



# EXPLORE

Introduction  
and  
A New Director's Views

## On Exploration



The people who were putting up millions of dollars were asking my father, "So, Captain, what do you expect to find?" and his answer to those people who were about to make major commitments was: "If I knew, I wouldn't go."

Jean-Michel Cousteau  
2005

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## Since 2001: Exciting Discoveries



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## Since 2001: Exciting Discoveries



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### Since 2001: Exciting Discoveries



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### Since 2001: Exploration Driving Technology



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### Since 2001: Technology Accelerators

- Processing Power and Data Storage, Miniaturization, Robotics, Autonomous Systems, Increased Energy Densities
- Megapixel, Megabyte Revolution coupled with fiber optics and optical analytics
- Signal processing and analysis algorithms, transducers, positioning, motion sensors, and visualization capabilities
- Communications

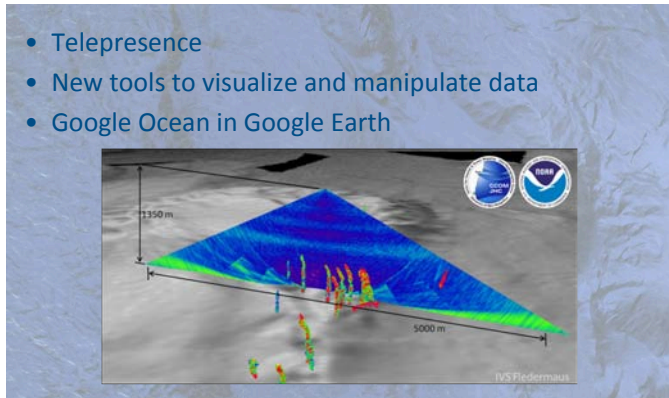
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### Since 2001: Visualization

- Telepresence
- New tools to visualize and manipulate data
- Google Ocean in Google Earth



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### Since 2001: Knowledge Commons

- Crowdsourced science; data collection
- Telepresence
- Real time or near real-time access to data
- Social networks
- Wikipedia
- Google Ocean
- Ocean Biogeographic Information System

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### Since 2001: Increasing Interest

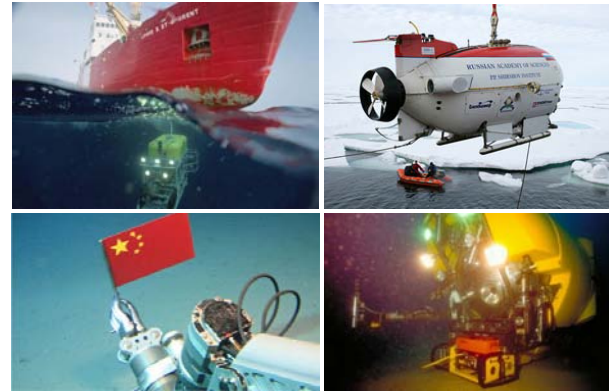


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### Since 2001: International Ocean Exploration

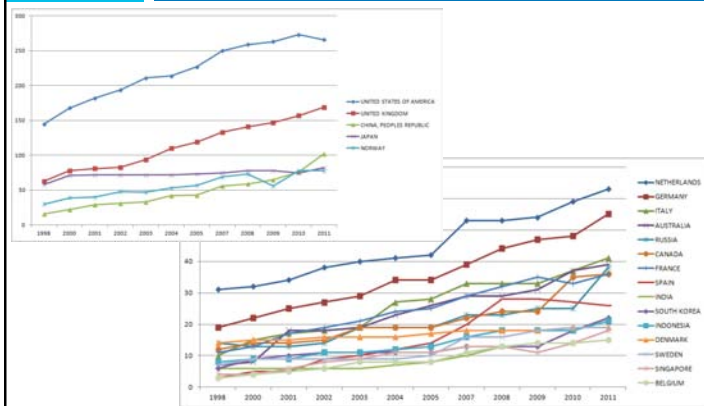


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### Since 2001: International Capacity to Map



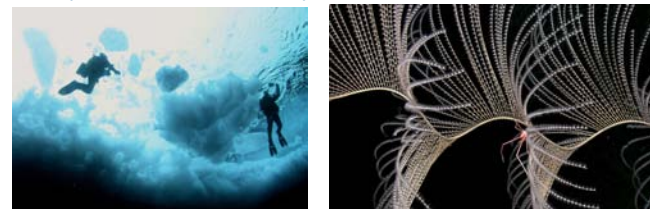
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### Since 2001: Sister Agency Ocean Explorers

- National Science Foundation
- National Aeronautics and Space Administration
- Department of the Interior
- Department of the Navy



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### 2012-2022: Future Exploration Environment

- Cost and technology drive changes in large platform use
- AUVs and ROVs more capable and deployed in new ways
- *in situ* sensors and analysis smaller, more capable, cheaper
- Increased bandwidth/lower cost communications
- Social media and crowdsourced science increasingly important
- International and unconventional partnerships critical

### 2012-2022: Future Global Environment

- Emerging holistic view of security: oceans and climate increasing concern re: national security
- Major demographic shifts in response to climate change
- Society – increasing concern over oceans' conditions
- Ocean environment: climate change; ocean acidification; oil and gas development; deep ocean mining
- More non-government explorers with more money
- Scientists and Engineers – networked collaboration over competition

### Purpose of the Review

- Strengthen program
- Recommendations - to *inform*:
  - NOAA senior leadership, OAR
  - Interagency ocean exploration partners
  - Congress
  - Science community
  - Non-governmental organizations, business, industry
- Recommendations - to *guide*:
  - NOAA Ocean Exploration Program towards the future
  - New Ocean Exploration Advisory Board

