

**NOAA**  
**FISHERIES**

Teacher at Sea

# NOAA's Teacher at Sea Program

**2013 Year in Review**

**December 2013**

# NOAA's Teacher at Sea Program

## 2013 Year in Review



### Overview

- 2013 NOAA Teacher at Sea (TAS) Season Snapshot
- Return on Investment
- Future Opportunities
- Background Material



"In addition to introducing me to the process of hydrographic surveying, I felt that the diversity of experiences I had was very enriching. I didn't just learn about the science, but got to participate as part of a research team and felt like I was contributing productively to the process." - Rosalind Echols, TAS 2013

# 2013 Snapshot

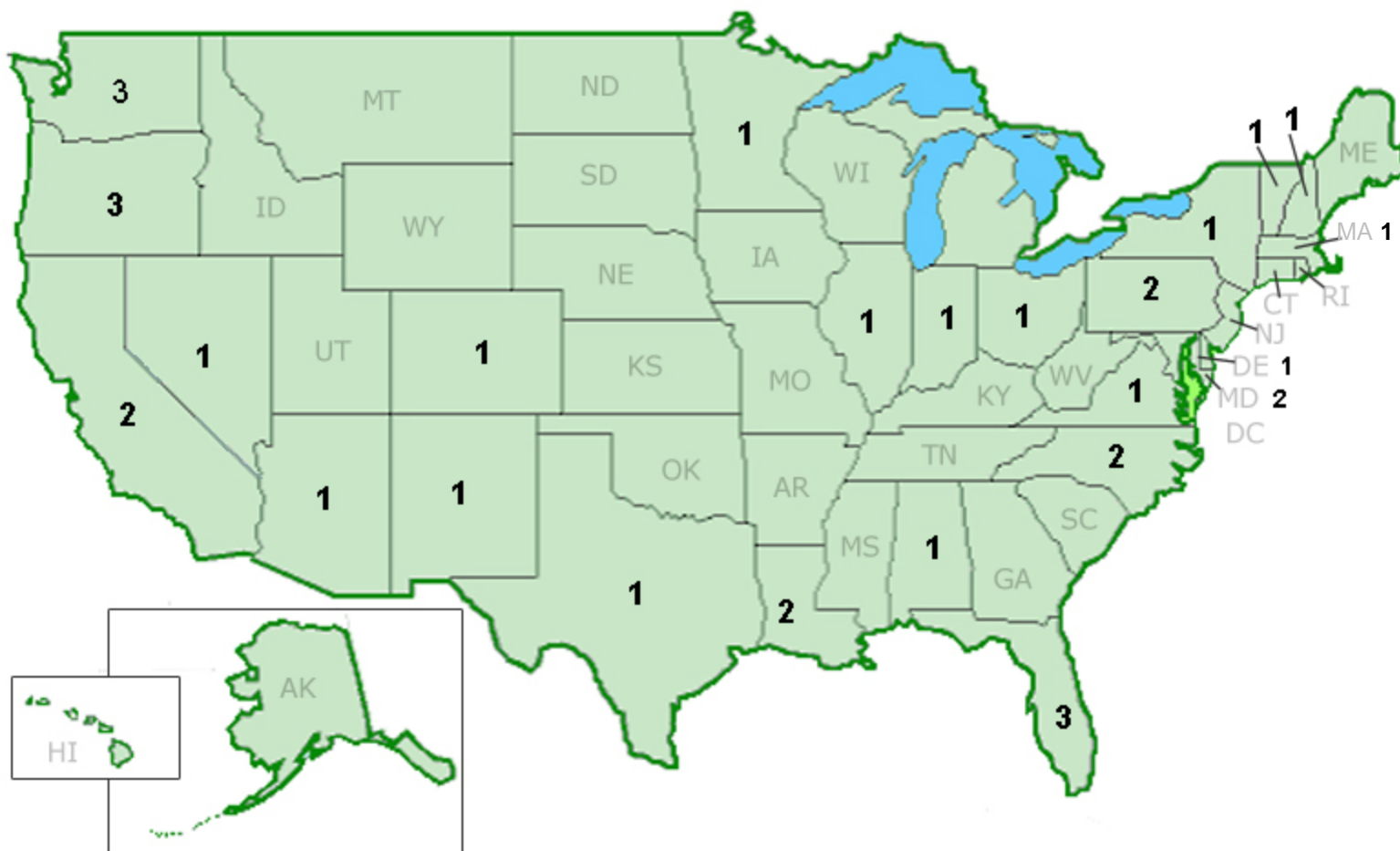


## By the Numbers

- Teachers sent to sea: 35
- Days at Sea: 520
- Research Hours: 6200
- States represented: 24
- Active Alumni : 300+
- Outreach events: 25
- Science blogs: 200
- Graduate Credits Awarded: 16
- Teachers placed lab & field (pilot program): 8
- Media (articles, radio, TV): 65

"I did not see the ocean until I was an adult and although I live by lakes, I couldn't fully grasp its importance and power until this [research] experience." – Bill Lindquist, TAS 2013

# 2013 Teacher at Sea Class



# 2013 Return on Investment

## Program Operations

- 35 teachers sailed on NOAA research cruises
- Teachers represented 24 states and every grade level
- Teachers worked side-by-side with NOAA scientists equivalent to 520 days at sea or 6200 hours
- 100% of the 2013 teachers who sailed completed post-cruise survey stated:
  - They benefited from participating
  - They would recommend the program
  - They were very satisfied with their research experience



NOAA Scientists Stacey Harter and Stephanie Farrington setting up equipment for ROV dives – July 2013

NOAA's Teacher at Sea Program is competitive and had 220 teachers apply for the 2013 season. All applications were peer-reviewed by a 70-person selection committee, and over 70 scientists volunteered to host and mentor our teachers.



# 2013 Return on Investment



## Web & Social Media Communication

- Launched a new lesson plan search feature - searchable by topic, grade level, geographical region, and teacher
