

DISCOVER THE OCEAN. UNDERSTAND THE
PLANET.

DIGITAL INFRASTRUCTURE OCEANS 2.0

OCEAN
NETWORKS
CANADA
INNOVATION

Benoît Pirenne

MEOPAR data management workshop

March 24-25, 2014

DISCOVER THE OCEAN. UNDERSTAND THE PLANET.

OCEAN NETWORKS CANADA

Discover the ocean. Understand the planet.

BRITISH COLUMBIA - CANADA

VENUS OBSERVATORY

VANCOUVER ISLAND

Port Alberni

Explorer
Plate

❖ The ONC Observatory:

- ❖ Home to VENUS (coastal), NEPTUNE (off-shore) and Cambridge Bay (Arctic) cabled observatories
- ❖ Over 300 instruments, hundreds of scalar sensors

Endeavour
2300 m

Cascadia
Basin
2660 m

Juan de

WASHINGTON - USA

North American
Plate

Seattle

Bathymetry
(50 m contour lines)

3500 m

Subduction Zone

Spreading Center

ONC's Observatories

- ❖ First significant foray of Ocean Sciences into the area of “Big Science”
- ❖ A Facility serving many different ocean science disciplines
 - Plate tectonic processes and earthquake dynamics, slope stability, tsunamis
 - Dynamic processes of fluid fluxes and gas hydrates in the sea bed
 - Regional ocean/climate dynamics and effects on marine biota
 - Deep-sea ecosystem dynamics
 - Engineering and computational research

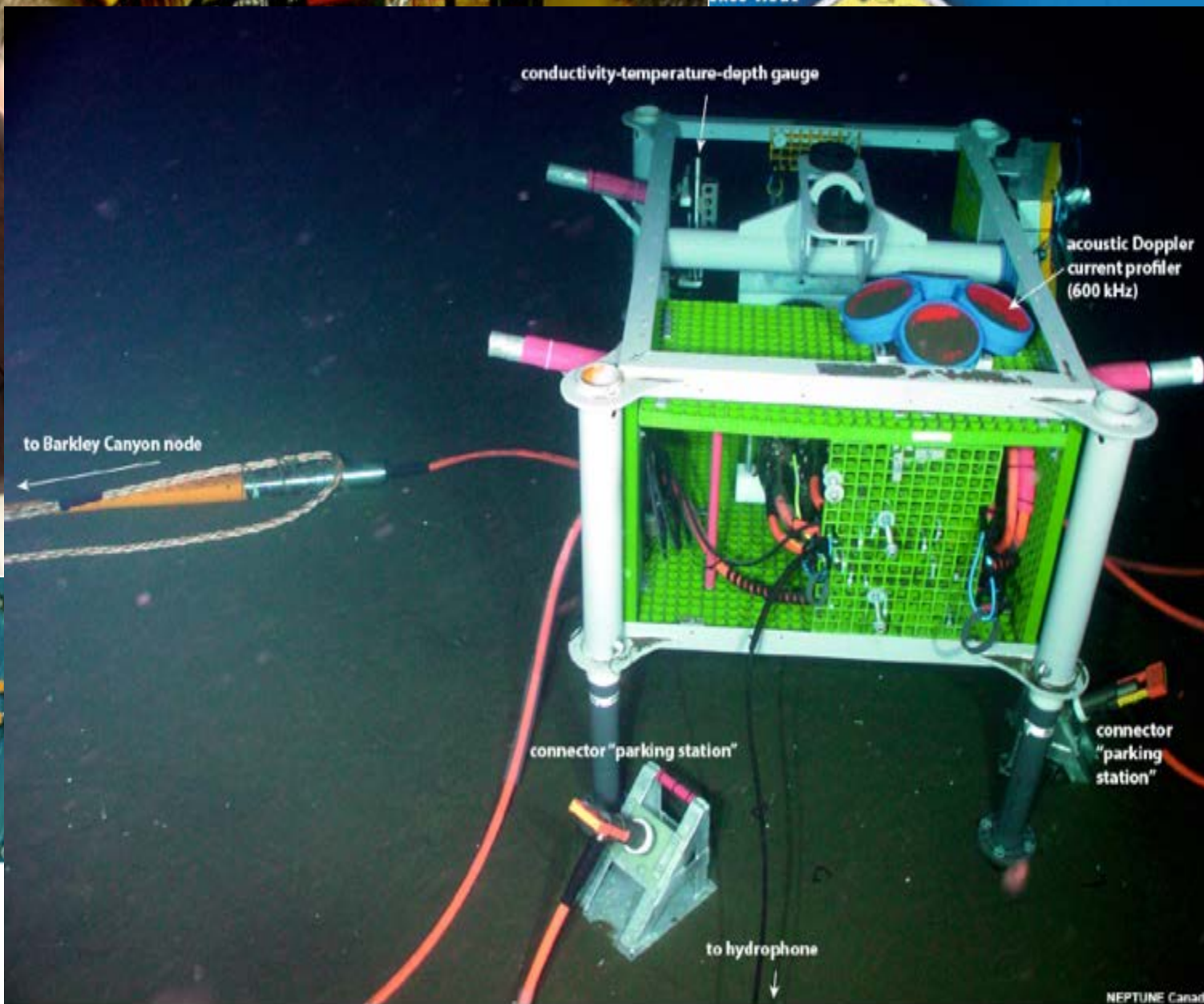
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OCEAN INFO DEMAND