### Need and Expectations for Review

- Touch on the past of the NOAA ocean exploration program; focus on its future
- Help illuminate the “important” and the “uncertain”
- Focus on how we move to a truly national ocean exploration program across federal agencies
  - .... and the increasingly important contributors outside of government

## 2012: Director's View-Government Role

- Coordinate systematic and strategic plans to identify and implement *national ocean exploration priorities*
- Mobilize the science community to contribute to the *national ocean exploration agenda*
- Conduct *long-term, systematic exploration* to meet national needs
- Focus on *national priorities* in STEM; in research
- Build a national framework for *data and information management systems*

## 2012: Director's View-PL 111-11

PL 111-11's Title IX-Oceans essentially implements the President's Panel report:

- Part I authorizes a National Ocean Exploration Program
- Part II authorizes the National Undersea Research Program

## 2012: Director's View-PL 111-11

The statute establishes a *coordinated* national ocean exploration program that calls for NOAA to:

- Promote collaboration with other federal agencies in ocean exploration
- Facilitate
  - Coordination of data and information management services
  - Outreach and education programs
  - Development and transfer of ocean exploration technologies

## 2012: Director's View-PL 111-11

- Conduct interdisciplinary voyages or other scientific activities with other Federal Agencies or academic or educational institutions
- Give priority attention to deep ocean regions
- Conduct scientific voyages that combine marine archeology and oceanographic sciences

## 2012 Director's View-PL 111-11



- Implement a [transparent] competitive process for conducting [ocean exploration] activities
- Enhance the technical capacity of the U.S. marine science community
- Establish an ocean exploration forum

## 2012 Director's View-PL 111-11

Calls for NOAA to:

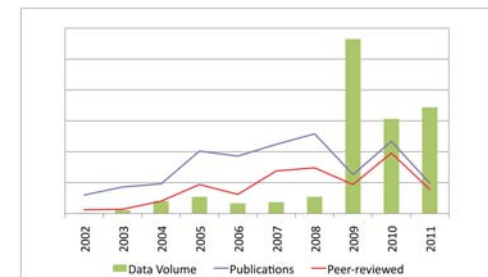
- Develop and implement an ocean exploration Technology and Infrastructure Task Force
  - Facilitate transfer of new exploration technology
  - Encourage cost-sharing partnerships
  - Coordinate development of agency budgets
- Appoint an Ocean Exploration Advisory Board

## 2002-2012 Funding Trends

NOAA Ocean Exploration Program - Allocation in Constant FY2002 Dollars

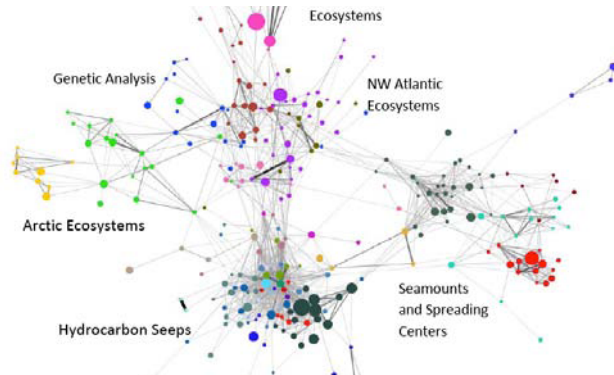


## Publications and Data Volume Trends





## 2002-2012: Increasing Knowledge

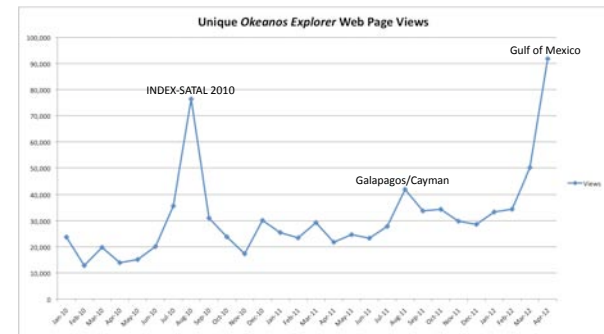


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## 2012: Trends



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## 2002-2012 Other Trends

- Partnerships
- Explorations
- Information Management
- Engagement through Education and Outreach



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## NOAA Ocean Exploration Context Snapshot

### Environmental Challenges:

- Declining federal budget
- Unstable funding
- NURP uncertainty
- Election year wildcards

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## NOAA Ocean Exploration Context Snapshot

- *External Opportunities:*
  - Increasing public attention on ocean exploration
  - Recognition of importance of “soft power” diplomacy
  - Global competition for natural resources

## NOAA Ocean Exploration Context Snapshot

- *Program Weakness:*
  - Strategic, long-term planning
    - Limited by budget uncertainty and instability

## NOAA Ocean Exploration Context Snapshot

- *Program Strengths:*
  - Dedicated, passionate, resilient team
  - Partnership culture
  - Advocates on the Hill



## Towards a National Program

- President's Panel Report provides a compelling vision and objectives for ocean exploration
- Public Law 111-11 provides
  - Solid framework for a national program
  - Basis for a tangible and compelling national strategic plan for ocean exploration to encourage and unify interagency, non-governmental, and private efforts
- Draft National Ocean Policy Implementation Plan
  - Emphasizes importance of ocean exploration and partnerships
  - Calls for five-year strategy for ocean exploration