IOOS® DMAC & OOI Cyber-infrastructure: COLLABORATION TO DATE

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[2] OOI-CI
[3] OOI-CI / ASA
[4] USGS
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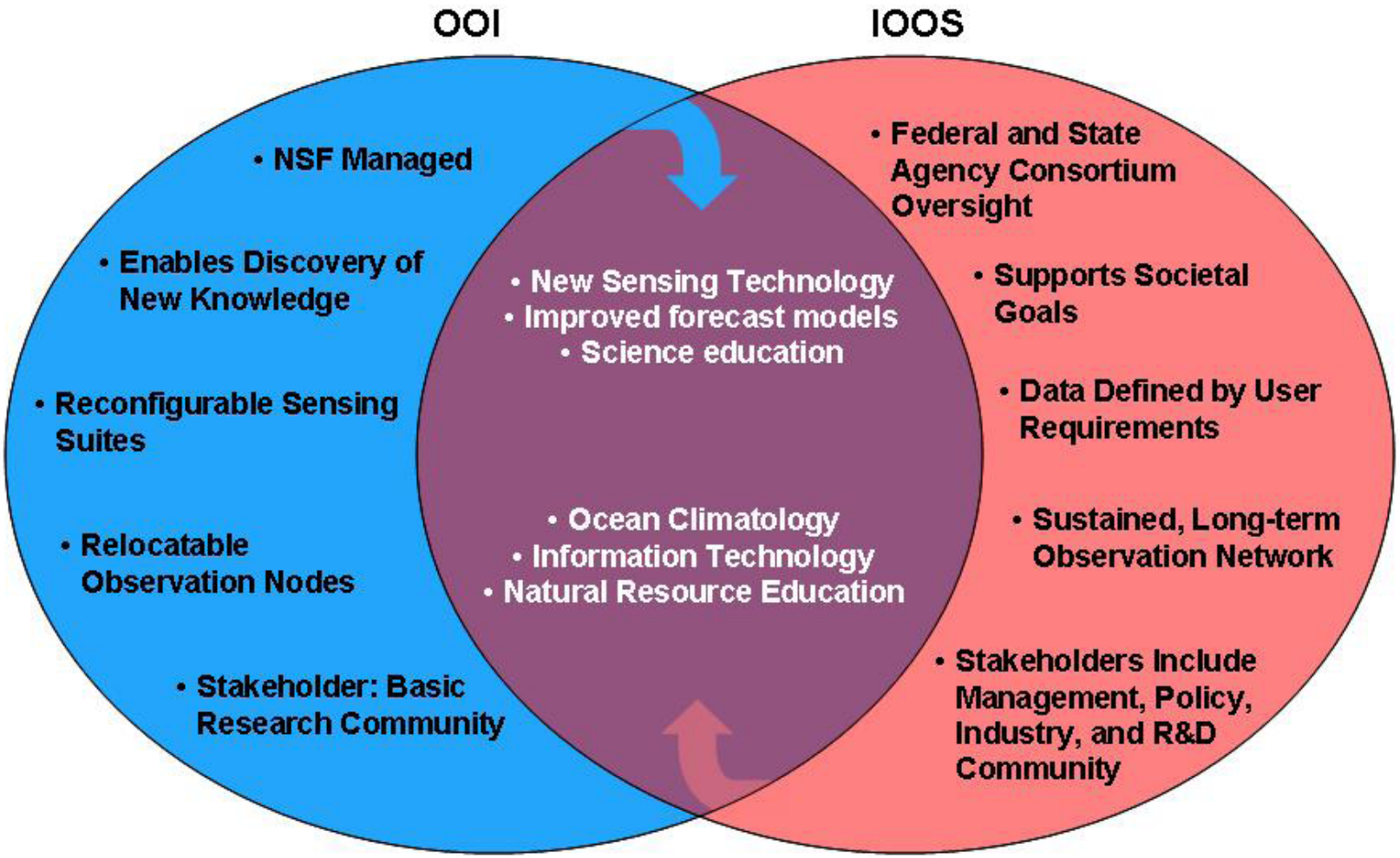
INTEGRATED OCEAN OBSERVING SYSTEM

IOOS®

OOI and IOOS



from July 2007 response to ORRAP

OOI and IOOS

	IOOS	OOI
Data	Driven by societal goals and must **routinely and continuously deliver data and data products** of known quality **in real time** to decision makers.	Governed by the needs of the research community, with **experimental data delivery in near-real time** ultimately leading to improved predictability of ocean processes in areas of societal need.
Sensors	Will depend on **highly reliable sensors** and data telemetry to ensure that critical data streams are not interrupted, as well as on operational models for making predictions with known levels of uncertainty.	Will provide the motivation and capability to try out **new, experimental sensors** and to develop new observing strategies that may eventually be adopted by the IOOS system once their reliability for routine operation is established.
Design	**Primarily stationary operational system**, designed to provide reliable operational data streams.	**Highly adaptive**, allowing scientists to respond to ocean events and control and adapt observatory assets and data streams to address new events.

