



# Pacific Marine Environmental Laboratory

**Wrap-up**

**Eddie Bernard**  
*Director*



# Reviewer Questions

- Quality
- Relevance
- Performance

# Quality Questions

- How does the quality of the laboratory's research and development rank among Research and Development (R&D) programs in other U.S. federal agencies? Other science agencies/institutions?
- Are appropriate approaches in place to ensure high quality work will be done in the future?

# Quality Answers

- Proven track record for global observational programs with pioneering use of web for data distribution
- World leaders in fields of climate observations, fisheries oceanography, underwater volcanoes exploration and monitoring , and tsunami forecasting
- Comparisons are difficult because of unique set of programs within one mission agency, but preeminence indicators are all



# Quality Questions

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# Quality Answers: PMEL Science Approach

← 10 Years →

| Project                                    | Science Planning | Experiment Design | Prototype Development | Implement       | Transition to Operations/ Applications | Science Products | NOAA Relevance          |
|--|------------------|-------------------|-----------------------|-----------------|--|------------------|-------------------------|
| <b>ENSO/ TAO</b>                           | X                | X                 | X                     | X               | <b>Underway</b>                        | X                | Climate Obs & Analysis  |
| <b>CO2 &amp; Ocean Acidification</b>       | X                | X                 | <b>Underway</b>       | <b>Underway</b> |  | X                | Climate Obs & Analysis  |
| <b>N. Pacific/Arctic Climate/Fisheries</b> | X                | X                 | x                     | <b>Underway</b> |  | X                | Climate & Ecosystems    |
| <b>Tsunami Measurements</b>                | X                | X                 | X                     | X               | <b>X</b>                               | X                | Weather & Water Tsunami |
| <b>Tsunami Modeling</b>                    | X                | X                 | X                     | X               | <b>Underway</b>                        | X                | Ecosystems Observations |
| <b>Seafloor Processes</b>                  | X                | X                 | X                     | <b>Underway</b> |  | X                | Ecosystem Research      |
| <b>Acoustic Monitoring</b>                 | X                | X                 | X                     | <b>Underway</b> |  | X                | Ecosystems Research     |

**Major Contributions to Climate : Argo floats, OceanSITES, PIRATA, RAMA**

**Major Planning Underway: Ocean Exploration, Tsunami, IOOS**

# Relevance Questions

- Does the research address existing (or future) societally relevant needs (national and international)?
- How well does PMEL address issues identified in the NOAA research plans or other policy or guiding documents?
- Are customers engaged to ensure relevance of the research?
- Are there R&D topics relevant to national needs that the laboratory should be pursuing but is not? Are there R&D topics in NOAA and OAR plans that the laboratory should be pursuing but is not?
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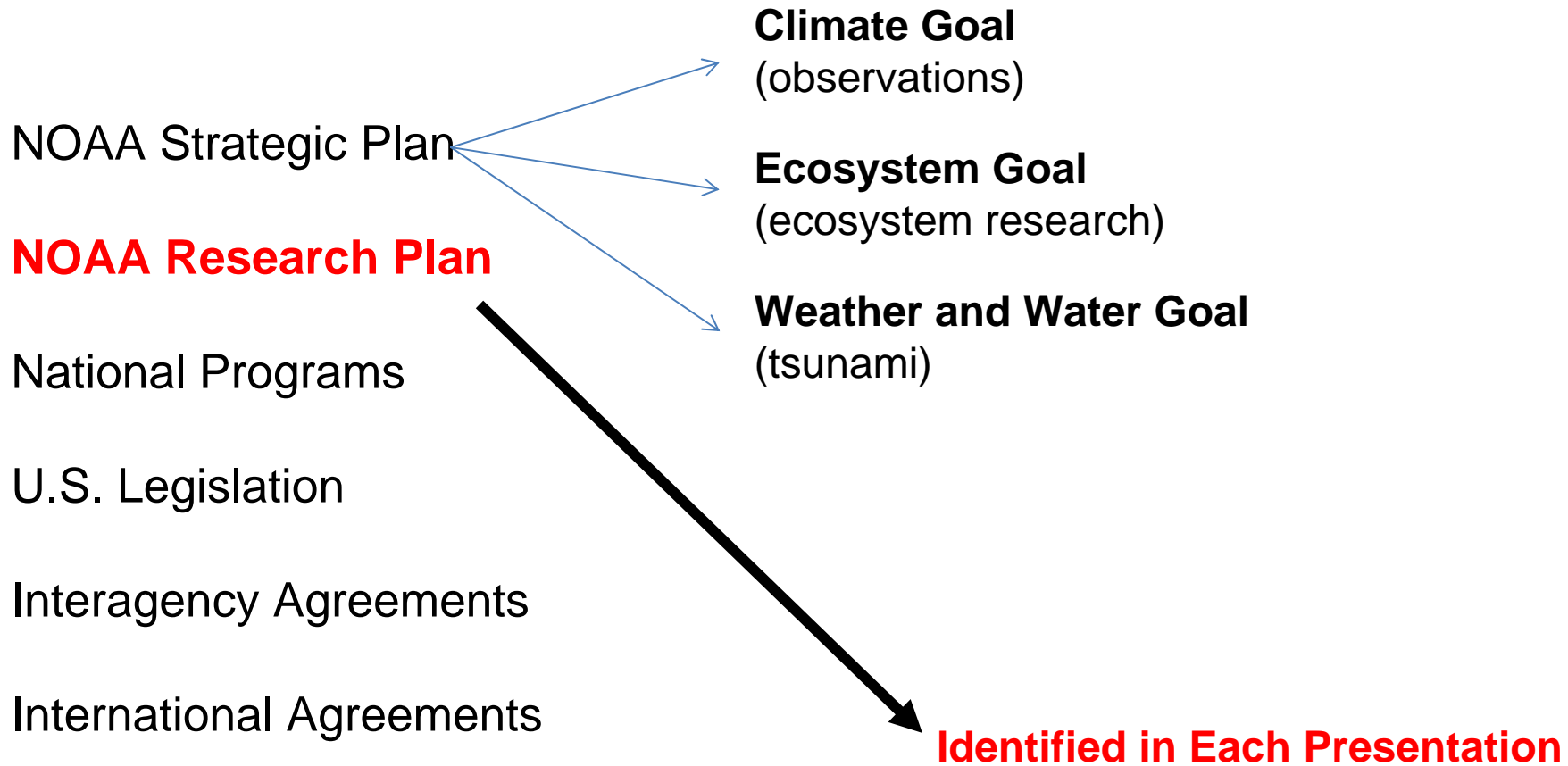
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# Relevance Answer: *PMEL Research – Guiding Documents*

