



Camrin D. Braun, MSc

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Education

- 2013-present** **Ph.D. candidate – Biological Oceanography**, MIT/WHOI Joint Program in Oceanography/Applied Ocean Science and Engineering, USA
Advisor: Dr. Simon Thorrold (Fish Ecology Lab)
- 2012-2013** **M.Sc. – Marine Science and Engineering**, King Abdullah University of Science and Technology (KAUST), Thuwal, Kingdom of Saudi Arabia. (3.89 GPA)
Thesis: “Movement ecology of *Manta alfredi* in the eastern Red Sea”
Advisor: Dr. Michael Berumen (Reef Ecology Lab, Red Sea Research Center)
- 2007-2011** **B.Sc. – Environmental Studies and Conservation Biology**, Summa Cum Laude, The College of Idaho, USA. (3.96 GPA)
Honors Thesis: “Movements of juvenile whale sharks (*Rhincodon typus*) in the Red Sea”
Advisors: Dr. Chris Walser (Biology) and Dr. Rochelle Johnson (Env. Studies).

Relevant Graduate Course Work:

Observational Physical Oceanography	Marine Chemistry	Biophysical Interactions	Str/Func Marine Ecosys
Quantitative Fisheries Oceanography	Applied Statistics	Bio Oceanography	Coral Reef Ecology
Adv Topics in Pelagic Ecology	Marine Life	Oceanography	Genomics

Research Experience

- 2013-present** **Ph.D. Candidate** for Dr. Simon Thorrold, Fish Ecology Lab, WHOI
- Devised new analysis and modeling technique to estimate geositions of marine animals that avoid surface waters.
 - Performed modeling, spectral analyses, and figure creation for several co-authored publications (see below).
- 2012-2013** **Masters Student** for Dr. Michael Berumen, Reef Ecology Lab, KAUST
- Served as member of two large, multi-national, collaborative research teams.
 - Assessed ability of various modeling techniques and tag technologies to accurately represent manta ray movements.
 - Utilized modeling and satellite remote sensing data to uncover physical and chemical drivers of manta habitat choice and movements.
 - Employed microsatellite and nuclear marker genetic analyses to elucidate population relatedness and speciation.
 - Conducted field-based tagging efforts in Saudi Arabia and Sudan while working together with local scientists and authorities.
- 2011-2012** **Research Assistant** for Dr. Simon Thorrold, Fish Ecology Lab, WHOI
- Investigated movement ecology of large pelagic fishes (incl. white, whale, basking, tiger sharks and mobulids) with satellite and acoustic telemetry techniques.
 - Managed large tagging database and performed all telemetry data analysis for publication

- Developed maps and figures for publication in peer-reviewed journals (*PNAS*, *Coral Reefs*, *CJFAS*), in addition to several professional presentations, theses, and dissertations.
 - Performed field-based tagging methods on whale sharks and manta rays.
- 2010-2011** **Lead Investigator** as BSc honors thesis at The College of Idaho
- Utilized satellite telemetry to track movements of juvenile whale sharks in the Red Sea.
 - Discovered new long-range movements of whale sharks within and exiting the Red Sea.
 - Manuscript from this work in prep.
- 2010** **Summer Student Fellow**, NSF Research Experience for Undergraduates, Dr. Thorrold, WHOI
- Learned novel identification, telemetry, and data analysis techniques for tracking large- and small-scale movements of juvenile whale sharks in the Red Sea.
 - Presented my results during an institution-wide seminar series (WHOI) and invited talk (CofI).
- 2010-2011** **Co-Investigator**, Butterflyfish Ecology on Heron Reef, 2010 Australia Expedition, The College of Idaho. *Co-investigator: SL Finch (CofI)*
- Performed GPS snorkel transects and GIS analysis to uncover spatial patterns and community dynamics of Chaetodontid species on Heron Reef.
 - Acquired funding to present findings at International Marine Conservation Congress 2011.
- 2009-2011** **Lead Investigator** as BSc research at The College of Idaho. *Co-author: CL Walser (CofI)*
- Conducted initial investigation of previously unstudied largemouth bass population in a southern Idaho river system.
 - Performed electrofishing and gut content analysis, museum and historical investigation, and complete manuscript preparation, revision, and publication with the aid of a faculty mentor (see *Publications* section).

Publications

6. Berumen ML, **Braun CD**, Cochran JEM, Skomal GB, Thorrold SR (2014). Movement patterns of juvenile whale sharks tagged at an aggregation site in the Red Sea. *PLoS One* 9: e103536.
5. Thorrold SR, Afonso P, Fontes J, **Braun CD**, Skomal GB, Berumen ML (2014). Extreme diving behavior in devil rays link surface waters and the deep ocean. *Nature Communications* 5.
4. **Braun CD**, Skomal GB, Thorrold SR, Berumen ML (2014). Diving Behavior of the Reef Manta Ray Links Coral Reefs with Adjacent Deep Pelagic Habitats. *PLoS One* 9: e88170.
3. Werry JM, Planes S, Berumen ML, Lee KA, **Braun CD**, Clua E (2014). Reef fidelity and migration of tiger sharks, *Galeocerdo cuvier*, across the Coral Sea. *PLoS One* 9(1): e83249.
2. Walter RT, Kessel ST...**Braun CD**...Hussey NE (2013). First record of living *Manta alfredi* x *Manta birostris* hybrid. *Marine Biodiversity*: 1-2. DOI: 10.1007/s12526-013-0183-2
1. **Braun CD**, Walser CA (2011). The diet and distribution of largemouth bass (*Micropterus salmoides*) in the lower Boise River, Idaho. *Western North American Naturalist* 71(3): 316-326.

Fellowships and Research Grants

2014-2015	Co-Principal Investigator, Access to the Sea Grant, WHOI - \$54,712
2014	National Geographic Young Explorer - \$5000
2013-2014	Coastal Ocean Institute Grant, WHOI - \$1500
2012-2013	Provost Award (KAUST) - \$6000
2011	The College of Idaho Student Research Grant - \$500
2011	Nel Tobias Award (CofI) - \$1000
2010	The College of Idaho Student Research Grant - \$1000

Academic Honors and Awards

- Summa Cum Laude** (2011) The College of Idaho
Honors Thesis in Environmental Studies (2011) The College of Idaho

Scarab Award (2011) The College of Idaho, recognition of academic excellence
Heritage Scholarship (2007-2011) The College of Idaho, full tuition scholarship
Dean's Honors List (2007-2011) The College of Idaho, 11 of 12 semesters
National Science Foundation Research Experience for Undergraduates Fellowship (2010) Woods Hole Oceanographic Institution
Abbott Award (2010) The College of Idaho, "For scholarship, character, and effective participation in the life and work of the College."
Outstanding Environmental Studies Student (2010) The College of Idaho
Best Poster in Ecology (2010) Idaho Academy of Sciences

Other Relevant Experience

- **Co-investigator** (2010-2011) Worked as a member of a large research team to understand effects of heavy metals on a rare trout subspecies in an Idaho river system. Performed biomarker assays and created maps for manuscript and presentation. Gunderson et al. (In prep).
- **Co-investigator** (2010-2011) Performed a combination of field sampling and GIS analyses to determine soil preferences of an endangered Idaho squirrel species. Applied this knowledge to inform and initiate a multi-year translocation project in an attempt to help reinstate squirrel populations within historical home range.
- **Conservation Research Volunteer** (2010) Analyzed spatial data for wilderness study area design and designation in Idaho/Oregon (Owyhee Wilderness Initiative).
- **Fisheries Bioaide** (2009) Worked for Idaho Department of Fish and Game performing electrofishing and snorkel stream surveys to document fish populations and inform fisheries policy to protect juvenile chinook salmon. Performed as a member of a small research team in extreme, often strenuous conditions.
- **Lead Investigator** (2009) Modeled population "hotspots" of a rare subspecies of rainbow trout in an Idaho river system. This work may facilitate future field sampling for model verification and species conservation efforts.

Teaching Experience

Biophysical Interactions in the Pelagic Environment, MIT/WHOI (2013): Ocean fronts lecture.
Heritage Scholar Student Mentor, The College of Idaho (2009-2011)
Teacher's Assistant, The College of Idaho (2010): Stream Ecology lecture and lab.
Course Development, The College of Idaho (2010): Independent study of advanced Geographic Information Systems and subsequent course development for future students.

Conference Presentations

- Braun CD**, Skomal GB, Thorrold SR. "Fidelity and migration of basking sharks in the Atlantic." Poster presentation at Ocean Sciences Meeting, February 2014, Honolulu, Hawaii, USA.
- Berumen ML, **Braun CD**, Cochran JE, Skomal GB, Thorrold SR. "Seascape-scale movements of whale sharks in the Saudi Arabian Red Sea." Oral presentation at 3rd International Whale Shark Conference, October 2013, Atlanta, Georgia, USA.
- Braun CD**, Skomal GB, Thorrold SR, Berumen ML. "Movement ecology of *Manta alfredii* in the eastern Red Sea." Oral presentation at Indo-Pacific Fish Conference, July 2013, Okinawa, Japan.
- Braun CD**. "Movements of juvenile whale sharks (*Rhincodon typus*) in the Red Sea." Oral presentation at American Elasmobranch Society and Joint Meeting of Ichthyologists and Herpetologists, July 2011, Minneapolis, MN, USA.
- Braun CD**, Finch SL. "Butterflyfish (*Chaetodontidae*) distribution on the Heron Reef, Great Barrier Reef, Australia." Poster presentation at International Marine Conservation Congress, May 2011, Victoria, BC, Canada.

- Braun CD**, Walser CA. "The diet and distribution of largemouth bass (*Micropterus salmoides*) in the lower Boise River, Idaho." Poster presentation at The College of Idaho Student Research Conference, May 2011, Caldwell, ID, USA.
- Braun CD**. "Movements of juvenile whale sharks (*Rhincodon typus*) in the Red Sea." Oral presentation at The College of Idaho Student Research Conference, May 2011, Caldwell, ID, USA.
- Braun CD**, Walser CA. "The diet and distribution of largemouth bass (*Micropterus salmoides*) in the lower Boise River, Idaho." Poster presentation at Idaho Chapter of American Fisheries Society annual meeting, March 2011, Boise, ID, USA.
- Braun CD**, Walser CA. "The diet and distribution of largemouth bass (*Micropterus salmoides*) in the lower Boise River, Idaho." Poster presentation at Idaho Statehouse, February 2011, Boise, ID, USA.
- Braun CD**, Finch SL. "Butterflyfish (*Chaetodontidae*) distribution on the Heron Reef, Great Barrier Reef, Australia." Poster presentation at The College of Idaho Student Research Conference, May 2010, Caldwell, ID, USA.
- Braun CD**, Finch SL, Yensen E. "Determining Southern Idaho Ground Squirrel (*Spermophilus brunneus endemicus*) Soil Preferences Using GIS Analysis." Poster presentation at The College of Idaho Student Research Conference, May 2010, Caldwell, ID, USA.
- Braun CD**, Finch SL. "Butterflyfish (*Chaetodontidae*) distribution on the Heron Reef, Great Barrier Reef, Australia." Poster presentation at Idaho Academy of Sciences, April 2010, Twin Falls, ID, USA. (Best Poster in Ecology)
- Braun CD**. "Using GIS to model populations of redband trout, *Oncorhynchus mykiss gairdneri*, in the headwaters of the Owyhee River drainage." Poster presentation at The College of Idaho Student Research Conference, May 2009, Caldwell, ID, USA.

Invited Talks and Seminars

- Braun CD**, Skomal GB, Thorrold SR, Berumen ML. "Movement ecology of *Manta alfredii* in the eastern Red Sea." October 2013, WHOI Biology Seminar Series, Woods Hole, MA.
- Braun CD**. "Movements of juvenile whale sharks (*Rhincodon typus*) in the Red Sea." May 2011, The College of Idaho.

Dive certifications: AAUS Scientific Diver, PADI Rescue Diver, AAUS Drysuit, NAUI Nitrox

Society membership: American Association for Underwater Scientists, Association for the Sciences of Limnology and Oceanography, American Fisheries Society, American Elasmobranch Society, Divers Alert Network, The Explorer's Club, Society for Conservation Biology

Current as of August 2014