

# KATIE L. CRAMER, PH.D.

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## EDUCATION

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<b>PhD</b>	Scripps Institution of Oceanography, University of California, San Diego <i>Oceanography</i> (Advisor: Jeremy Jackson)	2011
<b>MS</b>	Scripps Institution of Oceanography, University of California, San Diego <i>Marine Biology</i> (Advisor: Jeremy Jackson)	2007
<b>BS</b>	University of California, San Diego <i>Ecology, Behavior, Evolution</i>	1998

## APPOINTMENTS AND FELLOWSHIPS

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<b>Postdoctoral Fellow</b> <b>Scripps Institution of Oceanography (SIO), UC San Diego (UCSD)</b> <i>PI in cross-disciplinary study to construct a timeline of pre-historical and historical human impacts to coastal marine ecosystems along the Caribbean coast of Meso America from a synthesis of historical, archaeological, and paleontological data. This timeline identifies human drivers responsible for recent and historical changes in Caribbean coral reef ecosystems from analysis of an array of fossils found in reef sediment cores. In collaboration with environmental historian Matthew Vitz at UCSD and paleontologist Richard Norris at SIO.</i>	2015-2017
<b>Course Coordinator</b> <b>Scripps Institution of Oceanography, UC San Diego</b> <i>Led intensive summer course "Introduction to Marine Biodiversity, Conservation and Global Change". Developed and graded course assignments, provided context and common thread for diverse content, lectured on paleoecology and led field trip on coastal geology.</i>	2016
<b>Lecturer</b> <b>UC San Diego</b> <i>Co-taught "Introduction to Environmental Systems" undergraduate course. Designed and instructed a course curriculum focused on ecology, evolution, conservation ecology, water resources and pollution, and environmental economics and policy, and designed Teaching Assistant-led discussion sections to improve critical thinking and writing skills.</i>	2016

**Smithsonian Institution MarineGEO Postdoctoral Fellow** 2012-2014  
National Museum of Natural History/Smithsonian Tropical Research Institute (Panama)  
*PI in study to identify anthropogenic drivers of recent Caribbean reef declines by reconstructing a timeline of reef ecological change over the last millennium from analysis of coral reef fossils and sediments collected from cores. In collaboration with Aaron O’Dea and Torben Rick at Smithsonian Institution and Richard Norris at SIO.*

**Ecologist, Global Coral Reef Monitoring Network** 2012  
International Union for Conservation of Nature (Washington, DC)  
*In collaboration with reef researchers from universities, marine labs, management agencies, and environmental NGOs across the Caribbean, developed and analyzed largest database to date of Caribbean reef ecological survey data (spanning from 1959-present) to: (1) determine status and trends of reefs across the Caribbean,(2) identify varying trajectories of decline across reef locations to resolve drivers of recent ecological change, (3) provide recommendations to reef managers for promoting reef recovery and resilience.*

**NOAA Sea Grant Knauss Marine Policy Fellow** 2011-2012  
U.S. Senate Committee on Commerce, Science, and Transportation  
Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard  
*As congressional staffer to Senators Jay Rockefeller and Mark Begich, assisted in analyzing, proposing, and drafting legislation to advance sustainable management of fishery, coral reef, and other marine natural resources in federal waters; designed and coordinated oversight and legislative hearings; analyzed effectiveness of NOAA programs; advised Commerce Committee Senators and staff on marine science issues.*

**SIO Center for Marine Biodiversity and Conservation Fellow** 2009-2011  
**Smithsonian Tropical Research Institute (STRI) Pre-doctoral Fellow** 2008-2009  
**Organization for Tropical Studies Tropical Biology Field Course, Costa Rica** 2006  
**Smithsonian Tropical Research Institute (STRI) Short-term Fellow** 2004  
**NSF Integrative Graduate Education and Research Traineeship (IGERT) Fellow** 2004-2006  
*For doctoral work, reconstructed timeline of recent anthropogenic change in coral reef ecological communities and environments from analysis of reef coral and mollusk fossils, historical records, and archaeological data; developed a revised biogeographic scheme for the Eastern Tropical Pacific using shorefish species distributions.*

