NOAA's Initiatives on the Blue Economy

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National Oceanic and Atmospheric Administration

Session**: 5**
7 December 2016

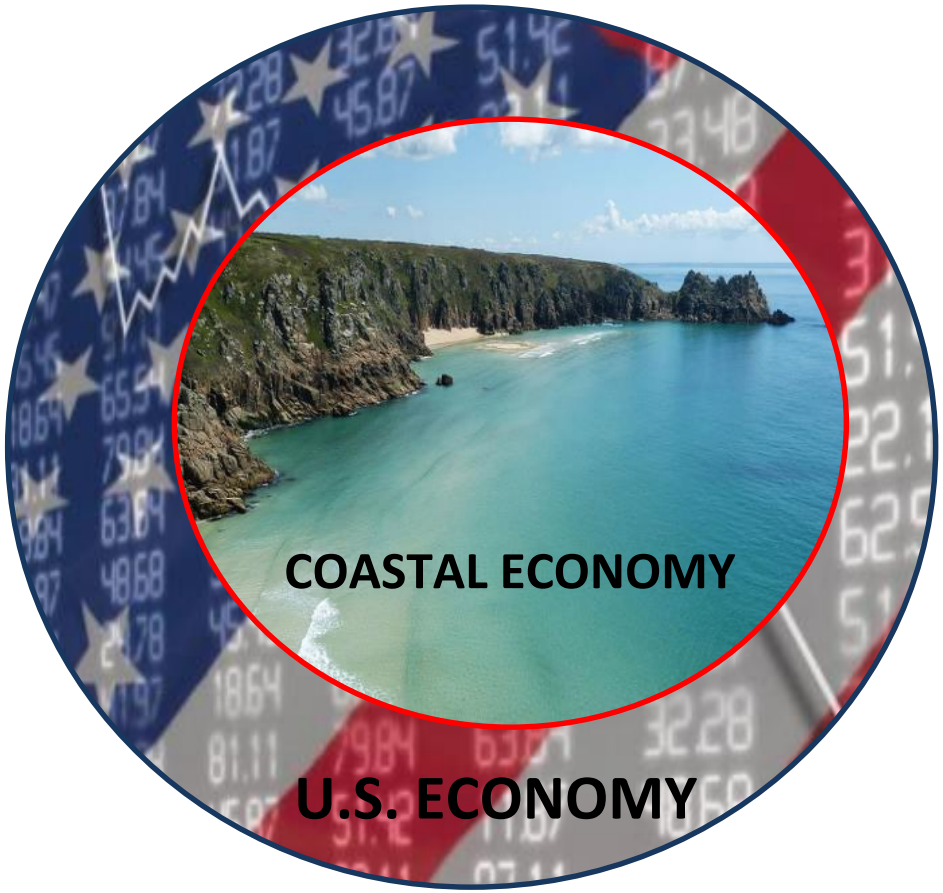
NOAA Current Initiatives

- Economics: National Ocean Watch (ENOW)
- Ocean Satellite Account
- *New Blue Economy*
- The Ocean Enterprise (IOOS)

The U.S. Economy

GDP = ~$17 TRILLION (2013)

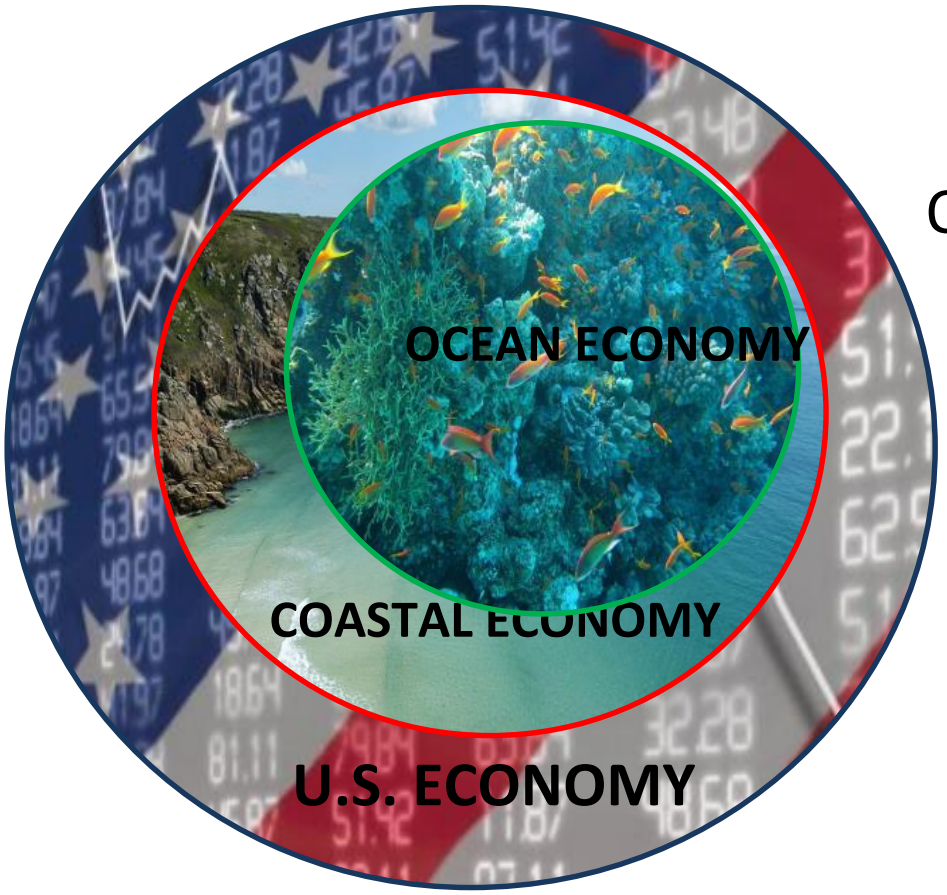
The U.S. Coastal Economy



TOTAL ECONOMY OF SHORE-ADJACENT COUNTIES

COASTAL GDP =~$8 TRILLION (2013)

The U.S. Ocean Economy



ECONOMIC ACTIVITIES USING OCEAN RESOURCES AS AN INPUT

OCEAN GDP = $359 BILLION (2013)