- 400,000+ visitors to the TAS website
- Managed content of 200+ science blogs
- Managed ~12,000 free for public photos
- Doubled number of Facebook “Likes” and reached ~5,000 people each week
- Increased Twitter followers by 55%

“It has allowed me to expand my horizons outside of the classroom and give first-hand experiences to my students. I feel that it is important that we ‘practice what we preach’ and this experience will allow me to do just that. I gained a great appreciation for NOAA, not just in fisheries science but the NOAA Corps as well.” - Jennifer Petro, TAS 2013

# 2013 Return on Investment

## Web & Social Media Communication

- Implemented responsive design - retrofitted website to respond to any device
- Maintained and developed creative social media and web campaigns to lead people to blogs and photos
  - Published over a year of “Photo of the Week” photos – provides science info about NOAA research at sea
  - Launched a new web and print “Did You Know” educational product – interactive images and science content from blogs



Elizabeth Eubanks (TAS 2007) has a Smart Board in her classroom and uses the “Did You Know” product each day to engage her 8<sup>th</sup> grade students in a conversation about real-world scientific research.

# 2013 Return on Investment



## Teacher at Sea Alumni Activities

- Presented and worked at 25 education and science conferences (with approximately ~600,000 attendees) on behalf of NOAA
- Were mentioned in 65 media posts (articles, TV, radio, web, etc.)
- Produced 80+ lesson plans, 50+ presentations, 1,000+ photos
- Distributed 20,000+ TAS books and other NOAA education products
- Alumni earned 16 graduate credits

Yaara Crane (TAS 2013) and Elizabeth Bullock (TAS 2011) shared hands-on STEM activities related to their NOAA Teacher at Sea research cruise during the *Change the World: Science & Engineering Careers, a public STEM fair* (U.S. Representative Frank Wolf and the National Science Foundation) sponsored on September 28, 2013 in Dulles, VA.