## Major Drivers:



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# Relevance Answer:

## Future Plans from Each Session

- **Climate:** expand current capabilities, explore new technologies, engage others
- **Fisheries:** Expand observations due to retreating ice, expand modeling
- **VENTS:** Explore new volcanic ecosystems with innovative observational capabilities
- **Tsunami:** Create new generation of “community models” linked with forecasts

# Performance Questions:

## 1. Research Leadership and Planning

Does PMEL have clearly defined and documented scientific objectives, rationale, and methodologies for key projects?

Has the scope of key projects been identified including methods for determining when projects should end or transitioned?

# Performance 1. Answer: Funded Proposals

| FY            | # of Proposals |            | Funding (\$M) |             | % of Base  |
|---------------|----------------|------------|---------------|-------------|------------|
|               | NOAA           | Reimburse  | NOAA          | Reimburse   |            |
| <b>2004</b>   | 74             | 32         | 16.3          | 2.4         | 195        |
| <b>2005</b>   | 73             | 20         | 19.8          | 1.7         | 224        |
| <b>2006</b>   | 60             | 35         | 19.0          | 2.3         | 222        |
| <b>2007</b>   | 49             | 38         | 15.1          | 3.8         | 189        |
| <b>Totals</b> | <b>256</b>     | <b>125</b> | <b>70.2</b>   | <b>10.2</b> | <b>217</b> |

**\$1 Base = \$3.17 Research Effort**

# Performance Questions:

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# Performance 1. Answers

- **Project Termination:**
  - Decrease in scientific relevance
  - Absence of funding
  - Loss of key talent/capability
- **Project Transition:** (Very Difficult)
  - NOAA Transition Board
  - Commercialization option

# Performance Questions:

## 2. Efficiency and Effectiveness

- Does the laboratory execute its research in an efficient and effective manner?
- Is the laboratory organized and managed to optimize the conduct and planning of research, including the support of creativity?
- How well integrated is the work with NOAA's planning and execution activities? Are there adequate inputs to the planning process of NOAA's Programming, Planning and Budgeting and Execution System (PPBES)?
- Is the proportion of the external funding appropriate relative to its NOAA funding?
- Are human resources adequate to meet current and future needs? Is the laboratory organized and managed to ensure diversity in its workforce?
- Are appropriate resources and support services available?