**Fisheries Ecologist, Protected Resources Division** 1998-2004  
National Marine Fisheries Service, Southwest Fisheries Science Center (La Jolla)  
*Led study assessing impact of yellowfin tuna purse seine fishery on reproductive output of depleted dolphin populations in the Eastern Tropical Pacific (ETP); participated in several pelagic research cruises in ETP; participated in several gray whale calf abundance surveys at Piedras Blancas field station (San Simeon, CA); became expert in fields of fisheries science, marine conservation ecology, population dynamics and modeling, computer programming.*

## NON-FELLOWSHIP GRANTS AWARDED

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“Best Research Idea” Prize, Association of Marine Laboratories of the Caribbean meeting (with co-PIs Richard Norris and Aaron O’Dea; \$2k)	2015
Private donor grant (with co-PI Richard Norris; \$2k)	2014
National Geographic Society / Waitt Foundation Grant (\$12.5k)	2013
UC Academic Senate Grant (with co-PI Jeremy Jackson; \$5.5k)	2013
Project AWARE Foundation Grant (\$1.5k)	2008
UC Academic Senate Grant (with co-PI Jeremy Jackson; \$20k)	2006

## PUBLICATIONS

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### *Peer-reviewed journal articles*

**Cramer KL**, O’Dea A, Carpenter C, Norris RD. 2017. A 3000 year record of Caribbean reef urchin communities reveals causes and consequences of long-term decline in *Diadema antillarum*. *Ecography* 40:001–010.

**Cramer KL**, O’Dea A, Clark TR, Zhao J, Norris RD. 2017. Prehistorical and historical declines in Caribbean coral reef accretion rates driven by loss of parrotfish. *Nature Communications* 8:14160.

Sibert EC, **Cramer KL**, Hastings PA, Norris RD. 2017. Methods for isolation and quantification of microfossil fish teeth and elasmobranch dermal denticles (ichthyoliths) from marine sediments. *Palaeontologia Electronica* 20:1–14.

**Cramer KL**, Leonard-Pingel JS, Rodríguez F, Jackson JBC. 2015. Molluscan subfossil assemblages reveal the long-term deterioration of coral reef environments in Caribbean Panama. *Marine Pollution Bulletin* 96:176–187.

Robertson DR, **Cramer KL** (*equal authorship*). 2014. Defining and dividing the Greater Caribbean: insights from the biogeography of shorefishes. *PLoS One* 9(7):e102918.

**Cramer KL**. 2013. History of human occupation and environmental change in western and central Caribbean Panama. *Bulletin of Marine Science* 89:955-982.

**Cramer KL**, Jackson JBC, Angioletti C, Leonard-Pingel J, Guilderson TP. 2012. Anthropogenic mortality on coral reefs in Caribbean Panama predates coral disease and bleaching. *Ecology Letters* 15:561-567.

Robertson DR, **Cramer KL** (*equal authorship*). 2009. Shore fishes and biogeographic subdivisions of the Tropical Eastern Pacific. *Marine Ecology Progress Series* 380:1-17.

**Cramer KL**, Perryman W, Gerrodette T. 2008. Declines in reproductive output in two dolphin populations depleted by the tuna purse-seine fishery. *Marine Ecology Progress Series* 369:273-285.

