

**Amy L. Kukulya**

Research Engineer  
Applied Ocean Physics and Engineering Department  
Woods Hole Oceanographic Institution  
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**Telephone:** (508) 289-3689**E-mail:** amy@whoi.edu**Website:** <https://www2.whoi.edu/staff/akukulya/>**Clearance: Secret****Education:**

**B.S.:** Rutgers University, 1999, Environmental Policy.  
American University, 1998, Summer Semester, Seville, Spain.

**Research Interests:**

Underwater vehicle system architecture for docking, navigation, communications, underwater archaeology, three-dimensional tracking of animals and under-ice capabilities; Development of science applications for underwater vehicles; Professional outreach communicator/speaker.

**Professional Experience:**

**Woods Hole Oceanographic Institution**, Woods Hole, MA (June 2001-present)  
Research Engineer, AOP&E (November 2018-current)  
Senior Engineering Assistant II (Principal Investigator), AOP&E (June 2015-November 2018)  
Senior Engineering Assistant I, AOP&E (August 2008-June 2015)  
Engineering Assistant III, AOP&E (March 2006-August 2008)  
Research Assistant III, AOP&E (November 2004-March 2006)  
Research Assistant II, Biology Department (2001 June, transferred to AOP&E in 2003 June)

**Cape Cod Cooperative Extension's Marine Program**, Barnstable County, MA (October 2000-June 2001)  
Program Assistant, Southeastern Massachusetts Aquaculture Center (SEMAC).

**AmeriCorps National Service Program**, Cape Cod, MA (September/1999-October/2000)  
Service Member, Experimental aquaculture/shellfish disease research, community service

**Department of Marine Sciences, Isla Magueyes Research Station** (May/1999-August/1999)  
USDA grant in aquaculture research, University of Puerto Rico, Mayaguez: Biologist/Student

**The US Fish & Wildlife Service**, Oceanville, NJ (May/1997-September/1997)  
Outreach coordinator and Biologist Assistant (co-op)

**The Department of Environmental Protection**, Trenton, NJ (February/1997-May/1997)  
Research Intern (co-op): Division of Science & Research

**Training, Certifications, Licenses:**

- UCLA Technical Management Program, 2016
- Harvard Kennedy School, Executive Education, Creating Collaborative Solutions, 2017
- United States Coast Guard Captains License- 50 Ton, Current
- Advanced First Aid, CPR
- PADI Open Water SCUBA certification
- Confined Space Training/Lockout Tag-out

- Respirator Training, Current.

**Professional Activities and Awards:**

- Linda Morse-Porteous Award for dedication to discovery, excellence and for serving as a role model to other women, 2015
- Woman’s Committee elected member, Webmaster, September 2007 (two year)
- Retirement Task Force- Member, May 2009-June 2010
- Member of the WHOI Tech Women's Group, 2017-current
- Wowster Mentor and Outreach Professional, Appointed by MA Governor's Office, 2012- ongoing

**Professional Affiliations:**

ASLO, American Society for Limnology and Oceanography, 2004-2006  
 IEEE Ocean Engineering Society, 2006 -current  
 Society of Women Engineers, 2017-current

**Supervision at WHOI:**

Summer Student Fellow, Jennifer Batryn, 2012  
 Thomas Rugh, Engineering Asst. I, Summer 2015  
 Peter Abdu, Engineering Asst. III, 2015, 2016  
 Sean Whelan, Senior Engineering Assistant II, 2017-Current  
 Paul Nekhamin, DHS/ADAC Engineering Intern, Feb-July 2018  
 Cecilia Kane, Part-time Helper, Summer 2018

