# Andrew R. Thurber, Ph.D.

***Curriculum Vitae***

College of Earth, Ocean, and Atmospheric Sciences
Oregon State University
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## Interests

Microbe-metazoan interactions. Trophic Ecology. Biogeochemical-Fauna Interactions. Ecosystem & Community Oceanography. Microbial Ecology. Invertebrate Zoology. Polar, Soft-Sediment, Cold-Seep, Hydrothermal & Deep-Sea Habitats.

## Education

2011-2014 Post Doctoral Fellow – Oregon State University
- Mentors – Drs. Rick Colwell (OSU) and Deron Burkepile (FIU)

2005-2010 Ph.D. in Oceanography - Scripps Institution of Oceanography, UC San Diego
- Advisor - Dr. Lisa Levin

2001-2005 M.S. in Marine Science (Distinction) - Moss Landing Marine Labs, CSU- Stanislaus
- Co-Advisors: Drs. Stacy Kim and Nicholas Welschmeyer

1997-2001 B.S. in Marine Biology (Magna Cum Laude) - Hawaii Pacific University
- Minor in Mathematics

## Experience

2016 **Assistant Professor** – College of Earth, Ocean, and Atmospheric Sciences (CEOAS) & Department of Microbiology, College of Science, Oregon State University (OSU), USA

2014-2106 **Assistant Professor (Senior Research)** – CEOAS, OSU

2011-2014 **Postdoctoral Fellow** – Oregon State University, USA

2011 **Affiliated Researcher** - Florida International University (FIU)

2011 **Guest Lecturer -** Global Learning Undergraduate Course- FIU

2010-present **Leader** of the Ecosystem Function Working Group – INDEEP

2010 **Chief Scientist**/ PI - 23 Day Cruise RV Melville - Processes of the Chile Margin

2010 **Guest Lecturer -** Deep-Sea Ecology in Community Ecology Course –FIU

2010 **Guest Lecturer -** Porifera in Invertebrate Zoology – FIU

2009 **Instructor** - A Hands-on Introduction to the Marine Invertebrates - University of California, San Diego Extension - Academic Connections.

2009 **Guest Lecturer** - (2 lecture series) Deep-Sea Biology and Soft-Sediment Communities in Biological Oceanography - Scripps Institution of Oceanography

2003 Invertebrate **Taxonomist**- Antarctic Marine Living Resources, NOAA, South Shetland Islands 2003 Fish Stock Assessment

2002 **Teaching Assistant** - MS-144: Biological Oceanography- Moss Landing Marine Labs, San Jose State University

2000-2001 **Research Assistant** - University of Hawaii (with Dr. Craig Smith)

1999 **Research Assistant** - Hawaii Pacific University (with Dr. Eric Vetter)

## Grants, Fellowships, Honors, & Awards (Total Awards as PI or Co-PI = $2.5M)

2016 **PI:** EAGER: Elucidating the Antarctic methane cycle at the Cinder Cones reducing habitat. National Science Foundation – Office of Polar Programs

2016-2018 **Co-PI:** Collaborative Research: Viral Reefscapes: The Role of Viruses in Coral Reef Health, Disease and Biogeochemical Cycling. National Science Foundation – GEO/Biological Oceanography

2015-2017 **Co-PI:** Hydrogen Sulfide reduces growth rates in manila clams (*Venerupis philippinarum*) on Lummi tide flats. USDA/ National Institute of Food & Agriculture (NIFA)/ Subaward from Northwest Tribal College (NWIC)

