NOAA’s Teacher at Sea Program
FY 2010 Year-End Report

teacheratsea.noaa.gov
NOAA’s Teacher at Sea Program: Outline

Purpose
- To provide an overview of the NOAA Teacher at Sea Program 2010 accomplishments

Overview
- 2010 NOAA Teacher at Sea Season
- Return on Investment
- Opportunities and Challenges
- Background Material
2010 NOAA Teacher at Sea Season
2010 Statistics

- **Applications received**: 250
- **Peer reviewers**: 35
- **Berths offered to teachers by scientists**: ~70
- **Teachers sent to sea**: 31
- **NOAA ships that hosted teachers**: 11
- **Charter ships that hosted teachers**: 2
- **Teachers placed in NOAA labs**: 5
- **Teachers placed in NOAA field projects**: 3
- **Teachers placed in aircraft projects**: 1 (teacher flew on P-3 for Hurricane Awareness Tour)
## 2010 TAS Participants

<table>
<thead>
<tr>
<th>Teacher Last Name</th>
<th>Teacher First Name</th>
<th>School City</th>
<th>School State</th>
<th>Subjects</th>
<th>Grades</th>
<th>Ship</th>
<th>Cruise Type</th>
<th>Line Office</th>
<th>Cruise Dates</th>
<th>Cruise Ports</th>
<th>Chief Scientist/POC</th>
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<tbody>
<tr>
<td>Altizio</td>
<td>David</td>
<td>New Rochelle</td>
<td>NY</td>
<td>Science</td>
<td>10th, 11th, 12th, 9th</td>
<td>Fairweather</td>
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<td>05/17/10-05/26/10</td>
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<td>Babicki</td>
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<td>Shark/Red Snapper Longline</td>
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<td>08/07/10-08/22/10</td>
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<td>Brustolon</td>
<td>Michele</td>
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<td>NH</td>
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<td>Oscar Dyson</td>
<td>Pollock</td>
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<td>06/27/10-07/16/9</td>
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<tr>
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<td>Anne</td>
<td>Gastonia</td>
<td>NC</td>
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<td>Hugh R. Sharp</td>
<td>Sea Scallop</td>
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</tr>
<tr>
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<td>Richard</td>
<td>Jekyll Island</td>
<td>GA</td>
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<tr>
<td>Deichstetter</td>
<td>Peggy</td>
<td>Elgin</td>
<td>IL</td>
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<td>Oregon II</td>
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<td>NMFS SE</td>
<td>08/30/10-09/11/10</td>
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<tr>
<td>Fulcar</td>
<td>Obed</td>
<td>NY</td>
<td>NY</td>
<td>Math</td>
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<td>NMFS AK</td>
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<td>Taina Honkalehto/ Mike Gutormsen</td>
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<tr>
<td>Kimport</td>
<td>Rebecca</td>
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<td>DC</td>
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<td>Kilo Moana</td>
<td>WHOTS</td>
<td>WHOI</td>
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<td>Bob Weller (WHOI)</td>
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<td>Knutson</td>
<td>Donna</td>
<td>Bismarck</td>
<td>ND</td>
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<td>9th</td>
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<td>Barbara</td>
<td>Anderson</td>
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<td>Henry B. Bigelow</td>
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<tr>
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<td>Montvale</td>
<td>NJ</td>
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<td>Matsumoto</td>
<td>Karen</td>
<td>Seattle</td>
<td>WA</td>
<td>Science</td>
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<tr>
<td>Miller</td>
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<td>Unalaska</td>
<td>AK</td>
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<td>07/19/10-08/06/10</td>
<td>Dutch Harbor, AK</td>
<td>Taina Honkalehto/ Mike Gutormsen</td>
</tr>
</tbody>
</table>
## 2010 TAS Participants (continued)