# 2013 Return on Investment



Throughout the year, many of our alumni receive special recognition. For example, Michele Brustolon (TAS 2010) and her eighth-grade science students welcomed U.S. Senator Jeanne Shaheen, D-NH, to their school. After Ms. Brustolon presented at the Smithsonian National Museum of Natural History at the Scientist is In: Ask an Expert event, Senator Shaheen wanted to see first-hand what Ms. Brustolon was teaching in her classroom.

"I was really impressed to see them honor Ms. Brustolon. I really wanted to come down and find out what things she is teaching in class." \_ Senator Jeanne Shaheen



*Photos courtesy of Mary Schwalm, Eagle Tribune*

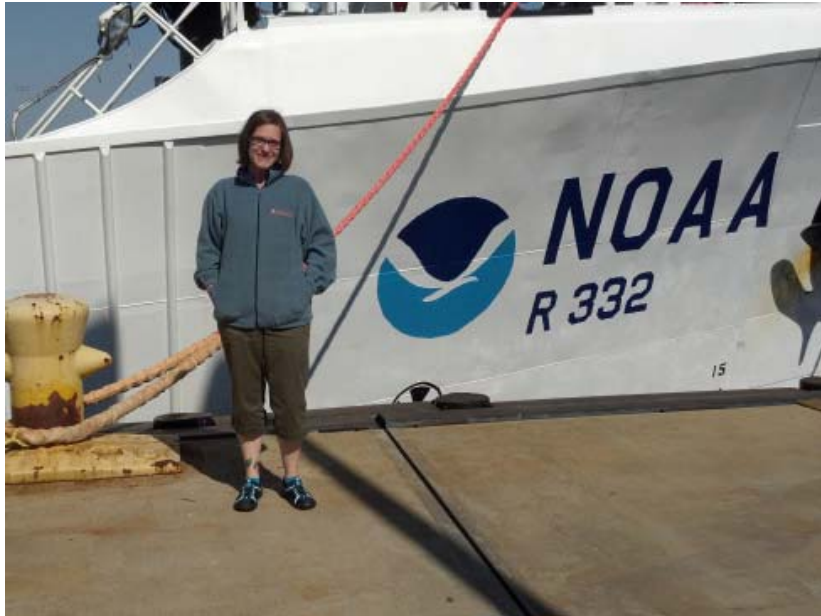
# Future Opportunities

- Expansion of program to include
  - Teacher at Sea
  - Teacher in the Lab (pilot phase)
  - Teacher in the Field (pilot phase)
  - Teacher in the Air (pilot phase)
- Leveraging alumni network to expand reach beyond classrooms
- Enhancing communication and outreach capabilities online
- Increasing external partnerships



“I received instant respect from the scientists and ship crew. They gave me the opportunity to participate right away and to be part of the team. The scientists, were very open to answering questions and took time to explain the value of the research and why they do what they do.” – Louise Todd, TAS 2013

# A Teacher's Perspective...



"My experience will help me show the kids at the Springs Nature Preserve all about how healthy oceans keep our desert healthy, and how they can grow up to be the scientists or ship crew members who protect our oceans." – Emilisa Saunders, TAS 2013

"This experience gives teachers a better understanding of what the expectations are so we can help our kids work toward those things. We want to make our teaching meaningful and memorable for our students so they can apply today's lessons in the future to solve problems." - Marla Crouch, TAS 2013





# A Scientist's Perspective...



Julia Harvey (TAS 2013) participating in the acoustic trawl survey on NOAA ship *Oscar Dyson*.

"The TAS Program serves a critical role in the success of these AT [acoustic trawl] surveys. Not all positions on the Science Team need be filled by acoustically-trained fish biologists. A positive attitude and willingness to learn (along with a good set of "sea legs") are all that is needed in the Fish Sampling Lab. In our 21 years of experience, we have yet to sail with a teacher who has not represented the best of their profession.