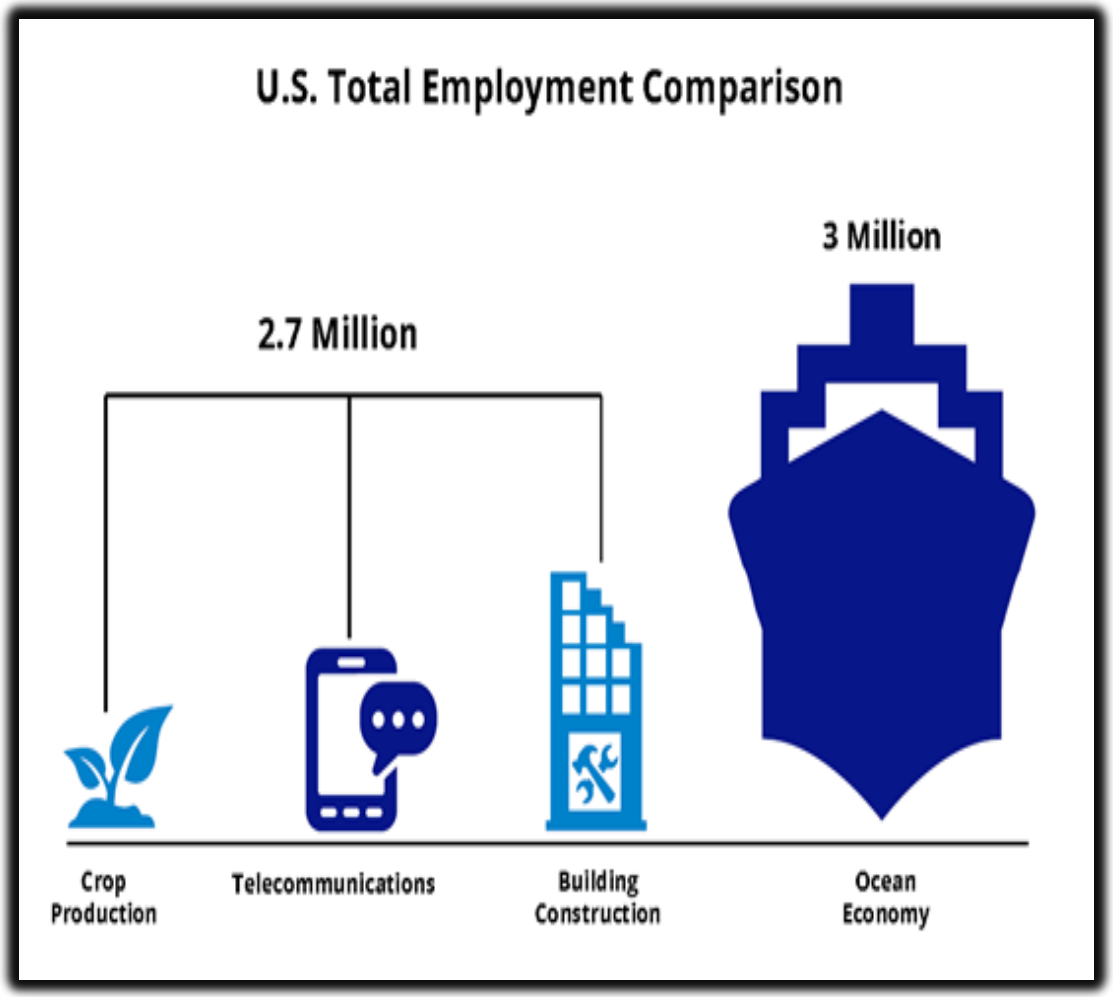
Economics: National Ocean Watch (ENOW)

Economics: National Ocean Watch (ENOW)

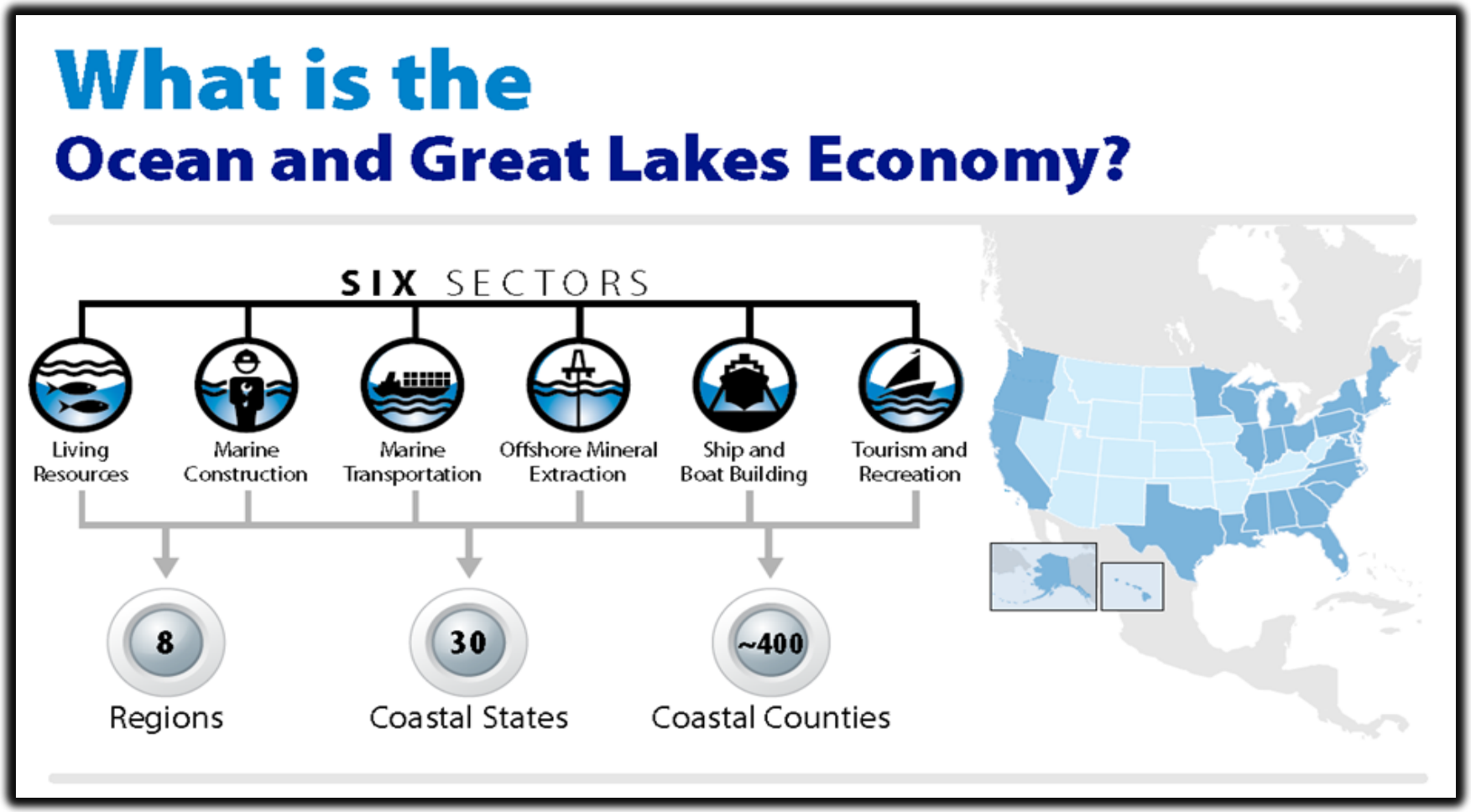
- Provides time-series data (2005- 2013) on the ocean and Great Lakes economy
- Includes six economic sectors dependent on the oceans and Great Lakes
- Available for counties, states, regions, and the nation in a wide variety of formats
- Updated annually

Economics: National Ocean Watch (ENOW)