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| 2015-2017 | **Co-PI:** Seasonal diet changes for manila clams (*Venerupis philippinarum*) on Lummi tide flats: Building NWIC capacity for diet analysis. NIFA/ NWIC |
| 2015-2016 | **Co-PI**: Edginess in the subsurface: Microbial diversity of deep subseafloor ecotones - Center for Dark Energy Biosphere Investigations/NSF |
| 2011-2014 | NSF Postdoctoral **Fellow** in Polar Regions |
| 2013 | **Outstanding Postdoctoral Researcher Award –** Student Advisory Committee, CEAOS - Oregon State University |
| 2012 | **Co-Chair** – Norwegian Research Council funded Workshop on Climate Change Impact on Ecosystem Function |
| 2012 | **Member** International Committee – Deep Sea Biology Conference, Wellington, NZ |
| 2011 | UCSD **Nominee** for Western Association of Graduate Schools Innovation in Technology Award |
| 2010 | UC Ship Funds Cruise - **Principal Investigator** |
| 2009 | Western Society of Naturalists - **Best Student Talk** - Community Ecology |
| 2009-2010 | Achievement Rewards for College Scientists (ARCS) **Fellow** |
| 2009-2010 | Sidney E. Frank Foundation **Fellow** |
| 2008 | Census of Marine Life - ChEss Training Awards for New Investigators |
| 2008-2009 | UC Marine Council-Coastal Environmental Quality Initiative **Fellow** |
| 2006 | Michael M. Mullin **Fellow** |
| 2005-2006 | Regents **Fellow** |
| 2005 | Marine Science **Student of the Year**- CSU Stanislaus |
| 2004 | John H. Martin Memorial **Fellow** |
| 2004 | PADI Foundation Grant |
| 2004 | Dr. Earl H. & Ethyl M. Myers Oceanographic & Marine Biology Trust |
| 2004 | **Antarctic Service Medal** |

## Publications Citations = 640**;** H-index$_{google}$ = 16

Vega Thurber R, Payet J, **Thurber AR**, Correa A. Virus-host interactions and their roles in coral reef health and disease. (in press, *Nature Reviews in Microbiology*)

Smith AR, Fisk MR, **Thurber AR**, Flores GE, Mason OU, Popa R, Colwell FS. 2016. Microbial communities in the Juan de Fuca ridge's oceanic crustal aquifer are governed by mineralogy. *Geomicrobiology*. DOI:10.1080/01490451.2016.1155001

Levin LA, Baco AR, Bowden D, Colaço, Cordes E, Cunha MR, Demopoulus A, Gobin J, Grupe B, Le J, Metaxas A, Netburn A, Rouse GW, **Thurber AR**, Tunnicliffe V, Van Dover C, Vanreusel A, Watling L. 2016. Hydrothermal vents and methane seeps: Rethinking the sphere of influence. *Frontiers in Marine Science* dx.doi.org/10.3389/fmars.2016.00072

Leduc D, Rowden AA, Clark MR, Bowden DA, **Thurber AR**. 2016. Limited among-habitat differences in the deep-sea macro-infaunal communities off New Zealand: implications for their vulnerability to anthropogenic disturbance. *Marine Ecology.* DOI: 10.1111/maec.12363

Verba C, **Thurber AR**, Alleau Y, Koley D, Colwell F, Torres M. 2016. Mineral changes in cement-sandstone matrices induced by biocementation. *International Journal of Greenhouse Gas Control* 49:312-322

Harris, D, Ummadi J, **Thurber AR**, Alleau Y, Verba C, Colwell F, Torres M, Koley D. 2016. Real-time monitoring of calcification process by *Sporosarcina pasteurii* biofilm. *Analyst* 141:2887-2895.

Correa A, Ainsworth T, Rosales S, **Thurber AR,** Butler CR, Vega Thurber RV. 2016. Cryptic viral outbreak in Corals driven by an in situ bleaching event: atypical herpes like viruses and a new Megavirus infecting *Symbiodinium*. *Frontiers in Microbiology.* 7:127 doi: 10.3389/fmicb.2016.00127

Levin LA, Mendoza GF, Grupe B, Gonzalez JP, Jellison B, Rouse G, **Thurber AR**, Waren A. 2015 Biodiversity on the Rocks: Macrofauna inhabiting authigenic carbonate at Costa Rica methane seeps. *PLoS ONE. DOI: 10.1371/journal.pone.0131080*

Bryson S, **Thurber AR**, Correa A, Orphan VJ, Vega Thurber R. 2015. A novel sister clade to the enterobacteria microviruses (family *Microviridae*) identified in methane seep sediments. *Environmental Microbiology* 17:3708-3721. doi: 10.1111/1462-2920.12758.

**Thurber AR**. 2014. Diet-dependent incorporation of biomarkers: Implications for food-web studies using stable isotope and fatty acid analyses with special application to chemosynthetic environments. *Marine Ecology* 36:1-17.

Marlow J, Steele J, Ziebis W, **Thurber AR**, Levin LA, Orphan VJ. 2014. Carbonate hosted methanotrophy: An unrecognized methane sink in the deep sea. *Nature Communications* 5: 5094.

**Thurber AR**, Sweetman AK, Narayanaswamy BE, Jones DOB, Ingels J, Hansman RL. 2014. Ecosystem function and services provided by the deep sea. *Biogeosciences* 10:10193-18240

Zepata-Hernández G Sellanes J, **Thurber AR**, Levin LA. 2014. Trophic structure of the bathyal benthos at an area with evidence of methane seep activity off southern Chile (~45ºS), *Journal of the Marine Biological Associate of the United Kingdom*, 94:659-669.

Zepata-Hernández G, Sellanes J, **Thurber AR**, Chazalon F, Levin LA, Linke P. 2014. New insights on the trophic ecology of bathyal communities from the methane seep area off Concepción, Chile (~36º S). *Marine Ecology* DOI: 10.1111/maec.12051.

**Thurber AR**, Levin LA, Rowden AA, Kröger K, Linke P, Sommer S. 2013. Microbes, Macrofauna, and Methane: The importance of aerobic methanotrophy in fueling a high-biomass, methane seep infaunal community. *Limnology and Oceanography* 58:1640-1656.

Mora C, Rollo A, Amaro T, Baco AR, Chen Q, Collier M, Danovaro R, Gooday AJ, Grupe B, Halloran PR, Ingels J, Jones DOB, Levin LA, Nakano H, Norling K, Ramirez-Llodra E, Ruhl HA, Smith CR, Sweetman AK, **Thurber AR**, Tjiputra JF, Usseglio P, Watling L, Wei C-L, Wu T, Yasuhara M. 2013. Projected climate change in the ocean and its impact upon marine biota and people. *PLoS Biology* 11(10): e1001682.

*Companion article: Chase J. 2013. Sea of Change. *PLoS Biology*. 10.1371/journal.pbio.1001683

*Product of working group led by Thurber

*3rd highest social media score of any paper published from OSU researchers

Bowden DA, Rowden AA, **Thurber AR**, Baco A, Levin LA, Smith CR. 2013. Cold seep epifaunal communities on the Hikurangi Margin, New Zealand: composition, succession, and vulnerability to human activities. *PLoS ONE* 8(10): e76869.

Dayton PK, Kim S, Jarrell SC, Oliver JS, Hammerstrom K, Fisher JL, O'Connor K, Barber JS, Robilliard G, Barry J, **Thurber AR**, Conlan K. 2013. Recruitment, Growth and Mortality of an Antarctic Hexactinellid Sponge, *Anoxycalyx joubini*. *PLoS ONE. 8(2): e56939. doi:10.1371/journal.pone.0056939*

Levin LA, Ziebis W, Mendoza G, Bertics VJ, Washington T, Gonzalez J, **Thurber AR,** Ebbe B, Lee RW. 2013. Ecological Release and Niche Partitioning Under Stress: Lessons from Dorvilleid Polychaetes in Sulfidic Sediments at Methane Seeps. *Deep-Sea Research II*. 92:217-233.

Blackman DK, Appelgate B, German CR, **Thurber AR**, Henig AS. 2012. Axial Morphology along the Southern Chile Rise. *Marine Geology* 315-318: 58-63.

Vega Thurber R, Burkepile DE, Shantz AA, Welsh R, Correa AMS, Pritchard C, **Thurber AR,** Rosales S. 2012. Macroalgae decrease growth and alter bacterial community structure of the scleractinian coral, *Porites astreoides*. *PLoS ONE* 7: e44246. doi:10.1371/journal.pone.0044246

**Thurber AR**, Levin LA, Orphan VJ, Marlow J. 2012. Archaea in the diet of Metazoans: Implications for Chemosynthetic Ecosystems. *ISME J* 6:1602-1612.

Bernardino AF, Levin LA, **Thurber AR,** Smith CR**.** 2012. Comparative composition, diversity and trophic ecology of sediment macrofauna at vents, seeps and organic falls. *PLoS ONE* 7: e33515. doi:10.1371/journal.pone.0033515

**Thurber AR**, Jones WJ, Schnabel K. 2011. Dancing for food in the deep sea: Bacterial farming by a new species of Yeti crab. *PLoS ONE*. 6(11):e26243. DOI:10.1371/journal.pone.0026243

*Supplemental video viewed >175,000 times; Nature News Write Up 3rd Most Read of 2011

Kim S, Hammerstom KK, Conlan KE, **Thurber AR.** 2010. Polar ecosystem dynamics: Recovery of communities from organic enrichment in McMurdo Sound, Antarctica. *Integrative and Comparative Biology*. 50:1031-1040.

Conlan KE, Kim SL, **Thurber AR**, Hendrycks E. 2010. Benthic changes at McMurdo Station, Antarctica, following local sewage treatment and regional iceberg-mediated productivity decline. *Marine Pollution Bulletin* 60: 419- 432.

**Thurber AR**, Kröger K, Neira C, Wiklund H, Levin LA. 2010. Stable isotope signatures and methane use by New Zealand cold seep benthos. *Marine Geology* 272:260-269.

Levin LA, Mendoza G, Gonzalez J, McMillan P, **Thurber AR**. 2010. Diversity of bathyal macrobenthos on the northeastern Pacific margin: the influence of methane seeps and oxygen minimum zones. *Marine Ecology* 34: 94-110.

Glover AG, Smith CR, Minks SL, Sumida PY, **Thurber A**. 2008. Macrofaunal abundance and composition on the West Antarctic Peninsula continental shelf: Evidence for a sediment 'food bank'and similarities to deep-sea habitats. *Deep-Sea Research II* 55:2491-2501.

**Thurber AR**. 2007. Diets of Antarctic sponges: links between the pelagic microbial loop and benthic metazoan food web. *Marine Ecology Progress Series* 351:77-89.

Kim SL, **Thurber A**, Hammerstrom K, Conlan K. 2007. Seastar response to organic enrichment in an oligotrophic polar habitat. *Journal of Experimental Marine Biology and Ecology* 346:66-75.

Kim SL and **Thurber A**. 2007. Comparison of seastar (Asteroidea) fauna across island groups of the Scotia Arc. *Polar Biology* 30:415-425.

Detrich HW, Jones CD, Kim S, North AW, **Thurber A,** Vacchi M. 2005. Nesting behavior of the icefish *Chaenocephalus aceratus* at Bouvetoya Island, Southern Ocean. *Polar Biology* 28:828-832.

*"Invited Companion Articles"*

**Thurber AR**. In Focus: The crabs that live where the hot and cold collide. Companion article for Marsh, L, Copley JT, Tyler PA & Thatje S. 2015. In hot and cold water: differential life-history traits are key to success in contrasting thermal deep-sea environments. *Journal of Animal Ecology* 84: 889-891.

*"Select cruise reports and informative pamphlets"*

Truede T, Rose K, Joye SB, Levin LA, Dickens G, Shipp C, Anderson ES, Claypool, Kastner M, Smith C, **Thurber A**. 2014. Chapter 2: Methane Gas Hydrates and the Natural Carbon Cycle. IN: Beaudoin, Y. C., Waite, W., Boswell, R. and Dallimore, S. R. (eds), 2014. *Frozen Heat: UNEP Global Outlook on Methane Gas Hydrates.* Volume 1. United Nations Environment Programme, GRID-Arendal.

