

# Michael O. Navarro

**Biology Program • Department of Natural Sciences • University of Alaska Southeast**

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## EDUCATION

Ph.D. 2014 UCSD Scripps Institution of Oceanography Oceanography

M.Sc. 2009 California State University Fullerton Biology

B.Sc. 2000 University of California Los Angeles Biology

## CURRENT APPOINTMENT

**Assistant Professor of Marine Fisheries** (2016-present), Biology Program, University of Alaska Southeast, Juneau, USA

## PREVIOUS APPOINTMENTS

**Postdoctoral Researcher** (2014-2016), NSF Ocean Science Division, Geosciences Directorate, CSU Monterey Bay, USA

**Graduate Researcher**, (2008-2014) UCSD Scripps Institution of Oceanography, CA Sea Grant Fellow 2012-2014 and NSF IGERT Fellow 2008-2011.

**Faculty and Science Education Program Coordinator** (2010-2011), Pre-college Program, Scripps Director's Office and UCSD Academic Connections, La Jolla, USA

**Biologist, Marine Region** (2007-2008), California Department of Fish and Wildlife, Santa Barbara, USA

## AWARDS AND HONORS

**Scripps Institution of Oceanography Honored Alumnus** (2021), Center for Marine Biodiversity and Conservation, Interdisciplinary Research, La Jolla, USA.

**American Association for the Advancement of Science Linton-Poodry Leader** (2018), Society Advancing Chicanos & Native Americans in Science, D.C., USA

**Auk Ta Ocean Excursion Coordinator** (2018) Tliex' Yaawk Gathering (One Canoe Conference). Culture Bearers Nainoa Thompson and Dr. Lance Twitchell, Juneau, USA.

**National Academy of Sciences Distinguished Young Scientist** (2017) Kavli Frontiers of Science, Irvine, USA

## **PEER-REVIEWED PUBLICATIONS** (*italics = mentee*)

Ahmadia GN, Cheng S, Andradi-Brown DA, Baez SK, Barnes MD, Bennett NJ, Campbell SJ, Darling ES, Estradivari, Gill D, Gress E, Gurney G, Horigue V, Jakub R, Kennedy EV, Manajan SL, Mangubhai S, Matsuda SB, Muthiga NA, **Navarro MO**, Santodomingo N, Veverka L, Valles H, Villagomez A, Wenger A, Wosu A (accepted, pending revision) Limited progress in improving gender and geographic representation in coral reef science. *Frontiers in Marine Science*.

Parnell PE, Levin LA, **Navarro MO** (2020) Gauging oxygen risk and tolerance for the megafauna of the southern California shelf based on in situ observation, species mobility and seascape. *ICES Journal of Marine Science*, 77(5):1941-1952.

**Navarro MO**, Parnell PE, Levin LA (2018) Essential market squid (*Doryteuthis opalescens*) embryo habitat: A baseline for anticipated ocean climate change. *Journal of Shellfish Research*, 37(3):601-615.

Marlow J, Borrelli C, Jungbluth SP, Hoffman C, Marlow J, Girguis PR, Dekas A, Skarke A, Blackman D, Fornari D, Soule A, Van Dover C, Bagge L, Barco R, Boulahanais B, Bowman K, Brugler M, Bush S, Djurhuus A, Fernandez J, Fulweiler R, Kinsey J, Kocot K, McVeigh D, **Navarro M**, Netburn A, Pasulka A, Twing K, Wagener A, Zambon J (2017) Telepresence is a potentially transformative tool for field science. *PNAS*, 19:4841-4844.

**Navarro MO**, Kwan G, Batalov O, Choi C, Pierce NT, Levin LA (2016) Embryonic market squid, *Doryteuthis opalescens*, can develop through chronic exposure to low environmental pH and [O<sub>2</sub>]. *PLoS One*, 11:e0167461.