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<th>Cruise Type</th>
<th>Line Office</th>
<th>Cruise Dates</th>
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<th>Chief Scientist/POC</th>
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<td>Moraga</td>
<td>Deborah</td>
<td>Columbus</td>
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<td>07/20/10-07/28/10</td>
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<td>Jenny Stock</td>
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<td>Mueller-Northcott</td>
<td>Julianne</td>
<td>Amherst</td>
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<td>Hugh R. Sharp</td>
<td>Sea Scallop</td>
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<td>Laura</td>
<td>Willington</td>
<td>CT</td>
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<td>Oscar Dyson</td>
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<td>Annette Dougherty</td>
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<td>Key Biscayne</td>
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<td>Dutch Harbor, AK</td>
<td>Jeff Napp/ Janet Duffy-Anderson</td>
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<td>Tanya</td>
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<td>NC</td>
<td>Science</td>
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<td>PaCOOS</td>
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<td>Andre DeBose/Mike Hendon/</td>
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<tr>
<td>Singler</td>
<td>Caroline</td>
<td>Sudbury</td>
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<td>Arctic Continental Shelf Survey</td>
<td>NOAA/NOS/USGS SGS et al</td>
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<td>Beth</td>
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<td>Pisces</td>
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<td>Wes</td>
<td>Moscow</td>
<td>ID</td>
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<td>Ka'imimoana</td>
<td>TAO</td>
<td>NWS</td>
<td>07/08/10-08/10/10</td>
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<td>Jonathan Heesch</td>
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<td>Bruce</td>
<td>Mendham</td>
<td>NJ</td>
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<td>10th, 11th, 12th</td>
<td>Oregon II</td>
<td>Summer Groundfish &amp; Hypoxia</td>
<td>NMFS SE</td>
<td>07/01/10-07/17/10</td>
<td>Galveston, TX; Pascagoula, MS</td>
<td>Mike Hendon/Andre Debose</td>
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<td>Scott Ferguson</td>
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<td>von der Heyde</td>
<td>Nicolle</td>
<td>Florrisant</td>
<td>MO</td>
<td>Science</td>
<td>8th</td>
<td>Pisces</td>
<td>Reef Fish</td>
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<td>06/14/10-07/02/11</td>
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<td>Paul Felts</td>
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<td>Fulton</td>
<td>NY</td>
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<td>Miller Freeman</td>
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<td>Kevin Rademacher</td>
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States Represented by 2010 TASs
TAS Alumni 1990 – 2010

NOAA’s Teacher at Sea Program
http://teacheratsea.noaa.gov
# 2010 Teacher in the Lab/Field Participants (Pilot Projects)

## NOAA Teacher in the Lab Pilot Project - Summer 2010

<table>
<thead>
<tr>
<th>Lab</th>
<th>Scientist</th>
<th>Teacher</th>
<th>Grade</th>
<th>Weeks</th>
<th>Research</th>
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<td>South East Fisheries Science Center, Miami</td>
<td>Trika Gerard</td>
<td>Mark Silverman</td>
<td>High School</td>
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<td>juvenile fish</td>
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<td>Alaska Fisheries Science Center, Juneau</td>
<td>Bonita Nelson</td>
<td>Lara Dzinich</td>
<td>Middle School</td>
<td>3</td>
<td>cultivating krill</td>
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<tr>
<td>Earth System Research Laboratory, Boulder</td>
<td>Dan Wolfe</td>
<td>Peter Blanken</td>
<td>College</td>
<td>3</td>
<td>climate</td>
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<td>South West Fisheries Science Center, La Jolla</td>
<td>Jeff Seminoff</td>
<td>Dana Tomlinson</td>
<td>Elementary School</td>
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<td>green turtle</td>
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<td>Chesapeake Bay Lab</td>
<td>John Jacobs</td>
<td>Hema Bhaskaran</td>
<td>Middle School</td>
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<td>water quality</td>
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<td>Jackie Hams</td>
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<td></td>
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## NOAA Teacher in the Field Pilot Project - Summer 2010

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<th>Grade</th>
<th>Weeks</th>
<th>Research</th>
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<td>Kate</td>
<td>Rick</td>
<td>High School</td>
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<td>Puget Sound</td>
<td>Gary Winans</td>
<td>Jon Baker</td>
<td>High School</td>
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<td>Puget Sound</td>
<td>Gary Winans</td>
<td>Jennifer Duncan</td>
<td>High School</td>
<td>3</td>
<td>genetics</td>
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<td>Puget Sound</td>
<td>Gary Winans</td>
<td>Michele Wolski</td>
<td>High School</td>
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<td>genetics</td>
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<td><strong>Subtotal</strong></td>
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<td><strong>Total</strong></td>
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<td></td>
<td></td>
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Canceled by scientist
Canceled by teacher
Return on Investment
Program Highlights

In FY 2010 NOAA’s Teacher at Sea Program:

