

Project Endorsement Form

1. PROJECT TITLE

Full title	Bluefin Larvae in Oligotrophic Ocean Foodwebs: Investigation of Nutrients to Zooplankton – Indian Ocean
Acronym	BLOOFINZ-IO
Website	https://www.bco-dmo.org/project/819488
Keywords (up to 10, describing the project research)	nutrients, nitrogen, phytoplankton, zooplankton, tuna larvae, growth, feeding, trophic ecology, biogeochemistry
New initiative or continuing programme?	New

2. APPLICANTS

Lead applicant / Project Leader / key research contact person:

First name	Michael
Last name	Landry
Affiliation	Scripps Institution of Oceanography, University of California, San Diego
Postal address	9500 Gilman Dr. La Jolla, California 92093-0227
Country	United States
Telephone	1-858-534-4702
Email address	mldandry@ucsd.edu
Institutional or personal website	

Other key participants / research team leaders: (repeat as needed)

First name	Sven
Last name	Kranz
Role in the project	Co-P.I. -- nutrients, primary production, new production, N ₂ fixation
Affiliation	Dept. of Earth, Ocean and Atmospheric Science, Florida State Univ.
Country	United States
Email address	Sven Kranz < skranz@fsu.edu >
Institutional or personal website	

Other key participants / research team leaders: (repeat as needed)

First name	Michael
Last name	Stukel
Role in the project	Co-P.I. – export, inverse and ecosystem modeling
Affiliation	Dept. of Earth, Ocean and Atmospheric Science, Florida State Univ.
Country	United States
Email address	Michael Stukel < mstukel@fsu.edu >
Institutional or personal website	

Other key participants / research team leaders: (repeat as needed)

First name	Karen
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Last name	Selph
Role in the project	Co-P.I. – flow cytometry, phytoplankton biomass structure
Affiliation	Dept. of Oceanography, University of Hawai'i at Manoa
Country	United States
Email address	Karen Selph <selph@hawaii.edu>
Institutional or personal website	

Other key participants / research team leaders: (repeat as needed)

First name	David
Last name	Die
Role in the project	Co-P.I. – tuna larvae, feeding, growth rates
Affiliation	RSMAS, University of Miami
Country	United States
Email address	Die, David J <ddie@rsmas.miami.edu>
Institutional or personal website	

Other key participants / research team leaders: (repeat as needed)

First name	Peter
Last name	Morton
Role in the project	Trace elements, atmospheric fluxes
Affiliation	Dept. of Earth, Ocean and Atmospheric Science, Florida State Univ.
Country	United States
Email address	Peter Morton <pmorton@fsu.edu>
Institutional or personal website	

N.B.: Please note that all these names and contact details will be added to the IIOE-2 membership database.

3. ABSTRACT– Brief description of the project: (1/4 page maximum)

This will be placed on the IIOE-2 Website after endorsement.

The BLOOFINZ cruise off of NW Australia will investigate **how mesoscale variability in new production, food-web structure and trophic fluxes affects feeding and growth conditions for larvae of southern bluefin tuna (SBT)**. The timing (Jan-Feb, 2022) corresponds to the peak period of SBT spawning during the NW Monsoon, when wind influences on nutrient distributions and variability are highest. **Sampling across mesoscale features** will be done to test hypothesized relationships linking variability in SBT larval feeding and prey preferences (gut contents), growth rates (otolith analyses) and trophic positions (TP) to the environmental conditions of waters selected by adult spawners. Trophic Positions of larvae and their prey will be determined using Compound-Specific Isotope Analyses of Amino Acids (CSIA-AA). **Lagrangian experiments** will investigate underlying process rates and relationships through measurements of water-column ¹⁴C productivity, N₂ fixation, ¹⁵NO₃⁻ uptake and nitrification; community biomass and composition (flow cytometry, pigments, microscopy, *in situ* imaging, genetic analyses); and trophic fluxes through micro- and mesozooplankton grazing, remineralization and export. Biogeochemical and food web elements of the study will be linked by CSIA-AA (N source, TP), ¹⁵N-constrained budgets and modeling. The study will advance understanding of biogeochemical and ecological dynamics in the poorly studied eastern IO and provide vital information on the food webs and processes supporting SBT larvae, a critically endangered top marine predator, in its only global spawning ground. The core science will address issues of broad

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Perth Australia Node
IOC Perth Programme Office
c/o Commonwealth Bureau of Meteorology
3rd Floor, 1 Ord Street
West Perth, Western Australia, 6005, Australia.
Phone: +61-8-92262899
Email: iioe-2@bom.gov.au

<https://iioe-2.incois.gov.in/>

Hyderabad India Node
Indian National Centre for Ocean Information Services
(INCOIS)
Pragathi Nagar
Hyderabad, Telangana 500 090, India.
Phone: +91-40-2388 6142
Email: iioe-2@incois.gov.in

oceanographic relevance (diazotrophy, shallow nitrification, new production, food-web structure and function, and export) using an integrated biogeochemical-ecological approach and state-of-the-art techniques that allow multiple avenues for exploring mass and isotopic balances to constrain fluxes and flows. The project elements will comprise an end-to-end coupled biogeochemistry-trophic study.