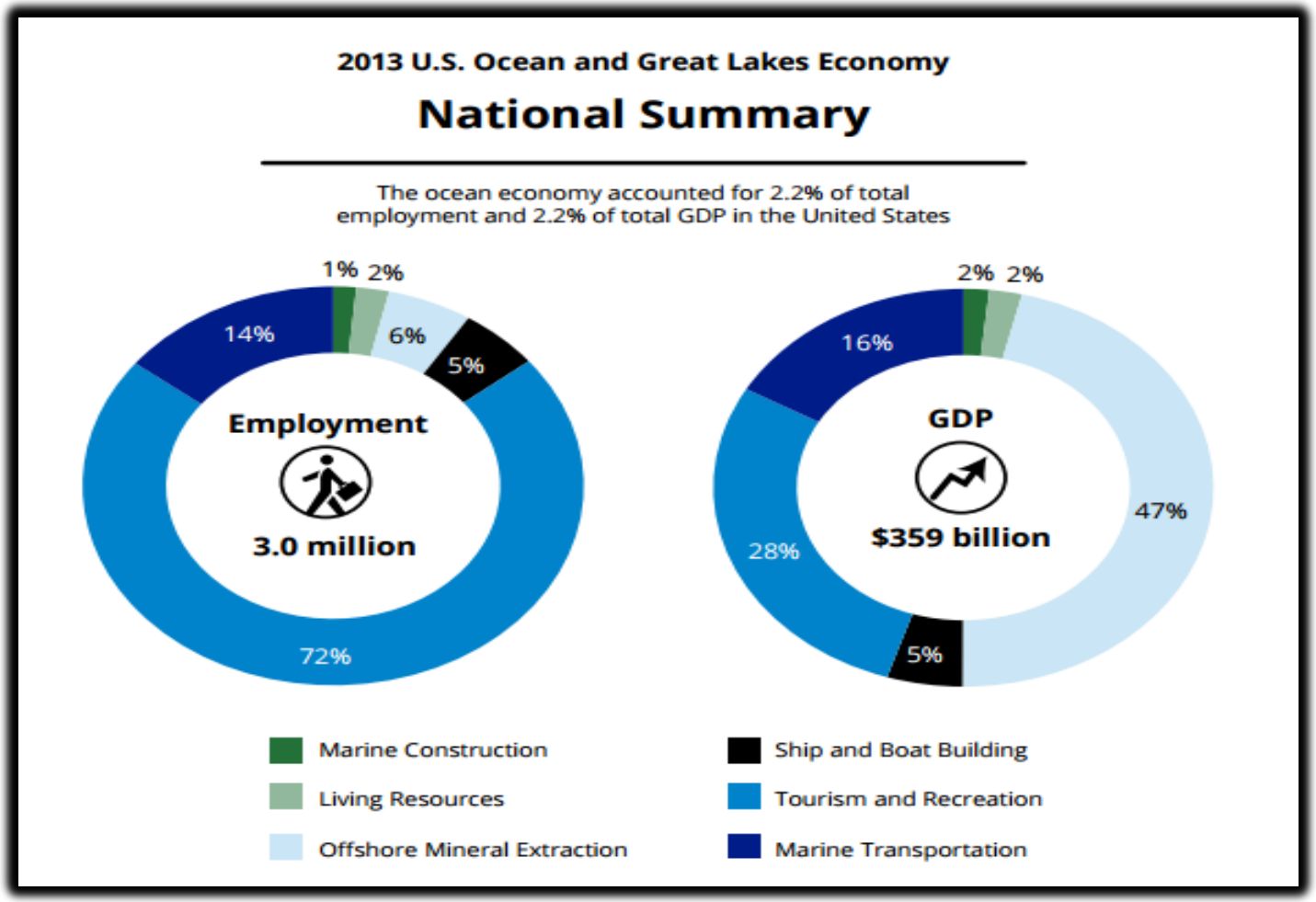
- INDICATORS
  - Establishments
  - Employment
  - Wages
  - GDP
  - Self-Employed Workers
  - Gross Receipts
- DATA SOURCES
  - U.S. Bureau of Labor Statistics (BLS)
  - U.S. Bureau of Economic Analysis (BEA)
  - U.S. Census Bureau



Economics: National Ocean Watch (ENOW)



ENOW – Employment and GDP



ENOW Quick Stats

- In 2013, the U.S. ocean economy accounted for:
  - 149,000 business establishments
  - 3 million employees and $117 billion in wages
  - $360 billion in goods and services
- In 2013, employment in the ocean economy increased 3% (adding 87,000 jobs). The national average employment growth was 1.7%.
- Half the jobs in the living resources sector are held by self-employed workers

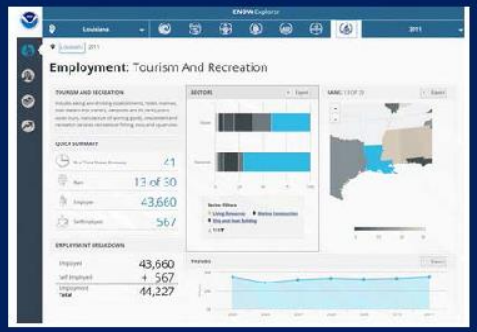
Accessing ENOW Data

See

Ocean Jobs Snapshot

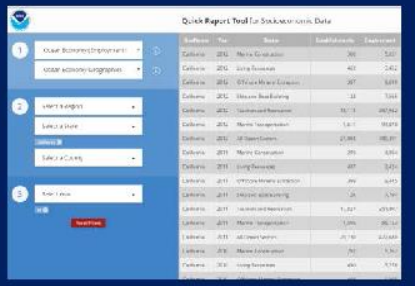
Story Maps

Interact



ENOW Explorer

Get



Quick Report Tool

www.coast.noaa.gov/digitalcoast/data/enow

ENOW and the Insular Economy

2016 Ocean Economy of US Caribbean Territories

Basic ENOW Framework + Local Data (*e.g., labor department, fishing cooperatives, individual businesses*)

+ Additional Industries (*e.g., retail, airline service, taxis*)

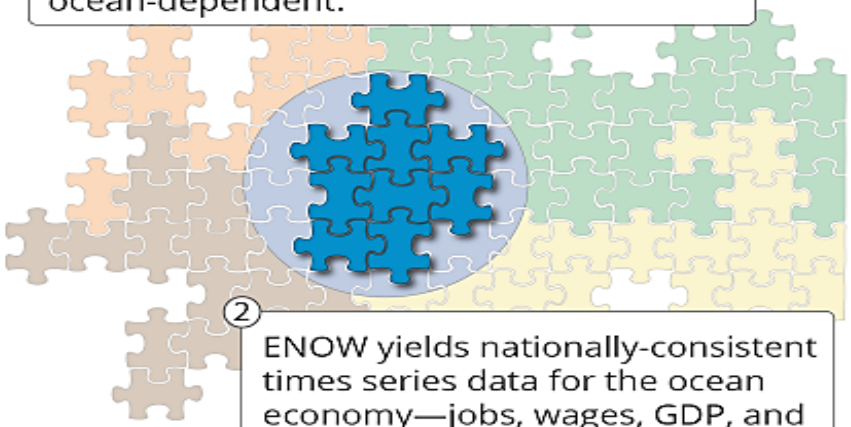
Location	Employment	
	Basic ENOW Framework	ENOW + Industries and Local Data
U.S. Virgin Islands	6,700	10,700
Puerto Rico	66,700	155,700

U.S. Ocean Satellite Account

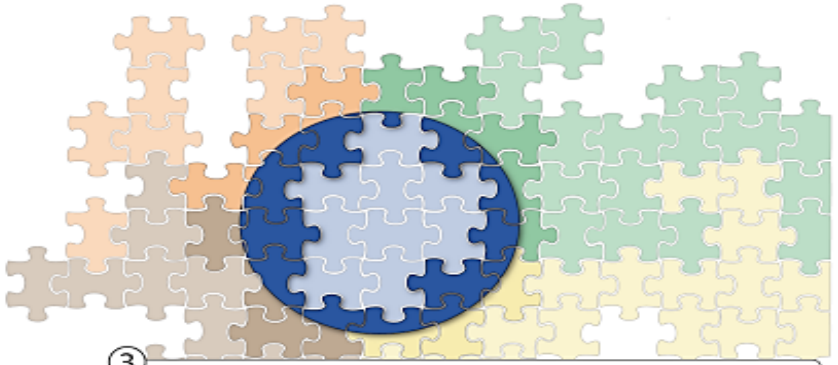
U.S. Ocean Satellite Account

Enhancing our Ocean Economy Data

1. NOAA's Economics: National Ocean Watch (ENOW) data aggregate statistics for about 50 classes of economic activity that are ocean-dependent.