- Sent 31 teachers to sea representing 23 states and 1 U.S. territory (Guam)
- Placed 8 teachers in lab and field projects as part of its growing pilot programs
- Received 4 recognitions by Congress and NOAA leadership
- Received 14 recognitions in the media
- Raised awareness of NOAA and its mission through an extensive TAS alumni network
- Established extensive social media use via Facebook and Twitter (approved by DOC)
- Trained and utilized 10 TAS alumni living in Gulf states to educate their communities about NOAA’s work during the Gulf oil spill
- Supported 2 TAS alumni selected as presenters for the Smithsonian’s Scientist Is In series
- Celebrated 20 years of excellence in October 2010 by honoring the first Teacher at Sea
- Rolled out an online application system
- Rolled out an online training system for participants
- Presented to the 2010 NOAA Ship Nancy Foster User Meeting via webinar
- Sponsored the James D. Martin Shepherd Elementary Science Fair
- Supported NOAA’s Bring a Child to Work Day
- Supported NOAA Day at Busch Gardens
2010 Program Outputs

- **Students reached**: over 700 (Based on 25 student class size per teacher, 2010-11 school year)
- **Adults reached**: nearly 1000 (Based on 1 outreach presentation to 30 people per teacher)
- **Capitol Hill/ NOAA Leadership recognition of TAS participants**: 4 (Ballard High School trip to Washington DC to meet with NOAA leadership and Senator Patty Murray; Representative William Clay’s recognition of Nicolle von der Heyde; Visit by Dr. Lubchenco to Dana Tomlinson’s classroom; Debora Mosher’s recognition by Eric Schwaab and John Oliver at Teacher Research Experience (TRE) Conference)
- **Media pieces about TAS participants**: 14 (The Birmingham News (AL), St. Louis Today (MO), KSDK News Channel Five (MO) – 2 appearances, St. Louis Globe (MO), Laurel Leader Call (MS), The Dutch Harbor Fisherman (AK), News Review (CA), Kansas City Info Zine (KS), Billings Gazette (MT), Indy Star (IN) – 2 articles, Desoto Times Tribune (MS), WISH TV8 (IN))
- **TAS alumni conference attendance to speak about TAS and NOAA**: 28 (National Science Teachers Association (NSTA) National 2010 (11), Teacher Research Experience (TRE) Conference (7), American Geophysical Union (AGU) Annual Meeting (5), AGU Fall Oceans Conference (3), BISREP (3), NSTA Regional Baltimore (1), NSTA Regional Nashville (1))
- **Web site visits**: Nearly 45,000 (January – December 2010)
- **Participant products**: Public blogs: 31; Photos: 500+; Videos: 3; Lessons: 20
Program Partnerships

**Internal**
- Sponsoring NOAA Scientists and Offices
- Office of Marine and Aviation Operations
- NOAA Office of Education & Education Council
- National Marine Sanctuaries
- NOAA Corps and ships’ crew

**External**
- TAS Alumni (600+)
- Centers for Ocean Sciences Education Excellence (COSEE)
- Columbia University Scientist Research Program
- PolarTREC (NSF)
- Project Maury (USNA and AMS)
- Smithsonian & National Aquarium
In 2010 an independent evaluator finished a two-year evaluation of NOAA’s Teacher at Sea Program.

In summary, regarding short- and mid-term goals:

- Teachers use the Teacher at Sea experience back in the classroom (NOAA data).
- The Teacher at Sea experience impacts how teachers teach (inquiry-based).
- The Teacher at Sea experience impacts participants on a very personal level (“life-changing”).
- Participants share their Teacher at Sea experiences with others (students, community members, teachers).
- Participants talked with others, including students and other teachers, about possible NOAA-related career opportunities.
In summary, regarding long-term goal:

- Data indicate that the NOAA Teacher at Sea Program is addressing its long-term goal: Build an understanding of NOAA-related sciences among teachers and students.

- Educators report that their own understanding of NOAA sciences has increased.

- In addition, the educators report that their students are more engaged in their science learning, know more about science as it applies to the world’s oceans/atmosphere/climate, and have an appreciation for the relevance of scientific research.
Future Opportunities and Challenges
Opportunities and Challenges

- Continuing expansion of program under Teacher at NOAA
  - Teacher at Sea
  - Teacher in the Lab (pilot phase)
  - Teacher in the Field (pilot phase)
  - Teacher in the Air (pilot phase)

- Further leveraging of alumni network

- Continued enhancement of program metrics

- Continued rigorous summative and formative evaluations

- Significant program outputs and outcomes

- Continued contribution to creating a more environmentally literate public and a future workforce for NOAA
Summary

“The Teacher at Sea experience was one of the most enriching and rewarding of my life. Without this program I never would have had the opportunity to work closely with scientists as a member of a research team. I am now able to communicate confidently with my students and the general public firsthand about the importance of ocean conservation, and the ongoing work of research scientists.”

