



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

Teacher Last Name	Teacher First Name	School City	School State	Subjects	Grades	Ship	Cruise Type	Line Office	Cruise Dates	Cruise Ports	Chief Scientist/ POC	
1	Altizio	David	New Rochelle	NY	Science	10th, 11th, 12th, 9th	Fairweather	Hydro	NOS/OMAO	05/17/10-05/26/10	Petersburg, AK; Seattle, WA	David Zezula
2	Babicki	Annmarie	Auburn	ME	English, Math, Science	5th	Oregon II	Shark/Red Snapper Longline	NMFS SE	08/07/10-08/22/10	Pascagoula, MS	Trey Driggers
3	Brustolon	Michele	Salem	NH	English, Science	8th	Oscar Dyson	Pollock	NMFS AK	06/27/10-07/16/9	Dutch Harbor, AK	Neal Williamson/ Mike Guttormsen
4	Byford	Anne	Gastonia	NC	Science	10th, 11th, 12th, 9th	Hugh R. Sharp	Sea Scallop	NMFS NE	06/08/10-06/20/10	Lewes, DE; Woods Hole, MA	Stacy Rowe
5	Chewning	Richard	Jekyll Island	GA	Science	5th, 6th	Oscar Dyson	Pollock	NMFS AK	06/04/10-06/24/10	Kodiak, AK; Dutch Harbor, AK	Paul Walline/ Mike Guttormsen
6	Deichstetter	Peggy	Elgin	IL	Science	11th, 12th, 9th	Oregon II	Shark/Red Snapper Longline	NMFS SE	08/30/10-09/11/10	Pascagoula, MS; Galveston, TX	Mark Grace/ Karen Mitchell
7	Fulcar	Obed	NY	NY	Math	6th, 7th, 8th	Oscar Dyson	Pollock	NMFS AK	07/19/10-08/06/9	Dutch Harbor, AK	Taina Honkalehto/ Mike Guttormsen
8	Kimport	Rebecca	Washington	DC	Science	10th, 11th	Oscar Dyson	Pollock	NMFS AK	06/27/10-07/16/10	Dutch Harbor, AK	Neal Williamson/ Mike Guttormsen
9	King	Steven	Washington	DC	All subjects	2nd	Kilo Moana	WHOTS	WHOI	07/27/10-08/04/10	Honolulu, HI	Bob Weller (WHOI)
10	Knutson	Donna	Bismarck	ND	Science	9th	Oscar Elton Sette	Corals, Cetaceans, Ocean Acidification	NMFS PI	09/01/10-09/30/10	Honolulu, HI	Erin Oleson
11	Koch	Barbara	Anderson	SC	English, Science	5th	Henry B. Bigelow	Autumn Bottom Trawl	NMFS NE	09/27/10-10/07/10	Woods Hole, MA; Newport, RI	Stacy Rowe
12	Lewis	Kimberly	Rio Grande	OH	Science	11th, 12th	Oregon II	Summer Groundfish & Hypoxia	NMFS SE	07/01/10-07/17/11	Galveston, TX; Pascagoula, MS	Mike Hendon/ Andre Debose
13	Macke	Natalie	Montvale	NJ	Science	10th, 11th, 12th, High School	Oscar Dyson	BASIS	NMFS AK	08/16/10-09/03/10	Dutch Harbor, AK	Ed Farley
14	Matsumoto	Karen	Seattle	WA	Science	Adult Education, General Public	Oscar Elton Sette	Corals, Cetaceans, Ocean Acidification	NMFS PI	04/16/10-05/04/10	Guam; Honolulu, HI	Marie Hill
15	Miller	Story	Unalaska	AK	Math, Science	7th, 8th	Oscar Dyson	Pollock	NMFS AK	07/19/10-08/06/10	Dutch Harbor, AK	Taina Honkalehto/ Mike Guttormsen