**Cruise/Field Work Participation (QTY:89):**

April 2001	F/V Odessa; Boston Harbor, yellowtail outfall pipe sampling.
May 2001	R/V Hatteras; Gulf of Maine <i>Alexandrium</i> studies.
September 2001	R/V Connecticut; Mass Bay, VPR/AVPPO.
April 2002	RVIB Palmer; Antarctica, BIOMAPER/SeaRover-Two months.
September 2002	R/V Connecticut; Mass Bay, VPR/AVPPO.
2001-2003	8 VPR mooring deployment cruises in New England waters.
April 2003	R/V Oceanus; Mass Bay., Scallop Sled
May 2003	Field ops in Carmel NY; AUV Tunnel Project.
June 2003	Field ops in Newport RI; NUWC REMUS trials.
August 2003	Field ops in Keyport WA; AUV Fest.
August 2003	R/V Asterias and F/V Patricia Lynn: MVCO REMUS Trials.
October 2003	Field ops in San Diego CA; NCEX REMUS-two months.
June 2004	Field ops in Camp Lejuene NC; REMUS.
September 2004	REMUS acoustic testing field ops, Dodge Pond, CT.
Sept. & Nov. 2004	R/V Pelican, REMUS ops, Panama City, FL.
2005	R/V Tioga, AWACS Field work participation
July 2005	Sublaunch Demonstration, Hawaii
November 2005	REMUS-600 Demonstration, La Spezia, Italy
February 2006	Docking Demonstration, Panama City, FL
April 2006	REMUS 600 Demonstration, Panama City, FL
Jan 22- Feb 8, 2007	CNAV 50 vehicle support, Keyport WA
Feb 20-March 2,2007	CNAV support, Keyport, WA
March 14-24 2007	REMUS 600 support, Panama City, FL
May 30-June 15 2007	AUVFEST 2007, Panama City, FL
August 21-24 2007	Hull Harbor Demo, San Diego, CA
February 2008	REMUS 600 Panama City, FL

March 2008	14 day REMUS ARL UT Training, Austin, TX
April 2008	10 day cruise, Towed Array Experiment, Andros Island, Bahamas
May 2008	10 days AUVFEST, Hull & Harbor Demo, Newport, RI
May/June 2008	10 day cruise, Towed Array, NJ shelf break
*August 2008	R/V Annika Marie, Beaufort Sea, Alaska- REMUS 100 Arctic
August 2008	Kiel Germany. Hull & Harbor Demo with REMUS 100
*February 2009	Honolulu, Hawaii, PO REMUS Operations, Gawarkiewicz.
April 16-May 2009	AUTEC Bahamas, Plus-INP, Argos Maine.
May 27-June 4 2009	NYC Tunnel Inspection, Carmel NY.
July 24-Aug 12 2009	R/V KNORR in Kauai Hawaii, PLUS-INP.
Oct 1 -8 2009	AUTEC, Sublaunch.
*February 2-5 2010	Seller's AUV Under-ice work, New Hampshire.
February 7-21 2010	Field Operations, Kauai, Hawaii.
*March 14-27 2010	Under Ice Arctic Expedition, Barrow, Alaska.
*April 4-9 2010	Lake Seneca Sublaunch training exercise (Navy), NY.
May-Sept 2010	PLUS-INP Local testing
Sept 23- Oct 7 2010	PLUS-INP cruise, R/V Moana Wava, San Clemente Island, CA.
*Jan 17-Feb 7 2011	Pink and White Terraces Discovery, New Zealand.
*February 14 - 18 2011	Acoustic Testing, Lake Seneca NY.
June 11 - 24 2011	AUV FEST, Panama City FL.
July 21-August 5 2011	PLUS INP, control center, Naval Undersea Warfare Center.
*Sept 7 - 15 2011	Fish Acoustics Cruise, R/V Sharp, Outerbanks, NC.
January 2012	USS Revenge Survey, Watchill, RI
**May-July 2012	Sharkcam, Provincetown and Chatham, MA
*May 11-29, 2012	Fish Acoustics Cruise, R/V Sharp, Outer Banks, RI
*July 13-29 2012	Greenland, Glacier and Fjord Survey, Camping
*April 2013	REMUS-100 mini magnetometer testing, Panama City, FL
*August 2013	Katama Bay Surveys, MV
July/Aug 2013	Pilgrim Nuclear Power Plant multi vehicle surveys, Plymouth, MA
October 2013	Night Operations REMUS-100 laser docking, Local, Lincoln Labs, Woods Hole, MA
**Oct 26 –Nov 12 2013	SharkCam II Expedition, R/V Horizon, Guadalupe Isle, Mexico
April 2014	Radon sensor and range finder integration and field testing, Knoxville TN
March 15-22 2014	Delivery of NPS docking station and training @ NPS, Monterey, CA
**July/August 2014	Turtle tagging and tracking fieldwork, Vineyard Sound, MA
**July 12-16 2014	Scallop Enhancements Expedition@ CA I George's Bank
**Sept 8-12 2014	Scallop Mortality II Expedition south of Block Island
July-Oct 2014	~40 days total, (2) REMUS-6000 FSM manganese nodules Expeditions, Hawaii
**March-April 2015	SharkCam expedition III, Florida
*6 -18 July 2015	LMR Whale Expedition (OASIS), Monterey, CA
**27 July – 1 Aug 2015	ScallopCam Expedition, George's Bank, MA
**3-23 Dec 2015	SharkCam IV, Guadalupe Island, Mexico
**7-12 Jan 2016	REMUS-600 Recovery Mission, Guadalupe Island, Mexico
**Jan 26 – Feb 2 2016	REMUS-600 Recovery Mission #2 (Successful), Guadalupe Island, Mexico
February 7-23 2016	REMUS LMR/OASIS Field Work: Kauai, HI
**April 2016	Nokomis Field Work: April 3-7, Charleroi, PA and April 18-22 2016 Woods Hole
*26 May – 2 June 2016	Cruise Pioneer Array aboard R/V Armstrong, Woods Hole to Woods Hole
**Summer 2017	TurtleCam Fieldwork, REMUS-100 (4 tagged turtles, 4 days)
**Nov 6-7 2016	Led DHS/Coast Guard/ADAC Center of Excellence Oil Spill Demo, Woods Hole