The value of the TAS Program to teachers, and their students and the public-at-large is well established. We would like to acknowledge and say thanks for the many positive benefits your Program has brought to our time at sea and our overall research efforts."

- Douglas DeMaster, Science and Research Director, Alaska Region, NOAA Fisheries

"My enthusiasm for the experience and the subject matter are exponential. People have said as such when I have been telling them about the trip. This excitement will be apparent back in the classroom as well." – Julia Harvey, TAS 2013



# Background Material



“As a teacher and coach, education and teamwork are at the very heart of everything I do. The real education I received during our 16 day voyage surpassed a large majority of the education I received during my college career. Ultimately, it is that gift that everyone has given me that will be the essence that changes the lives of my students forever.” - Paul Ritter, 2013

# 2013 Teacher at Sea Class



	Last Name	First Name	Subjects	Grades	School/Institution	School City	State	NOAA Research	Days at Sea	Ports	Ship
1	Boehm	Sarah	Science	4th, 5th, 6th	Community Day Charter Public School	Lawrence	MA	SEAMAP Summer Groundfish Survey	06/23/13-07/07/13	Galveston, TX; Pascagoula, MS	<i>Oregon II</i>
2	Clark	John	Science - chemistry, Science - physics, Science - AP physics	10th, 11th, 12th	Deltona High School	Deltona	FL	Autumn Bottom Trawl Survey	09/23/13-10/04/13	Newport, RI	<i>Henry B. Bigelow</i>
3	Crane	Yaara K	Science - General Chemistry, Science - IB Chemistry	10th - mixed 10-12th grade, 12th - mixed 11- 12th grade	Fairfax County Public Schools - Annandale High School	Annandale	VA	Hydrographic Survey	06/22/2013 - 07/03/2013	Lewes, DE; Norfolk, VA	<i>Jefferson</i>
4	Crouch	Marla M	Science - Earth and Space, Other - Robotics	6th, 7th, 8th	Maywood MS/Issaquah	Renton	WA	Alaska Pollock Survey	06/08/13-06/26/13	Dutch Harbor, AK	<i>Oscar Dyson</i>
5	Culbertson	Britta	Science	8th	The Center School	Seattle	WA	FOCI EMA YOY Pollock Survey	09/04/13-09/22/13	Kodiak, AK	<i>Oscar Dyson</i>
6	Cullumber	Sue L	Science - all areas	6th - 5th grade science, 7th, 8th, 9th, 10th, 11th, 12th	Howard Gray School	Scottsdale	AZ	Ecosystems Monitoring Survey	06/05/13-06/24/13	Newport, RI; Norfolk, VA	<i>Gordon Gunter</i>
7	Echols	Rosalind	Science - Physics	11th	Science Leadership Academy	Philadelphia	PA	Hydrographic Survey	07/08/13-07/25/13	Kodiak, AK	<i>Rainier</i>
8	Eli	Amie N	Science - Earth, Science - Space, Science - Physical, Math - Algebra	9th, 9th - 9-12	White Salmon Valley S.D.	White Salmon	WA	Alaska Pollock Survey	06/30/13-07/18/13	Kodiak, AK	<i>Oscar Dyson</i>
9	Ellison	Susy	Science - earth science, Science - life science, Science - physical science, Science - integrated science, English - novel study	9th, 10th, 11th, 12th, 9th - mixed grades 9-12	Yampah Mountain High School	Glenwood Springs	CO	Hydrographic Survey	09/09/13-09/26/13	Kodiak, AK	<i>Rainier</i>
10	Gee	Sherie L	Science - Aquatic Science, Science - AP Environmental Science, Science - Environmental Systems	12th	John Paul Stevens High School	San Antonio	TX	Sea Scallop Survey	06/26/13-07/07/13 (returned 6/29/13)	Lewes, DE; Woods Hole, MA	<i>Hugh R. Sharp</i>