Takeshita Y, Frieder CA, Martz TR, Ballard JR, Feely RA, Kram S, Nam S, **Navarro MO**, Price NN, Smith JE (2015) Including high frequency variability in coastal ocean acidification projections. *Biogeosciences*, 12:5853-5870.

**Navarro MO**, Bockmon EE, Frieder CA, Gonzelez J, Levin LA (2014) Development of geochemical proxies for embryonic squid statolith exposure to low O<sub>2</sub> and pH. *Water*, Special Issue: Impact of Ocean Acidification on Marine Organisms-Unifying Principles and New Paradigms, 6:2233-2254.

Robin JP, Roberts M, Zeidberg L, Bloor I, Rodriguez A, Briceño F, Downey N, Mascaró M, **Navarro MO**, *et al.* (2014) Transitions during cephalopod life history: the role of habitat, environment, functional morphology & behaviour. *Advances in Marine Biology: Advances in Cephalopod Science: Biology, Ecology, Cultivation and Fisheries*, 67C:361-437.

Frieder CA, Gonzalez JP, Bockmon EE, **Navarro MO**, Levin LA (2014) Semidiurnal pH variability and oxygen influence on acidification outcomes for mussel larvae. *Global Change Biology*, 20:754–764.

Bockmon EE, Frieder CA, **Navarro MO**, White-Kershek LA, Dickson AG (2013) Technical Note: Controlled experimental aquarium system for multistressor investigation of carbonate chemistry, oxygen saturation, and temperature. *Biogeosciences*, 10:5967-5975.

**Navarro MO** (2008) California market squid IN: *Review of Some California Fisheries for 2007*. Sweetnam D (ed.) California Cooperative Oceanic Fisheries Investigations (CalCOFI) 2008 Report, 49:19-21.

**Navarro MO**, Bearzi M (2007) Effects of marine mammals on the sport fishery in Santa Monica Bay, CA. *Southern California Academy of Sciences Bulletin*, 106:215-217.

#### **MANUSCRIPTS IN PREPARATION** (*italics = mentee*)

Collins JM, Barbour N, Ekstrom M, Quealey D, Garza C, **Navarro MO**. Rippled scour depressions drive benthic megafaunal community structure of the upper continental shelf in Monterey Bay, CA. Target journal: *Landscape Ecology*

**Navarro MO**, Wehde D, Ekstrom M., Quealey, D. Range expansion of a keystone species, *Doryteuthis opalescens*. Target journal: *Biogeography*.

Navarro MO, Neal B., Ekstrom M., Meclanachan L. The historic loss of king salmon in Southeast Alaska. Target Journal: *Fisheries Research*

Zakroff C, **Navarro MO**. Why is age recorded? Physiological processes of hard structures used for age determination in Cephalopods.

#### **SELECT SCIENTIFIC CONFERENCE PRESENTATIONS** (*italics=mentee, \*=invited*)

**Navarro MO**. Variable drivers of ocean warming along the coast of the Gulf of Alaska evidenced and tracked by a persistent range expansion of the market squid, *Doryteuthis opalescens*. Poster presented at: Ocean Sciences Meeting: Effect of warming on biological, ecological and biogeochemical ocean processes: responses from organismal to ecosystem scales session. 2020 Feb. 18-21, San Diego, USA

Cape MR, Heath HC, **Navarro M**, Wright G. Kayak oceanography as a vehicle for exploring high latitude processes and coupled human-natural systems in Southeast Alaska. Poster presented at: Ocean Sciences Meeting: Transdisciplinary Research and Education in Coastal Systems Session. 2020 Feb. 18-21, San Diego, USA

**Navarro MO**, Palsson W. Ocean warming along the coast of the Gulf of Alaska evidenced and tracked by a persistent range expansion of market squid, *Doryteuthis opalescens*. Oral session presented at: Cephalopod International Advisory Council Conference; 2018 Nov. 12-16, St. Petersburg, USA

Wehde D, **Navarro MO**. Pilot investigation into the age structure of market squid, *Doryteuthis opalescens*, in the Gulf of Alaska. Poster presented at: Alaska Marine Science Symposium; 2018 Jan 22-25, Anchorage, USA

Barbour N, **Navarro MO**. Spatial and temporal variability of a biological guild on the Monterey Bay sandy continental shelf during the 2015-2016 El Niño. Oral session presented at: Western Society of Naturalists Conference; 2016 Nov. 10-13, Monterey, USA.