- \* March 4-20 2017      Seabed Acoustics Cruise, REMUS-100 PO/AOPE; R/V Sharp
- \*\* August 14-18 2017    MC20 Site Oil Spill Survey, REMUS-100, GoM, Louisiana
- \*\* Summer 2017        TurtleCam Fieldwork, 5 tagged turtles (5 days)
- \*\* March-April 2018     SharkCam 5 Expedition, Bimini Bahamas
- \*\* May 2018             Aquaculture Surveys, REMUS-100, Maine

\* Denotes Technical Leader/Expedition Leader

\*\* Denotes Technical Leader/Expedition Leader and Principal Investigator

#### Technical Documentation/Published Reports:

- Final Reports for ~24 Cruises
- LRAUV Field Test Report, Published: [http://adac.uaa.alaska.edu/home/project\\_4\\_auv](http://adac.uaa.alaska.edu/home/project_4_auv) 2016
- Seafloor Docking Manual, 2014
- Seafloor Docking Test Frame, 2014
- DIDSON Technical Documentation, 2004
- Barley Straw for Algae Control, SEMAC/Cape Cod Cooperative Extension, 2001
- Fishing for Answers in an Urban Estuary, New Jersey Audubon Society, 2000

#### Managed Facilities/Labs/Websites:

- Created and Manage OSL RHIB R/V Hurricane Cost Center
- OSL REMUS-100 AUV Fleet
- Director and PI for Tag Lab, launch August 2018
- Created OSL website and manage: <http://www.whoi.edu/page.do?pid=29856>
- Created TurtleCam and SharkCam websites: <http://www.whoi.edu/osl/sharkcam> and <http://www.whoi.edu/osl/turtlecam>

#### Publications:

J. D. Holmes, W. M. Carey, J. F. Lynch, A. E. Newhall and **A. Kukulya**, "An Autonomous Underwater Vehicle Towed Array for Ocean Acoustic Measurements and Inversions", ASA Vancouver, 2005.

