BRIAN STOCK

University of California, San Diego
Scripps Institution of Oceanography
Marine Biology Research Division
9500 Gilman Dr., La Jolla, CA, 92093
tel. 425-919-7879
b1stock@ucsd.edu

EDUCATION

2013 –   PhD candidate, Marine Biology
                Scripps Institution of Oceanography, La Jolla, CA
                Advisor: Dr. Brice Semmens

                "Improving process-based models for management of exploited species"
                1. Bayesian mixing models, open-source software for isotope analysis (MixSIAR)
                2. Spatial prediction of fisheries bycatch
                3. Using in situ length data to determine stock status of protected aggregating fish species
                4. Fine-scale ecology of Nassau grouper icthyoplankton

2005 – 2009 B.S., Mathematical Biology (with distinction)
             Harvey Mudd College, Claremont, CA

PUBLICATIONS

2017 Upadhayay HR, Bodé S, Griepentrog M, Huygens D, Bajracharya RM, Blake WH, Dercon G, Mabit L, Gibbs M, Semmens BX, **Stock BC**, Cornelis W, Boeckx P. Methodological perspectives on the application of compound-specific stable isotope fingerprinting for sediment source apportionment. *Journal of Soils and Sediments*: 1-17.

2016 **Stock BC** and Semmens BX. Unifying error structures in commonly used biotracer mixing models. *Ecology* 97(10): 2562-2569.

2016 deVries MS, **Stock BC**, Christy JH, Goldsmith GR, and Dawson TE. Specialized morphology corresponds to a generalist diet: linking form and function in smashing mantis shrimp crustaceans. *Oecologia* 128(2): 429–442.

2013 Freedman, R, Kuriyama P, Li D, Olson E, Scholten G, Siders Z, Stachura M, and **Stock B**. Considering the future of Gulf of Mexico Sturgeon management in the Apalachicola and Suwannee Rivers. (White paper). National Marine Fisheries Service, National Oceanic and Atmospheric Administration, US Department of Commerce.

2010 Lewallen S, Williams TD, Dray A, **Stock BC**, Mathenge W, Oye J, Nkurikiye J, Kimani K, Müller A, and Courtright P. Estimating incidence of vision-reducing cataract in Africa. *Arch Ophthalmol,* pp.1584-1589.

In review:

Semmens BX, **Stock BC**, Jackson A, Ward EJ, Parnell A, Phillips DL, Inger R, and Bearhop S. "MixSIAR: Analyzing mixing systems using a new generation of Bayesian tracer mixing models."

Blake W, **Stock BC**, Smith H, Navas A, Bodé S, Goddard R, Kuzyk ZZ, Lennard A, Lobb D, Owens P, Palazon L, Petticrew E, Gaspar L, Boeckx P, and Semmens B. "Application of ecological hierarchical Bayesian unmixing models to river basin source apportionment".

Stock BC, Ward EJ, Eguchi T, Jannot JE, Thorson JT, Feist BE, and Semmens BX. "Random forests outperform other species distribution models for spatiotemporal fisheries bycatch prediction."

CONFERENCE PRESENTATIONS (* = MENTORED UNDERGRAD STUDENT)

Stock BC, Mullen A, Roberts P, Jaffe JS, Pattengill-Semmens C, McCoy C, and Semmens BX. Fine-scale dispersal of eggs from a Nassau grouper (*Epinephelus striatus*) spawning aggregation. Poster presented at the ICES Annual Science Conference, Fort Lauderdale, FL, Sept 2017.

Stock BC, Mullen A, Roberts P, Jaffe JS, Waterhouse L, Pattengill-Semmens C, McCoy C, and Semmens BX. Fine-scale dispersal of eggs from a Nassau grouper (*Epinephelus striatus*) spawning aggregation. Poster presented at the 147th American Fisheries Society Annual Meeting, Tampa, FL, Aug 2017.

Stock BC, Mullen A, Roberts P, Jaffe JS, Waterhouse L, Pattengill-Semmens C, McCoy C, and Semmens BX. Fine-scale dispersal of eggs from a Nassau grouper (*Epinephelus striatus*) spawning aggregation. Paper presented at the 69th Annual Gulf and Caribbean Fisheries Research Institute, Grand Cayman, Cayman Islands, Nov 2016.

*Arnold L, **Stock BC**, Waterhouse L, Burton R, McCoy C, Pattengill-Semmens CV, and Semmens BX. Identification of Nassau grouper eggs in the plankton: is size a valid metric? Poster presented at the 69th Annual Gulf and Caribbean Fisheries Research Institute, Grand Cayman, Cayman Islands, Nov 2016.