# 2013 Teacher at Sea Class



	Last Name	First Name	Subjects	Grades	School/Institution	School City	State	NOAA Research	Days at Sea	Ports	Ship
11	George	Melissa D	Science - General, Gifted, and ELL	8th	Lafayette Tecumseh Junior High School	Lafayette	IN	Alaska Pollock Survey	07/22/13-08/09/13	Kodiak, AK	Oscar Dyson
12	Greene	Angela K	Science - Evolution, Science - Astronomy, Science - Reproduction, Math - Intervention	8th	Tecumseh Middle School	New Carlisle	OH	Northern Right Whale Survey	04/29/13-05/10/13	Woods Hole, MA; Boston, MA	Gordon Gunter
13	Harrington	Elizabeth	Science - Earth/Physical, Science - Forensics, Science - Belize Field Study, Science - ecology	9th, Other - 11th & 12th, Other - 10th - 12th, 12th	Essex High School	Essex Junction	VT	Shark/Red Snapper Bottom Longline	08/10/13-08/25/13	Mayport, FL; Pascagoula, MS	Oregon II
14	Harvey	Julia	Science - Biology, Science - Environmental Science, Science - Life Science, Science - Principles of Environmental Science, Science - Ecology Studies	9th - 10th, 12th, 10th - 11th, 12th	Eugene SD 4J	Eugene	OR	Alaska Pollock Survey	07/22/13-08/09/13	Kodiak, AK	Oscar Dyson
15	Haukebo	Sepp	Science; Knauss Fellow	Middle School			NM	Juvenile Salmon Survey	09/08/13-09/20/13	Santa Cruz, CA; Newport, Oregon	Bell M. Shimada
16	Hubacz Jr	Frank	Science - Chemistry, Science - Environmental Chemistry	University	Franklin Pierce University	Rindge	NH	FOCI Spring Moorings	04/26/13-05/10/13	Seward, AK; Dutch Harbor, AK	Oscar Dyson
17	Karre	Julie A	English - Language Arts	7th, 8th	Armistead Gardens Elementary and Middle School/Baltimore City Public Schools	Baltimore	MD	Shark/Red Snapper Bottom Longline	07/26/13-08/08/13	Pascagoula, MS; Mayport, FL	Oregon II

# 2013 Teacher at Sea Class



	Last Name	First Name	Subjects	Grades	School/Institution	School City	State	NOAA Research	Days at Sea	Ports	Ship
18	Lindquist	Bill	Other - elementary science methods	University - School of Education	Hamline University	Saint Paul	MN	Hydrographic Survey	05/06/13 - 05/16/13	Ketchikan, AK; Petersburg, AK	Rainier
19	Lyte	Melanie A	All subjects, Science - K-5	1st, Other - Science Coordinator	East Greenbush Central Schools	Troy	NY	Northern Right Whale Survey	05/22/13 - 05/31/13	Boston, MA; Newport, RI	Gordon Gunter
20	Marvin	Avery	Science	8th science	Taft 7-12	Depoe	OR	Hydrographic Survey	07/08/13-07/25/13	Kodiak, AK	Rainier
21	McGinnis	Patty A	Science	7th - gifted , 8th - gifted, 7th - science fair, 8th - science fair	Arcola Intermediate School	Eagleville	PA	Juvenile Rockfish Survey	05/22/13 - 05/29/13	San Francisco, CA	R/V Ocean Starr
22	Nyman	Elizabeth	Other - Political Science	University	University of Louisiana at Lafayette	Lafayette	LA	SEAMAP Reef Fish Survey	05/27/19-06/07/13	Key West, FL; Mayport, FL	Pisces
23	Owens	Beverly	Science	8th	Middle School	Shelby	NC	Deepwater Coral Habitat	06/10/13-06/24/13	Newport, RI	Henry B. Bigelow
24	Peters	Christina M	All subjects	4th	Farmland Elementary School	Rockville	MD	SEAMAP Summer Groundfish Survey	07/10/13-07/19/13	Pascagoula, MS	Oregon II
25	Petro	Jennifer	Science - All	Middle School - no longer informal ed updated 4/1/13	Everitt Middle School	Panama City	FL	South Atlantic MPA	07/01/13-07/14/13	Mayport, FL	Pisces
26	Renick	Adam C	Science - Earth and Planetary	9th	Health Sciences High School	San Diego	CA	Kona IEA	06/12/13-06/26/13	Honolulu, HI	Oscar Elton Sette
27	Ritter	Paul A	Science - Biology, Science - Earth Science	10th, 11th, University	Pontiac High School	Pontiac	IL	Southeast Fishery Independent Survey (SEFIS)	07/17/13-08/01/13	Mayport, FL	Pisces
28	Salisbury	Rita	Science - Biology, Other - Response to Intervention	10th	Seaford Senior High School	Seaford	DE	Hawaii Bottomfish Survey	04/15/13-04/29/13	Honolulu, HI	Oscar Elton Sette