R. Stokey, A. Roup, C. von Alt, B. Allen, N. Forrester, T. Austin, R. Goldsborough, M. Purcell, F. Jaffre, G. Packard, **A. Kukulya**, "Development of the REMUS 600 Autonomous Underwater Vehicle", Oceans 2005.

\***Kukulya, A.**, et. al, "Recent Science Applications for the REMUS AUV", Presented ASLO 2004, Hawaii.

B. Allen, T. Austin, N. Forrester, R. Goldsborough, **A. Kukulya**, G. Packard, M. Purcell and R. Stokey, "Autonomous Docking Demonstrations with Enhanced REMUS Technology", September 2006. Presented at Oceans 2006, Boston.

J. D. Holmes, **A. Kukulya**, "Characteristics of an autonomous underwater vehicle with a towed hydrophone array", September 2006. Presented at Oceans 2006, Boston.

\***A. Kukulya**, A. Plueddemann, et. al, "Under-ice Operations with a REMUS-100 AUV in the Arctic," Proceedings: IEEE Autonomous Underwater Vehicle Conference 2010, Mapping the World's Oceans, Naval Postgraduate School, Monterey, California 1–3 September 2010. \*Presented

S. L Walker, C. E J de Ronde, D. J Fornari, M. I Leybourne, V. Ferrini, **A. Kukulya**, et. al. "Hydrothermal Venting at Lake Rotomahana, New Zealand, 125 Years After the Tarawera Eruption of 1886," AGU SESSION: EP19. Post-Eruptive Processes Operating on Volcanic Landscapes.

C. E. J. de Ronde, D. Fornari, V. L. Ferrini, **A. L. Kukulya**, et. al. "Rediscovery of the 8th Natural Wonder of the World: The Pink and White Terraces' survival of the 1886 Tarawera Rift eruption," AGU 2011 SESSION: EP19: Post-Eruptive Processes Operating on Volcanic Landscapes.

G.E. Packard, **A. L. Kukulya**, et. al. "Continuous Autonomous Tracking and Imaging of White Sharks and Basking Sharks Using a REMUS-100 AUV". Presented IEEE MTS Oceans, San Diego October 2013.

**A. Kukulya**, et. al. "3D Real-time Tracking, Following and Imaging of White Sharks with an Autonomous Underwater Vehicle", IEEE Proceedings (2015)

**Kukulya, A.L.**, J.G. Bellingham, J.W. Kaeli, C.M. Reddy, M.A. Godin, R.N. Conmy, "Development of a Propeller Driven Long Range Autonomous Underwater Vehicle (LRAUV) for Under-Ice Mapping of Oil Spills and Environmental Hazards", IEEE Proceedings (Nov. 2016), Presented AUV 2016, Tokyo, Japan.

**Kukulya, A. L.**, R. Stokey, C. Fiester, E.M. Hoyos-Padilla, A.C. Pelagios Kakunja, G. Skomal, "Multi-Vehicle Autonomous Tracking and Filming of White Sharks *Carcharodon carcharias*", IEEE Proceedings (Nov. 2016), Presented AUV 2016, Tokyo, Japan.

**Kukulya, A.L.**, J.G. Bellingham, R.P. Stokey, S.P. Whelan, C.M. Reddy, R.N. Conmy, I. Walsh, "Autonomous Chemical Plume Detection and Mapping Demonstration Results with a COTS AUV and Sensor Package", submitted to IEEE Oceans Proceedings 2018.

#### **Papers In Referred Journals:**

Plueddemann, **A. Kukulya**, R. Stokey, L. Freitag, "Autonomous Underwater Vehicle Operations Beneath Coastal Sea Ice," TMECH-04-2011-1580, (Peer-Reviewed 2011).