*Cohn BC, **Stock BC**, Waterhouse L, Heppell S, Pattengill-Semmens CV, Bush PG, McCoy CM, Johnson BC, and Semmens BX. Using in-situ length data to test a data-poor stock assessment model and assess stock status of protected aggregating fish species *Epinephelus striatus*. Poster presented at the 69th Annual Gulf and Caribbean Fisheries Research Institute, Grand Cayman, Cayman Islands, Nov 2016.

Candelmo A, Pattengill-Semmens CV, McCoy CM, Waterhouse L, **Stock B**, Sparke T, Semmens BX. Survival of Nassau and tiger grouper early life stages from a Little Cayman spawning aggregation. Poster presented at the 69th Annual Gulf and Caribbean Fisheries Research Institute, Grand Cayman, Cayman Islands, Nov 2016.

Stock BC, Ward EJ, Eguchi T, and Semmens BX. "Predicting fisheries bycatch risk for dynamic spatial management." Presented at 3rd Scripps Student Symposium, La Jolla, CA, Sept 2016.

deVries MS, **Stock BC**, and Christy JH. "A vicious coral reef predator: morphological specialization broadens the diet of a mantis shrimp." Presented at 13th International Coral Reef Symposium, Honolulu, Hawaii, June 2016.

Blake W, Smith H, Navas A, Bodé S, Goddard R, Kuzyk ZZ, Lennard A, Lobb D, Owens P, Palazon L, Petticrew E, Gaspar L, **Stock B**, Boeckx P, and Semmens B. "Application of hierarchical Bayesian unmixing models in river sediment source apportionment." Poster presented at the European Geosciences Union (EGU) General Assembly 2016, Vienna, Austria, April 2016.

Stock BC, Ward EJ, Eguchi T, and Semmens BX. "Spatial prediction of fisheries bycatch." Presented at the National Protected Species Toolbox Mini-Symposium, NOAA Science Center, Silver Spring, MD, Nov 2015.

Stock BC, Waterhouse L, Heppell S, Pattengill-Semmens C, Semmens BX, Bush P, and McCoy C. "Using *in situ* length data to determine stock status of protected aggregating fish species: a case study of Nassau grouper (*Epinephelus striatus*)." Paper presented at the 68th Annual Gulf and Caribbean Fisheries Research Institute, Panama City, Panama, Nov 2015.

Stock BC, Ward EJ, Eguchi T, Jannot JE, Forney E, and Semmens BX. "Predicting Bycatch in Space: Comparison of Different Approaches." Paper presented at the 145th American Fisheries Society Annual Meeting, Portland, OR, Aug 2015.

Stock BC, Semmens BX, Ward EJ, Parnell A, Jackson AL, Phillips DL, Bearhop S, and Inger R. "Use and Abuse of Mixing Models (MixSIAR)." Paper presented at the 100th ESA Annual Convention, Baltimore, MD, Aug 2015.

Stock BC, Semmens BX, Ward EJ, Moore JW, Parnell A, Jackson AL, Phillips DL, Bearhop S, and Inger R. "MixSIAR: advanced stable isotope mixing models in R." Paper presented at the 99th ESA Annual Convention, Sacramento, CA, Aug 2014.

Siders, ZA, Freedman R, Kuriyama P, Li D, Olson E, Scholten G, Stachura M, and **Stock B**. "Considering the future of Gulf of Mexico sturgeon management in the Apalachicola and Suwannee Rivers." Paper presented at the 143rd American Fisheries Society Annual Meeting, Little Rock, AR, Sept 2013.

Semmens BX, **Stock BC**, Ward EJ, Moore JW, Parnell A, Jackson AL, Phillips DL, Bearhop S, and Inger R. "MixSIAR: A Bayesian stable isotope mixing model for characterizing intrapopulation niche variation." Paper presented at the 98th ESA Annual Convention, Minneapolis, CA, Aug 2013.

PATENTS

Butterfield RD, **Stock B**, Strait M, Dudley H, and Rosenthal S. 2010. Model-Based Infusion Site Monitor. WO/2010/129720. Filed May 5, 2010 and issued Nov 11, 2010.