OOI Science Mission

OOI Science Themes

Ocean-Atmosphere Exchange

Climate Variability, Ocean Circulation, and Ecosystems

Turbulent Mixing and Biophysical Interactions

Coastal Ocean Dynamics and Ecosystems

Fluid-Rock Interactions and the Subseafloor Biosphere

Plate-scale Ocean-Geodynamics

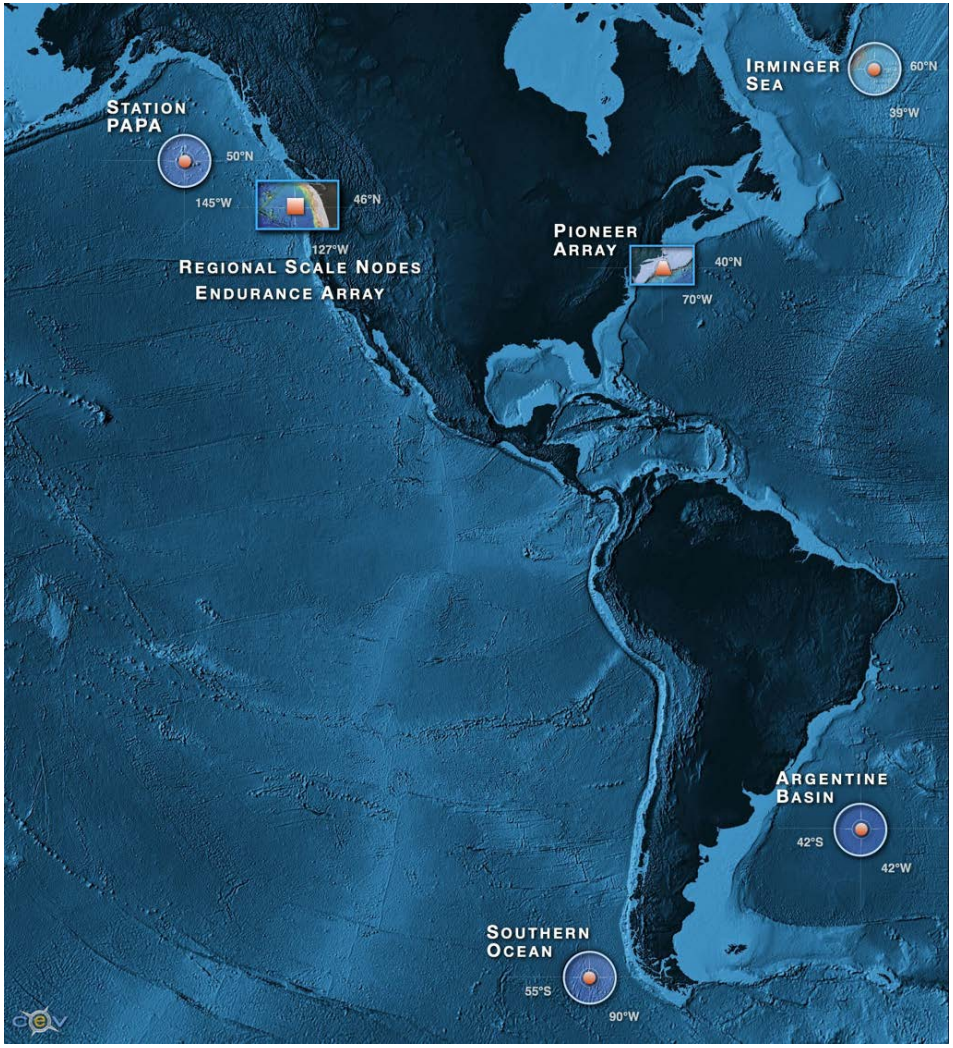
Additional Science Focus

Ocean ecosystem health

Climate change

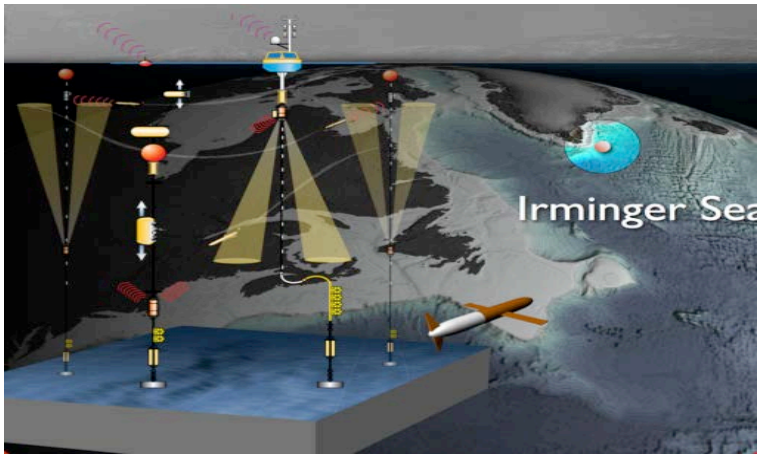
Carbon cycling

Ocean acidification



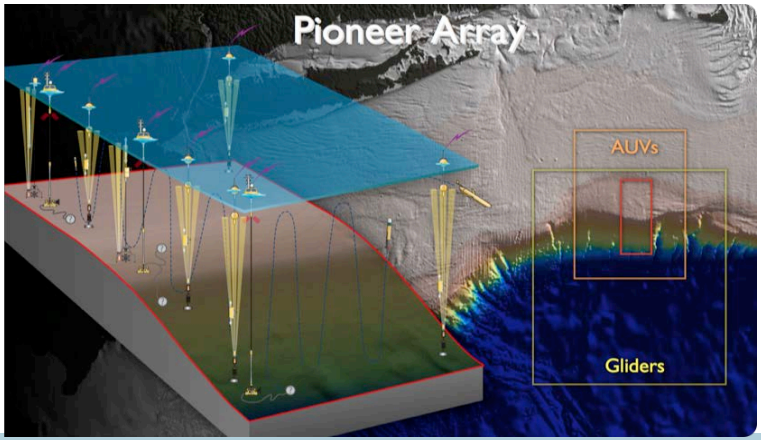
Marine Network Configurations

Global Array