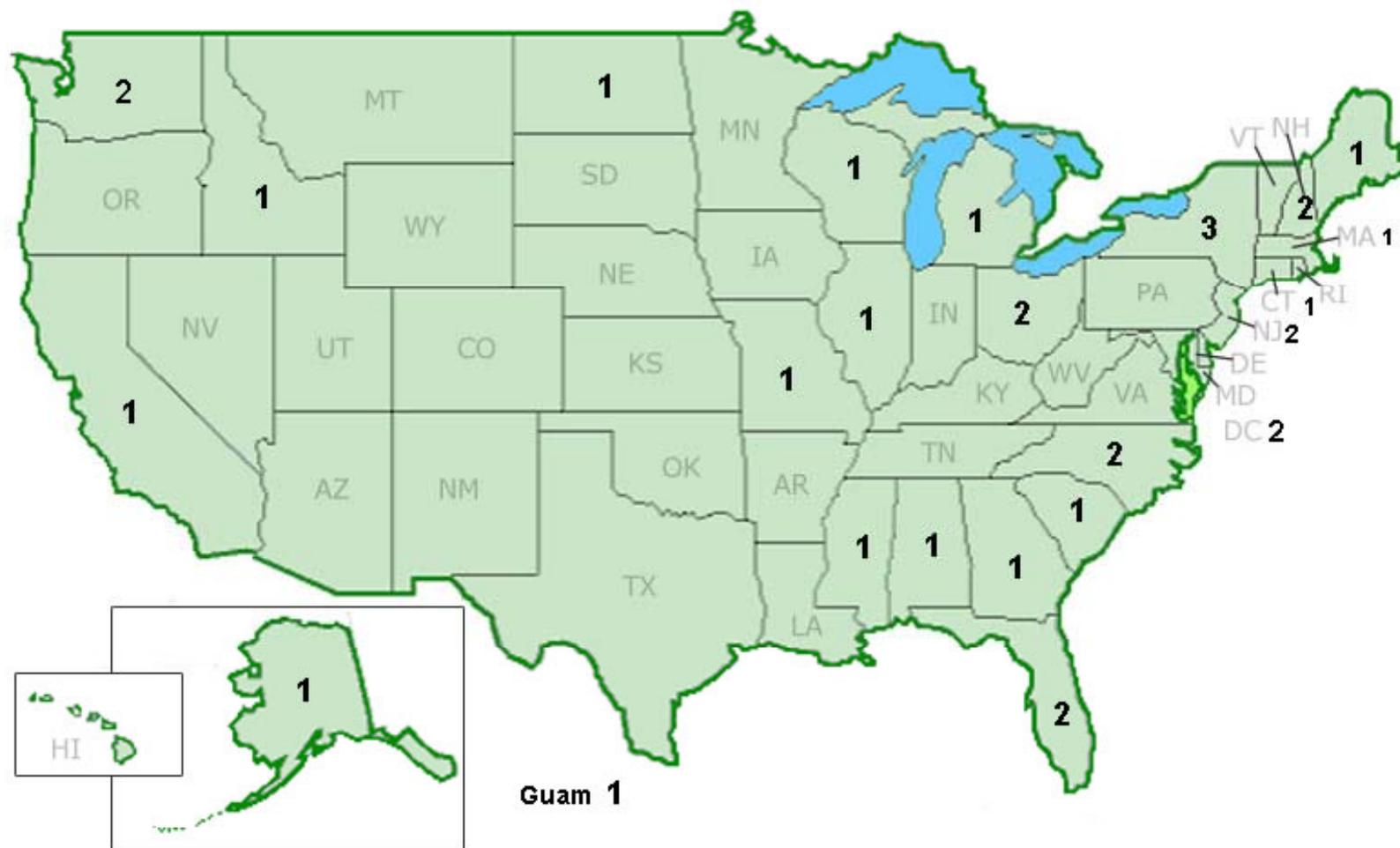


2010 TAS Participants (continued)

Teacher Last Name	Teacher First Name	School City	School State	Subjects	Grades	Ship	Cruise Type	Line Office	Cruise Dates	Cruise Ports	Chief Scientist/ POC	
16	Moraga	Deborah	Columbus	OH	Science	6th	R/V Fulmar	Offshore Ecosystems Monitoring	NOS/Sanct	07/20/10-07/28/10	Oxnard, CA	Jenny Stock
17	Mueller-Northcott	Julianne	Amherst	NH	Science	10th, 11th	Hugh R. Sharp	Sea Scallop	NMFS NE	05/11/10-05/22/10	Lewes, DE	Vic Nordahl
18	Rodriguez	Laura	Willington	CT	Science	7th	Oscar Dyson	FOCI Late Larval	NMFS AK	05/21/10-06/01/10	Dutch Harbor, AK	Annette Dougherty
19	Schroeder	Kathy	Key Biscayne	FL	Science	6th	Oscar Dyson	FOCI Spring Ichthyoplankton	NMFS AK	05/06/10-05/18/10	Dutch Harbor, AK	Jeff Napp/ Janet Duffy-Anderson
20	Scott	Tanya	Newport	NC	Science	6th	Miller Freeman	PaCOOS	NMFS NW	06/16/10-06/21/10	Newport, OR; Seattle, WA	Rick Brodeur/ Toby Auth
21	Shoemake	Mechelle	Ellisville	MS	Science, Math, and Social Studies	4th	Oregon II	Summer Groundfish	NMFS SE	06/23/10-06/30/10	Pascagoula, MS; Galveston, TX	Andre DeBose/ Mike Hendon/
22	Singler	Caroline	Sudbury	MA	Science	11th, 12th, 9th	USCGC Healy	Arctic Continental Shelf Survey	NOAA/NOS/JSGS et al	08/02/10-09/08/10	Dutch Harbor, AK; Barrow, AK	Helen Gibbons (USGS)