PUBLISHED SOFTWARE

2016   **Stock BC** and Semmens BX. MixSIAR GUI User Manual, version 3.1, 2016. *https://github.com/brianstock/MixSIAR*

MixSIAR, an R/JAGS package to run Bayesian mixing models:
- Estimates diet—the proportions of source (prey) contributions to a mixture (consumer)
- 3787 CRAN downloads as of Sept 2017

FELLOWSHIPS AND FUNDING

2017   *UCSD Frontiers of Innovation Scholars Program* ($25,000)
             NSF Graduate Research Internship Program ($5,000)
2014   *NSF Graduate Research Fellowship* ($132,000)
             NMFS-Sea Grant Fellowship in Population and Ecosystem Dynamics ($96,249-declined)
             Contract with Ocean Associates (NMFS) ($37,617)

INVITED TALKS

2017   *What spatial statistical model is best for predicting fisheries by catch risk?*
                 Claremont Colleges Applied Math Seminar, Sept 11
             Careers in Oceanography, Harvey Mudd College, Sept 11
             The "Grammar of Graphics" system and ggplot2, SIO R-Users group, Jan 26
2016   *GitHub Intro,* SIO R-Users group, Nov 1
             How can we tell what animals eat?, Birch Aquarium, Sept 29
2015   *What do mantis shrimp eat?*, Ocean Enterprises dive shop, Dec 10
             Intro to Lyx, SIO R-Users group, Nov 30
2014   *Using stable isotope mixing models to quantify diets*, Univ of Alaska Anchorage, Apr 15
             Tools and tips for sharing R code, SIO R-Users group, Feb 4
2013   *Quantifying diets with MixSIAR*, SIO/SWFSC Quantitative Ecology seminar, Dec 2
             Building GUIs in R, SIO R-Users group, Feb 14

WORKSHOPS AND TRAININGS (LED/HOSTED)

2017	*Intro to R for marine ecology*, UC San Diego, Aug 1-3
	Ecological data analysis, Yelapa, Mexico, Mar 23-Apr 2
	Content at: https://github.com/brianstock/StatsClass_public
2015	*Bayesian mixing models (MixSIAR)*, UC San Diego, July 27-31
2014	*The guts of MixSIAR*, Northwest Fisheries Science Center, Seattle, Aug 29

WORKSHOPS AND TRAININGS (ATTENDED)

2015	*Decision Analysis in Natural Resource Management*, UW Friday Harbor Lab, Sept 25-30
2014	*Motorboat Operator*, UC San Diego, Dec 4-9
	Numerical Computing for Natural Resources, Hatfield Marine Science Center, Sept 26-30
	Open Science for Synthesis, NCEAS, Santa Barbara, July 21-Aug 8
2013	*Introduction to Fisheries Stock Assessment*, CAPAM/SIO, Dec 9-13
	NMFS RTR: Marine Resources Population Dynamics, Univ. of Florida, June 8-22
	Scientific Diver, UC San Diego, Sept 7-20

UNDERGRADUATE STUDENT MENTORING

2017	India Dove	"Assessing the recovery of Nassau Grouper via length-frequency analysis from underwater laser caliper video," June-Aug
	Kayla Martinez-Soto	"Egg morphometrics and fertilization rates of Nassau Grouper and Tiger Grouper in the Cayman Islands," June-Aug
2016	Lauren Arnold	"Plankton near a spawn cloud of Nassau grouper eggs," June-Aug
	Brian Cohn	"Tag counts on a Nassau grouper spawning aggregation," June-Aug
2015	Bethany Fowler	"Passive acoustic monitoring of grouper in the Cayman Islands," June-Aug
	Jarvon Stout	"Fingerprinting fish: Computer-aided pattern matching of the Nassau Grouper (*Epinephelus striatus*)," June-Aug
	Patricia Villalobos	"Length distribution analysis of a Nassau grouper (*Epinephelus striatus*) spawning aggregation in the Cayman Islands," June-Aug

GRADUATE STUDENT MENTORING

| 2016 | Gwendal Le Fol (MAS) | "Finfish bycatch in the California large mesh drift gillnet fishery" |
| | Daniel Metz (PhD) | Peer mentor program |

CLASSROOM TEACHING EXPERIENCE

2017	*Guest Lecturer* (1 lecture), SIO 187: Statistical Methods in Marine Biology
2014	*Guest Lecturer* (2 lectures), SIO 187: Statistical Methods in Marine Biology
2013	*Teaching Assistant,* SIO 187: Statistical Methods in Marine Biology
2010 – 2012	*Secondary Math/Computer Teacher,* U.S. Peace Corps, Uganda

REVIEWER

Ecography, Ecological Applications, Methods in Ecology and Evolution, Functional Ecology, Marine Ecology Progress Series, Oregon Sea Grant

Outreach

Exploring Ocean STEM Careers, Birch Aquarium, April 26 2017
Job shadow day, Andrew Dafnis from High Tech High, San Marcos, CA , May 19 2017