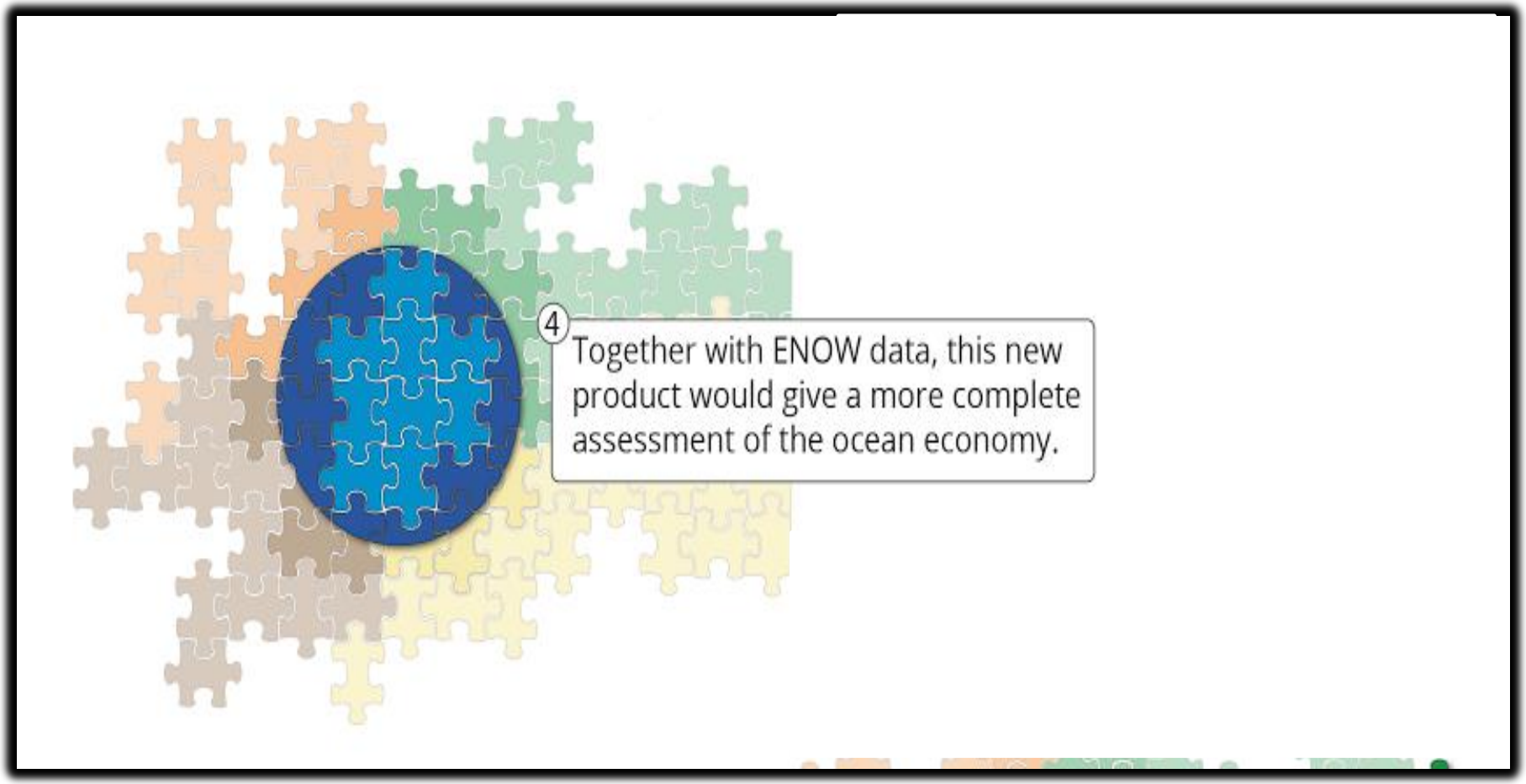


2. ENOW yields nationally-consistent times series data for the ocean economy—jobs, wages, GDP, and the number of business establish-ments.