Respond to a demand for *Smart Ocean Systems* that can continuously monitor, detect, and respond to natural and man-made events





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Data Management @ ONC

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- ❖ Extension of the Internet under the Ocean
- ❖ Capture data from *many* different types of sensors (1D->5D data)
- ❖ Interact with underwater instrumentation (e.g., cameras)
- ❖ Precision time
- ❖ Keep data + metadata for 25 years
- ❖ Provide search, visualization, data products to many users
- ❖ Allow for X-correlation between data from various sensors
- ❖ Detect and react to events

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Data Management @ ONC

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- ❖ Built a system based on integrated data stewardship
 - “Drivers” to talk to instruments from various origins/manufacturers
 - Metadata collected before, during and after instrument deployment
 - Data stored on disks in multiple locations
 - Data access providing different data products for different user needs

Types of data

❖ The whole gamut...

- Sensors producing single numbers from time to time
- Sensors producing n-dimensional matrices
- Sensors producing streams of data at high sampling rates (seismometers, hydrophones, cameras, ...)

End users

- ❖ Scientists
- ❖ Emergency responders
- ❖ the Public (crowdsourcing)

Funding structure

- ❖ Ocean Networks Canada is a “Major Science Infrastructure” in Canada
- ❖ Operating funds come from the CFI (40%) in 5-year chunks
- ❖ Challenge is to find other 60%! (Province is not keen)
- ❖ Looking for other sources of funding that include more federal sources and commercial revenue through our commercialization Innovation Centre.

ONC Digital Infrastructure

- ❖ ONC's Digital Infrastructure has demonstrated:
 - Ability to acquire data in quasi real time from hundreds of sensors, online or not
 - Have the ability to quality-control, archive and be the steward for the data
 - Make data available to many users, both professional and the public
- ❖ Concerns include funding — but demonstration of societal relevance gets us there