**Navarro MO**, Collins JM, Burgess C, Barbour N, Garza C. Tracking geomorphological processes of the sandy seafloor and their associated effects on the spatial patterns of inhabitants (including market squid, *Doryteuthis opalescens*). Oral session presented at: California Cooperative Oceanic Fisheries Investigation (CalCOFI) Conference; 2015 Dec. 14-16, Moss Landing, USA.

Collins JM, **Navarro MO**, Garza C. Rippled scour depressions (RSDs) and their impacts on a dominant marine organism of the continental shelf. Poster presented at: CalCOFI Conference; 2015 Dec. 14-16, Moss Landing, USA.

**Navarro MO**, Parnell PE, Levin LA, Garza C. Essential embryo habitat of the market squid, *Doryteuthis opalescens* (including the first direct and continuous measurements of pH and O<sub>2</sub>). Oral session presented at: The Cephalopod International Advisory Council Conference; 2015 Nov. 10-14, Hakodate, Japan.

\***Navarro MO**, Sato K, *et al.* Habitat use, site fidelity, and migration of San Diegan fisheries in response to a changing climate. Oral session presented at: Oceans 13 International Conference, 2013, San Diego, USA.

Kwan GT, **Navarro MO**, Levin LA. Response of embryonic market squid, *Doryteuthis opalescens*, to oxygen, pH and pCO<sub>2</sub> from upwelling margin environments. Oral session presented at the Coastal and Estuarine Research Federation Biennial Conference, 2013, 3-7 November, San Diego, USA. *Kwan won 2<sup>nd</sup> place among all undergraduate student presentations.*

**Navarro MO et al.** Low-level pH and O<sub>2</sub> effects on embryonic squid, *Doryteuthis opalescens*: Morphology and proxies. Oral session presented at: 3<sup>rd</sup> International Symposium on the Ocean in a high CO<sub>2</sub> world International Conference, 2012, Monterey, USA.

**Navarro MO**, Zacherl DC, Paradis G, Nezlin N, Warner RR (2008) Linking statolith chemistry of *Aplysia californica* to watershed runoff. Oral session presented at: SACNAS National Conference, 2008, Salt Lake City, USA. **Best Oral**

### **INVITED SEMINARS AND PUBLIC LECTURES**

**Navarro MO**. Interdisciplinary research and educational approaches at a 'ground-zero' of climate change in the USA, Southeast Alaska. The 2021 honored alumnus at: 8<sup>th</sup> Annual Jackson-Knowlton Distinguished Lecture Series; 2021 Feb. 4, La Jolla, USA.

**Navarro MO**. Decolonizing the ocean sciences. Seminar presented at: Power and Privilege Symposium; 2020 Nov. 10, Juneau, USA. <https://www.uas.alaska.edu/power-and-privilege/index.html>

**Navarro MO**. Environmental variability impacts on nearshore ecosystems of the North East Pacific. Seminar presented at: Sonoma State University; 2020 Sept. 14, Rohnert Park, USA.

**Navarro MO**. Seafood security in the changed seascape of Southeast Alaska. Speaker at the UAS Chancellor's Circle Event; 2018 Oct. 3, Juneau, USA.

**Navarro MO**. Seafood Security in Southeast Alaska. Seminar presented at: Evening at Egan; 2017 Oct. 13, Juneau, USA.

**Navarro MO**. Range extension into the Gulf of Alaska of a keystone species, *Doryteuthis opalescens*, and implications for a new fishery. Oral session and poster presented at: National Academy of Sciences, Kavli Distinguished Young Scientist Frontiers of Science Symposium; 2017 Jun. 26-28, Irvine, USA.