**Cramer KL**. 1998. Trace element characterization of San Diego bay invertebrates. *Journal of Undergraduate Research, University of California, San Diego*

### ***Papers in revision/review***

**Cramer KL**, Jackson JBC, Greenstein BJ, Donovan MK, Korpanty CA, Pandolfi JM. Local anthropogenic stressors and the mid-20th century decline of Caribbean acroporid corals. *In review, Proceedings of the National Academy of Sciences of the United States.*

Łukowiak M, **Cramer KL**, Madzia D, Hynes MG, Norris RD, O’Dea A. Historical change in a Caribbean reef sponge community and long-term loss of sponge predators. *In revision, Marine Ecology Progress Series.*

### ***Submitted papers***

**Cramer KL**, O’Dea A, Leonard-Pingel J, Norris RD. Historical local human activities have unraveled Caribbean reefs at a scale similar to past large-scale hydrological changes. *Submitted to Ecology.*

### ***Papers in progress***

Jackson JBC, Donovan MK, **Cramer KL**, and 86 others. Regulation of fishing and coastal development increases ecological resilience to climate change on Caribbean reefs. *To be submitted to Science Advances in early 2018.*

**Cramer KL**, Carilli JE, Clark TR, Zhao J, Jackson JBC. Historical changes in coral growth rates in response to natural versus anthropogenic environmental change in Caribbean Panama. *To be submitted to Coral Reefs in mid-2018.*

### ***Book chapters***

**Cramer KL**. Historia del impacto humano sobre los ecosistemas costeros del Caribe panameño. 2014. *In: Rodríguez F, O’Dea A, editors. Historia Natural del Istmo de Panamá. Panamá: Albacrome S.A.*

### ***Reports***

Jackson JBC, Donovan MK, **Cramer KL**, Lam W (editors). 2014. Status and trends of Caribbean coral reefs: 1970-2012. Global Coral Reef Monitoring Network, International Union for Conservation of Nature, Gland, Switzerland.

Jackson J, **Cramer KL**, Donovan M, Friedlander A, Hooten A, Lam V. 2012. Tropical Americas coral reef resilience workshop report, April 29-May 5, 2012. Global Coral Reef Monitoring Network, 33 pp.

Hull PM, Aburto-Oropeza O, Bedolla Y, **Cramer KL**, Hanson K, Marhaver K, Murray J, Roth M, Tomas-Nash F, Sandin S, Sanchez C, Sala E. 2006. An ecological and economic baseline for the Revillagigedo Archipelago Biosphere Reserve, Mexico. *Expedition Report to UC-Mexus Program.*

**Cramer KL**, Perryman WL. 2002. Estimation of reproductive and demographic parameters of the eastern spinner dolphin (*Stenella longirostris orientalis*) using aerial photography. NOAA Administrative Report LJ-02-31, National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, CA.

### **Conference Abstracts from Invited Talks**

**Cramer KL**, Norris RD, O’Dea A. 2016. Prehistorical and historical deterioration of Caribbean reef ecosystems linked to declines in reef accretion, herbivory, and water quality. 13th International Coral Reef Symposium, International Society for Reef Studies, Honolulu, HI

Carpenter C, **Cramer KL**, O’Dea A, Norris RD. 2016. A 3000 year record of abundance and dynamics of the keystone urchin *Diadema antillarum* from analysis of subfossil spines from reef sediment cores. 13th International Coral Reef Symposium, International Society for Reef Studies, Honolulu, HI

McComas K, **Cramer KL**, O’Dea A, Norris RD. 2016. A modern fish tooth reference collection to help track historical change in Caribbean reef fish communities from tooth fossils found in reef sediments. 13th International Coral Reef Symposium, International Society for Reef Studies, Honolulu, HI

**Cramer KL**, Norris RD, O’Dea A. 2015. A quantitative reconstruction of historical change in Caribbean reef ecosystems. 37<sup>th</sup> Meeting of the Association of Marine Laboratories of the Caribbean, Curacao.

**Cramer KL**, Norris RD, O’Dea A. 2013. Historical change in Caribbean reef fish and coral communities. 94<sup>th</sup> Meeting of the Western Society of Naturalists, Oxnard, CA

**Cramer KL**, Jackson J, Angioletti C, Leonard-Pingel J, Guilderson T. 2013. Historical anthropogenic change in reef coral and molluscan communities in Caribbean Panama. 46<sup>th</sup> Meeting of the Western Society of Malacologists, San Diego, CA

**Cramer KL**, Norris RD, O’Dea A. 2013. Changes in Caribbean coral reef environments and fish communities over the last millennium. Smithsonian Tropical Research Institute Fellows Symposium, Balboa, Panama.