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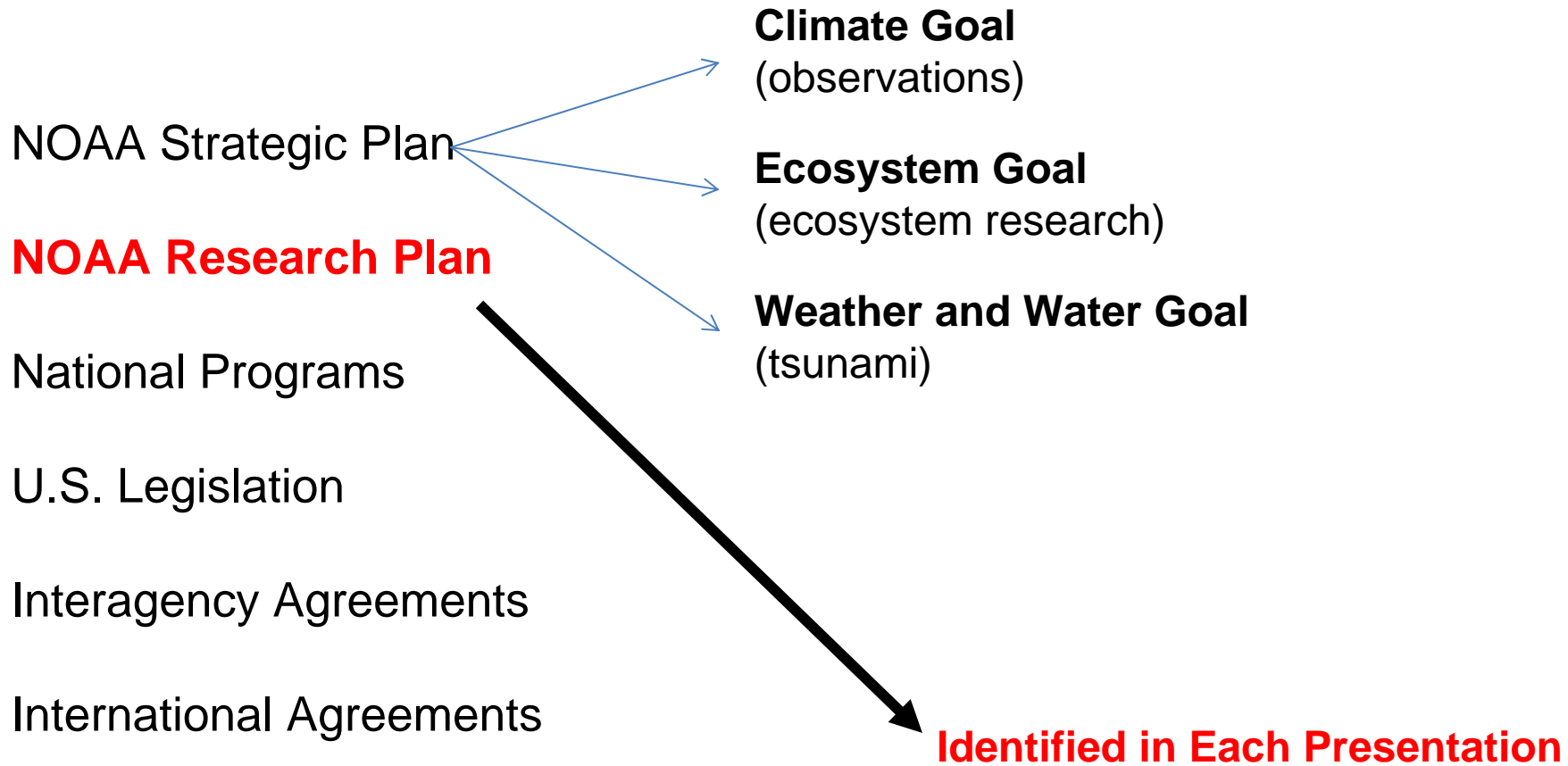
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# Performance 2. Answer: *PMEL Research – Guiding Documents*

## Major Drivers:



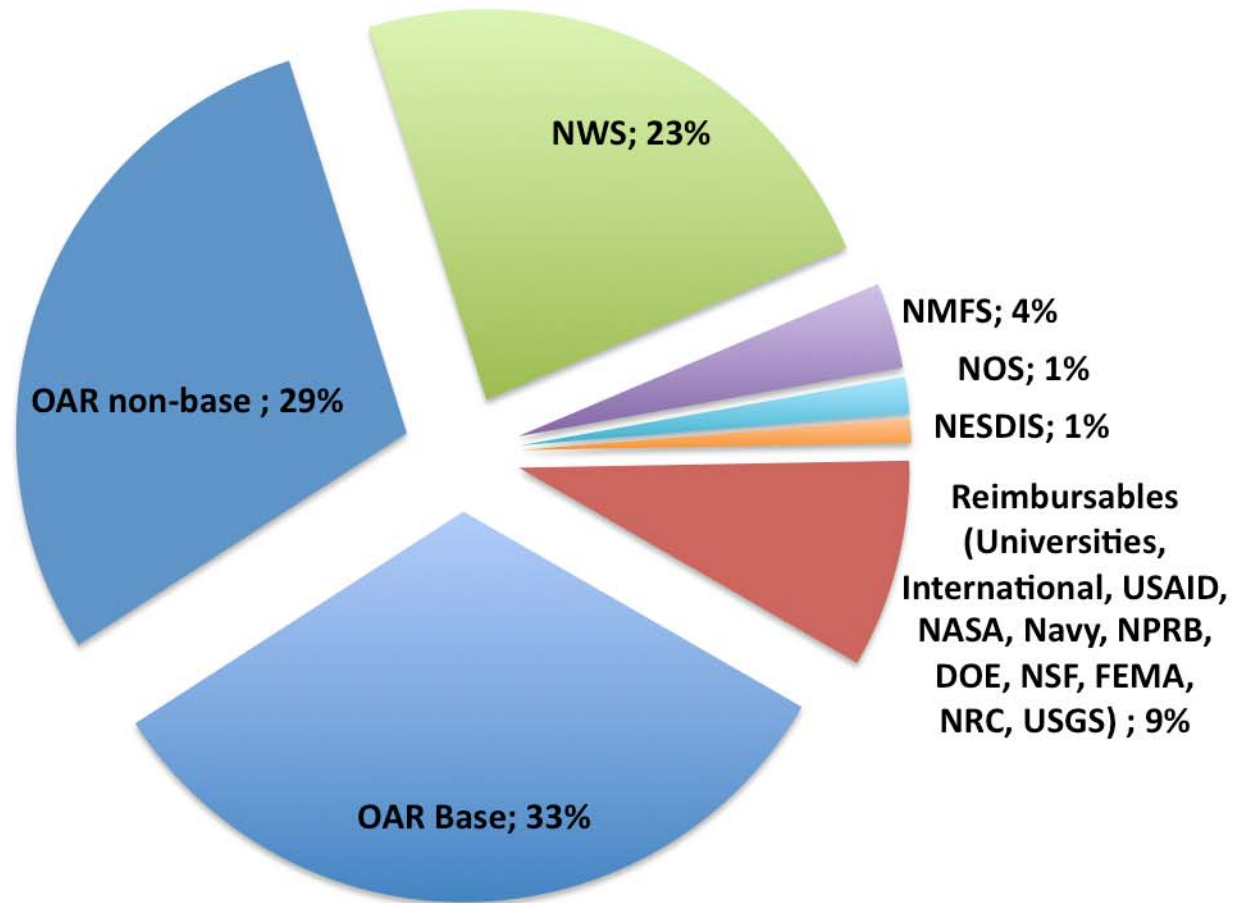
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## Performance 2.: Efficiency & Effectiveness

