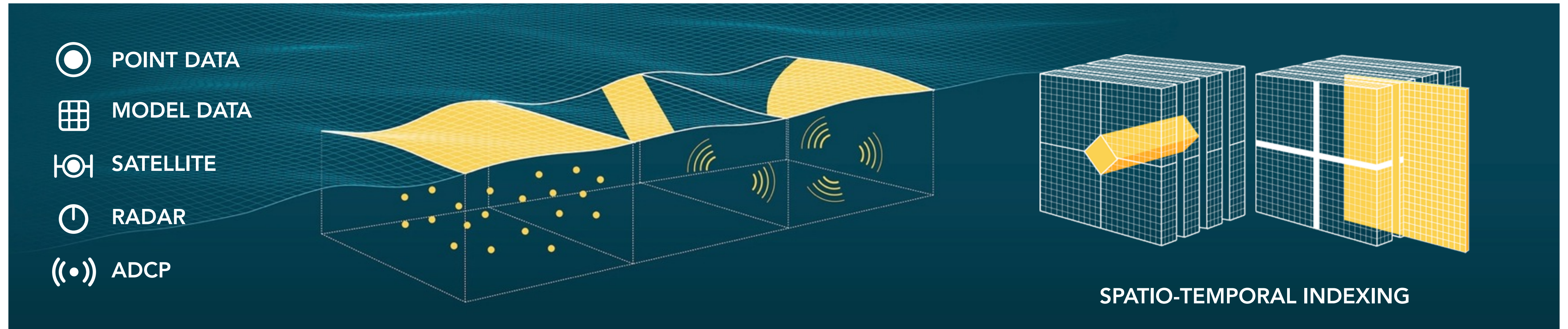
Architecture

How to speed up data activities related to the oceans?

By automatically centralizing data with a focus on location and time.
Finding, accessing, transforming, integrating, cleaning, storing, analyzing, visualizing and distributing ocean data.

A Platform for Spatio-Temporal Data

Operational on **40,000+** data streams with **1 trillion** data values by **31** institutions