Robertson DR, **Cramer KL**. 2013. The Caribbean sandwich: biogeographical revelations from shore-fishes. 9th Indo-Pacific Fish Conference, Okinawa, Japan

**Cramer KL**, Jackson J, Angioletti C, Leonard-Pingel J, Guilderson T. 2012. Anthropogenic mortality on Caribbean coral reefs before coral bleaching and disease. 12<sup>th</sup> International Coral Reef Symposium, International Society for Reef Studies, Cairns, Australia

Jackson J, **Cramer KL\***, Donovan M, Friedlander A, Hooten A, Lam V. 2012. Disparate trajectories of coral reef decline inform strategies for recovery. 12<sup>th</sup> International Coral Reef Symposium, International Society for Reef Studies, Cairns, Australia (*\*presenter*)

**Cramer KL.** 2011. Historical change in coral and molluscan communities in Caribbean Panama. Colloquium on Ecological and Evolutionary Change in Tropical American Seas Over Broad Time-Scales, Smithsonian Tropical Research Institute, Bocas del Toro, Panama

**Cramer KL.** 2008. Historical changes in coral communities along a gradient of land use in Bocas del Toro, Panama. 11<sup>th</sup> International Coral Reef Symposium, International Society for Reef Studies, Ft. Lauderdale, FL

**Cramer KL, Perryman W.** 2003. Estimation of reproductive and demographic parameters of the eastern spinner and northeastern offshore spotted dolphin using aerial photogrammetry. 15<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Society for Marine Mammology, Greensboro, NC

## **TEACHING AND MENTORING EXPERIENCE, SEMINARS, AND OUTREACH**

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### ***Teaching, Seminars, and Outreach***

- 2017 Expert on science panel for audience Q&A following public screening of “Chasing Coral”, La Paloma Theater, Encinitas, CA
- 2016 Course Coordinator for graduate course “Introduction to Marine Biodiversity, Conservation and Global Change”
- 2016 Instructor for undergraduate course “Introduction to Environmental Systems” (ESYS 10), University of California, San Diego
- 2016 Departmental seminar titled “Anatomy of an ecological collapse: reconstructing a timeline of long-term change in Caribbean coral reefs” at Department of Earth and Biological Sciences, Loma Linda University
- 2016 Departmental seminar titled “Uncovering the antiquity and causes of Caribbean coral reef collapse with paleontological, archaeological, and historical data” to Marine Biology Research Division, Scripps Institution of Oceanography
- 2015 Leader of Better Education for Women in Science (BEWiSE) workshop on coral reef historical ecology and conservation using recent fossils, National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, CA (8<sup>th</sup>/9<sup>th</sup> grade students)
- 2014 Paleobiology Departmental Seminar, Smithsonian National Museum of Natural History, Washington, DC
- 2014 Presentation entitled “What should Caribbean reefs look like?” to National Geographic Society, Washington, DC
- 2014 Guest lecture entitled “Historical ecology of Caribbean coral reefs”, Perspectives on Ocean Science undergraduate course at SIO
- 2014 Leader of Better Education for Women in Science (BEWiSE) workshop on marine historical ecology using fossils, National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, CA (8<sup>th</sup>/9<sup>th</sup> grade students)
- 2013 Public lecture to San Diego Shell Club on historical changes in Caribbean coral reef mollusks from human activities, Balboa Park, San Diego, CA
- 2012 Leader of Better Education for Women in Science (BEWiSE) workshop on coral reef paleoecology, Scripps Institution of Oceanography (8<sup>th</sup>/9<sup>th</sup> grade students)
- 2010 Guest Lecturer, UCSD Academic Connections summer course in Paleobiology for local high school students