L.A. Stevens, F. Straneo, S.B. Das, A.J. Plueddemann, **A.L. Kukulya**, M. Morlighem, "Linking catchment-scale subglacial discharge to subsurface glacially modified waters near the front of a marine terminating outlet glacier using an autonomous underwater vehicle", Journal The Cryosphere (TC) 2015.

G. Skomal, M. Hoyos-Paudilla, **A. Kukulya**, R. Stokey, "Subsurface observations of white shark predatory behavior using an underwater vehicle", Journal of Fish Biology, 87, 1293-1312, 2015

C.E.J. de Ronde, **A. L. Kukulya**, et. al, "The Pink and White Terraces of Lake Rotomahana: What was their fate after the 1886 Tarawera Rift eruption?" Journal of Volcanology and Geothermal Research, VOLGEO-05753; No of Pages 16 (2016)

Dodge KL, **A.L. Kukulya**, E. Burke, M.F. Baumgartner, "TurtleCam: A "Smart" Autonomous Underwater Vehicle for Investigating Behaviors and Habitats of Sea Turtles", *Front. Mar. Sci.* 5:90. doi: 10.3389/fmars.2018.00090, March 2018.

#### **Participation in Documentaries/Science Programming/Publications and Media coverage:**

- 2002, *Plankton* radio interview, NPR
- 2009 October, National Geographic Adventure Magazine, The Big, Record-Breaking, Green, Disease-Busting, Deep-Sea, Crime-Fighting IDEAS for 2009
- 2010, Design Squad, PBS- Featured
- 2010, WHOI Oceanus Video, *The Icebot: flying blind under the Arctic Ice*
- 2012, WHOI Oceanus Feature Article: *In Search of the Pink and White Terraces*

- 2013, WHOI Oceanus Video, *The Ocean's Hidden Predators: Revealed*
- 2013, WHOI Oceanus Feature Article: *Swimming with Sharks*
- 2013 Documentary, *Return of Jaws*, Discovery Channel
- 2014 Documentary, *Jaws Strikes Back*, Discovery Channel
- 2015 Documentary, *Shark Trek*, Discovery Channel
- 2015, Featured Oceanus Video: TurtleCam
- 2016, NPR interview *Living Lab on the Point*, Conservation of Turtles with TurtleCam
- 2016 Documentary, *Jaws of the Deep*, Discovery Channel
- Featured on Discovery. com: <http://www.discovery.com/tv-shows/shark-week/videos/women-at-the-forefront-of-shark-science-amy-kukulya/>
- 2016 WHOI Oceanus Video and Article: *To Track a Sea Turtle*
- 2018 Documentary, *SharkCam Stakeout*, Discovery Channel
- 2018 Documentary, *SharkCam Strikes Back*, Discovery Channel
- Engineer Girl Featured engineer: <http://www.engineergirl.org/Engineers/Directory/2984.aspx>
- My research has also been featured in the Boston Globe, Wall Street Journal, PBS, Cape Cod Times, Science Daily, Phys.org, Forbes.com, IFLS.com, ABC Chronicle (2017 & 2010)

#### Patent:

- **A.L. Kukulya**, T. Austin, F. Jaffre, "System and Method for Autonomous Tracking and Imaging of a Target", Pub. No.: US 2018/0082166 A1. Pub. Date: Mar. 22, 2018

#### Participation in Education Programs:

- Faculty at Children's School of Science, Woods Hole, Ichthyology June 2001-August 2007
- Developed and taught Robotics Class at Falmouth Academy (2008)
- Started the Ocean Robotics Club at Morse Pond Elementary School and taught 10-week class, 2013
- Lectured Sea Education Association Oceanography class, August 8, 2018

