

# Yubin Raut

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## Education

### UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

- *Ph.D. | Ocean Sciences | 2015 – 2021*
- Cumulative GPA: 4.0/4.0
- Thesis: Biological nitrogen fixation associated with living and decomposing macroalgae
- Advisor: Dr. Douglas G. Capone

### TEXAS A&M UNIVERSITY, COLLEGE STATION, TX

- *Bachelor of Science | 2011 – 2015*
- Major: Biology, Geology | Minor: Oceanography
- Cumulative GPA: 3.63/4.0 | Honors: Cum Laude

## Professional Experience

### UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

- *Postdoctoral Scholar | Fuhrman Lab | July 2021 – present*

## Publications

**Raut, Y.**, Morando, M., and Capone, D.G. (2018). Diazotrophic macroalgal associations with living and decomposing *Sargassum*. *Frontiers in Microbiology*, 9. doi:10.3389/fmicb.2018.03127

Navarrete, I.A., Kim, D.Y., Wilcox, C., Reed, D.C., Ginsburg, D.W., Dutton, J.M., Heidelberg, J., **Raut, Y.**, and Wilcox, B.H. (2021). Effects of depth-cycling on nutrient uptake and biomass production in the giant kelp *Macrocystis pyrifera*. *Renewable and Sustainable Energy Reviews*. doi:10.1016/j.rser.2021.110747

**Raut, Y.** and Capone, D.G. (2021). Macroalgal detrital systems: an overlooked ecological niche for heterotrophic nitrogen fixation. *Environmental Microbiology*. doi.org/10.1111/1462-2920.15622.

## Manuscripts in Preparation

**Raut, Y.**, and Capone, D.G. (2021). Pelagic *Sargassum* remineralization: A previously unaccounted niche for biological nitrogen fixation in the Atlantic. In Preparation.

Morando, M., **Raut, Y.**, and Capone, D.G. (2021). Direct Measurements of Primary Production at the San Pedro Ocean Time (SPOT) Series Station: A Two-Year Record. In Preparation.

## Conference Presentations

**Raut, Y.** and D.G. Capone. Increased Nitrogen Fixation Observed With Degrading *Sargassum* Communities. Abstract presented at 2020 Ocean Sciences Meeting, San Diego, CA, 16 Feb.-21 Feb. (Oral Presentation)

**Raut, Y.**, M. Morando, and D.G. Capone. Shifts in microbial community composition associated with decomposing macroalgae and the role of nitrogen fixation in these detrital coastal systems. Abstract presented at 2019 Aquatic Sciences Meeting, San Juan, Puerto Rico, 23 Feb.-2 Mar. (Oral Presentation)

**Raut, Y.,** S. Matzke, C. Vieira, and D.G. Capone. Nitrogen fixation associated with *Sargassum horneri* and *Sargassum palmeri*. Abstract presented at 2017 Aquatic Sciences Meeting, Honolulu, HI, 26 Feb.-3 Mar. (Oral Presentation)

Ortiz, S., **Y. Raut,** D.G. Capone. The Effect of Decomposition on Nitrogen Fixation Associated with *Codium fragile* off the Coast of Santa Catalina Island. Abstract presented at 2019 SACNAS – The National Diversity in STEM Conference, Honolulu, HI, 31 Oct.-2 Nov. (Poster Presentation)

Pernice, M.C., **Y. Raut,** A. Caputo, D.G. Capone, E.A. Webb, D.A. Hutchins, and R.A. Foster. Effect of molecular communication on nitrogen fixation. Abstract presented at 2018 13<sup>th</sup> European Nitrogen Fixation Conference, Stockholm, Sweden, 18-21 Aug. (Poster Presentation)

Dillon, T.N., **Y. Raut,** and D.G. Capone. Nitrogen fixation by sulfate-reducing diazotrophs associated with the decomposition of macroalgae. Abstract [ED34A-2394(B)] presented at 2018 Ocean Sciences Meeting, Portland, OR, 12-16 Feb. (Poster Presentation)

Matzke, S., **Y. Raut,** C. Vieira, and D. G. Capone. Nitrogen fixation rates associated with anatomical features of *Sargassum horneri* surrounding Catalina Island, CA. Abstract presented at 2017 Aquatic Sciences Meeting, Honolulu, HI, 26 Feb.-3 Mar. (Oral Presentation)

## Fellowships and Awards

- William E. Trusten Award | Most Accomplished Graduate Student in Biological Sciences | University of Southern California | 2020/2021
- Provost's Research Enhancement Fellowship | University of Southern California | 2020 – 2021 academic year
- Wrigley Institute Graduate Summer Fellowship | University of Southern California Wrigley Institute for Environmental Studies | 2018, 2019, 2020
- Victoria J. Bertics Graduate Summer Fellowship | University of Southern California Wrigley Institute for Environmental Studies | 2016, 2017