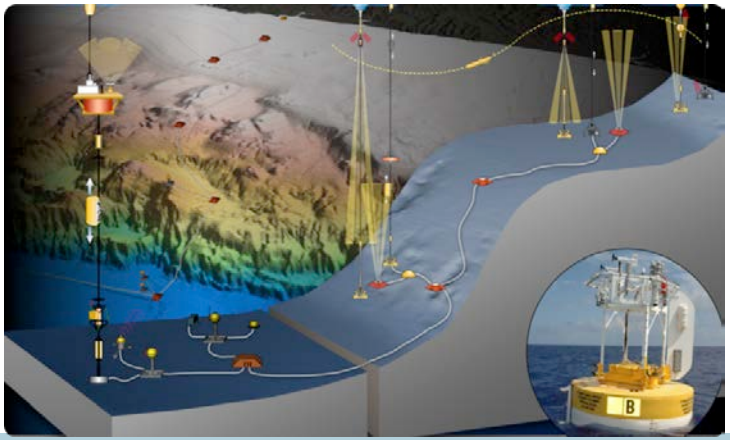


Regional Node

Coastal Array

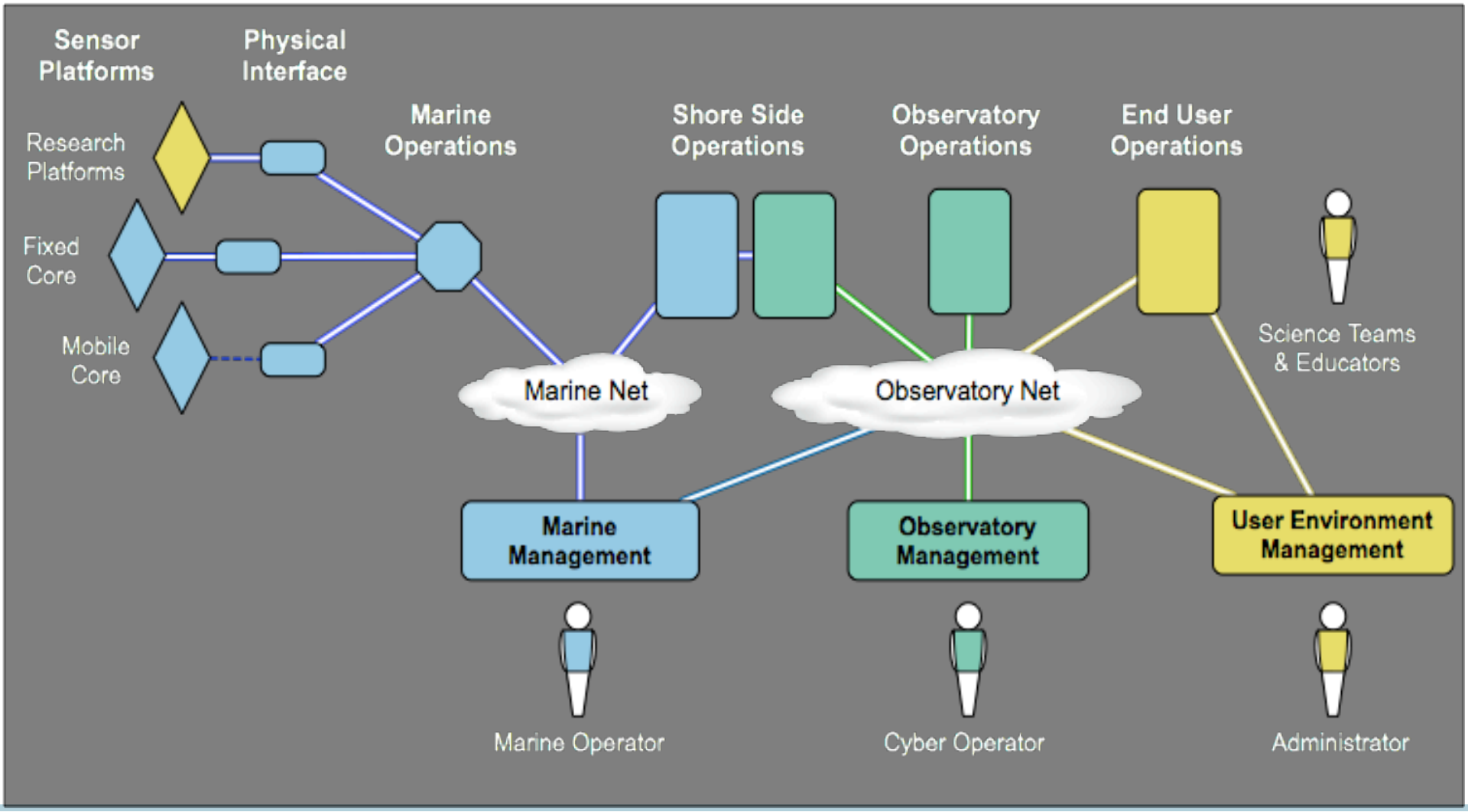


Regional Node + Coastal Array

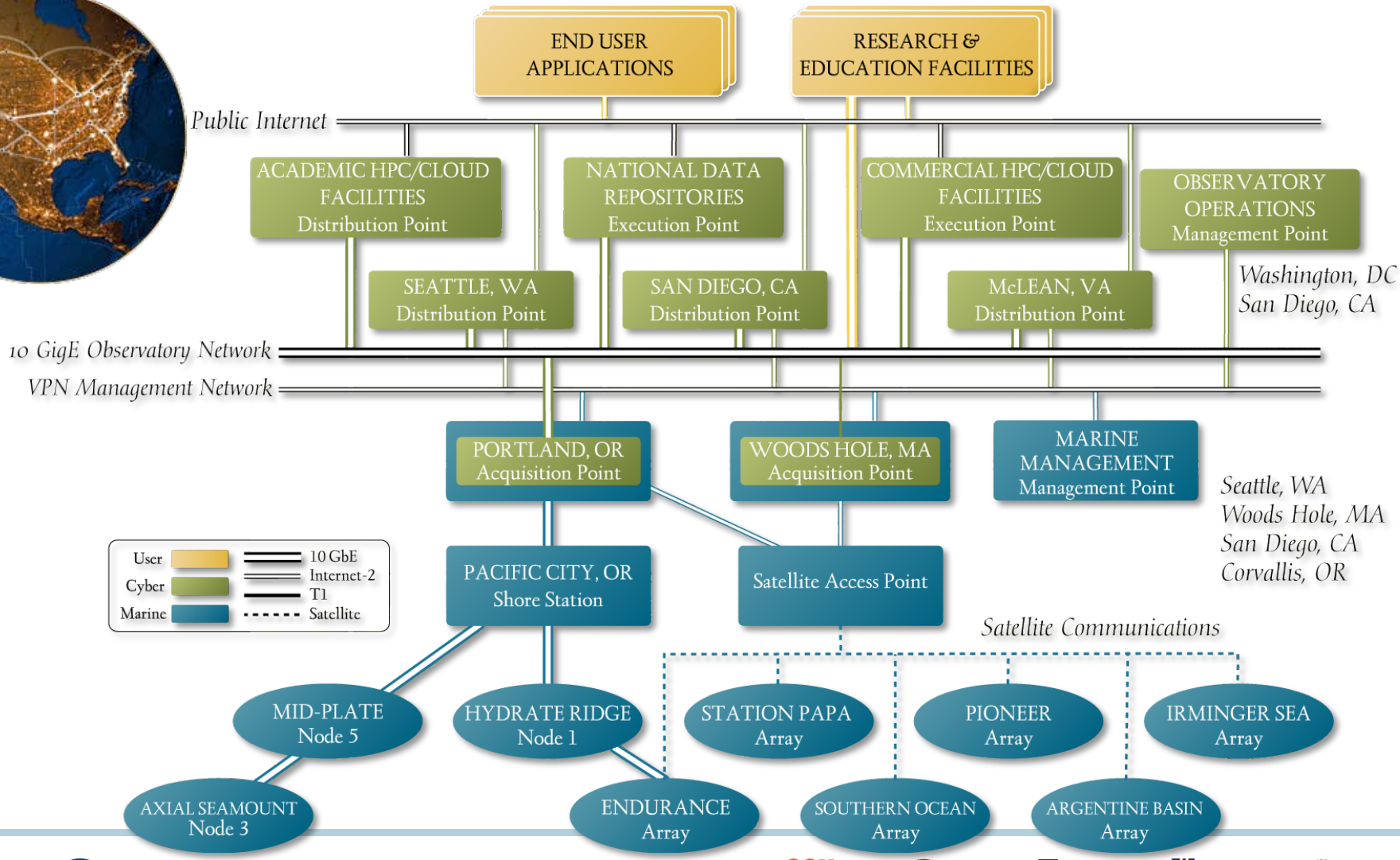


Role of Cyberinfrastructure

Federated Observatory Network

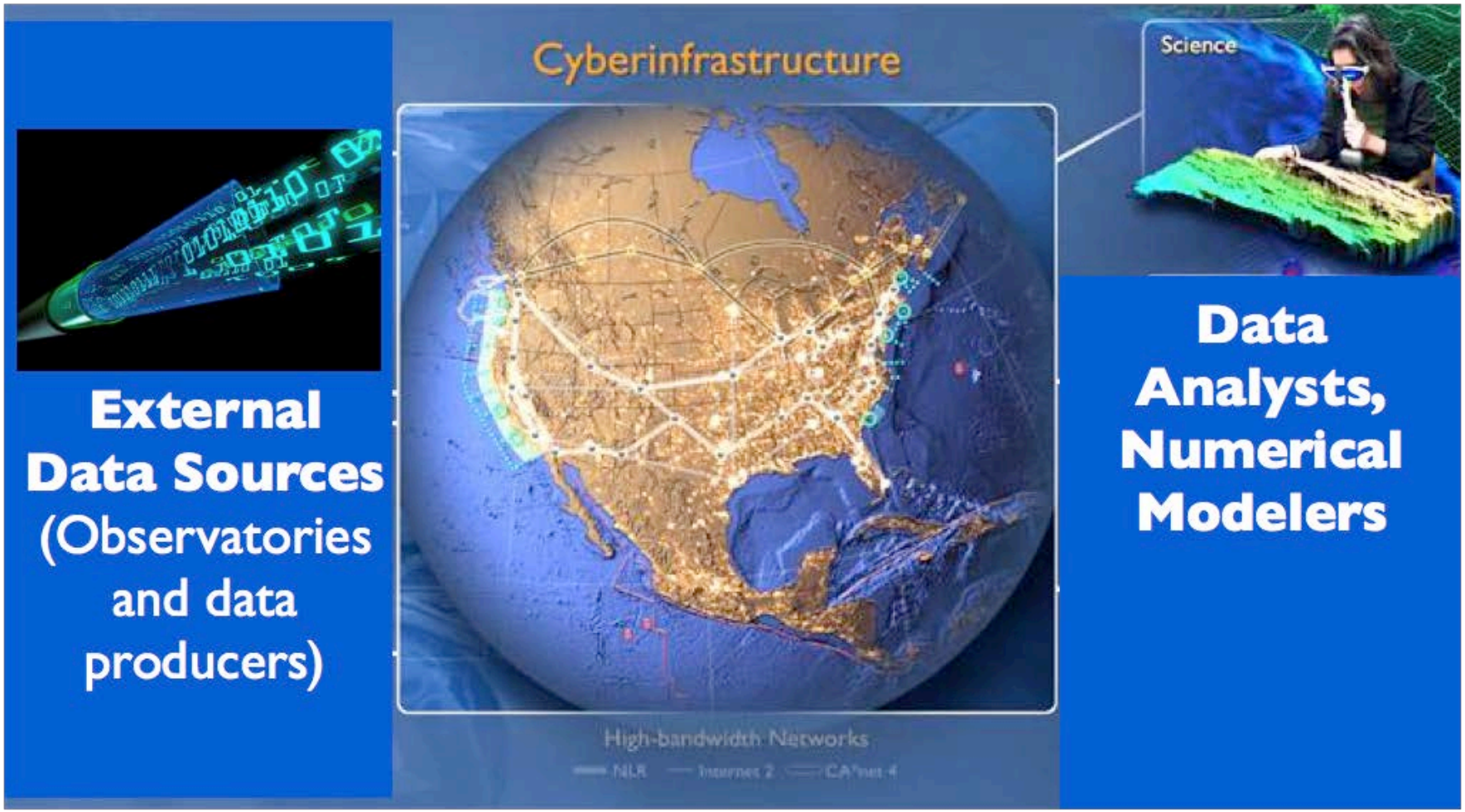


Network Deployment

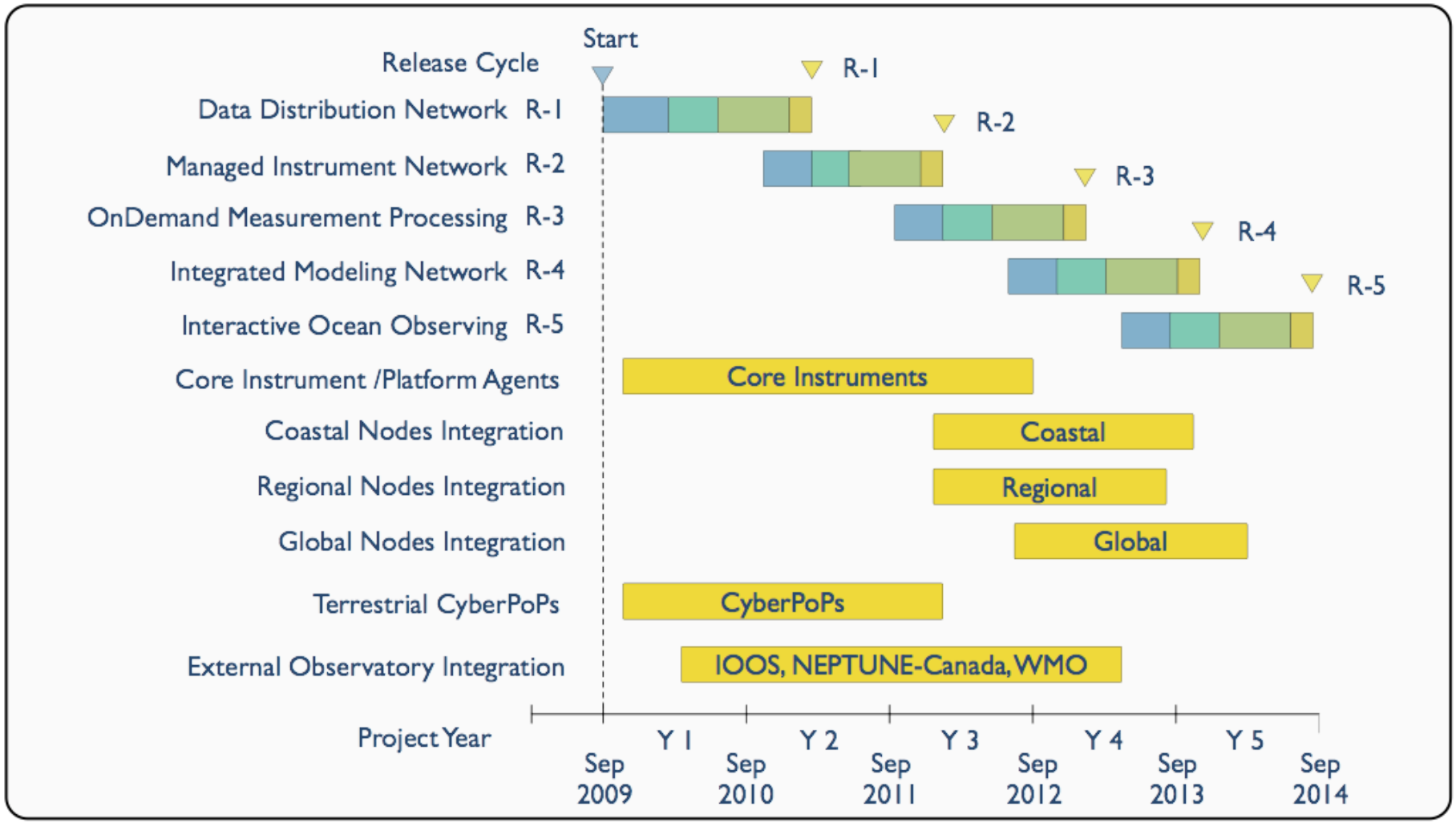


Cyberinfrastructure Plan

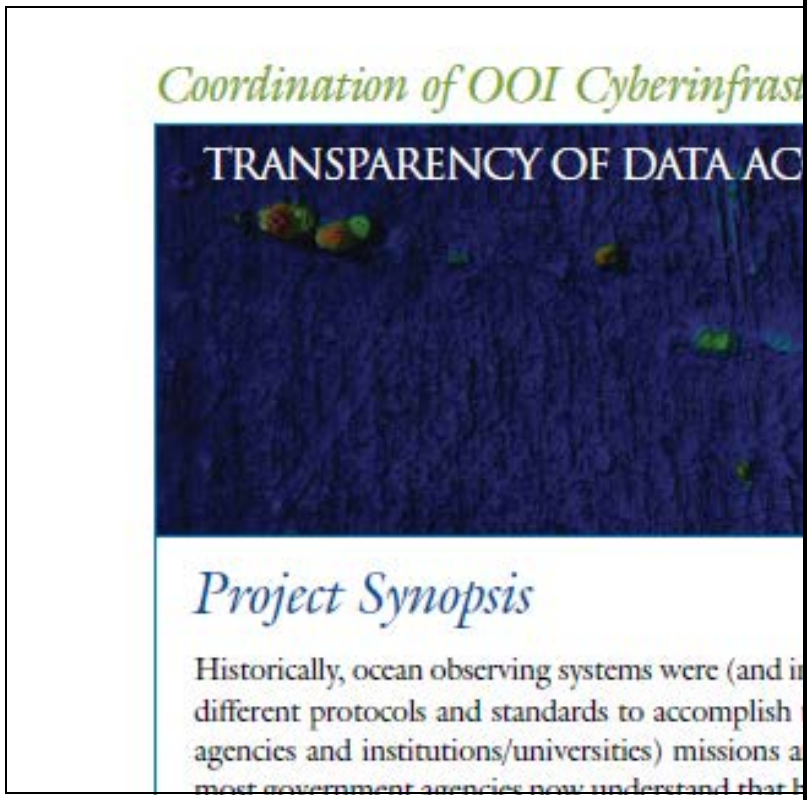
Release 1: Data Distribution Network



Cyberinfrastructure Schedule



Initial OOI – I



Orcutt/Vernon – 2007 grant proposal t

Serving Ocean Model Data on the Cloud

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Abstract- **The NOAA-led Integrated Ocean Observing System (IOOS) and the NSF-funded Ocean Observatories Initiative Cyberinfrastructure Project (OOI-CI) are collaborating on a prototype data delivery system for numerical model output and other gridded data using cloud computing. The strategy is to take an existing distributed system for delivering gridded data and redeploy on the cloud, making modifications to the system that allow it to harness the scalability of the cloud as well as adding functionality that the scalability affords.**