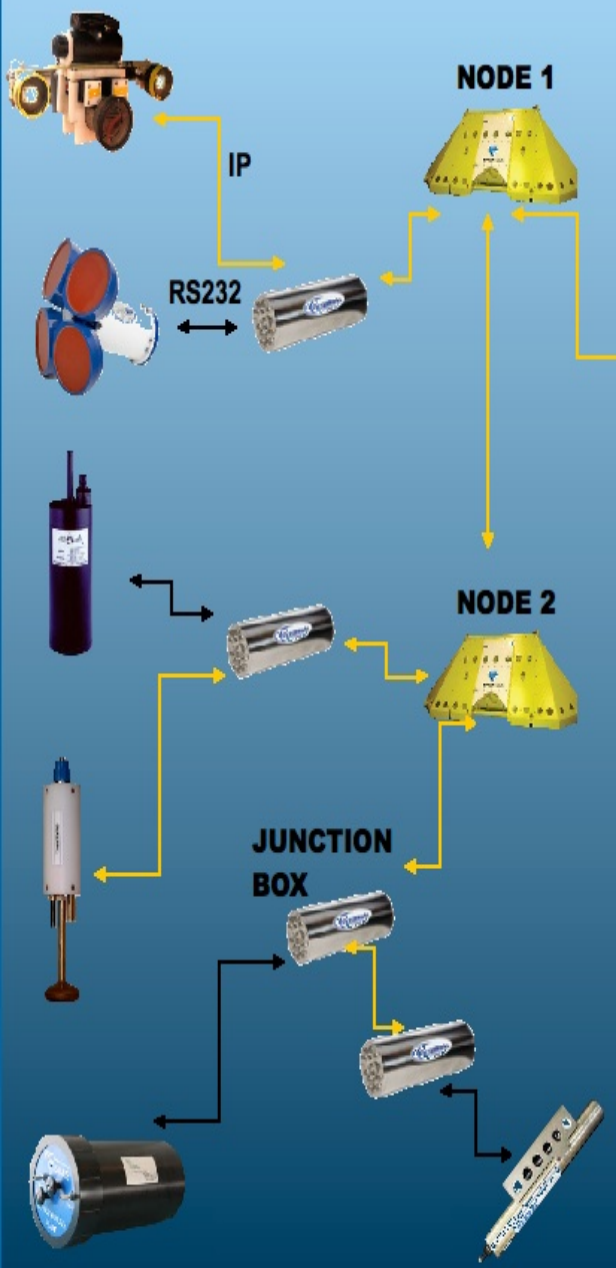
International Linkages

- ❖ Most important linkages include the US Ocean Observatory Initiative
- ❖ Other groups worldwide interested in getting ONC to help them setup their own system
- ❖ Use of interoperability approaches to provide data to both user communities
 - OGC for simple sensors
 - OpenDAP for multi-dimensional data

Oceans 2.0



WET PLANT

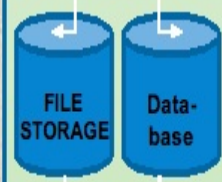


SHORE STATION



- Buffering
- Routing
- Instrument Commanding

OPERATION CENTRE



CANARIE LINKS



- Database
- File Storage
- Web Server
- Firewall
- Resource Scheduling



SCIENTISTS



PUBLIC

- Web
- Web Services
- Forms
- SQL
- Smart Phone Applications
- Streaming Video & Sound



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DISCOVER THE OCEAN



Digital Fishers

Fixed Location Camera Depth: 986m
 Latitude: 48.3168
 Longitude: -126.0502



Date: 13-Jul-2012 20:02:21
 Share this: [f](#) [t](#) [+](#) [S](#) [v](#)



Replay Next Clip Random

Level

Level 1 [Icons]

Level 2 [Icons]

Level 3 [Icons] Next card in 8 annotations.

Level 4 [Icons]

Level 5 [Icons]

View My Cards

My Status

Level: 3
 Total Annotations: 30
 Today's Annotations: 0

Digital Fishers Leaders

All Time Today

Name: Harold Smith
 Level: 5
 Total Annotations: 18909

How to Play | Level 3 Tutorial

Sealife: Select Comment:

Location+Count: Select

Seafloor: Select

Objects: Select

Save Annotation

Clear Selections

About Us | Current Mission



Data Search Help

BARS

Device

- OceanEngUW BARS 01 (15002)
- [Details](#) | [Documentation](#)

Variables

- Corrected Temperature
- Eh
- Reference Temperature
- Resistivity High Gain (X 5)
- Resistivity Low Gain (X 0.2)
- Resistivity Moderate Gain (X 1)

Select Data Product

ONC DI structure

Software Dev & QC
(20)

- Polyvalent IT staff

Systems & Ops (5)