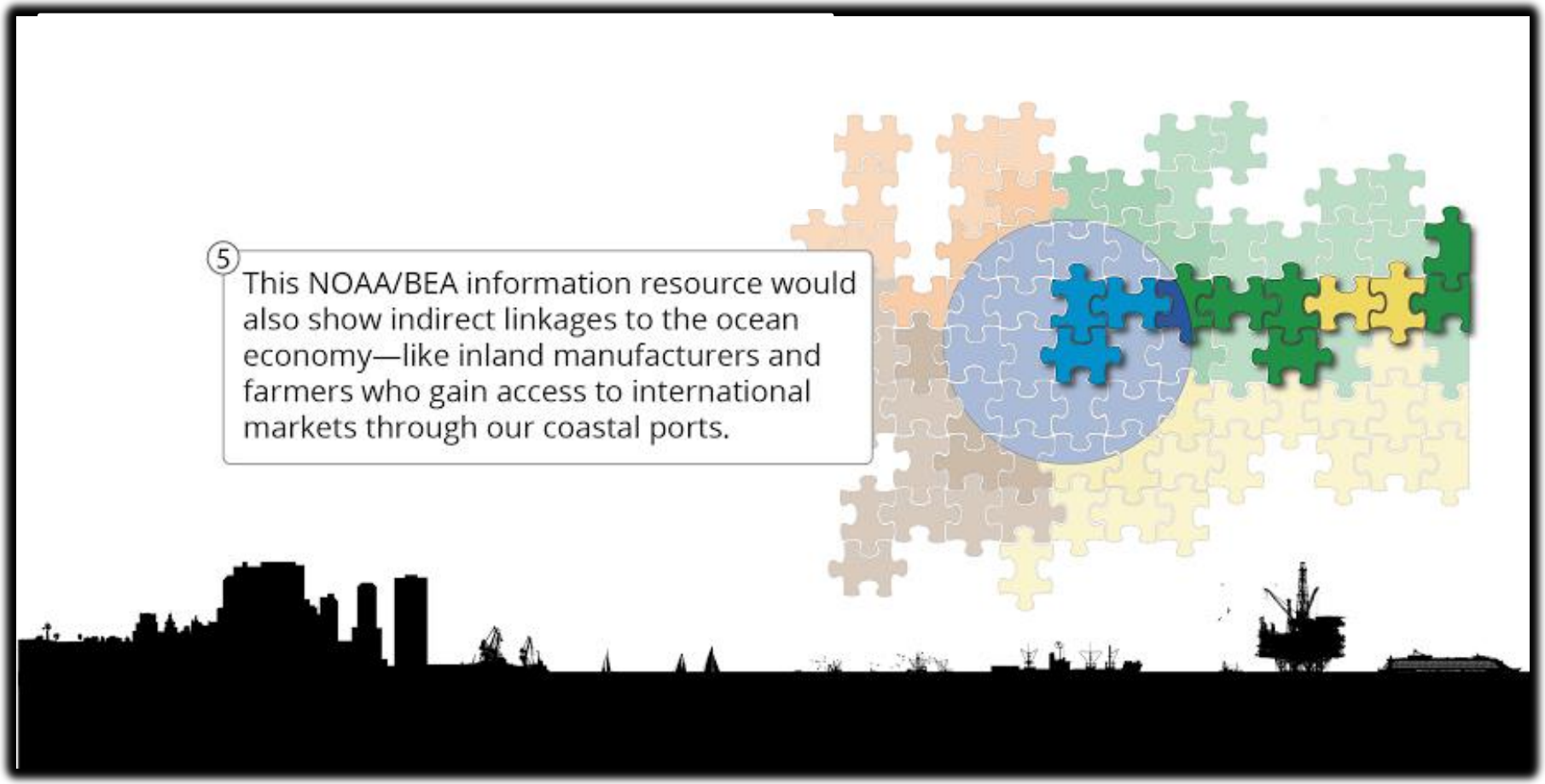


3. NOAA and the Bureau of Economic Analysis (BEA) are discussing plans to expand our understanding of the ocean economy, allowing us to include data for economic classes where only part of the activity is linked to the ocean.

U.S. Ocean Satellite Account



U.S. Ocean Satellite Account



The *New* Blue Economy


NEW BLUE ECONOMY
Extant.....Emerging.....Hidden
The new blue economy is a knowledge-based economy, looking to the sea not for extraction of material goods, but for data and information to address societal challenges and inspire their solutions.

What's Needed

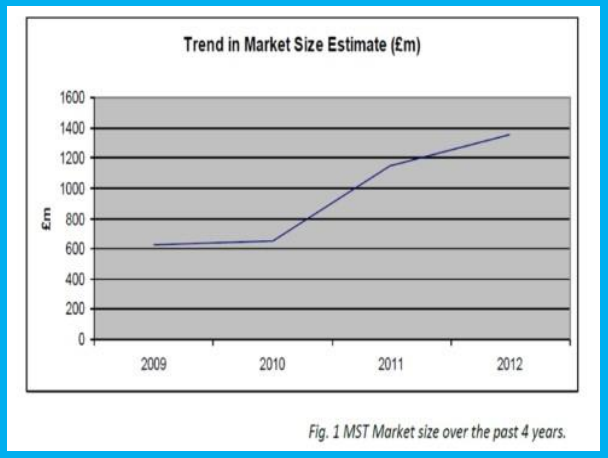
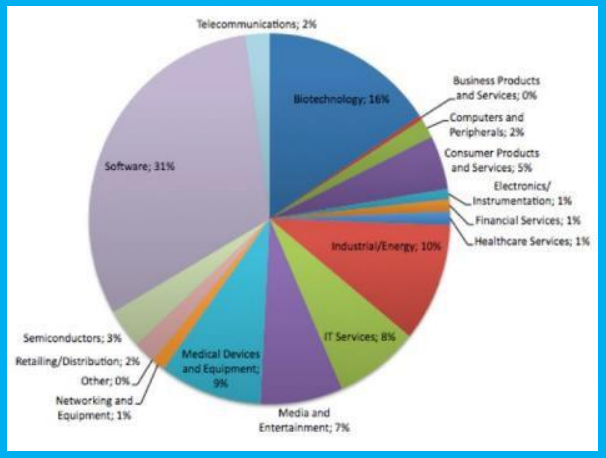


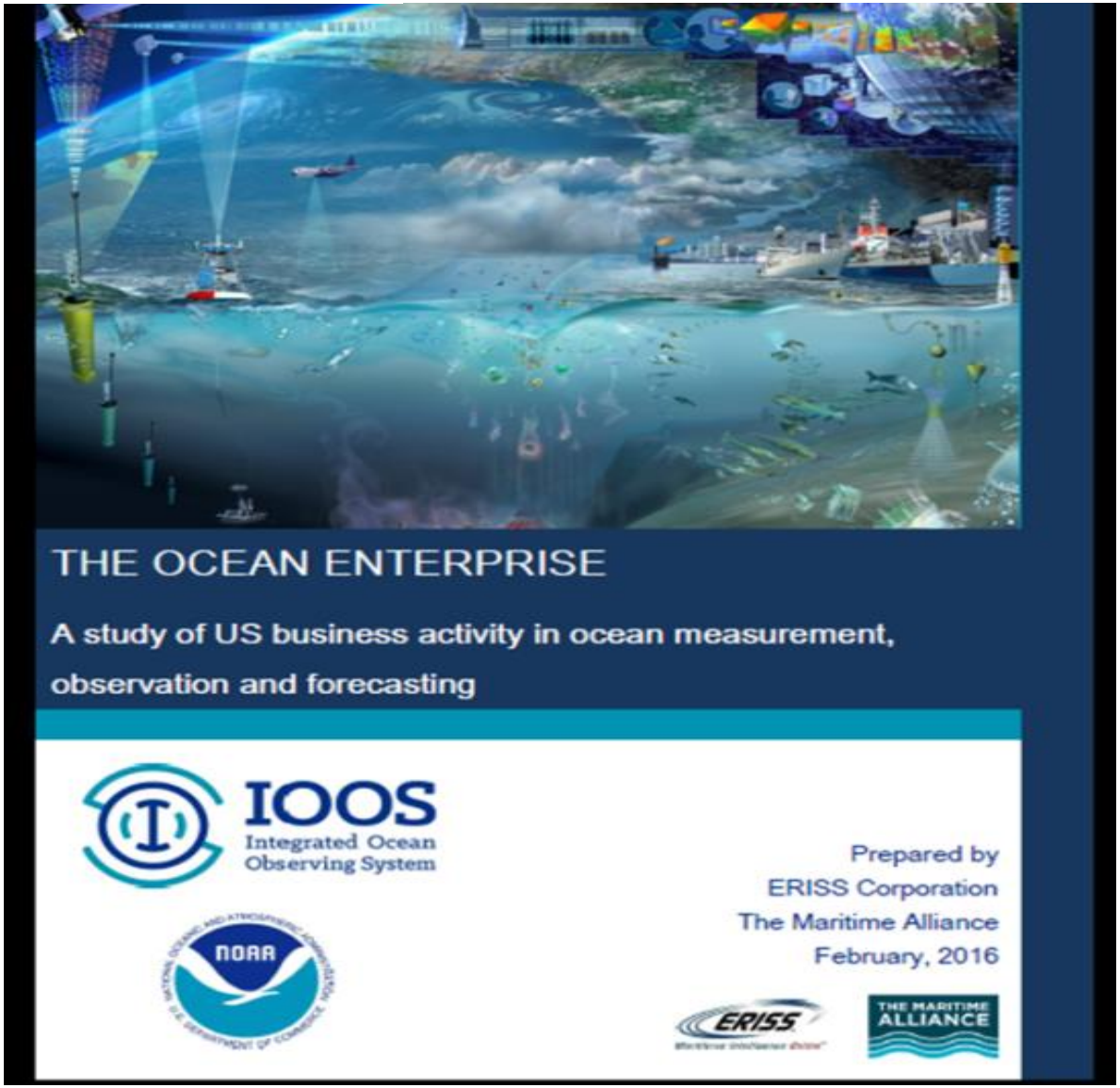
Fig. 1 MST Market size over the past 4 years.