**Navarro MO**. Has the Kraken been released? Resilience of market squid embryos and sighting in the Gulf of Alaska. Fisheries Seminar: CFOS Juneau; 2017 Mar. 3, Juneau, USA.

**Navarro MO**. Natural history as a compass to direct research testing on the effects of a changing environment on marine ecology. Ecology seminar: CSU Monterey Bay, Div. of Science and Environmental Policy, 26 January 2015, Seaside, USA.

### **GRANTS AND AWARDS AT THE UNIVERSITY OF ALASKA SOUTHEAST**

Thornton T, Pyare S, **Navarro MO** (Pending) Secure Futures for Arctic Coastal Communities. National Science Foundation, \$1,393,809.

Amundson J, Pyare S, **Navarro MO**, Nagorski S, Wright G (2020-2023) Undergraduate field studies across the icefield-to-ocean environment of Southeast Alaska. Alaska Space Grant Program, \$84,924.

Tallmon D, **Navarro MO**, Tamone S, Bergstrom C (2019) UA Southeast Salmon Projects. Douglas Island Pink and Chum Hatchery directed funds through the UA Foundation, \$28,500.

**Navarro MO** (2019) Experiential Education for STEM Undergraduates to Explore Oceanography. Alaska Space Grant Program, \$22,481.

**Navarro MO**, Bundy R (2019) Oceanographic solutions to human-induced environmental threats to seafood security in Southeast Alaska. NSF GOLD ASPIRE Award, \$14,400.

**Navarro MO** (2018) Ocean warming along the coast of the Gulf of Alaska evidenced and tracked by a persistent range expansion of market squid, *Doryteuthis opalescens*. CIAC International Conference, St. Petersburg, USA. Research Travel Grant: UAS Evelyn Rhoads Wilson Fund, \$1,500.

**Navarro MO** (2018) SACNAS National Conference, San Antonio, USA. Travel Grant: Biological learning and student training, \$2,000.

**Navarro MO** (2018) SACNAS: Funding to Increase the Underrepresented Student Pipeline in STEM at UA Southeast. UA Southeast Innovation Fund, \$1,995.

**Navarro MO**, Tamone S (2018) Auke Bay Marine Training Center for Undergraduate Fisheries Research. Douglas Island Pink and Chum Hatchery directed funds to PIs Navarro and Tamone through the UA Foundation, \$30,000.

**Navarro MO** (2016-2018) Sub-Award, Alaska Technical Vocational Education Program, PI: Deans Karen Schmitt (16-17) and Paula Martin (17-18), \$17,580.

**Navarro MO** (2017) SACNAS National Conference, Salt Lake City, USA Travel Grant: Biological learning and student training, \$1,990.

**Navarro MO**, Pearson H (2017) Visiting Scholars: Hannah Bassett and Dave Steckler. Special “one-health” seminars for undergraduates in BIOL 492. Travel Grant: Biological learning and student training, \$1,920.

**Navarro MO**, Tamone (2017) Visiting Scholar: Lily Simonson. Special “Art and Science” seminar for undergraduates and the public in BIOL 492. Travel Grant: UAS Academic Innovation Fund, \$910.

**Navarro MO** (2017) Geomorphology Drives Species Distribution: A Case Study Plains of the Continental Shelf. NSF Ocean Sciences Division Postdoctoral Research Fellowship Award #1421310, \$10,326.

**Navarro MO** (2016) Climate disruption effects on the health of nearshore fisheries. Equipment Award: Biological learning and student training, \$46,745.