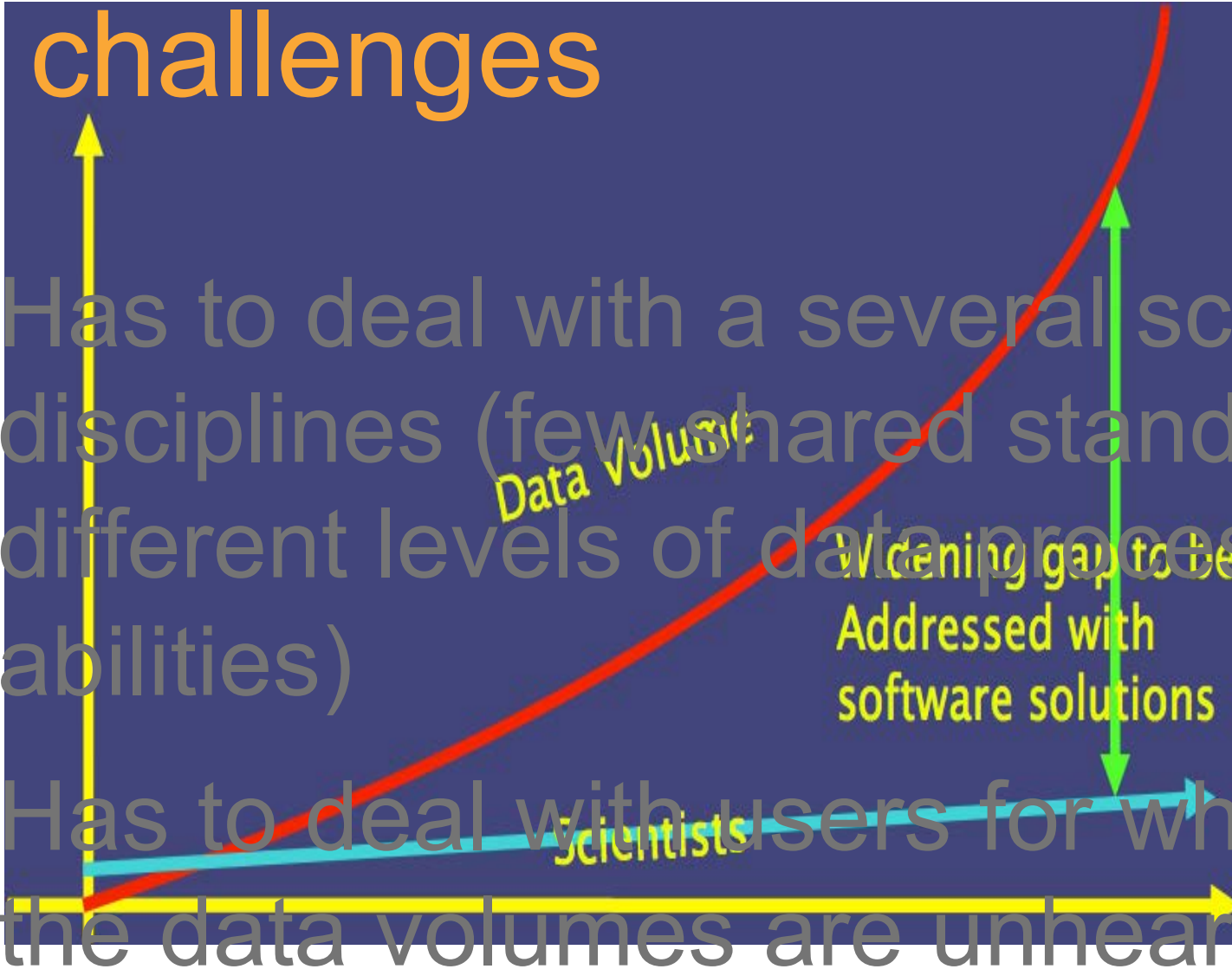
- On call
- Network, systems management
- Redundancy management
- Support software management