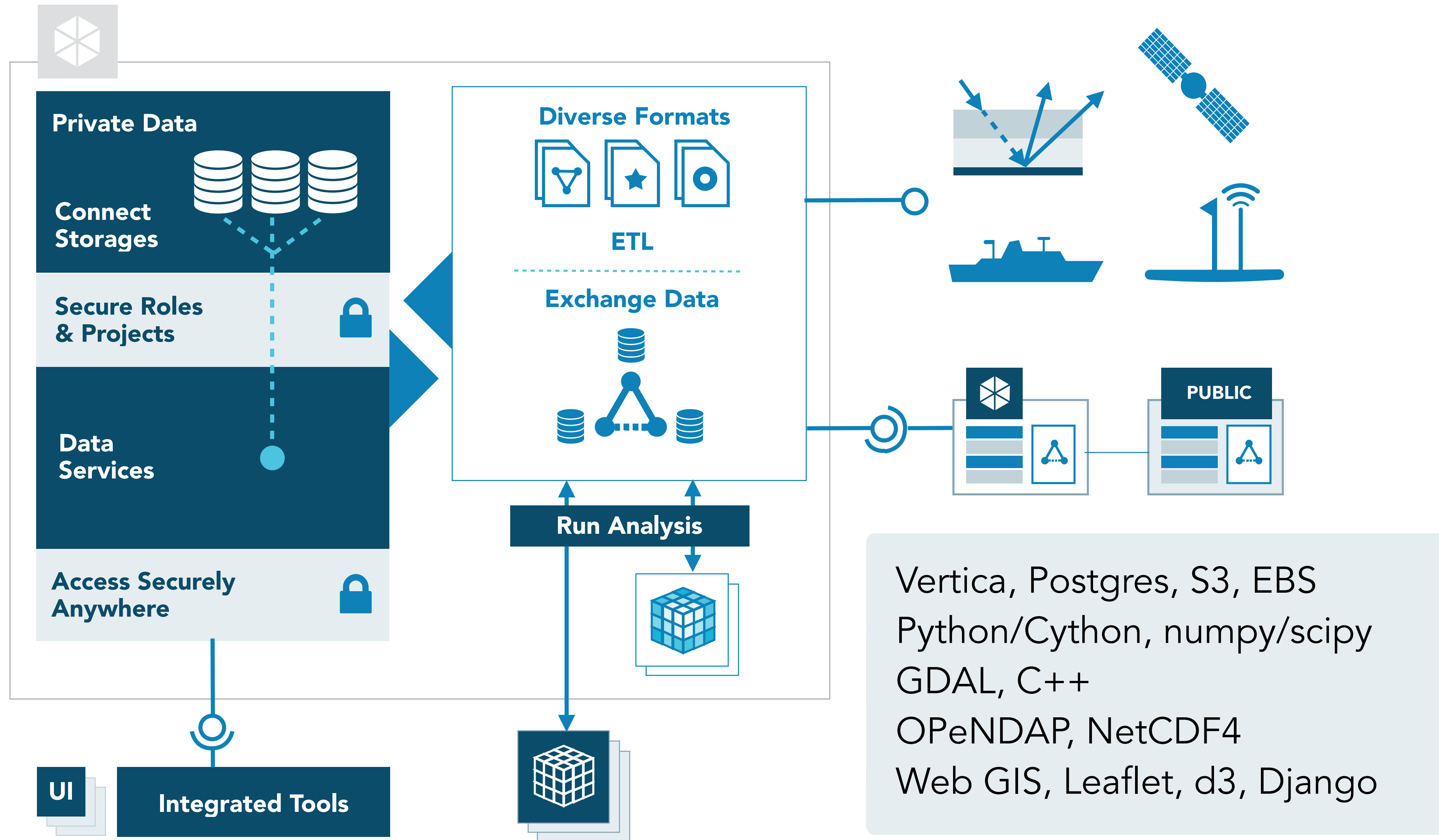
Built on cloud technologies

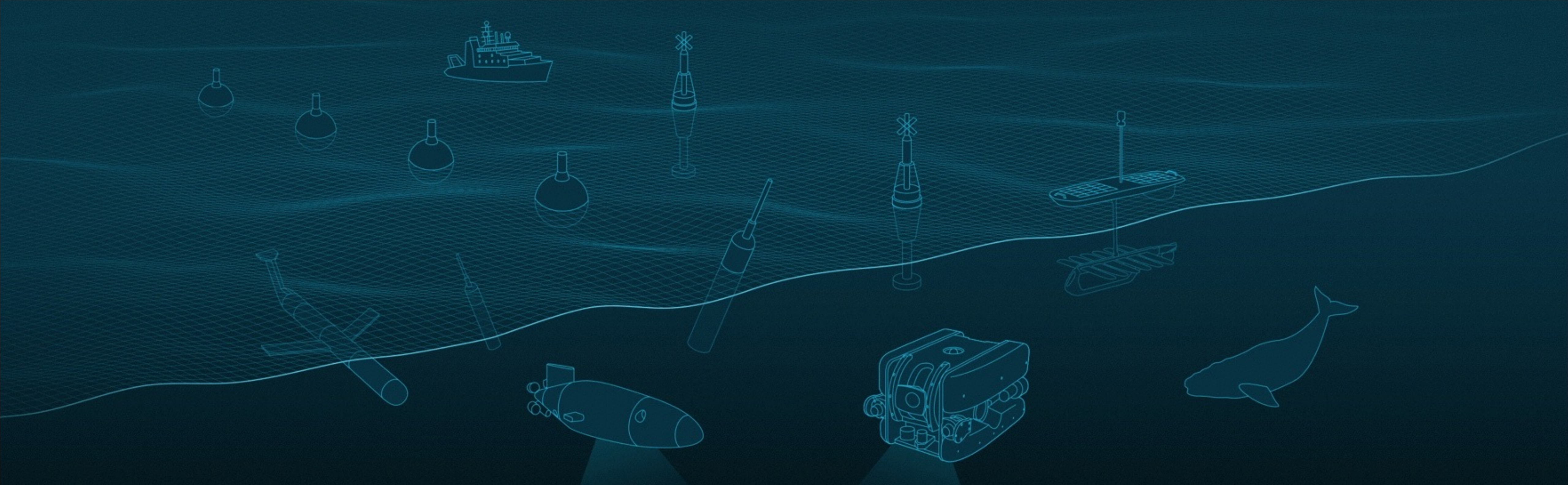
- **StreamFlow** hybrid dataflow and workflow
- **StreamStorage** machine generated data and metadata storage
- **StreamWork** user experience for exploration, processing, management, collaboration, APIs

Key Features

- Scalable Stream-based Plugin Architecture
- Repeatable and Revertible Processing
- Automated and Manual Data Collection
- Integrated Data Model: Observations & Models
- All Major Ocean Data Types and Formats
- Private and Public Users

High-Level Platform Architecture





marineOS

sea the difference

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