## Teaching Experience

### GRADUATE TEACHING ASSISTANT | UNIVERSITY OF SOUTHERN CALIFORNIA | AUGUST 2015 - PRESENT

- *BISC 457, Methods in Marine Biology and Biological Oceanography* | *Spring Maymester 2020*
  - Co-developed a field and lab work intensive course for an online platform due to Covid-19 restrictions.
  - Overall Rating: 3.67/4.0 | *Spring 2020*
- *BISC 483, Geobiology and Astrobiology* | *Spring 2017, Spring 2019*
  - Overall Rating: 4.53/5.0 | *Spring 2017*
  - Outstanding TA Award | *Spring 2017, Spring 2019*
- *BISC 102, Humans and Their Environment* | *Fall 2015, Spring 2016, Fall 2019*
  - Overall Rating: 4.82/5.0, 4.94/5.0, 3.47/4.0 | *Fall 2015, Spring 2016, Fall 2019*

### ADJUNCT PROFESSOR | MOUNT SAINT MARY'S UNIVERSITY | FALL 2019

- *BIO\_003L, General Microbiology Lab* | *Fall 2019*
  - Plan lectures, assignments, experiments, quizzes, and exams for two lab sections.
  - Overall Rating: 6.78/7.0 | *Fall 2019*

**SUPPLEMENTAL INSTRUCTION LEADER | TEXAS A&M UNIVERSITY | JANUARY 2013 – MAY 2015**

- Serve as a Supplemental Instructor for a variety of introductory courses including Geology 101, Biology 107, and Political Science 207.

## **Mentoring Experience**

**UNDERGRADUATE THESIS ADVISOR | BARNARD COLLEGE | FALL 2019 – SPRING 2021**

- *Sarah Ortiz* | The Effect of Decomposition on Nitrogen Fixation Associated With Green Macroalgae off the Coast of Santa Catalina Island

**UNDERGRADUATE THESIS ADVISOR | UNIVERSITY OF SOUTHERN CALIFORNIA | FALL 2020 – SPRING 2021**

- *Elizabeth Vasi* | Trends in Long Term Monitoring of Temperature, Nutrients, Chlorophyll, and Dissolved Oxygen at the San Pedro Ocean Time Series.

**SUMMER RESEARCH EXPERIENCES FOR UNDERGRADUATES MENTOR | UNIVERSITY OF SOUTHERN CALIFORNIA | SUMMER 2016 – PRESENT**

- *Shannon Matzke, Camille Vieira, Taylor Dillon, Calyn Crawford, Sarah Ortiz* | *Summer 2016, 2017, 2018, 2019*
  - Guided the summer projects for all mentees looking at various aspects of nitrogen fixation associated with living and decomposing macroalgae using the Acetylene Reduction method.
  - Helped undergraduates with experimental design, sample collection, data synthesis, data processing and analysis, and generating poster presentations for international conferences.

**UNDERGRADUATE MENTOR | UNIVERSITY OF SOUTHERN CALIFORNIA | AUGUST 2016 – DECEMBER 2018**

- *Suriya Tanjasiri, Weimin Deng* | *August 2016 – December 2018*
  - Helped train in various molecular techniques (e.g. DNA extractions and quantification, carrying out PCRs and downstream processing of PCR products).

**ASPIRE | TEXAS A&M UNIVERSITY | FINANCE CHAIR, MENTOR | AUGUST 2012 – MAY 2015**

- Organized social events and workshops to help familiarize first generation college students with campus life, academic responsibilities, and managing finances.

## **Outreach and Professional Service**

**WRIGLEY MARINE SCIENCE CENTER | UNIVERSITY OF SOUTHERN CALIFORNIA | SANTA CATALINA ISLAND | SUMMER 2016 – PRESENT**

- Helped lead guided snorkels and kayaks through giant kelp forests with all age groups, advised on various high-school, undergraduate, and citizen science group projects, and served on career and graduate school panels for high-school and undergraduate groups.
- Science lectures given to the general public at the “Saturday at the Lab” summer series.

**SMITHSONIAN OCEAN PORTAL | MARINE MICROBE SERIES | A KELP'S SLIME | JULY 8, 2019**

– <https://www.youtube.com/watch?v=U9kzjI1IwTQ>

**AD HOC REVIEWER** – *Limnology and Oceanography*, 2020

## **Research Cruises**

**SAN PEDRO OCEAN TIME-SERIES (SPOT) | UNIVERSITY OF SOUTHERN CALIFORNIA WRIGLEY INSTITUTE FOR ENVIRONMENTAL STUDIES | R/V YELLOWFIN | JULY 2015 – MAY 2017**

- Participated in monthly SPOT cruises with the New Approaches to New Production project (NSF-OCE-1437458).

**TRICOLIM CRUISE | UNIVERSITY OF SOUTHERN CALIFORNIA | R/V ATLANTIS | FEBRUARY 2018 – MARCH 2018**

- Participated in this transatlantic (N. and S. Atlantic) cruise with the Iron and phosphorus balanced limitation of nitrogen fixation in the oligotrophic ocean project (NSF-OCE-1657757).