### **COURSES TAUGHT AT UNIVERSITY OF ALASKA SOUTHEAST (itl.=new course)**

BIOL S110: Introduction to Marine Fisheries (S17, S18, S19, S20, S21, S22)

BIOL S115: Fundamental in Biology I (F16)

BIOL S116: Fundamental in Biology II (S18, S20, S22)

BIOL S298: Research in Biology: *Fisheries, Oceanography* (S19)

BIOL S311: Communicating Science (F18, F20)

BIOL S349: *Biological Oceanography* (F17, F19, F21)

BIOL S362: Genetics (F16, F17, F18, F19, F20)

BIOL S375: Current Topics in Biology: *Global Trends in Fisheries* (S17, S19)

BIOL S492: Biology Seminar (S17)

BIOL S491: Internship (F19, Sum20, F20, Sum21)

BIOL S493: *Oceanographic Expedition (May21, Jul 19-formerly S393 Kayak Oceanog.)*

BIOL S498: Research in Biology: *Fisheries, Oceanography* (S17-S18, F19, S20)

### **OTHER AWARDS AND HONORS**

**Deep-Submergence Science Leader** (2016) University-National Oceanographic Laboratory Systems, Woods Hole, USA

**Marine Geosciences Leader** (2015), National Science Foundation, D.C., USA

**Megafauna Research Group Principle Investigator** (2012), R/V Melville (global class), California Coastal Margin, USA

**Bouchet Graduate Honor Society Member** (2012), Yale University, New Haven, USA

**University of California Affirmative Action and Diversity Committee** (2012-2013), Student Representative (for the entire UC-wide system), UC Office of the President, Oakland, CA

**Vice-Chancellor of Scripps Institution of Oceanography Review Committee** (2011), UCSD Chancellor's Office (only student invited by the Chancellor), La Jolla, USA

**Chief Scientist** (2010), R/V Sproul (regional class), California Coastal Margin, USA

**Outstanding Diversity Outreach Awards** (2008, 2010 (2)), UCSD Chancellor's Office, La Jolla, USA

**Outstanding teacher** (2005), CSU Fullerton, Donald Gardner Scholarship, Fullerton, USA

## **REFEREE**

### **Journals:**

Marine Fisheries Review

Fisheries Oceanography

Marine Biology

Hydrobiology

Marine Ecology

Marine and Freshwater Research

Deep Sea Research I

California Department of Fish and Wildlife Quarterly

Limnology and Oceanography

### **Research Programs:**

NSF Fellowship Reviewer (2019, 2021)

Oregon SeaGrant SEED Competition Reviewer (2020)

NSF Grant Panelist (2019)

MIT SeaGrant Core Research Reviewer (2016)

## **UNDERGRADUATE RESEARCHERS IN THE NAVARRO LAB**

### *Current:*

Molly Ekstrom (F18, S19, F19, S20): Junior, UAS-UAF Joint Fisheries and Ocean Science, Concentration in Fisheries Science B.Sc. Program. **2019 BLaST scholar, 2020-21 DIPAC scholar.**

Dillon Quealey (F18, S19, Sum19, F19, S20): Junior, UA Southeast Marine Biology, B.Sc. Program. **NOAA Partnership Education Program Alaska and UAS Auke Bay Marine Station Joint Summer 2019 REU Scholar.**

### *Past:*

Mikayla Clark (F19, S20): Senior, UA Southeast Biology, B.Sc. Program **2020 UA Southeast URECA scholar.**



Dawn Wehde (F17, S18): Marine Biology, B.Sc. 2018, **2018 UA Southeast URECA scholar**. Currently a Fisheries Biologist at Norton Sound Economic Devel. Corp, Nome, AK

Vasily Sekerak (F17, S18): **2018 UA Southeast URECA scholar**. Left UA Southeast for a military deployment in 2018.

Trevor McLean (F17): Senior, Marine Biology, B.Sc. 2018. **2018 UA Southeast URECA scholar (through the Navarro Lab)**. Since, he has moved on to contribute research in both the Stekoll and Tallmon Labs.

