

MICHAEL HANG



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EDUCATION



CSU Monterey Bay

M.S. in Applied Marine and Watershed Science

Advisor: Dr. Steve Moore



CSU Long Beach

B.S. in Marine Biology

Coursework: Research Methods, Advance GIS, Benthic Habitat Mapping, Electronics for Grad Research, Advance Marine Science & Policy, Environmental & Resource Economics, Robotics Technology Integration, Marine Biology, Invertebrate Zoology, Ichthyology, Tropical Marine Ecology, Marine Ecological Processes, Wetlands Ecology, Biostatistics, Oceanography, Genetics, Phycology, Oceanography, Comparative Animal Physiology, and Undergraduate Directed Research

WORK



Research Intern

NASA Ames Research Center / 1.2017 – present

Implement NASA ARC's fallowed area mapping algorithm in Google's remote sensing API, Earth Engine. I am developing Python code that uses satellite images to monitor land fallowing during drought in near real-time under a Google grant. This code will be adapted for California, Washington, and Oregon. A Google App interface will be created for our partners at the CDWR, WSDA, the Oregon Department of Agriculture, and the Washington State Department of Ecology.



Graduate Research Assistant

NASA Ames Research Center / 04.2016 – 12.2016

NASA ARC is developing a model to track the extent of fallowed lands in California's Central Valley using satellite imagery for drought management. I was part of the team ground-truthing the results from the model by surveying farm fields all over the Central Valley. We were trained on crop identification, and irrigation techniques.



Student Assistant

CSU Monterey Bay – Office of the Chief Information Officer / 10.2013 – 12.2015

Helped develop and test CSUMB's Student Data Warehouse; created media and tools to promote campus-wide cyber security awareness, built budget analyses



Research Technician/Network Administrator

Southern California Coastal Water Research Project / 07.2010 – 07.2013

Desktop/server management; network security; data management; virtualization; audiovisual; graphic design; website development. Marine debris field surveys; designed and managed deployable field cameras for wildlife monitoring; conducted image processing and analyzation. Provided technology support for other departments.

RESEARCH

Application of SquidPods, underwater camera sensor platforms, to quantify natural mortality rates of *D. opalescens* embryos in the field

CSU Monterey Bay / 2013-2017

Built custom underwater oceanographic instruments equipped with temperature, oxygen, lux, and flow sensors and HD cameras using open-source technologies to record timelapse video of market squid egg clusters. The goal was to identify sources of mortality and quantify natural mortality rates *in situ*. These instruments were deployed using small boats, divers, tow cameras, and ROVs.

Remote multi-camera image acquisition system for beach monitoring

SCCWRP / 2012-2013

Designed and implemented a monitoring network in which DSLR cameras enclosed in weatherproof cases were used to calculate the temporal abundance of sea birds using timelapse photography. Cameras were mounted to lifeguard stations in Doheny State Beach, CA for six months. The photos were analyzed to correlate the presence of high bacterial content in the beach water with the presence of sea birds.

California State Pellet Study - The abundance, distribution, and seasonality of pre-production plastic pellets on California beaches

SCCWRP & State Water Resource Control Board / 2011-2013

Conducted field surveys of beaches along Southern California for pre-production plastic pellets to determine the abundance and distribution in order to inform policy.

Prevalence and severity of *Porites trematodiasis* in the presence of *Chaetodon* butterflyfish hosts in Kaneohe Bay, Hawaii

CSU Long Beach / Spring 2010

Research trip to Coconut Island at the Hawai'i Institute of Marine Biology where I conducted field experiments to study parasitism in local butterfly fish species.

Palatability and susceptibility of marine invertebrate larvae to two sessile *Anthozoans*: *Corynactis californica* and *Muricea* sp.

CSU Long Beach / Fall 2009

Spent the semester on Catalina Island at the Wrigley Institute for Environmental Studies taking classes and conducting field and lab research on plankton defenses as part of the Catalina Semester program.

PRESENTATIONS

Application of SquidPods, underwater camera sensor platforms, to quantify natural mortality rates of *D. opalescens* embryos in the field [Talk]

MARINE's 8th Annual Oceans Colloquium / 04.08.2017

Innovative uses of low-cost, open source technologies for marine ecological research [Talk]

Western Society of Naturalists / 11.05.2015

The abundance, distribution, and seasonality of pre-production plastic pellets on California beaches [Poster]

SETAC 33rd Annual Meeting Colloquium / 11.15.2012

SKILLS

Field

- Experienced small boat operator (certified by CSUMB)
- ROV and TowCam design, maintenance, and operation
- Ocean instrumentation creation, deployment, and retrieval
- Dive operation support
- Marine debris survey
- Beach seines
- Plankton tows

Lab/Shop

- Plastic and metal fabrication - CNC mill, lathe, 3D Printing
- Electronics - Building circuits, wiring, soldering
- Woodworking
- Marine animal husbandry
- Fish/invertebrate dissection
- Plankton identification
- Beach water quality filtration

Platforms

- Arduino, Raspberry Pi, Beagle Bone, Android
- Linux - Ubuntu, Knoppix, Debian
- Windows Server 2008
- unRAID

Languages

- Python, JavaScript, bash
- PHP, MySQL, Powershell
- Vietnamese

Software

- Google Earth Engine, ArcGIS, RealWorks, Mapbox
- R, Rstudio, Pycharm
- Solidworks, SketchUp, FreeCad, Cura
- Adobe - Photoshop, Lightroom, Premiere, After Effects, Illustrator
- Microsoft - Office Suite, Visio, Sharepoint, Office 365
- Mendeley
- Vmware Workstation, Virtualbox
- Spiceworks