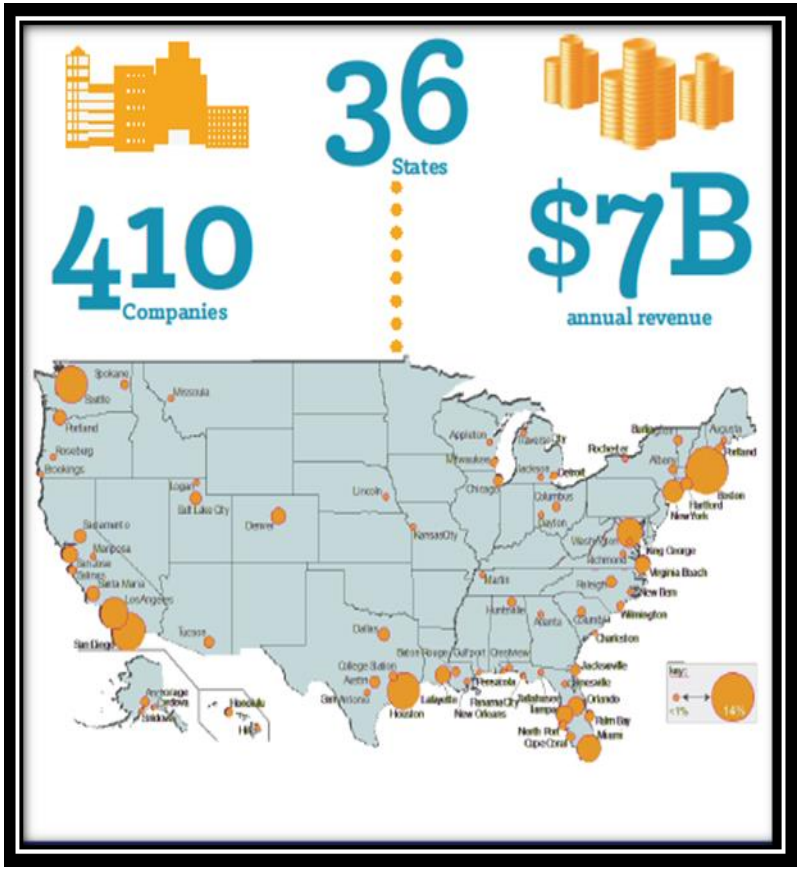
OBSERVATIONS and TOOLS

MARKET and RISK ANALYSIS

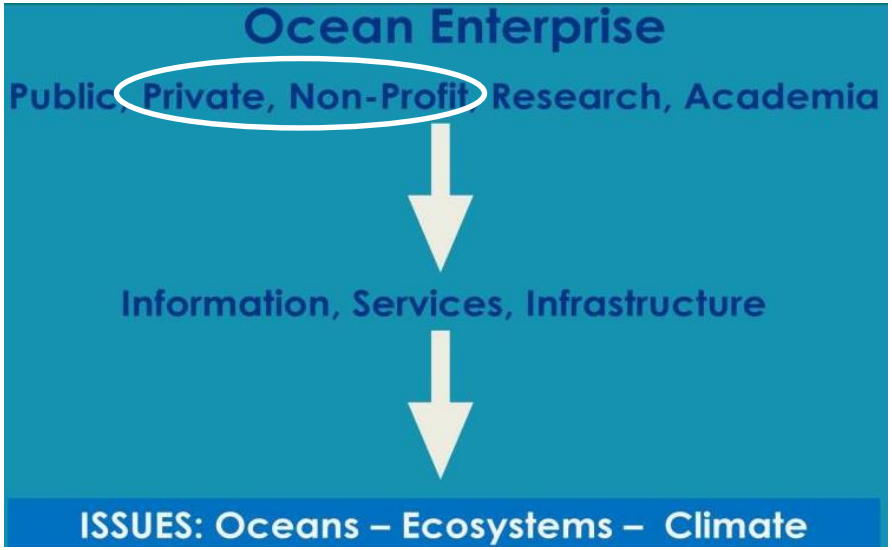
CAPITAL INVESTMENT


THE OCEAN ENTERPRISE
A study of US business activity in ocean measurement, observation and forecasting
IOOS
Integrated Ocean Observing System
NOAA
Prepared by
ERISS Corporation
The Maritime Alliance
February, 2016
ERISS
THE MARITIME ALLIANCE

The Ocean Enterprise - Study



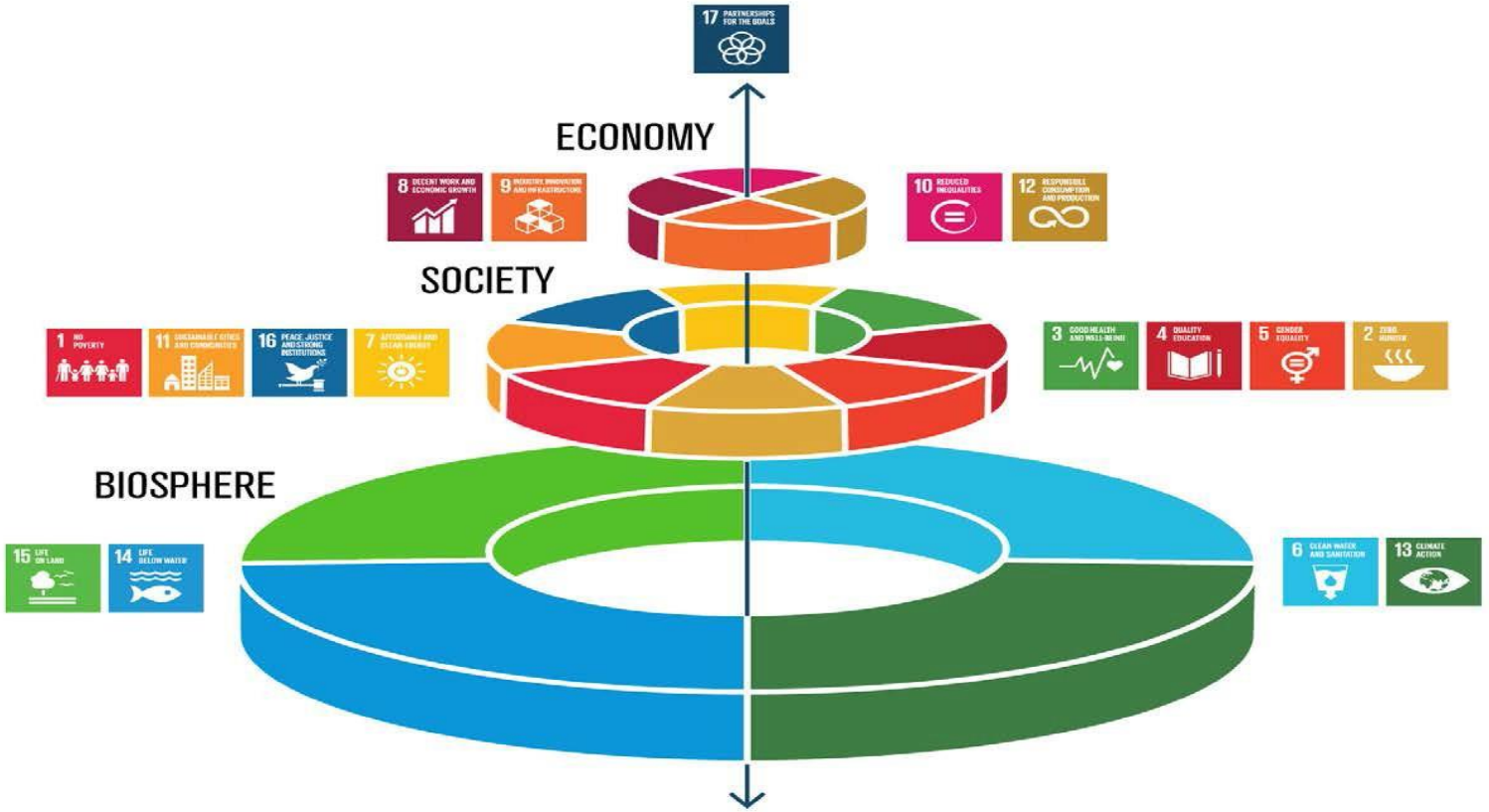
Objective:
Determine the breadth and value of the U.S. Ocean Observation Enterprise