I. INTRODUCTION

The *Ocean Observatories Initiative (OOI)* [1] is an NSF-funded program to establish the ocean observing infrastructure of the 21st century benefiting research and education. It will start its 5-year construction period in September 2009, promising to deliver cyber and physical observatory infrastructure components as well as substantial core instrumentation to study a wide range of environmental processes during an operational period of 25 years or more.

The OOI comprises three types of interconnected observatories spanning global, regional and coastal scales. The global component addresses planetary-scale problems via a network of moored

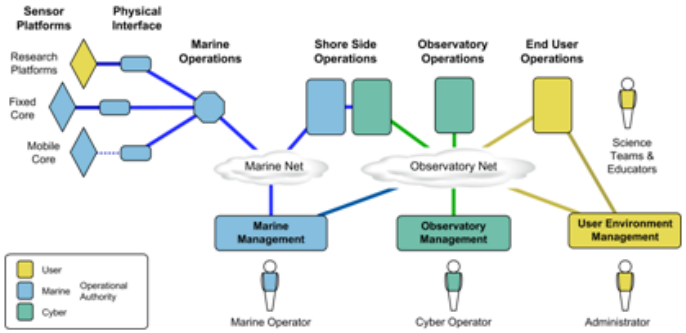
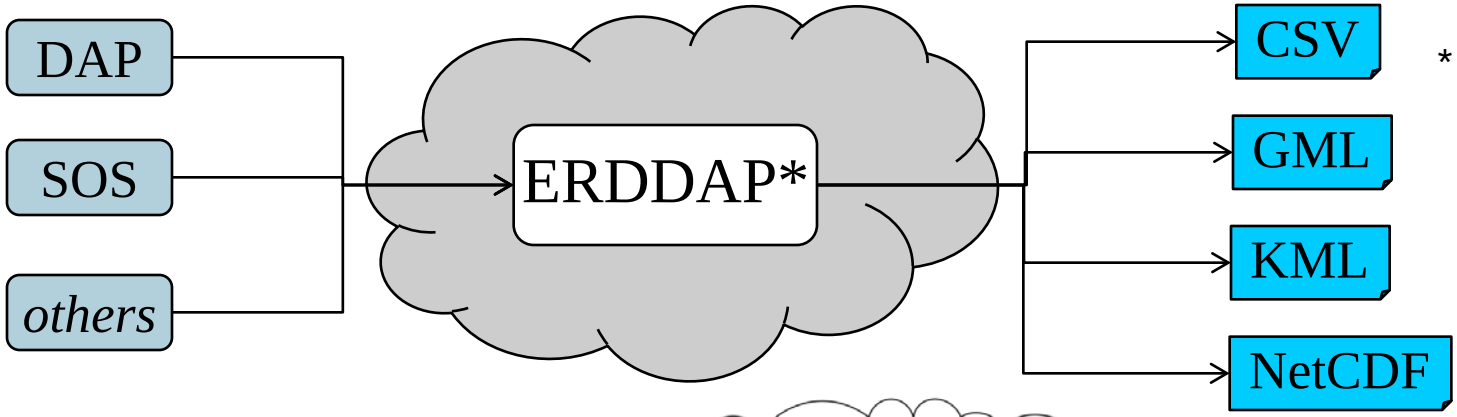


Fig. 1. OOI Data Distribution Network spanning multiple authority domains

2008 OOI – IOOS Collaboration

Scalable translation/visualization service in the cloud

Input formats & services ⇨ *translator* ⇨ *Output formats & services to meet user needs*