### PMEL Funding Sources, 2004-2007



# Performance Questions:

## 3.Transitions

- How well is the transition of research to applications and/or dissemination of knowledge planned and executed?
- Are there appropriate interactions with stakeholders and customers? Are end users of the research and development involved in the planning and delivery of applications and/or information services?
- Are the research results communicated to stakeholders and the public?

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# Performance 3.- Transitions: Answers

- **From Research to Applications**

Examples: Publications, Assessments (IPCC & Fisheries), Data, Community Leadership and Service, Patents, Licenses

- **From Research to NOAA Operations**

Examples: El Nino Observing Array, Tsunami Detection and Forecasting

- **From Research to Research**

Examples: Easy-to-Deploy Mooring Technology, Live Access Server (IPCC)

# Performance Questions:

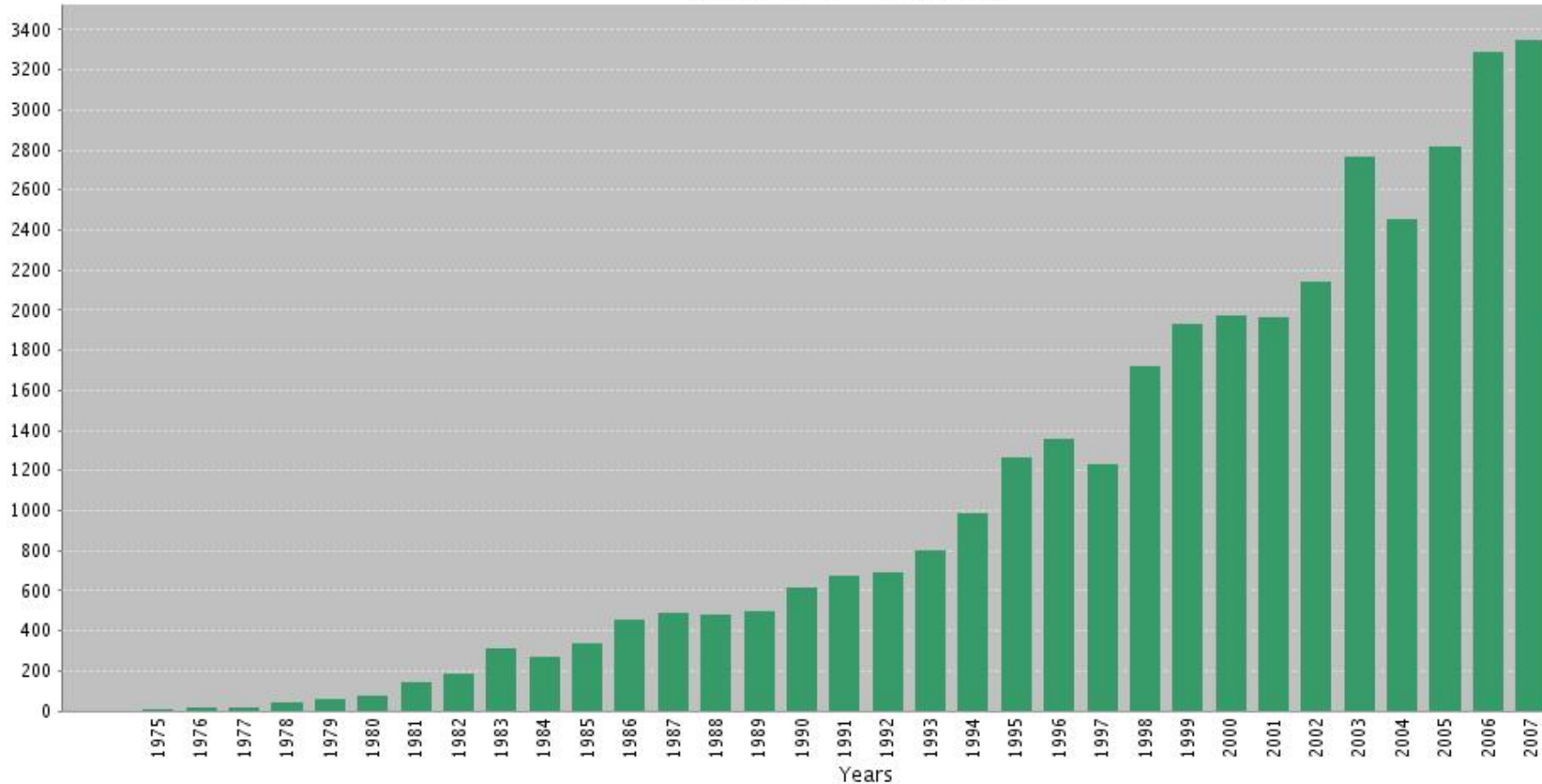
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# Performance 3. Answers