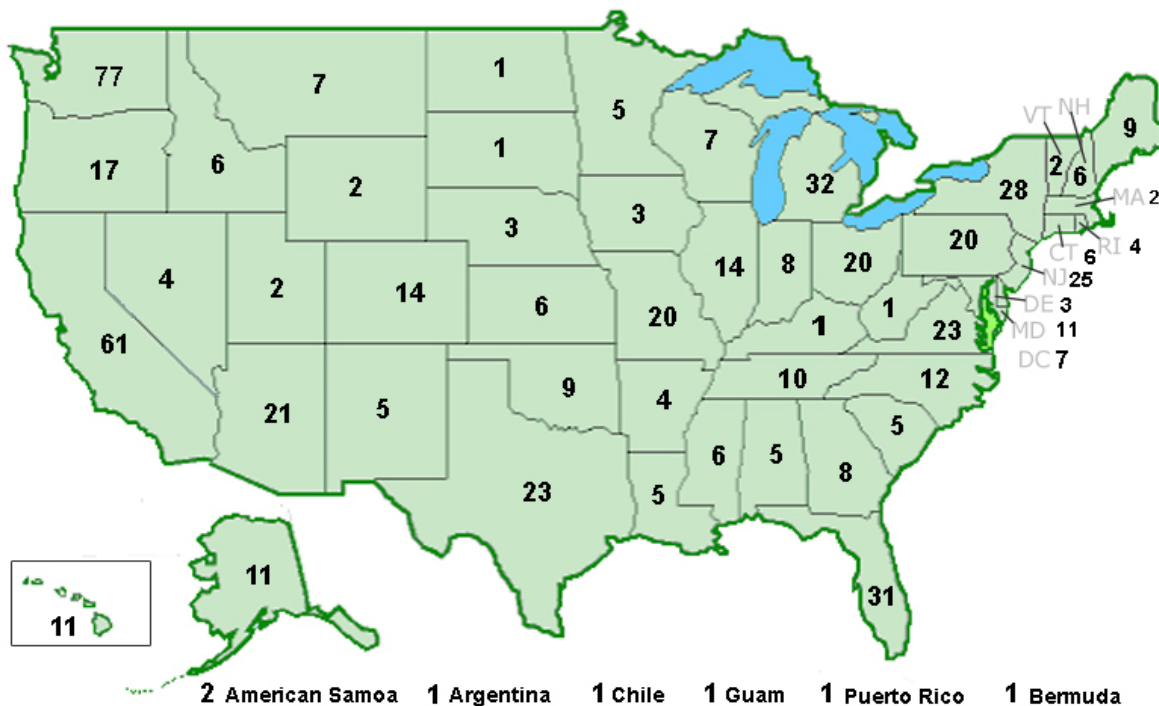


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29	Sard	Katie	science	6th-8th science	Isaac Newton Magnet School	Newport	OR	Hydrographic Survey	07/29/13-08/15/13	Kodiak, AK	Rainier
30	Saunders	Emilisa	Other - Science/nature, history, sustainability, Science - Science and naturalist skills, Other - Natural history, history, sustainability, Other - Science, Natural history, history, sustainability	Other - Family Programs, Other - One-on-one interpretation/interactions, Other - Museum tours, Other - Community outreach	Springs Preserve/Las Vegas Valley Water District	Las Vegas	NV	SEAMAP Spring Plankton Survey	05/14/13-05/30/13	Pascagoula, MS	Oregon II
31	Todd	Louise V	Other - Science, customer service and presentation skills, Science - Interpretation in the aquarium about our exhibits	Other - Youth Volunteers in 7th-10th grades, Other - General audience (includes adults and children)	Audubon Aquarium of the Americas	New Orleans	LA	Shark/Red Snapper Bottom Longline	09/15/13-09/29/13	Galveston, TX; Pascagoula, MS	Oregon II
32	Trimlett	Kate	Science		Berkeley High School	Berkeley	CA	Sanctuary Cruise - Applied CA Current Ecosystem Studies Cruise	07/21/13-07/30/13	CA	Fulmar
33	Ulmer	Robert D	Science - Physical, Biological, and Earth Sciences	8th	Lake Butler Middle School	Lake Butler	FL	Hydrographic Survey	06/15/13-07/03/13	Juneau, AK; Kodiak, AK	Rainier
34	Velarde	Eric J	Science - Honors Earth/Environmental Science, Science - Honors Biology, Science - Physical Science	9th, 10th, 11th	The Early/Middle College at Bennett College for Women	Greensboro	NC	Sea Scallop Survey	06/13/13-06/24/13	Lewes, DE	Hugh R. Sharp
35	Warren	Virginia E	Science - Physical and Life Science, Other - Social Studies (Maps and early US history)	5th	Breitling Elementary School (Mobile County Public School System)	Grand Bay	AL	Sea Scallop Survey	07/09/13-07/19/13	Woods Hole, MA	Hugh R. Sharp

# 1990 - 2013 Teacher at Sea Program Snapshot



## By the Numbers

- 650+ teachers sent to sea