** ERDDAP = NOAA Environmental Research Division Data Access Program*

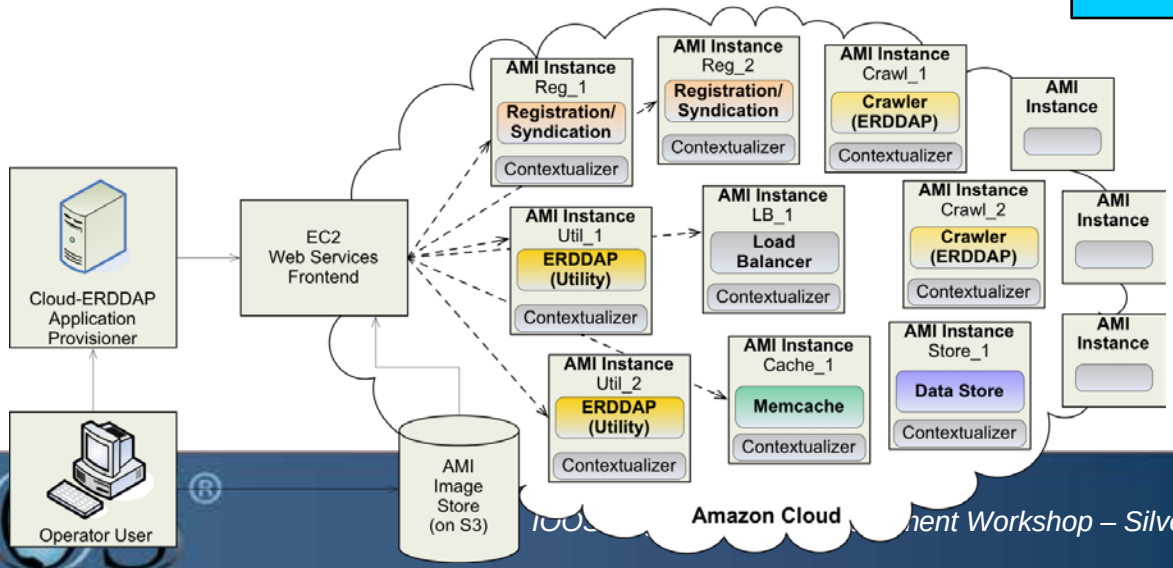


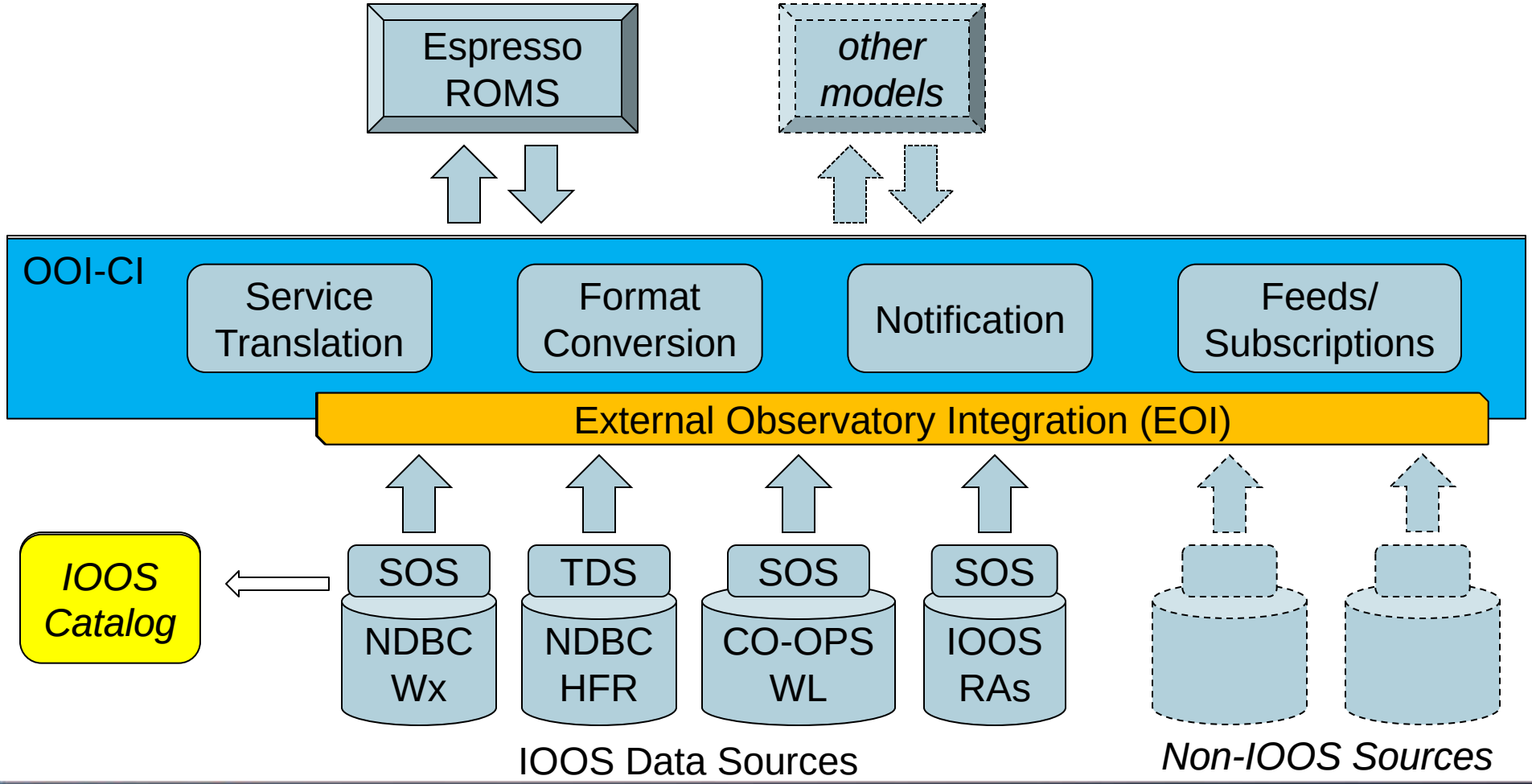
Figure from M. Arrott et al., Proc. MTS/IEEE Oceans 2009

2009 OOI – IOOS Collaboration

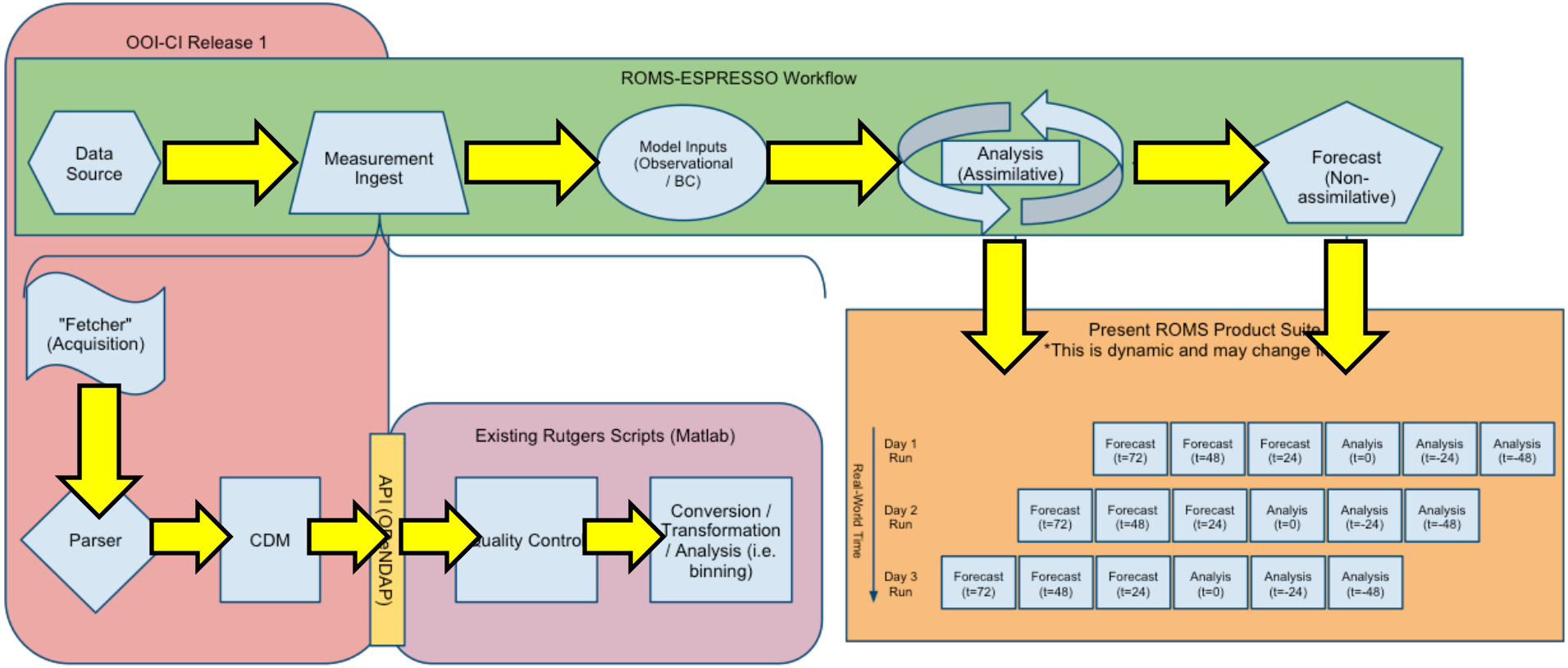
Scalable translation/visualization service in the cloud