John Taylor (S17): Exchange student, Marine Biology, B.Sc.

Former Mentees at CSU Monterey Bay: Michael Hang M.Sc. 2016, now a **NASA Ames Research Intern**; Nicole Barbour B.Sc. 2016, now at a **Ph.D. student at Univ. of Maryland**; Jesirae Collins B.Sc. 2016; Chelsea Burgess B.Sc. 2016, now a **M.Sc. student at Kansas University**; Madison Heard B.Sc. in progress; Veronica Larwood B.Sc 2015 and now a Bio. Science Technician at USGS, Sacramento, CA; Elena Perez M.A.S. 2014, Fulbright Fellow at the Darwin Institute, Galapagos Islands and now a **Fulbright Latinx Ambassador**.

Former Mentees at Scripps Institution of Oceanography: Brittany Jellison B.Sc. 2010, **Ph.D. 2018, UC Davis**; Olga Batalov B.Sc. 2012, M.Sc. 2014, now a **Senior Research Associate at Cibus LLC**, San Diego, CA, Jesse Andrews B.Sc. 2013, Ernesto Villasenor B. Sc. 2014, Garfield Kwan B.Sc. 2012, now a **Ph.D. candidate at Scripps Institution Of Oceanography**; Shannon Walker M.Sc. 2016, now a Strategic Advisor at Seattle Department of Transportation; Mary McCormick M.Sc. 2014, Mayra Paz B.Sc. in progress.

## SERVICE

### *Statewide*

**Dive Control Board Chair** (2020). UA AAUS Dive Program.

**Steering Committee Member** (2017-present), UAS/UAF Joint Fisheries and Ocean Sciences, Concentration in Fisheries Science B.Sc.

**UAS Representative** (2017-2019). University of Alaska Fisheries, Seafood, and Maritime Initiative Working Group.

**Faculty Partner** (2019). NOAA Partnership Education Program Alaska, Summer Research Internships for Undergraduates. Collaboration between NOAA, UAF (and UAS).

*University*

**UAS Faculty Advisor** (2017-present). Society for the Advancement of Chicanos and Native Americans in Science, Alaska Chapters. UAF BLaST and UAS.

**Undergraduate Curriculum Committee Member** (2017-2019), Natural Sciences Dept. Representative

**Auk Ta Ocean Excursion Coordinator** (2018) Tliex' Yaawk Gathering (One Canoe Conference).

*Media Outreach:*

**American Natural History Museum**, TBD 2021, "Cephalopod Week Podcast"

**Juneau Empire**, 6 Nov. 2020. "Supporting the next generation of scientists is part of a sustainable Alaska." By **Michael Navarro**

**Alaska Space Grant News**, Fall 2020, "Oceanography program enables study of remote environments." By Carol Brzozowski

**Sea Grant Alaska News**, 30 Aug. 2019. "Program aims to provide Alaska Native and rural students with opportunities at NOAA." By Paula Dobbyn.

**Juneau Empire**, 22 Aug. 2019. "Scholar to study subsistence, university launches a new program and a rare book is donated." By Ben Hohenstatt

**Juneau Empire**, 5 Oct. 2018. "Kayaking into a scientific adventure: Exploring Endicott Arm from sea level." By **Michael Navarro**

**Undark**, 14 Mar. 2018. "As Alaskan waters warm, market squid extent their reach northward." By Theresa Soley.

**Juneau Empire**, 17 Dec. 2017. "Squid fishery proposed for Southeast." By Kevin Gullufsen.

**UAS Whalesong**, 8 Nov. 2017. "Helping Hurricane Maria victims from 5,000 miles away." By Maria Romfoe.

**Juneau Empire**, 14 Oct. 2017, "Could migrating squid help Alaska predict climate change?" By Kevin Gullufsen.

**Scripps Institution of Oceanography**, 17 Jan. 2017. "Research Highlight: A story of survival." By Kate Furby