**Average Citations (04-07) = 2,980/year**  
**10 Year Average = 2445/year +22%**

Citations in Each Year



# Performance 3.-Transitions: Answers

- **Media:** 580 media stories on PMEL science activities (TV- 127, Newspapers- 157, Radio- 25, Periodicals- 49, Web stories- 222) – See web site for details
- **Web Activity:** 682 M hits in last 4 years  
Average of 170M hits/year

# Future Activities

- **Climate:** Continue leadership/collaboration role in climate research with completion of the global tropical array and development of new measuring technologies
- **Arctic Marine Ecosystems:** Continue leadership/collaboration role in developing ecosystem management research strategies in support of climate and ecosystems
- **VENTS Ecosystems:** Continue leadership/collaboration role in exploring and monitoring submarine volcanic systems to assess chemical and thermal impacts on ecosystems and climate
- **Tsunami:** Complete transition of forecast system to operations, continue leadership/collaboration role through the development of new forecast tools and products for weather and water goal

# PMEL Mission Platforms

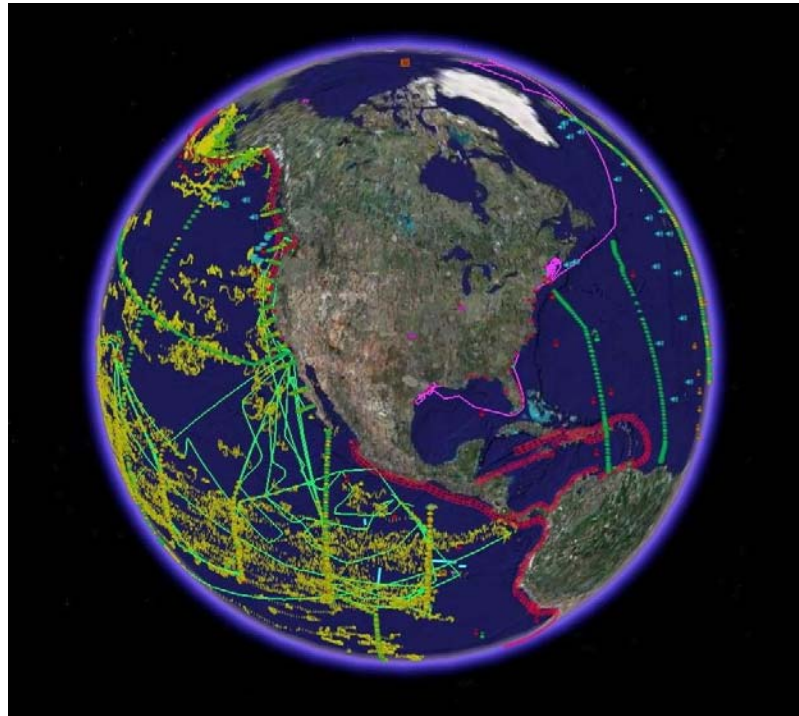
## Conventional



NOAA Fleet



Charter Vessels



## Transitional

## Autonomous



Moored Arrays



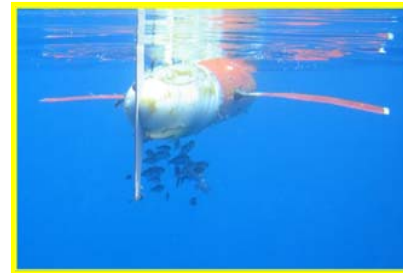
ARGO Drifters



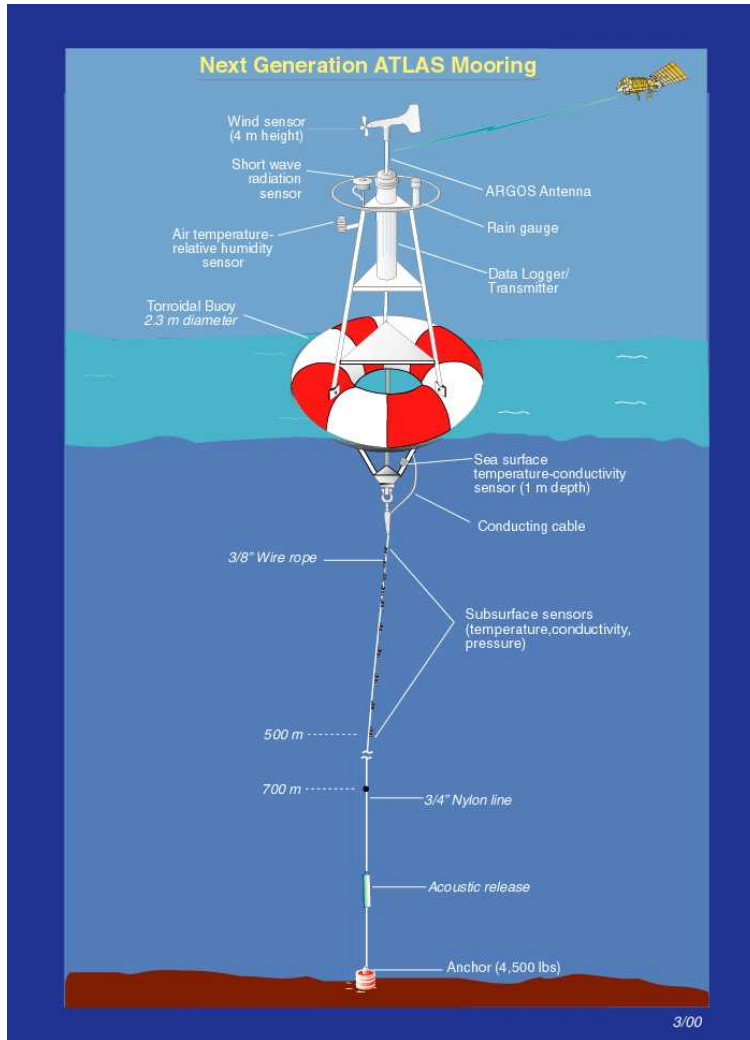
Easy-To-Deploy (ETD) Moorings