23	Spear	Beth	Salem	WI	Science	10th, 11th, 12th, 9th	Delaware II	Shark/Red Snapper Longline	NMFS SE	07/30/10-08/09/10	Pascagoula, MS; Morehead City, NC	Mark Grace/ Karen Mitchell
24	Storey	Melinda	Birmingham	AL	All subjects	3rd, 4th, 5th, 6th	Pisces	Reef Fish	NMFS SE	06/14/10-07/02/10	Pascagoula, MS	Paul Felts/ Karen Mitchell
25	Struble	Wes	Moscow	ID	Science	10th, 11th, 7th, 9th, Elective	Ka'imimoana	TAO	NWS	07/08/10-08/10/10	San Diego, CA; Manzanillo, Mx	Jonathan Heesch
26	Taterka	Bruce	Mendham	NJ	All subjects, Science	10th, 11th, 12th	Oregon II	Summer Groundfish & Hypoxia	NMFS SE	07/01/10-07/17/10	Galveston, TX; Pascagoula, MS	Mike Hendon/ Andre Debose
27	Tatreau	Linda	Mangilau	Guam	Science	11th, 12th	Oscar Elton Sette	Corals, Cetaceans, Ocean Acidification	NMFS PI	02/11/10-03/14/10	Guam	Scott Ferguson
28	von der Heyde	Nicolle	Florissant	MO	Science	8th	Pisces	Reef Fish	NMFS SE	06/14/10-07/02/11	Pascagoula, MS	Paul Felts
29	Ward	Tom	Fulton	NY	Science	10th, 9th	Miller Freeman	FOCI Fall Ichthyoplankton	NMFS AK	09/02/10-09/15/10	Seattle, WA; Dutch Harbor, AK	Janet Duffy-Anderson
30	Warren	Elizabeth	Redmond	WA	All subjects	6th	Pisces	Reef Fish	NMFS SE	07/07/10-07/13/10	Pascagoula, MS	Kevin Rademacher
31	Wotkyns	Anne Marie	North Hollywood	CA	English, Science	3rd, 4th	Pisces	Reef Fish	NMFS SE	07/07/10-07/13/11	Pascagoula, MS	Kevin Rademacher