#### Other Highlighted Accomplishments:

- Developed Project TurtleCam by crowd sourcing funds from over 130 private donors.
- Developed an AUV suction cup tag.
- Mentored all girls STEM Robotics Team at Creighton University for Vex World Competition (2016-ongoing)
- Center for Marine Robotics, Network of Talent Member, 2016-ongoing
- Panel Expert, WHOI Symposium on Ocean Aquaculture & Science, June 14-15 2018
- Expert Witness: Full Senate Hearing, Commerce, Science, & Transportation, July 18, 2018, 'Sharks' ; <https://www.commerce.senate.gov/public/index.cfm/hearings?ID=0D071A3B-42CD-40CF-BFA8-914DA9E7E264>
- Transfer of technology to Hydroid, Mini Tag Board, 2018
- Developed trademarked SharkCam logo
- Developed OceanRobotCam brand and have ~12,000 followers: <https://www.facebook.com/oceanrobotcam/>

#### Professional Talks (Sub sample):

2018 10 Nov IMAX Presentation: Exploration through the eyes of animals, NEAQ, Boston, MA  
 2018 25 Oct IEEE Oceans 2018: Conference paper presentation, Dye Mapping, Charleston, SC  
 2018 7 Feb Black Dog Dinner & Lecture Series: TurtleCam, Martha's Vineyard, MA  
 2017 21 Sept Center for Marine Robotics, Keynote Presenter, Annual Meeting, Woods Hole  
 2017 26 June WHOI Research Talk, Highfield Hall, Falmouth

2017 May Participated in Fleet Week, NYC  
 2017 29 Apr Ocean Tech YPO Event, BIOS, Bermuda  
 2017 06 Apr Hydroid, Lunch time talk, Robots Making Science  
 2017 01 Feb South Shore Natural Science Center, Lecture  
 2016 Nov AUV 2016, presented two talks (lead author, topics sharks/LRAUV oil/ice), Tokyo, Japan  
 2016 30 Sept Society for Women in Marine Science, Talk  
 2016 30 Sept Center for Marine Robotics, Talk, LRAUV under-ice oil detection  
 2016 06 June Chandler Elementary School Visit, Talk, Redfield Auditorium  
 2015 03 Nov Oceans 2015 IEEE, Genoa Italy, two talks and papers, see publication listing.  
 2015 15 Mar Presenter, AUV Technology and Science, Duxbury Beach Reservation Event (DBR)  
 2015 29 Jan Presenter: MTS Speaker, CMR Event, AUV Technology, Smith Conference Room  
 2015 27 Jan Presenter, ONR Review Meeting, SharkCam Technology, Fort Walton, FL  
 2015 08 Jan Presenter: Falmouth Newcombers Club, AUV Technology & SharkCam, Falmouth, MA  
 2014 09 Oct Presenter: Trustees' Access to the Sea meeting, SharkCam Technology, Carriage House  
 2014 21 Aug Presented to Senator Elizabeth Warren, AUV Technology and REMUS Lab Tour  
 2013 10 Sept Presenter to WHOI science writers fellows, Smith Conference Room  
 2013 20 Aug Presenter: Science Made Public talk, *SharkCam: Robots chase sharks where no else can go*. Redfield Auditorium  
  
 2013 16 Aug Lead 1930 society Tioga cruise with REMUS  
 2013 07 Aug Presenter: Public Event: *White Sharks, Gray Seals: Chasing the Cape's Most Charismatic Predators*, Redfield Auditorium  
  
 2013 March Presenter: Sandwich elementary school presentation and hands-on AUV lesson  
 2012 08 Sept Keynote Speaker: First Robotics Competition. Newton North High School  
 2012 12 Aug *Finding New Zealand's Lost Pink and White Terraces*. Science Made Public Lecture, WHOI  
  
 2012 April Guest Speaker @ Massachusetts's Marine Educator's Conference, *Adventure's of Icebot*, Redfield Auditorium  
  
 2008 02 April Woman's History Month Panel Discussion Participant, *Woman of WHOI, Yesterday, Today and Tomorrow*  
  
 2006 28 July *Robots Untethered*, WHOI Exhibit Center  
 2006 05 Oct *REMUS, The Ultimate Science Tool*, MBL Club Talk to Newton Middle School