- 7,800 days at sea
- 94,000 hours of research
- 30,000 science photos
- 1,300 educational products
- 2.3 million people reached
- 325,000 students reached
- 2,400 science blogs post
- 1,200 teacher-scientist partnerships

“This program enables educators to experience science... Increasing our understanding of science while acquiring new skills and knowledge, enables us to become better teachers.” – Heather Haberman (TAS 2011)



# NOAA Teacher at Sea 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 the Teacher at Sea Program is meeting its Short- and Mid-term Goals. More analysis is needed to evaluate Long-term impacts.





# History & Status

A matrix program, NOAA's Teacher at Sea Program is housed within NOAA Fisheries, receiving support from the Office of Marine and Aviation Operations and providing educational resources to all the NOAA line offices.

## 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
  - Teacher in the Lab, Teacher in the Field, and Teacher in the Air are being piloted
- 2011 - present: Program operating out of Fisheries Communications Office

Note: This timeline is subject to some change due to fiscal appropriation.  
Check the website regularly for updates to the schedule.





# Operations

## **Call for Applications (October)**

- Call for applications takes place from 10/1 – 10/31
- Eligible candidates include full-time Kindergarten through College teachers, as well as museum and aquaria educators
- Receive an average 200 applications per year

## **Selections (December – January)**

- Applications reviewed by a panel of 50+ 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 and applicants notified by March



# 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)



# Partnerships

## Internal

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

## External

- TAS Alumni
- University of St. Francis
- PolarTREC (NSF)
- Project Maury (USNA and AMS)
- Smithsonian Ocean Hall
- Cal Poly State University STEM Teacher and Researcher (STAR) Program