2010 OOI – IOOS Collaboration

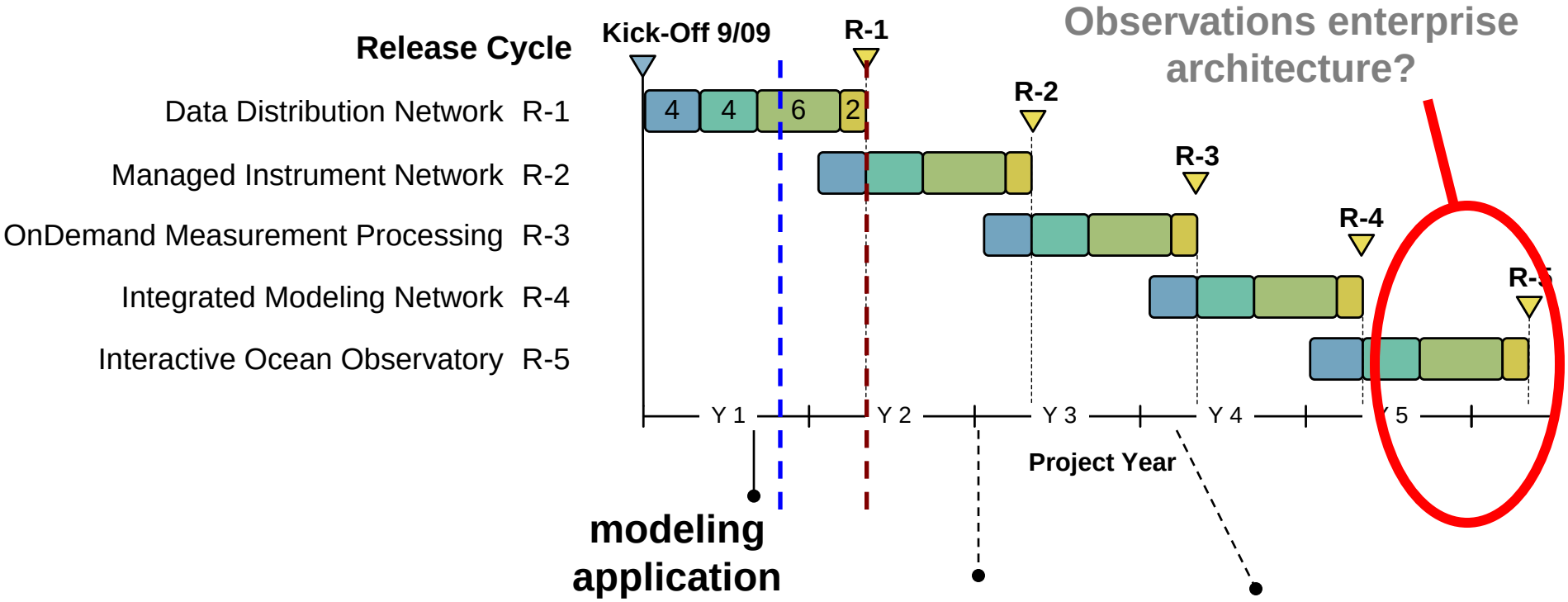
IOOS as external observatory feeding model customer via OOI