~ Karen Matsumoto, 2010 NOAA Teacher at Sea (NOAA Ship Oscar Elton Sette)
Contact Information

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Phone: 301-713-0353 x225

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Phone: 301-713-0353 x138

Elizabeth Bullock, Program Support Specialist
E-mail: elizabeth.bullock@noaa.gov
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NOAA Teacher at Sea Program Office
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Background Material
Mission and Vision

- **Mission**: to give teachers a clearer insight into our ocean planet, a greater understanding of maritime work and studies, and to increase their level of environmental literacy by fostering an interdisciplinary research experience.

- **Vision**: to be NOAA’s main provider to teachers of opportunities to participate in real-world scientific research and maritime activities through teacher research experiences.

- **Overarching Goal**: NOAA’s Teacher at Sea program’s goals support NOAA’s environmental literacy, outreach, and education goals and also support NOAA’s workforce retention goal to recruit and retain a highly adaptable, technically competent and diverse workforce.
Program Goals

Short-term Goals (Skills and Knowledge)
Teachers will:

- Understand how NOAA oceanic and atmospheric research is linked to National Education Science Standards and Ocean Literacy Principles.
- Understand the education and training paths that lead to NOAA-related careers.

Mid-term Goals (Behavior and Action)
Teachers will:

- Use NOAA data and resources in classroom activities.
- Use NOAA-related career information in classroom activities, when mentoring students and when working with colleagues.

Long-term Goals (Social, Environmental, and Economic)
In support of NOAA’s mission, the Teacher at Sea Program will:

- Build an understanding of earth system science among teachers and students.
- Build a workforce for science, technology, engineering, and math careers.

Note: Goals were created using the Bennett Logic Model. External evaluation data indicates we are meeting our Short- and Mid-term Goals, and beginning to meet long-term goal.
Program History

NOAA’s Teacher at Sea Program is housed within NMFS from which it receives the majority of funding, but is considered a matrix program since it works with all Line Offices and Goal Teams. OMAO and NOAA Office of Education support program via funding as well.

OMAO Years

- 1990: Established within OMAO by NOAA Corps Officer (LT Ilene Byron)
- 2003: OMAO hired program manager
- 2004 – 2007: Program in formative years

NMFS Years

- 2008: Program moved to NMFS for expansion
- 2008 – Present: Program operating and expanding
  - Teacher in the Lab, Teacher in the Field, and Teacher in the Air are being piloted under umbrella program called Teacher at NOAA
Program Operations

Call for Applications (October – November)
- Call for applications takes place every year from 10/1 – 11/30
- Eligible candidates include full-time K-20 teachers, as well as museum and aquaria educators
- Receive an average 200 applications per year

Selections (December – February)
- Applications reviewed by a panel of 35+ TAS alumni and NOAA employees
- Reviews follow rubric
- Number of participants determined by budget, but usually around 30
- Final selections approved by NMFS Deputy Assistant Administrator
Program Operations (continued)

Placement Process (February – November)

- Ship Placement – Teachers matched with cruise based on availability, research interests, and geographical preferences
- Training – Teachers must complete online training course prior to sailing
- Deliverables – Teachers must agree to a Statement of Work but prior to sailing (Standard, but can be modified)
- Travel – Program funds and arrange for participants (at least one month before cruise)
- Communication
  - With teacher (frequent)
  - With scientist (frequent)
  - With ship XO (frequent)
Program Legal Authority and Mandate

Legal Authority

- Fish and Wildlife Coordination Act
  - Public Law 109–360

- DOC GC - “The Government is prohibited from paying for the travel of non-Government people unless those individuals are providing a direct service to the Government.” - Elise B. Packard Senior Attorney, DOC, 2004

- NAO 217-106 – Transportation of Nongovernment Personnel as passengers on NOAA Vessels, Aircraft, and Motor Vehicles

Mandate

- America COMPETES Act 2007 & 2010
“Research experiences for science teachers can have a direct impact on the achievement of their students, increasing their performance significantly on state assessments. There are also economic benefits – to the schools and to society at large – in having science teachers take part in research experiences. These are the findings Samuel C. Silverstein of Columbia University and colleagues describe in the Oct. 16 issue of Science magazine.”

Reference: