



## Camrin D. Braun, MSc

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### Education

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- 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

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- 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***

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7. Priest, MA, Almany GR, **Braun CD**, Hamilton RJ, Lozano-Cortés DF, et al. (2014). Isolation and characterization of 29 microsatellite markers for the bumphead parrotfish, *Bolbometopon muricatum*, and cross amplification in 12 related species. *Marine Biodiversity*. doi: 10.1007/s12526-014-0278-4.
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***

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|-----------|-------------------------------------------------------|
| 2014-2016 | Principal Investigator, Access to the Sea Grant, WHOI |
| 2014      | National Geographic Young Explorer                    |
| 2013-2014 | Coastal Ocean Institute Grant, WHOI                   |
| 2012-2013 | Provost Award (KAUST)                                 |
| 2011      | The College of Idaho Student Research Grant           |
| 2011      | Nel Tobias Award (CofI)                               |
| 2010      | The College of Idaho Student Research Grant           |

### Academic Honors and Awards

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**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

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- **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

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**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

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- 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 3<sup>rd</sup> 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

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- 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, Term Member - The Explorer's Club, Society for Conservation Biology

*Current as of October 2014*