- 2010 Leader of Better Education for Women in Science (BEWiSE) workshop on coral reef paleoecology, National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, CA (8<sup>th</sup>/9<sup>th</sup> grade students)
- 2009 Public lecture on coral reef conservation (in Spanish), Meliá Panamá Canal Hotel, Colón, Panama
- 2009 American Cetacean Society public lecture on tuna/dolphin issue, Cabrillo Aquarium, San Pedro, CA
- 2008 Coral reef conservation lecture and lab to K-12 students in local indigenous community, Bocas del Toro, Panama (in Spanish)
- 2007 Teaching Assistant, undergraduate course in Biological Oceanography at UCSD (led two sections each consisting of ~30 students)

### **Mentoring**

- 2017 Supervisor to Master's student conducting independent research in Norris laboratory at SIO
- 2016 Supervisor to two UCSD undergraduate students conducting independent research in Norris laboratory at SIO
- 2015 Advisor to five UCSD undergraduate students and one undergraduate student from Brazil conducting independent research projects in Norris laboratory at SIO
- 2014 Advisor to 11 UCSD undergraduate students conducting independent research projects for course credit in Norris laboratory at SIO
- 2013 Supervisor to three UCSD work-study students in laboratory of Richard Norris at SIO
- 2013 Advisor to two UCSD undergraduate students conducting senior research projects in Norris laboratory at SIO
- 2013 Advisor to two volunteers (recent UCSD graduates) working on projects related to my post-doctoral research, in Norris laboratory at SIO
- 2013 Advisor to under-represented Summer Undergraduate Research Fellowship (SURF) student in Norris laboratory at SIO
- 2013 Advisor to two UCSD undergraduate students conducting independent research projects for course credit in Norris laboratory at SIO
- 2010 Advisor to Summer Training Academy for Research in the Sciences (STARS) under-represented undergraduate student in laboratory of Jeremy Jackson at SIO
- 2009 Advisor to Panamanian undergraduate student intern
- 2008 Advisor to UCSD undergraduate student conducting senior project in laboratory of Jeremy Jackson at SIO

### **POPULAR COVERAGE OF RESEARCH**

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Washington Post, "240-Year-Old Nautical Maps Show Coral Loss is Much Worse than We Knew" by Ben Guarino

[https://www.washingtonpost.com/news/speaking-of-science/wp/2017/09/06/240-year-old-nautical-maps-show-coral-loss-is-much-worse-than-we-knew/?utm\\_term=.f7899f7bf4de](https://www.washingtonpost.com/news/speaking-of-science/wp/2017/09/06/240-year-old-nautical-maps-show-coral-loss-is-much-worse-than-we-knew/?utm_term=.f7899f7bf4de)

Oceana Blog, "To Make a Tropical Paradise, Start With Parrotfish Poop" by Amy McDermott

<http://oceana.org/blog/make-tropical-paradise-start-parrotfish-poop>

Scripps Institution of Oceanography News, “Study Finds Parrotfish are Critical to Coral Reef Health” (with accompanying video)

<https://scripps.ucsd.edu/news/study-finds-parrotfish-are-critical-coral-reef-health>

Smithsonian Institution, Smithsonian Science News, “Study reveals Agriculture and Fishing Cause Coral Reef Decline” by Cristina Wu

<http://smithsonianscience.si.edu/2015/08/study-reveals-agriculture-and-fishing-cause-coral-reef-decline>

Scripps Institution of Oceanography, “Research Highlight: Agriculture and Fishing Cause Coral Reef Decline” by Cristina Wu

<https://scripps.ucsd.edu/news/research-highlight-agriculture-and-fishing-cause-coral-reef-decline>

New York Times, Dot Earth blog, “Protecting Parrotfish on the Path to a Caribbean Reef Revival” by Andrew C. Revkin