MARACOOS Integration Design



Next Steps



OOI-CI – IOO-DMAC collaborations for R1-3

Thank You

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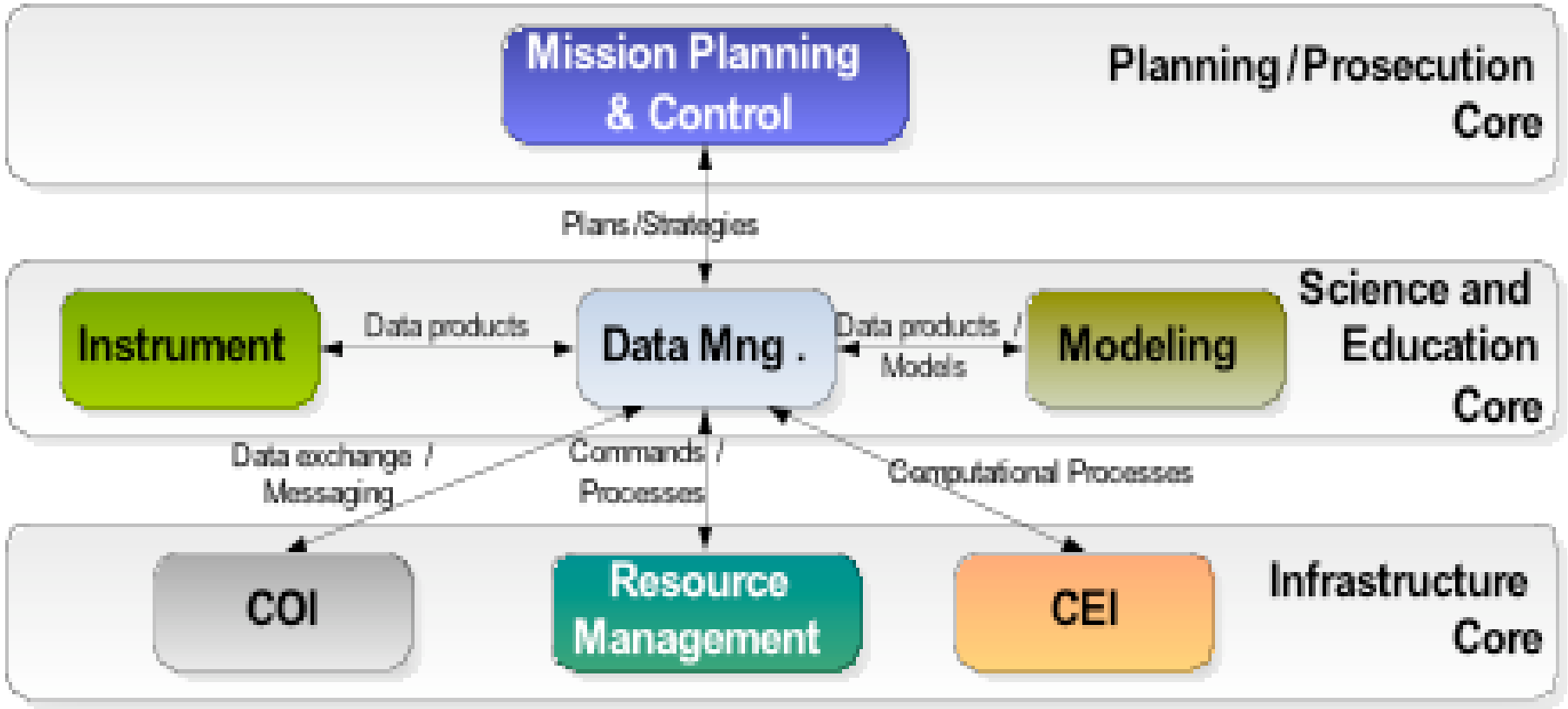
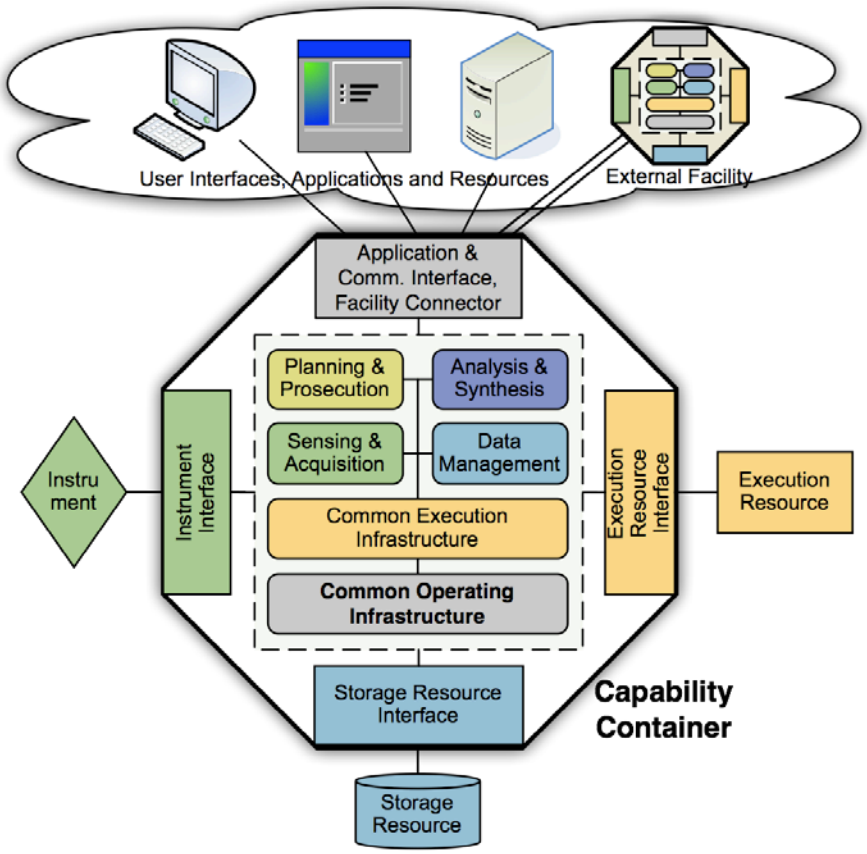
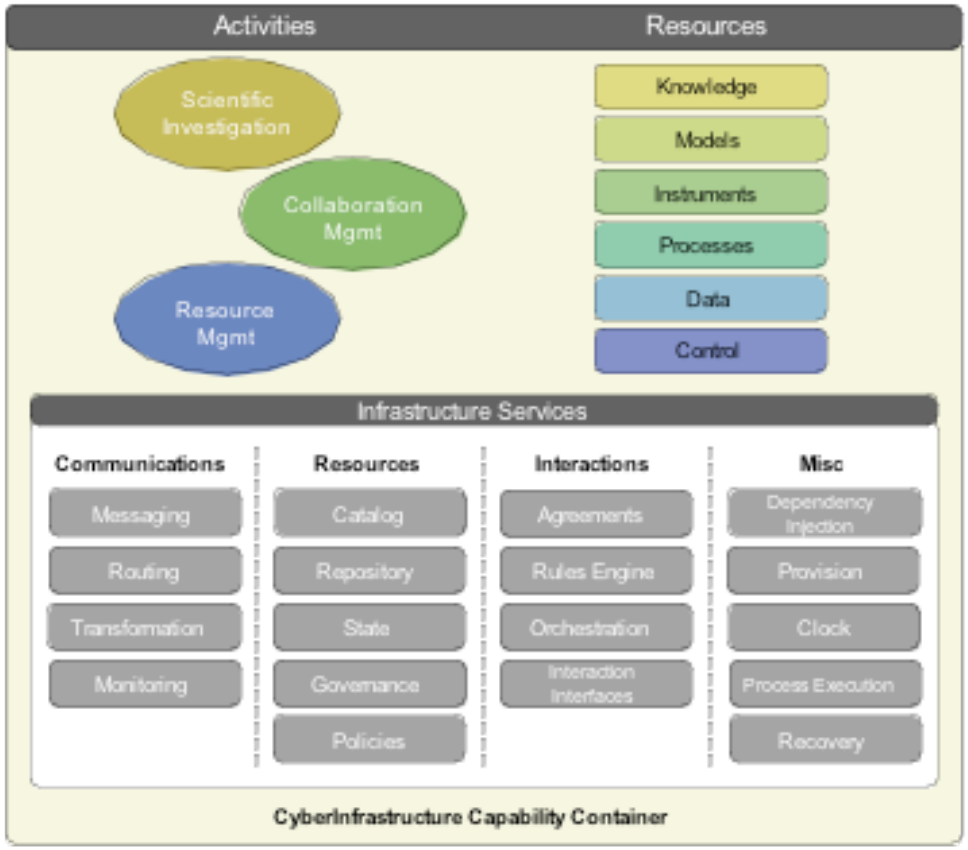
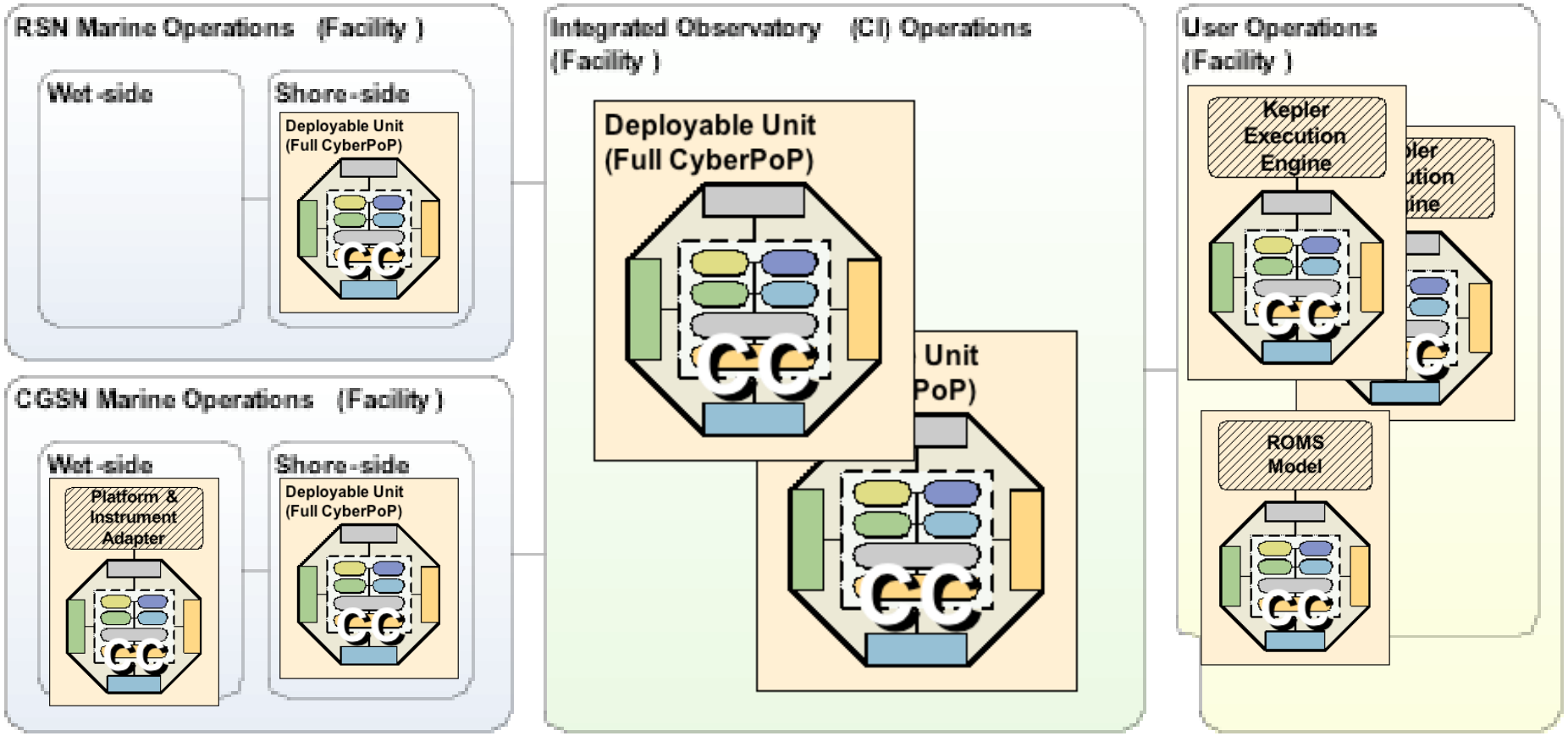
BACKUP SLIDES

Functional Architecture



Composable Functional Unit of Deployment





Distributed Functional Deployment