4. LINKS TO IIOE-2 SCIENCE PLAN: (1/2 page maximum)

How do you anticipate your project to contribute to the IIOE-2 strategy and science delivery, with reference to which (either one or more) of the six IIOE-2 Science Plan themes that your project responds. Please state the specific issues and questions addressed by your project in the context of the IIOE-2 Science Plan themes and key issues.

ST-2: Boundary currents, upwelling and ecosystem dynamics – our project was initially developed as part EIOURI (an upwelling study) and involves the ITF region, upwelling and mesoscale features of the slope region off of Australia, and ecosystem processes supporting recruitment to a fishery.

ST-3: Monsoon Variability and Ecosystem Response – our project is an ecosystem study during the Austral summer NW Monsoon; the goal is to understand the implications of climate change on recruitment variability of Southern Bluefin Tuna, a top predator and important fishery.

5. INTERNATIONAL COLLABORATION(S):

Is the project part of a related multi-national activity? **Not formally, but was developed as part of EIOURI (Eastern Indian Ocean Upwelling Research Initiative)**

If No, would you welcome international collaboration in your project? **We have participants from Australia, New Zealand, European Union (Spain, France, Italy), China (Hong Kong) and Africa (Nigeria)**

6. REGION(S) OF STUDY

Provide a description of ‘where’ the research is to be conducted (for field based activities) and/or the region or regions to which the research pertains (you are encouraged to consider providing either the coordinates of the area of studies or the coordinates of the planned cruise tracks, as well as a figure as an addendum to your proposal).

Argo Basin region off of NW Australia in ITF-influenced tropical waters (12-20°S, 110-122°E). There is no formal cruise track. We will respond to real-time mesoscale variability and locations of larval tuna patches, which will be marked by satellite-tracked drifters for process study.

6. TIMETABLE OF THE PROJECT

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Hyderabad India Node
Indian National Centre for Ocean Information Services
(INCOIS)
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Start date:
09/2019 – cruise dates Jan-Feb 2022

End date:
08/2024 (anticipated)

7. LINKAGES WITH OTHER PROJECTS / PROGRAMMES / INITIATIVES

Is the project part of a related national or multi-national activity? **YES, partially**

If yes, provide the related activity title and website for reference, if available:

The project was developed as a US contribution to IIOE-2 but funded by the US National Science Foundation as an independent project under regular peer-review/panel competition, not as a component of a designated program. The project lead P.I. is a member of the US Organizing Committee for IIOE-2 and a member of the Steering Committee of SIBER.

Is your project part of, or affiliated to, another SCOR, IOC or IOGOOS activity or project? **NO**

If “yes”, please indicate which activity or project:

8. DATA MANAGEMENT AND SHARING

1. Will new data be collected as part of this project? **YES**

2.

Contact information if any, of the person in charge of the data management from whom the metadata can be accessed by interested IIOE-2 stakeholders.

Please note that for all IIOE-2-endorsed projects, IIOE-2 will have developed its own metadata portal. Once the project is endorsed, the project leader will be asked to provide the metadata information of the project.

The data will be freely available at <https://www.bco-dmo.org/project/819488>. The lead person for data submission is the project P.I., Michael Landry (full contact information as give above).

3. Recognizing the need for an initial period of exclusive data use, would you be willing to provide timely access to all data generated under this project and associated metadata in accordance with relevant national and funding agency data sharing policies? **YES. It will be publicly available per NSF policy.**

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9. FUNDING

Please note that IIOE-2 strongly encourages funded/resourced projects. However, IIOE-2 may endorse projects yet to receive funding/resourcing if IIOE-2 endorsement can be clearly shown to significantly aid in prospects for funding/resourcing.

Has funding and resources to successfully achieve and undertake the project been obtained? Indicate the sources of funding and resources that have been approached and/or secured.

The project is fully funded by the US National Science Foundation as award OCE-1851247, "Collaborative Research: Mesoscale variability in nitrogen sources and food-web dynamics supporting larval southern bluefin tuna in the eastern Indian Ocean".

10. BENEFITS FROM IIOE-2 ENDORSEMENT (1/4 page maximum)

Specify why you are seeking endorsement and how the activity would benefit from endorsement, and how the IIOE-2 SC could assist in the implementation of your project.

This project was developed specifically as a US contribution to IIOE-2, involving international collaborators. The P.I. is a member of the US Organizing Committee for IIOE-2 and SIBER Steering Committee.

11. OPTIONAL: OTHER COMMENTS/INFORMATION/MATERIAL (length and detail may be at the discretion of and as deemed necessary by the applicant)

Please feel free to provide any other comments, information or materials that you feel relevant to your proposal for the IIOE-2 Steering Committee's information and benefit. You may provide this as general information or provide the additional comments/information/materials as relevant to any of the specific Sections above.



(Signature of the PI)

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