The Ocean Economy in the National Income Accounts, 2015[1]-2016[2] Studies

	China	US: NOEP/ ENOW	Canada	U.K.	France	Spain	Ireland	Australia	South Korea	Philippines	PEMSEA	MARNET	OECD
Marine Fishery													
Offshore Oil and Gas Industry													
Ocean Mining Industry													
Shipbuilding Industry													
Engineering & Construction													
Communication & Transportation													
Coastal Tourism													
Marine science research													
Marine Education													
Marine Management/ Pub Admin/Defense													
Marine Electric Power Industry													
Ocean-related Services													
Marine insurance and social security industry													
Marine technology services													
Marine Environment Monitoring and Prediction services													
Marine Geologic Exploration Industry													
Marine environmental protection industry													
Marine social and international organizations													
Marine Agriculture, Forestry Industry													
Ocean-related products and materials manufacturing													
Ocean-related construction and installation industry													
Marine Wholesale and Retail Industry													
Marine Chemical Industry													
Seawater Utilization Industry													
Marine Information Services													
Marine Salt Industry													
Marine Biomedicine Industry													
Marine Safety and Surveillance													
Marine equipment Industry													

The Blue Economy and SDGs



Source: Johan Rockstrom & Pavan Sukhdev, "EAT", Stockholm 2016
https://stockholmuniversity.box.com/s/qg1d4xmahk3n2rjl2dj1x0do4y7t1ju4

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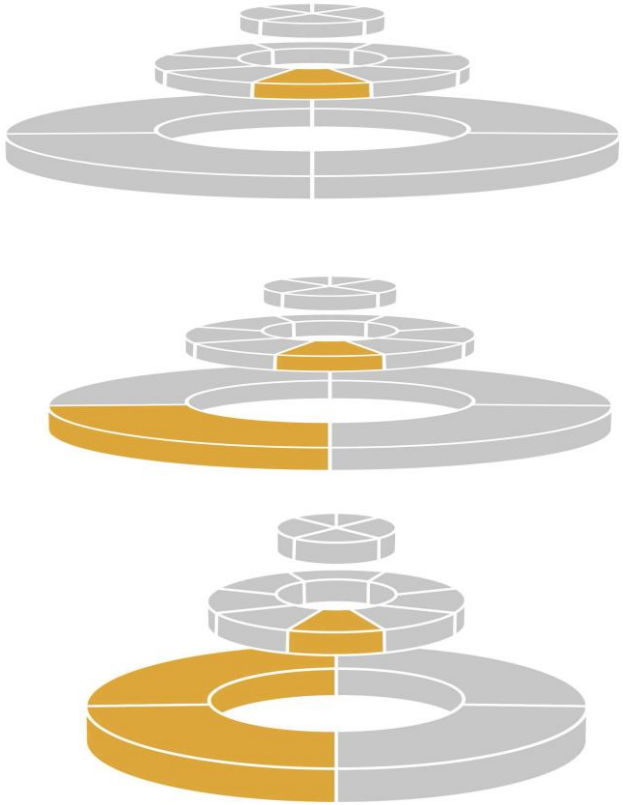
(WEBSITE) http://www.performance.noaa.gov/economics/

Extra Slides

The Blue Economy and SDGs



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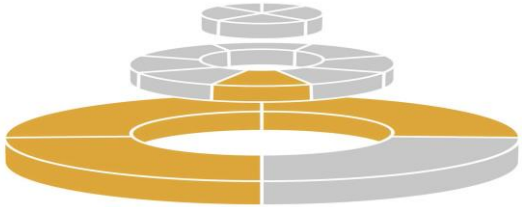

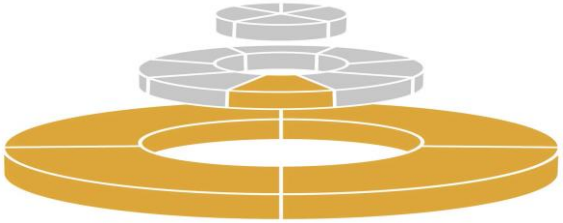

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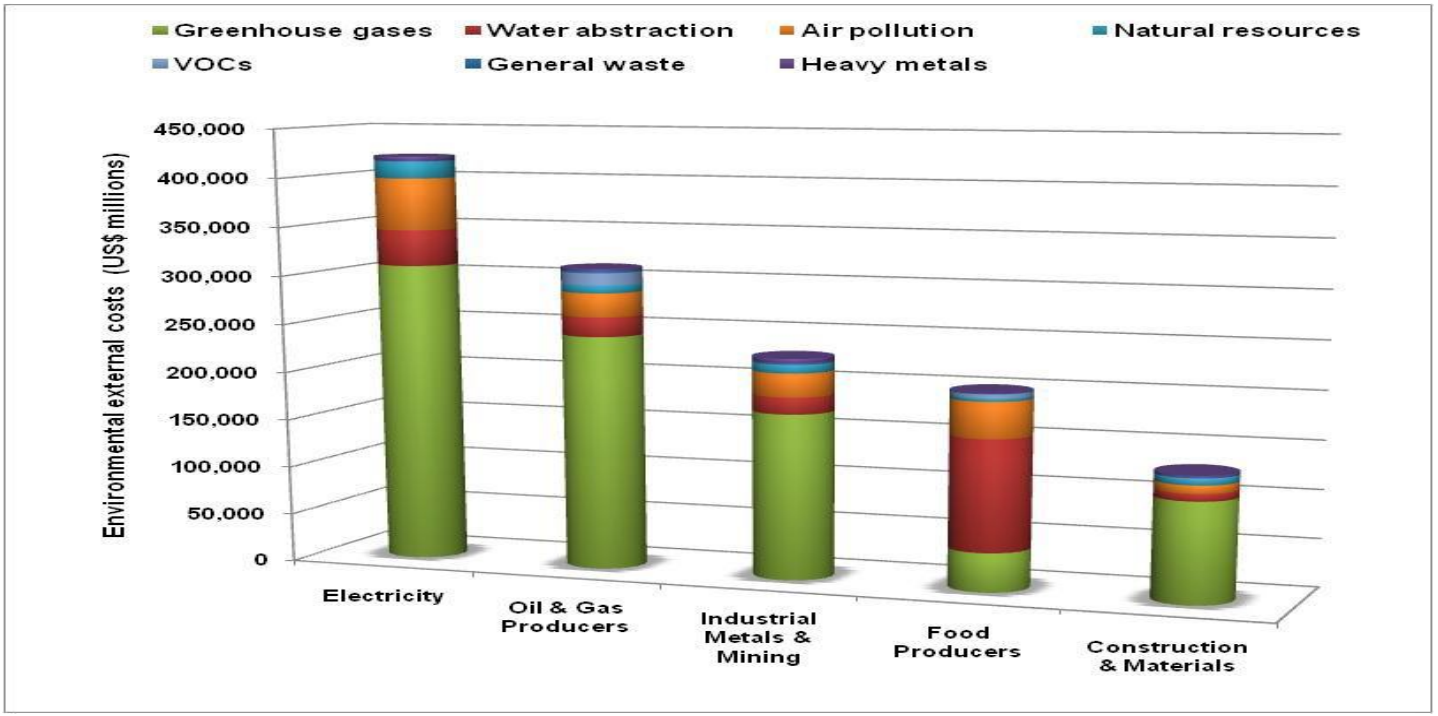
Environmental Damages Costs