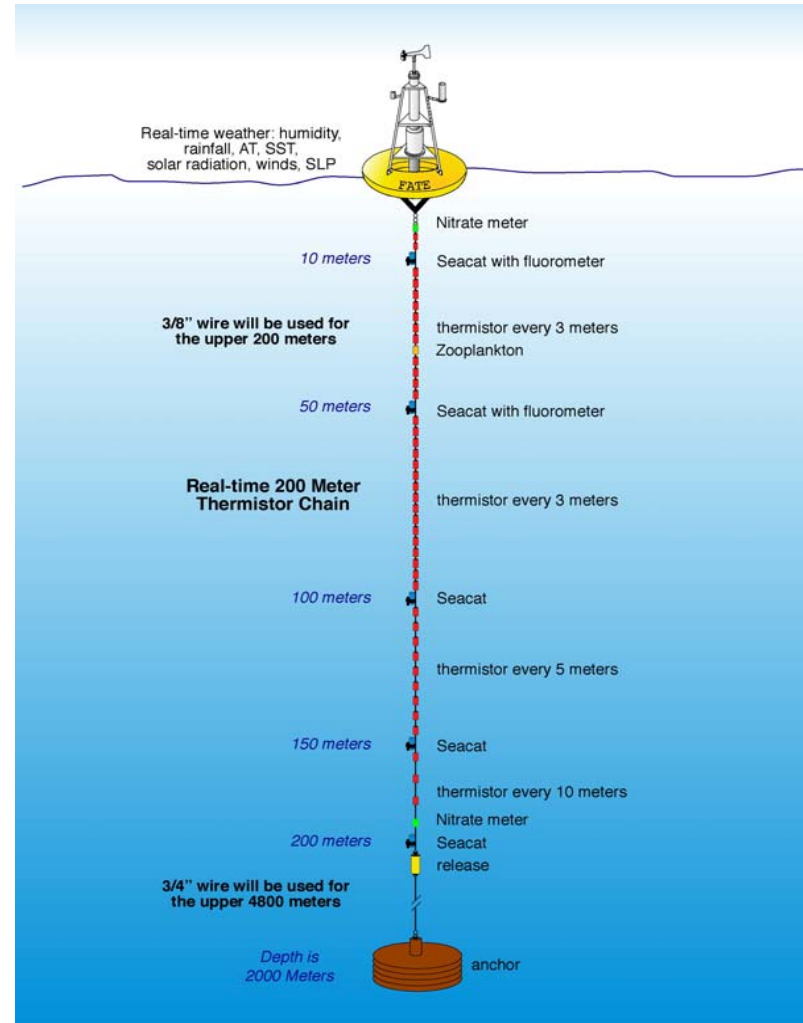
Autonomous Underwater Gliders



# First Generation Buoy Development: Cable Transmitted Data

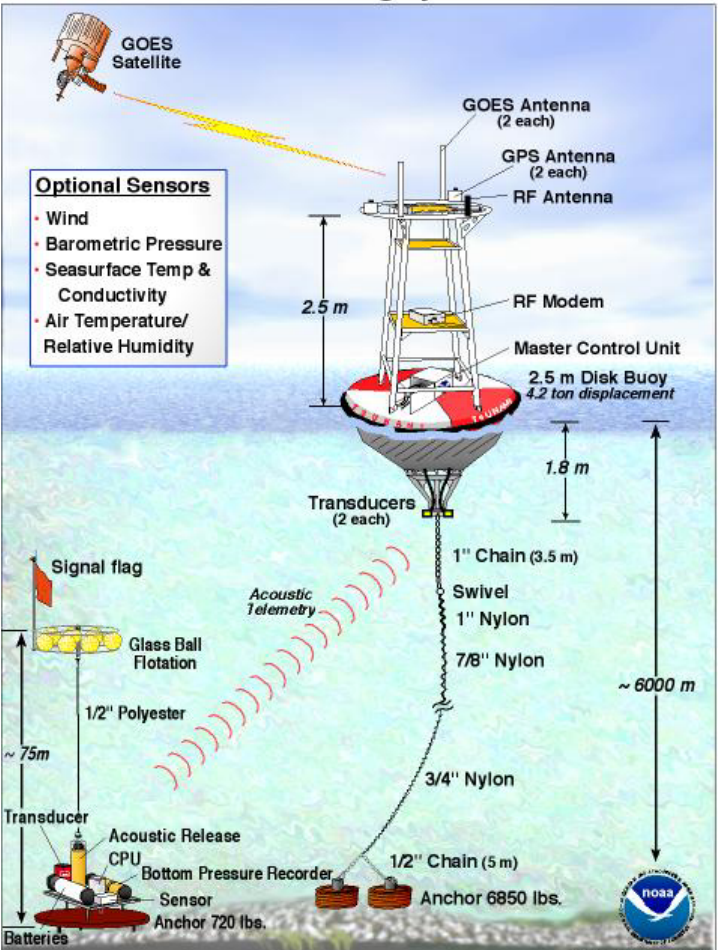


**TAO**

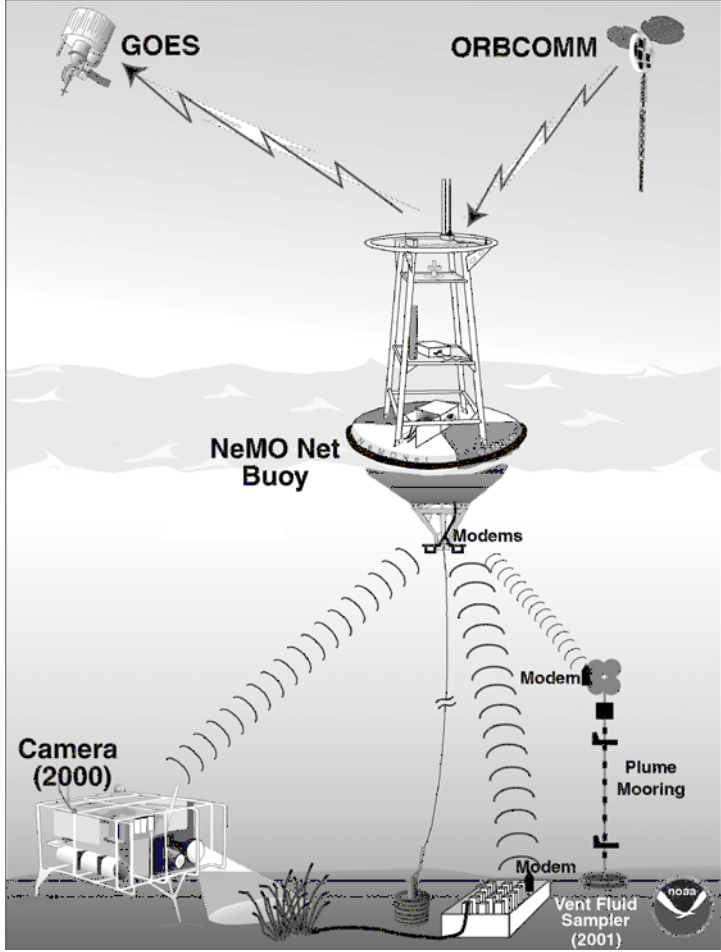


**FOCI**

# Second Generation Buoy Development: Acoustic Transmitted Data



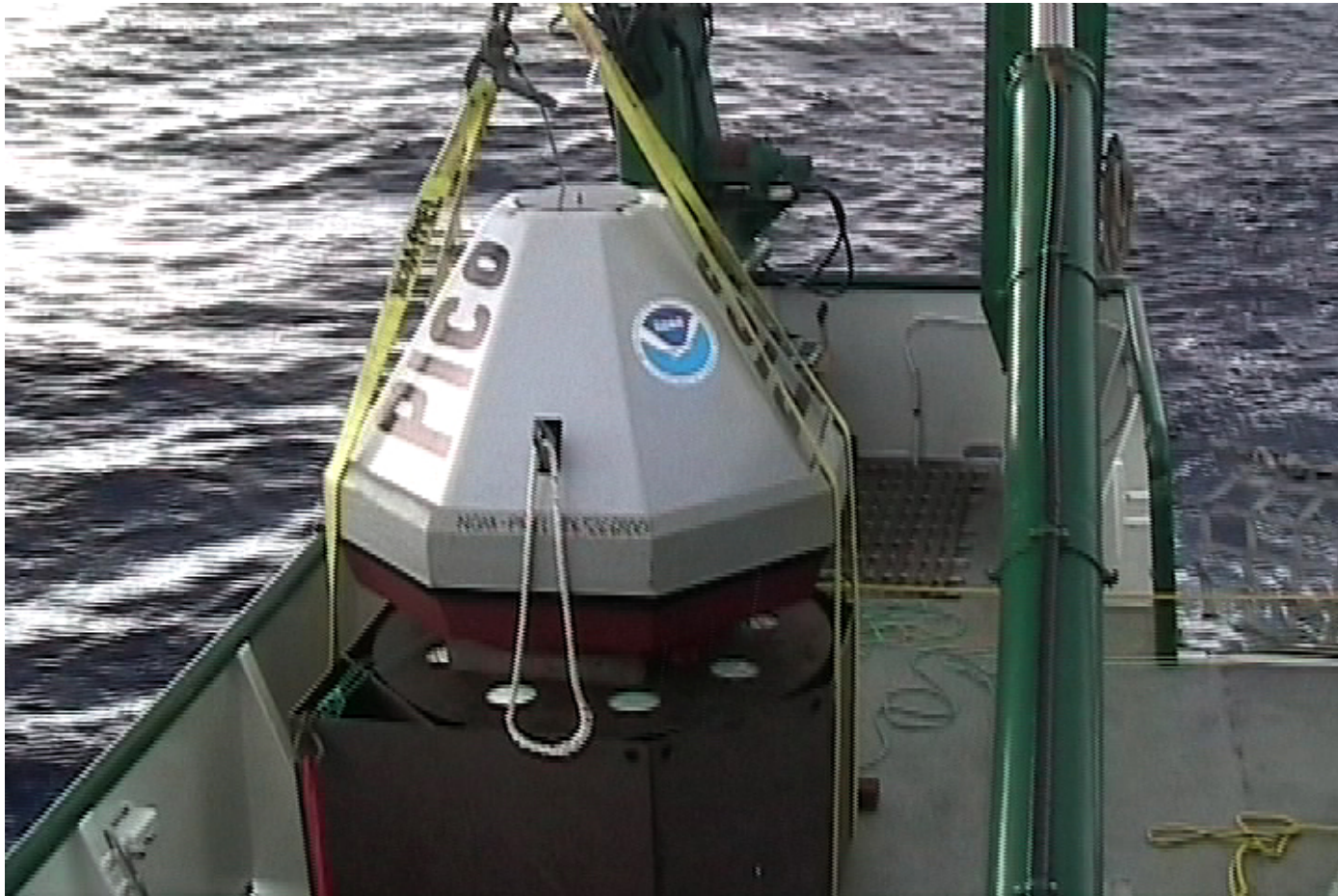
**Tsunami**



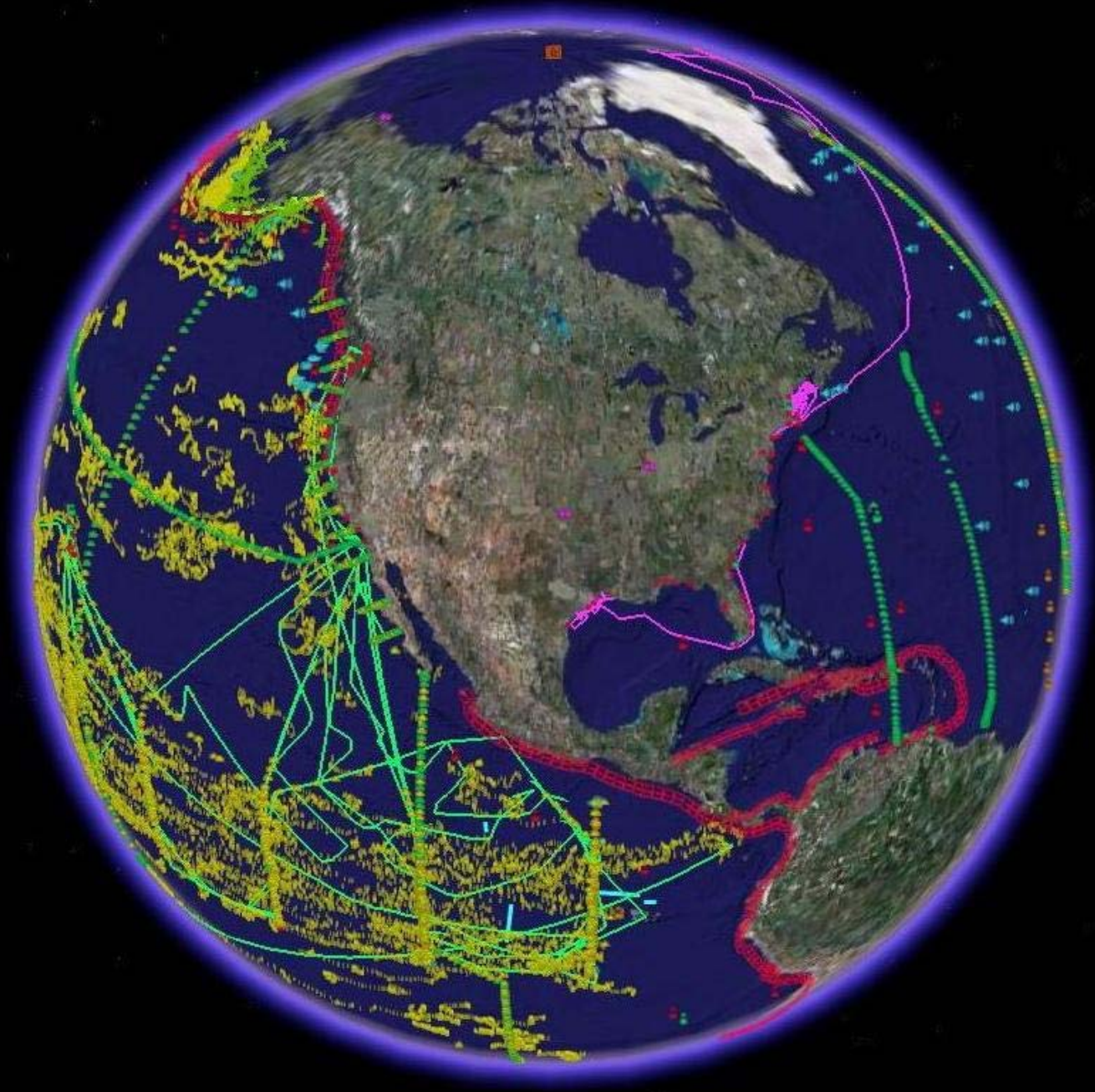
**VENTS**



# Third Generation Buoy



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