**Thurber AR,** 2011. INDEEP Dive in: Ecosystem function.

**Thurber AR**, 2011. Multicore and Biology. In: Bialas J. (ed) *FS Sonne Cruise Report SO-214 NEMESYS*, Leibniz-Institute of Marine Sciences, IFM-GEOMAR, Kiel, Germany. Pp40; 123-127.

**Thurber A,** Kröger K, Martin R, Zemke -White L, Boyd S, 2007. Foraminiferal and metazoan biology. In: Bialas J., J. Greinert, P. Linke, O.Pfannkucke (eds.) *FS Sonne Cruise Report SO 191 New Vents*. Leibniz-Institute of Marine Sciences, IFM-GEOMAR, Kiel, Germany. Pp120-122.

Kim S, **Thurber A**, Mooi R, Lockhart S, Rowley R, 2003. Benthic invertebrate bycatch. In: Lipsky, J.D. (ed.) *AMLR 2002/2003 Field Season Report. Objectives, Accomplishments and Tentative Conclusions*. Southwest Fisheries Science Center. La Jolla, CA. pp.144-157.

Welschmeyer NA, Younan L, **Thurber A,** Wagner G, 2003. Phytoplankton, biodiversity, and invasive species in Elkhorn Slough. In: Carless, J. (ed) *Ecosystem Observations for the Monterey Bay National Marine Sanctuary 2003*. Monterey National Marine Sanctuary, CA. pp. 13-14.

## Workshop Participation

**2016** Ocean Observatories Initiative - Hydrate Ridge Workshop, Galveston, TX
**2016** Seaview Workshop, New Orleans
**2015** Sustainable Ocean Development, New York
**2015** Chemosynthetic Crossroads, Scripps Institution of Oceanography, La Jolla
**2015** Deep Ocean Stewardship Initiative **–** Aviero, Portugal
**2014** Ocean Networks Canada – INDEEP partnership development workshop, Victoria, Canada
**2013** **Chair –** Structure and Function in Deep-Sea Ecosystems**,** Stavanger, Norway
**2012** **Co-Chair** - Climate change impacts on deep-sea pelagic and benthic ecosystems (CLIDEEP), Friday Harbor, USA
**2011** UNOLS DEep Submergence Science Committee (DeSSC), San Francisco, USA
**Chair-** International Network for Scientific Investigations of Deep-sea Ecosystems Deep-Sea Ecosystem Function Meeting, Aberdeen, Scotland.
**2010** INDEEP Initial meeting, New Orleans, USA
Census of Marine Life: Chemosynthetic Ecosystem Science (ChEss)- RENEWZ workshop - Planning future science on New Zealand reducing ecosystems
ChEss Southern Hemisphere Biogeography Meeting
**2008** Census of Marine Life: Continental Margin Ecosystems (COMARGE) workshop - Habitat heterogeneity in generating and maintaining biodiversity on continental margins.

## Ad Hoc Reviewer

*The Biological Bulletin, Biogeosciences, Deep-Sea Research I & II, Ecology, Environmental Microbiology, Journal of Animal Ecology, Journal of Experimental Marine Biology and Ecology, Journal of Marine Biology, Limnology and Oceanography, Limnology and Oceanography: Methods, Microbiology Open, Marine Biotechnology, Marine Ecology, Marine Ecology Progress Series, Marine Geology Letters, Microbiology Open, Molecular Ecology, PLoS ONE, Proceedings of the Royal Society Biology, Progress in Oceanography. National Science Foundation – GEO-OCE, GEO-OPP, and HBCU-UP, Schmidt Ocean Research Foundation, EUROFLEETS, Oregon Seagrant*

## Review Editor

*Frontiers in Ecology and Evolution and Marine Science/ Deep-Sea Environments and Ecology*

## Courses Taught

Oregon State University – OC 103 Explorations of the deep. OC 201e: eCampus - Introduction to Oceanography. OC 295: Introduction to Field Oceanography (not instructor of record – field course on RV *Oceanus* for undergraduates). OCE 407/507/607: Student Seminar Series.

## University Service

**2016-Current:** Ocean Ecology and Biogeochemistry Graduate Admissions Committee Member. **2015-Current:** Chair of CEOAS Seminar Committee; **2013- current** Dive Safety Control Board Member; **2005 - 2010** Webmaster for siostudents.ucsd.edu; **2007-2008 -** Chair, Students at SIO; **2006-2007 -** Vice Chair, Students at SIO; **2002** - President, Student Body of Moss Landing Marine Labs

## Selected Talks and Posters

**2016** Gordon Research Conference on Natural Gas Hydrate Systems (*invited*) **–** Thinking Beyond the Now at the Hydrate Ridges OOI Node: Using Power and Data Streams to Drive Hydrate Research in Novel Directions

**2015** Sustainable Ocean Development- a perspective from former, current and future Kiel marine Scientists – Columbia University (*invited*) - Vast, Unknown, and Critical: Ecosystem function and services provided by the deep sea.

Deep-Sea Biology Symposium, Aviero, Portugal - The Global Freezer Survey: biogeography of benthic deep-sea microbial communities.

**2014** University of Oregon, Eugene (*invited*) - Doom, gloom and carbon cycling: bacteria as a critical component of benthic food webs now and in the future.

The Pennsylvania State University (*invited 2 talk series*) - Stewardship of the unknown: Science and Conservation of the deep sea & Top-down and bottom-up control of biogeochemical cycles: the microbe-metazoan link

Gordon Research Conference on Natural Gas Hydrate Systems (*invited*) **–** Fauna, Food webs, and Flux: Integrating Ecosystem Ecology into our understanding of Methane cycles

ASLO Ocean Sciences, Hawaii **–** Microbial- Animal competition in the cold: Carbon cycling in a high Antarctic infaunal Food Web.

**2013** International Symposium on Chemosynthetic-Based Ecosystems, Victoria, British Columbia, Canada (*invited plenary*) – When the small paint the big picture: using microbes to identify a hydrothermal habitat at the Chilean Triple Junction.

**2012** University of Oregon, Coos Bay, OR – Yeti crabs that dance for food and other novel deep-sea trophic relationships

Deep-Sea Biology Symposium, Wellington, NZ – Warm mud at the Chilean Triple Junction: A methane ladder between stepping stones?

Ecological Society of America, Portland, OR - Diet-dependant incorporation of biomarkers from microbial food sources: Implications for food-web studies that use stable isotope and fatty acid analyses.

SCAR Antarctic Sciences Meeting, Portland, OR – Paint and Worms: Art of Antarctic soft-sediment communities.

**2011** Oregon State University, Oregon – Intersection of trophodynamics and biogeochemical cycling at Pacific Ocean methane seeps.

World Conference on Marine Biodiversity, Aberdeen, Scotland – Integrating all domains of life into food webs: the role of Archaea in metazoan diets and implications for ecosystem function.

James Cook University (*invited*), Townsville, Australia - Methane, macrofauna and dancing crabs: Microbial-metazoan interactions at Pacific Ocean cold seeps

Rosenstiel School of Marine and Atmospheric Science (*invited*), Florida - Methane, macrofauna and dancing Crabs: Microbial-metazoan interactions at Pacific Ocean cold seeps.

Florida International University (*invited*), Florida - Methane, macrofauna and dancing Crabs: Microbial-metazoan interactions at Pacific Ocean cold seeps.

**2010** IFM-GEOMAR (*invited*), Kiel, Germany - Rocks, worms, and dancing crabs: Microbe-metazoan interactions from Pacific methane seeps.

Deep Sea Biology Symposium, Reykjavik, Iceland - Dancing for food in the deep sea: Bacterial farming by a new species of Yeti crab

**2009** Chemosynthetic Ecosystem's Meeting, Okinawa, Japan - Importance of aerobic methanotrophy in fueling a high-abundance macro-infauna seep community

**2008** European Geosciences Union, Vienna, Austria - Metazoan use of chemosynthetic food sources at New Zealand cold seeps

**2007** Western Society of Naturalists, Ventura, CA - High spatial variability in the distribution of Antarctic megabenthos with implications for management.

**2005** Western Society of Naturalists, Seaside, CA - The gutless link between the pelagic microbial loop and benthic metazoan food web: fatty acids and stable isotopes in Antarctic sponges.

## Public Outreach

**2016 –** Testified at the Pacific Marine Fisheries Council on Deep Sea Ecosystems, Vancouver, WA. **2015-** Consortium of Ocean Leadership Ocean's Day "Twitter Event" – Tweets reached 394k accounts and received a 4.5M impression rating. **2015 –** Testified at the Pacific Marine Fisheries Council on Deep Sea Ecosystems, Sacramento, CA; **2015 –** Filmed with BBC for "*Oceans*" – Sequel to the "*Blue Planet*" – release planned fall 2017. **2015** – Undergraduate "at sea" experience for 10 OSU undergraduates. **2015** – Donor Visit for CEOAS - **2015 –** *Science Pub* Speaker – Bend, OR. **2014 –** *Science Café* Speaker**; 2014** – Association of Life Long Learning Presenter; **2013 –** *Da Vinci Days* presenter. **2013 –**Quotes in Scholastic Magazine (up to 22 million K-12 student readership); **2013 -** 2x Wired Science Blog Interviews with >70k readership; **2012-2013 –** Research blog: 'Cold Dark Benthos' read by >2000 people/month from 65 countries. **2012 -** Art show about Oil Paintings based on work at Los Angeles based 'CB Galleries' (Collaboration with L. Simonson, Artist) **- 2011-** Interviewed on the Canadian Broadcast Company *Quirks and Quarks;* **2011-** Production of INDEEP Ecosystem function flyer for deep-sea stake holders; **2010 - "**Focus on the Future: The Compton - UC San Diego Connection" - helped lead a day long oceanographic cruise for minority high school students; **2010-** Helped develop a bilingual cruise website including teaching materials, blogs, essays, and media. Hosted live shipboard broadcast to four countries - INPIRE at oceanexplorer.noaa.gov; **2008** - Seminar - Rancho Santa Fe 7th and 8th grade classes (~80 students); **2008** - Seminar - Loma Linda Academy (High School) Earth Science Class; **2008** - Tour of SIO - High Tech High Elementary School Class; **2007** - Job Fair - Job fair at National City Middle School; **2004** - Website - ASPIRE 2004 - Daily updates for elementary school readers; **2004** - Seminar - Crary Science Lecture, McMurdo Station Antarctica; **2004** - Seminar - Spring Hill Elementary and Seaside High School; **2003** - Seminar - Friends of Moss Landing Marine Labs; **2002** - Seminar - Monterey Bay Aquarium Student Oceanography Club; **2002** - Website - ASPIRE 2002, Webmaster and Daily Updates (1 of 6 contributors).

## Cruise Experience (286 days at sea)

**2015 –** MV Alucia – Costa Rican Methane Seeps – 4 days; **2015 –** RV Oceanus – Umpqua Depocenter – Oregon – 4 days; **2012 -** RV Melville **–** Chilean Triple Junction - 5 days**; 2011 –** RV Atlantis **–** Hydrate Ridge Methane Seeps –9 days; **2011-** RV Sonne **-** NEMESYS, New Zealand Methane Seeps - 19 days; **2010**- RV Sproul - Guest lecturer on **"**Focus on the Future: The Compton - UC San Diego Connection" Oceanographic Cruise - 1 day; **2010 -** RV Melville - *Chief Scientist* of INSPIRE**:** Chile Margin - 23 days; **2010 -** RV Atlantis **-** Costa Rica Methane Seeps **-** 8 days; **2009** - RV New Horizon - Guest Lecturer on Biological Oceanography Cruise - 1 day; **2009 -** RV Atlantis - Costa Rica Methane Seeps - 15 days; **2007 -** RV Atlantis - Juan de Fuca Hydrothermal Vents - 13 days; **2007 -** RV Sonne - New Zealand Methane Seeps - 24 days; **2006** - RV Tangaroa - New Zealand Methane Seeps - 24 days; **2006** - RV Atlantis - NE Pacific Methane Seeps - 37 days; **2006 -** RV Atlantis - Costa Rica Methane Seeps - 4 days; **2004 -** RV(IB) Nathanial B. Palmer - Southern Ocean Sub - Antarctic Islands - 61 days; **2003** - RV Yuzhmorgeologiya - NOAA - SWFSC - AMLR South Shetland Islands - 26 days; **2000** - RV Kaimikai O Kanaloa - $CO_2$ Sequestration study - 4 days; **2000** - RV Kaimikai O Kanaloa - Hawaiian Ocean Time Series 116 - 4 days.