[http://dotearth.blogs.nytimes.com/2014/07/04/protecting-parrotfish-on-the-path-to-a-caribbean-reef-revival/?\\_php=true&\\_type=blogs&smid=tw-dotearth&seid=auto&r=0](http://dotearth.blogs.nytimes.com/2014/07/04/protecting-parrotfish-on-the-path-to-a-caribbean-reef-revival/?_php=true&_type=blogs&smid=tw-dotearth&seid=auto&r=0)

Smithsonian Tropical Research Institute, “Three Caribbean Seas” by Beth King

[http://www.stri.si.edu/english/about\\_stri/headline\\_news/news/article.php?id=1836](http://www.stri.si.edu/english/about_stri/headline_news/news/article.php?id=1836)

Crítica newspaper, Panamá, “Estudio revela que humanos han alterado los ambientes terrestres y marino-costeros” by Delfia Cortez

<http://www.critica.com.pa/notas/1632668-estudio-revela-que-humanos-han-alterado-los-ambientes-terrestres-y-marino-costeros->

University of Panamá news page, “En Panamá, los humanos han alterado el ambiente muchísimo antes de lo que pensábamos” by Javier Hurtado

<http://universidaddepanama.info/noticias/comunidad-universitaria/4838-en-panama-los-humanos-han-alterado-el-ambiente-muchisimo-antes-de-lo-que-pensabamos.html#19988-en-panama-los-humanos-han-alterado-el-ambiente-muchisimo-antes-de-lo-que-pensabamos>

Smithsonian Institution Science blog, “Q&A: Katie Cramer on the long term human impact on coral reefs in Caribbean Panama” by Emily Grebenstein

<http://smithsonianscience.org/2013/08/qa-katie-cramer-on-the-long-term-human-impact-on-coral-reefs-in-caribbean-panama/>

Smithsonian Institution E-Torch blog, “Building on the past to save the future of the coral reef” by Emily Grebenstein

<http://www.e-torch.org/2013/08/building-on-the-past-to-save-the-future-of-the-coral-reef/>

Scripps Institution of Oceanography, “Declines in Caribbean coral reefs pre-date climate change damage” by Chris Palmer

<http://explorations.ucsd.edu/research-highlights/2012/declines-in-caribbean-coral-reefs-pre-date-damage-resulting-from-climate-change/>

Smithsonian Tropical Research Institute, “Coral contains a message” by Beth King

[http://stri.si.edu/english/about\\_stri/headline\\_news/news/article.php?id=1461](http://stri.si.edu/english/about_stri/headline_news/news/article.php?id=1461)



## PROFESSIONAL AFFILIATIONS

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- International Society for Reef Studies
- Society for Conservation Biology
- Western Society of Naturalists
- American Geophysical Union
- Western Society of Malacologists
- San Diego Coral Club (consortium of coral reef researchers from SIO, San Diego State University, University of San Diego)

## PROFESSIONAL ACTIVITIES AND SKILLS

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- Co-chair of cross-disciplinary session “The value of historical, archeological and paleoecological data for assessing and conserving coral reefs”, 13<sup>th</sup> International Coral Reef Symposium, Honolulu (June 2016)
- Co-Chair of special session on Marine Historical Ecology at 37<sup>th</sup> Scientific Meeting of the Association of Marine Laboratories of the Caribbean, Curacao (May 2015)
- Reviewer for *Atoll Research Bulletin*, *Coral Reefs*, *Ecography*, *Journal of Biogeography*, *Marine Ecology Progress Series*, *Molecular Ecology*, *Oryx*, *Revista de Biología Tropical*, *Scientific Reports*
- Proposal reviewer for Netherlands Organization for Scientific Research (Dutch government equivalent to US National Science Foundation)
- American Academy of Underwater Sciences-certified Scientific SCUBA Diver
- Proficiency in computer programming (R, FORTRAN), biostatistics, and ecological modeling
- Proficiency in written and spoken Spanish