Global environmental damage caused by human activity in 2008 represented a monetary value of $6.6 trillion, equivalent to 11% of global GDP

Source: Trucost for UNPRI, 2010

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[1] Center for the Blue Economy. 2015. "Oceans in National Income Accounts, Symposium Proceedings.

[2] OECD (2016),The Ocean Economy in 2030,OECD Publishing

Accounting for U.S. ecosystem services at national and subnational scales

Ken Bagstad[1], Carter Ingram[2], Carl Shapiro[1], Jeff Adkins[3], Jim Boyd[4], Frank Casey[1], Cliff Duke[5], Monica Grasso[3], Justin Johnson[6], Glenn-Marie Lange[7], John Matuszak[8], Kirsten Oleson[9], Charles Rhodes[10], Sarah Ryker[1], Francois Soulard[11], Michael Vardon[12], Ferdinando Villa[13], Brian Voigt[14], and Scott Wentland[15]

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Building natural capital accounts: A synthesis effort

Accounting approaches for ecosystem services are gaining increasing traction worldwide as governments and the private sector use them to monitor integrated environmental and economic trends. A synthesis of data needed to advance natural capital accounting (**NCA**) in the U.S. has yet to occur.

In October 2016, we brought together experts from governments, academia, and the private sector. From 2016-2019, with support from the USGS Powell Center and SESYNC, we will perform three synthesis activities to build a foundation for a U.S. NCA system:

1. Compile existing NCA-relevant data nationwide, linking and quantifying environmental-economic trends over time;
2. Run national-scale models of ecosystem services using national spatial datasets developed by USGS and others that take advantage of recent advances in cloud/supercomputing and context-aware modeling;
3. Apply NCA at the subnational scale, within one or more landscapes managed by multiple Federal agencies and for which economic data to value ecosystem services are available.

How do NCA & ecosystem service assessment differ (Figure 1)?

1. Uses accounting framework to track ES stocks & flows (i.e., opening & closing stocks) over time;
2. Measured in both biophysical & monetary terms;
3. Different approaches to economic valuation (exchange value, not consumer surplus);
4. Explicit connection to economic accounts, i.e., System of National Accounts (Figure 2).

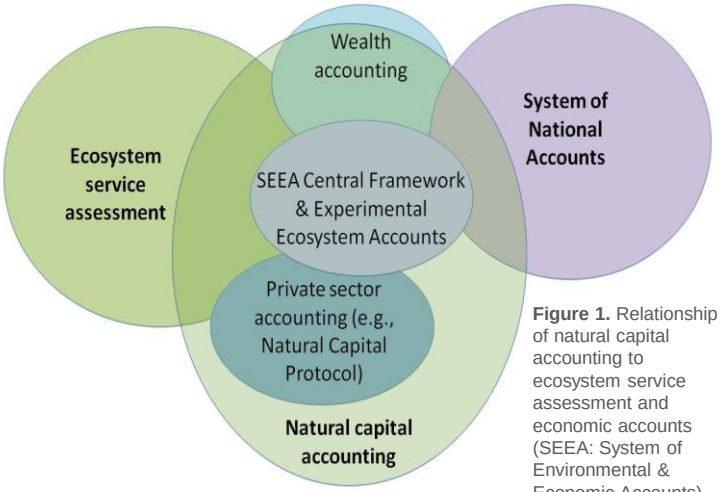

Figure 1. Relationship of natural capital accounting to ecosystem service assessment and economic accounts (SEEA: System of Environmental & Economic Accounts)

Figure 2. Key guidances on natural capital accounting, building on the System of National Accounts.

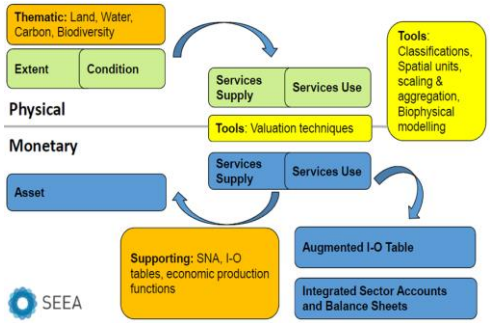

Figure 3. Major components of SEEA Experimental Ecosystem Accounts.

Multi-year workplan

2016-2017:
- Introductory journal article on NCA readiness in U.S.
- First iteration U.S. & subnational land account
- First iteration U.S. & subnational water account
- Solicit critical feedback on land & water accounts

2017-2019:
- Second iteration U.S. & subnational land & water accounts
- Pilot test national-scale ecosystem accounts for selected ecosystem services
- Conduct public & private-sector outreach

Key datasets

- Land accounts:
  1. U.S. National Land Cover Dataset, 2001-2006-2011
  2. National land-use data, USGS & academic-derived
  3. Property value data, Zillow (in partnership with BEA)
- Water accounts:
  1. USGS Water Use, 2000-2005-2010
  2. USGS & USEPA water quality data
  3. BEA water & wastewater infrastructure asset values
- Diverse datasets for ecosystem services modeling & valuation (Figure 3)

Join us!

We envision our group's role as a *project broker* – synthesizing rather than generating all NCA-relevant data. Join us by:
- Learning more about NCA methods & applications;
- Contacting the authors to understand key data gaps and needs to improve the scientific & decision-making value of NCA;
- Collaborating & contributing ecosystem service data, models, & accounts to the broader effort within the NCA framework.

[1]U.S. Geological Survey, [2]Ernst & Young, [3]National Oceanic & Atmospheric Administration, [4]Resources for the Future, [5]Ecological Society of America, [6]University of Minnesota, [7]World Bank, [8]U.S. Department of State, [9]University of Hawaii, [10]ORISE Postdoctoral Program, [11]Statistics Canada, [12]Australian National University, [13]Basque Centre for Climate Change, [14]University of Vermont, [15]Bureau of Economic Analysis

USGS science for a changing world

Powell Center

SESYNC NATIONAL SOCIO-ENVIRONMENTAL SYNTHESIS CENTER