## Selected Research highlighted in the Popular Press

2016 – Deep-Sea Hydrothermal Vents Play A Vital Role In Maintaining Global Climate – IFL science
2015 – Conservation Voices: Q&A with Andrew Thurber – Pew Charitable Trusts
2014 – Microbial life discovered inside deep-sea rocks - IFLscience
The deep sea is vast, unexplored, and incredibly important – Washington Post
Mining the bottom of the ocean is as bad for the environment as it sounds – Vice News – Mothorboard
Deep sea crucial to our live, study shows – Our World, United Nations University
OSU scientists warn of peril to deep ocean – Gazette Times
The riches that lie in the deep sea: New study examines ocean depths – Science World Report
From Finding Nemo to minerals: What riches lie in the deep sea? – Science Daily
Deep Sea at Great Risk? – The Corvallis Advocate

2013 – Swimming Beneath the Brinicles, in Antarctica – Wired Blogs
Undersea Icicle - Scholastic magazine
Scientists Predict Climate Change will affect most ocean life by 2100 - Oregon Public Broadcasting
Bacteria-fuelled worms soaking in ocean methane seeps – Science Learning
Climate change will significantly impact ocean health by 2100 – CBS News
Novel worm community affects methane release in Ocean – Astrobiology Magazine
Worms Create Methane Release in Ocean – KEZI – ABC News
2012 – 'Feast or Famine' - *The Antarctic Sun*, United State Antarctic Program
Researchers Dive for Science - The Barometer, Oregon State University
2011 – "Yeti crab grows its own food" - *Nature* News
*Third most read Nature News article of 2011
"Yeti Crab" Radio interview on *Quirks and Quarks*- Canadian Broadcast Company
"Yeti Crab Waving" Radio interview on *As it Happens* - Canadian Broadcast Company
" Deep-sea crab farms food on its arms" *Wired* science
"Yeti Crabs grow bacteria on their hairy claws" *Scientific American* blog
"Yeti crabs farm food on own arms – a first" *National Geographic* news
"Yeti crab farms bacteria on its arms" *Discover Magazine*
"Kiwa puravida, 'Yeti Crab' grows food on its arms" *Huffington Post*
"Yeti Crab Roundup" *Deep Sea News*
"Fancy some crackers" Meet the dancing Yeti crab that grows its own food … on its claws" *The Daily Mail UK*
"Yeti crab cultivates bacteria on its claws to feed itself" *Mongabay*
"This disgusting new crab species eats food grown on its own arms" *Gizmodo*
"Farming Deep Sea Crab Discovered" *Science 2.0*
"A crab that grows its bacterial meals on its own body" *Popsci*
"New Yeti crab farms bacteria on its arms to eat" *Geekologie*
"Yeti Crab cultivates bacteria on claw, then eats them" *Slashdot.org*
"New crab species discovered in Costa Rica named after pura vida" *Tico Times* (Costa Rica)
Article on *Ynet*, an Israeli news source
Article on Vesti.ru a Russian News Source
2010 - NOAA Ocean Explorer's Feature
Future Now "Hairbrush with ears"
2010 - Compton High School Students Focus on the Future
2010 - *Barco científico de EE.UU. llegó al país para estudiar fauna marina*
El Mercurio (Chilean newspaper), Feb. 13, 2010