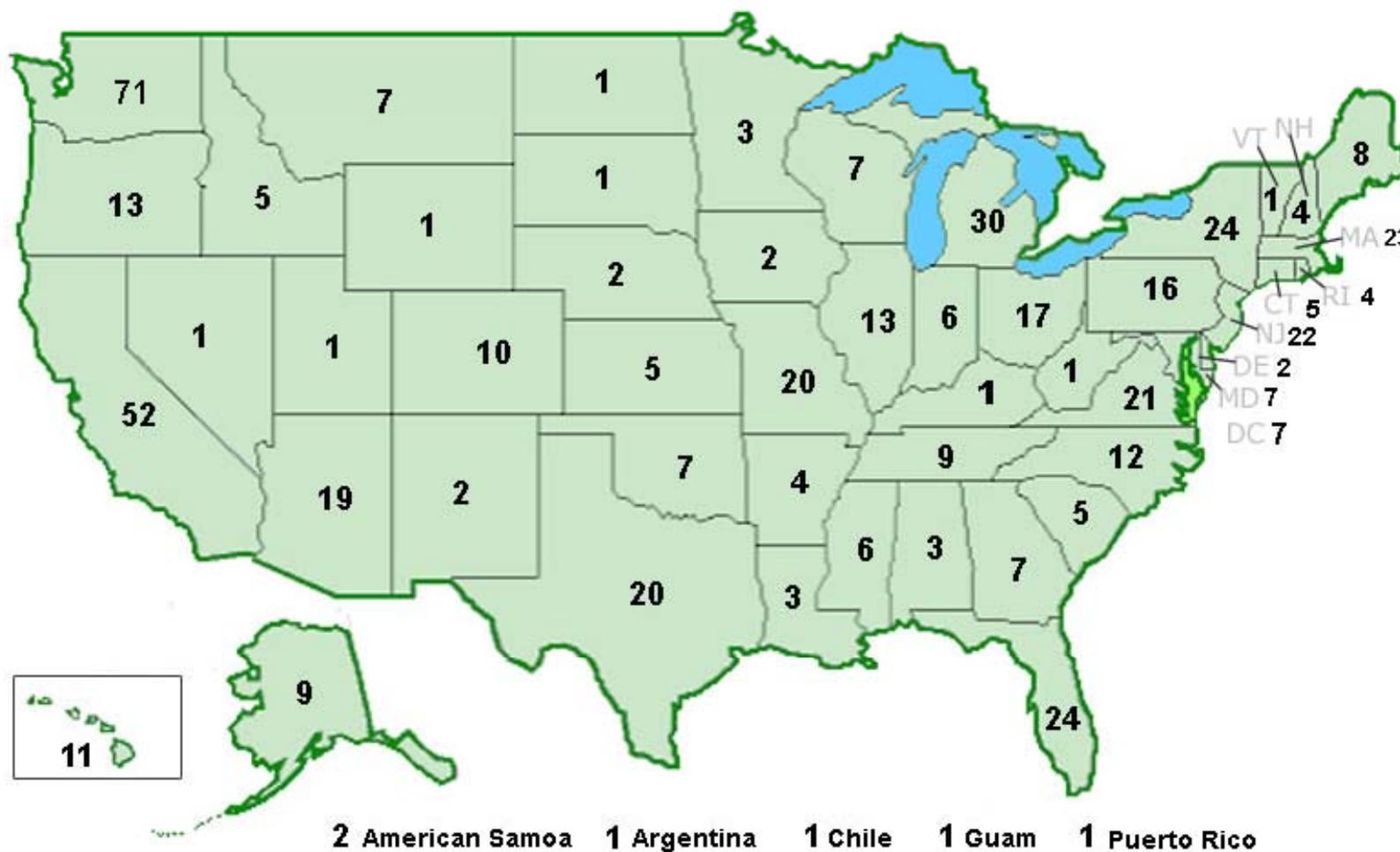


States Represented by 2010 TASs





TAS Alumni 1990 – 2010





2010 Teacher in the Lab/Field Participants (Pilot Projects)

NOAA Teacher in the Lab Pilot Project - Summer 2010					
Lab	Scientist	Teacher	Grade	Weeks	Research
South East Fisheries Science Center, Miami	Trika Gerard	Mark Silverman	High School	4	juvenile fish
Alaska Fisheries Science Center, Juneau	Bonita Nelson	Lara Dzinich	Middle School	3	cultivating krill
Earth System Research Laboratory, Boulder	Dan Wolfe	Peter Blanken	College	3	climate
South West Fisheries Science Center, La Jolla	Jeff Seminoff	Dana Tomlinson	Elementary School	3	green turtle
Chesapeake Bay Lab	John Jacobs	Hema Bhaskaran	Middle School	3	water quality
Long Beach Lab	Bill Peterson	Jackie Hams	Community College	0	Tuna
				16	
NOAA Teacher in the Field Pilot Project - Summer 2010					
Field	Scientist	Teacher	Grade	Weeks	Research
Pribilof Islands	Kate	Rick	High School	0	seal pup
Puget Sound	Gary Winans	Jon Baker	High School	3	genetics
Puget Sound	Gary Winans	Jennifer Duncan	High School	3	genetics
Puget Sound	Gary Winans	Michele Wolski	High School	3	genetics
				9	

Total

25

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





Program Evaluation

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.



Program Evaluation (continued)

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 on-going work of research scientists.”

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





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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 arranges 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



2009 *Science* Article (Indicating the value of teacher research experiences)



“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:

Silverstein, S.C., Dubner, J., Miller, J., Glied, S., & Loike, J.D. (2009). Teachers' participation in research programs improves their students' achievement in science. *Science*, 326, 440. doi: 10.1126/science.1177344