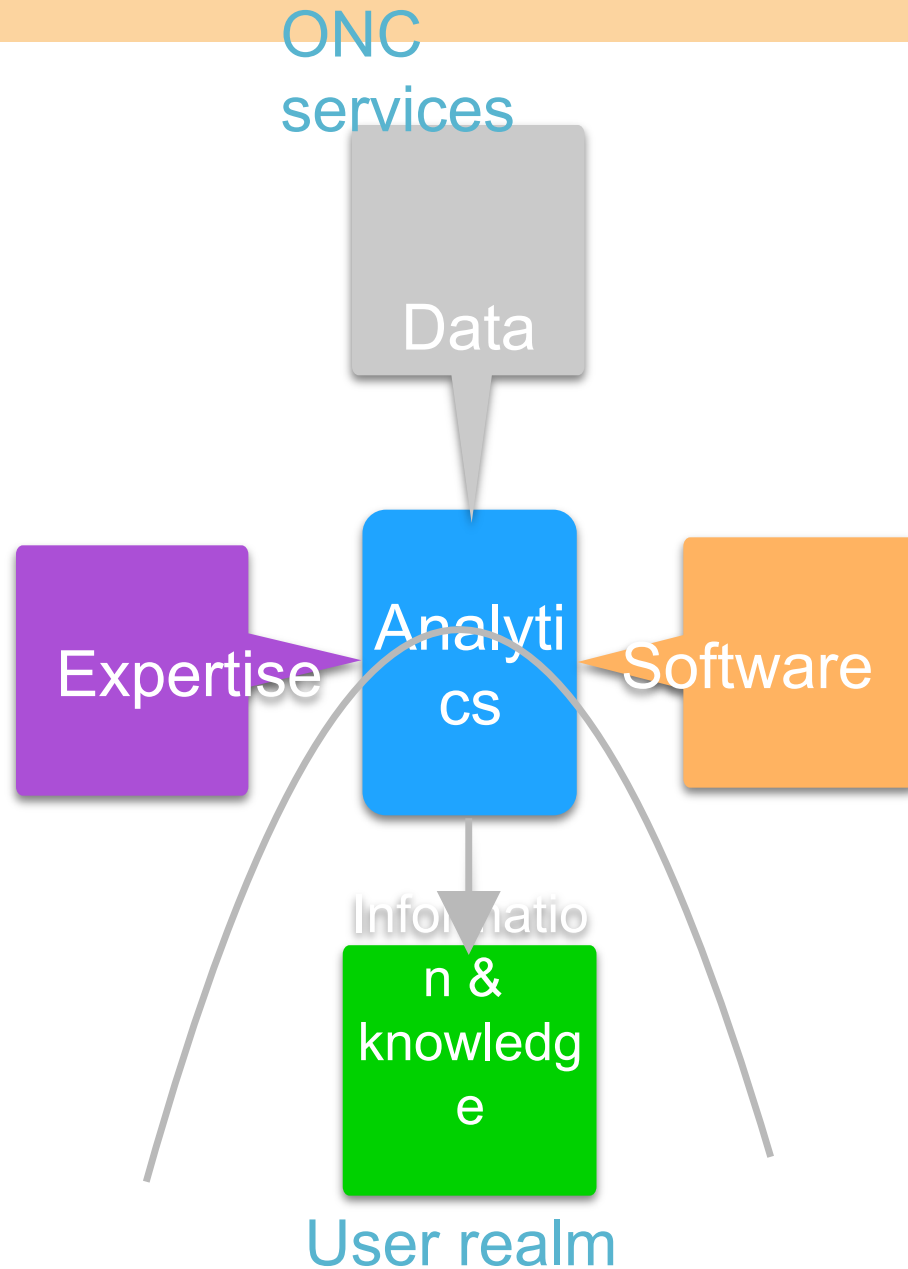
Data Stewardship (4)

- Data QA/QC
- Data annotation
- Overall metadata quality
- User support
- GIS

DI challenges

- ❖ Has to deal with a several science disciplines (few shared standards, different levels of data processing abilities)
- ❖ Has to deal with users for whom the data volumes are unheard of!



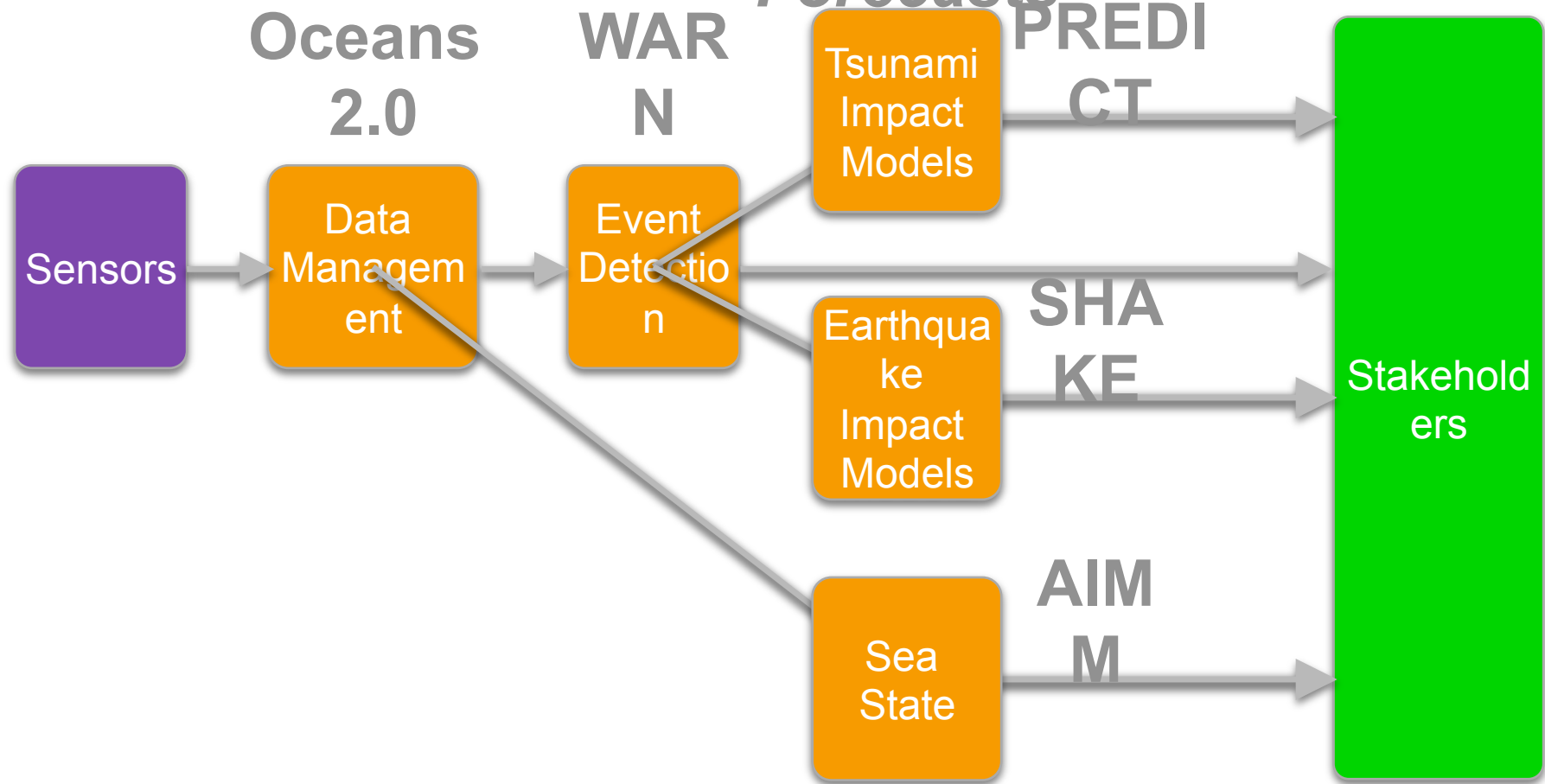


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Smart Ocean Systems™

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Localized Forecasts



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Thanks
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