Builders Initiative Grant Application

**PART A – Organization Details**

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| Name of Organization: | University of California, Santa Barbara - Environmental Markets Lab | | |
| Name of Project/Proposal: | Viability of parametric fisheries insurance as a tool for conservation | | |
| Signature of Director/CEO: |  | Date: |  |
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| Organization Name: | Reagents of the University of California, Santa Barbara |
| Does your organization have a fiscal sponsor? | Yes X No  If yes, list organization name: |
| Organization Address: | 3227 Cheadle Hall  University of California, Santa Barbara, CA 93106 |
| Organization Telephone: | 805-893-5175 |
| Tax ID Number: | 95-6006145 |
| Head of Org/Authorized Signatory: | Jenny Chavira |
| Head of Org/Authorized Signatory Email address | chavira@research.ucsb.edu |
| Key Contact: | Chris Costello |
| Key Contact email: | c\_costello@ucsb.edu |
| Key Contact phone: | 805-893-5802 |

1. **Organization Background (Up to 500/1000 characters)**

Include a short description of the organization and its history.

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| **The Environmental Markets Lab (emLab)** is a research organization at the University of California Santa Barbara that conducts cutting-edge, data-driven research on the power, limitations, and design of market-based approaches to tackle the world's most pressing environmental problems. In collaboration with implementing partners, we aim to better align environmental objectives and economic incentives in support of sustainable livelihoods and a resilient planet. Leveraging our diverse expertise, we generate timely insights into effective and equitable solutions for Climate & Energy, Land & Freshwater, Ocean & Fisheries, and People & Poverty. Within the Oceans & Fisheries program, our team leverages rigorous and innovative methods to enhance the ecological and economic performance of fisheries and other marine sectors. Our team includes renowned natural resource economists with expertise in fisheries management, bioeconomic modeling, and conservation finance. |

**PART B – Proposal Details**

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| Total Amount Requested: | $xx | | Matching Amounts (by year, if applicable) | | | |
| Request as a % of annual budget: | xx | | Request as a % of project budget: | | xx |
| Grant Summary  (1-2 Sentences) | Parametric fisheries insurance holds promise as a potentially scalable solution to provide timely economic relief to fishing communities in the wake of sudden loss of harvest opportunity. This project aims to assess the viability of parametric fisheries insurance and study how parametric fisheries insurance can be structured to be an incentive compatible product that results in greater fisheries conservation outcomes. | | | | | |
| Award Term | Length in months: 18 | | | | | |
| Total Requested  (by year if multi-year): | BI Request: $xx | | Match Request (if applicable): $xx | | | |
| Grant Year 1: | $xx | Year 1 | $xx | | |
| Grant Year 2: | $xx | Year 2: | $xx | | |
| Grant Year 3: |  | Year 3: |  | | |
| Fiscal Year Dates for Organization: | July 1 - June 30 | | | | | |

**PART C – Proposal Narrative**

1. **Goal(s) of Funding Request (Up to 500 characters)**

What is the goal(s) of your proposed work? By “goal,” we mean key changes in conditions – such as attitudes, behaviors, knowledge, skills, status – that you’re aiming to generate at an individual, organizational, environmental, product, community, field, market, policy, or system level through your funded activities.

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| With climate change-linked acceleration of ecological and economic disasters for marine fisheries, there is an urgent need for timely economic relief and increased fisheries resilience. Building upon previous theoretical groundwork for assessing the viability of parametric insurance to support both fisher welfare and conservation outcomes, this project will assess the real-world viability of parametric insurance for fisheries resilience.  Our longer-term goal is to provide practitioners with the tools and guidance needed to determine if/when insurance is a viable solution to achieve their objectives. Coupled with increased confidence for insurers in underwriting parametric fisheries insurance products, we hope to see the uptake of insurance as a tool to smooth fisher risk while providing greater fisheries conservation outcomes. |

1. **Description of Funded Activities (Up to 2500 characters)**

Describe the activities that this funding request will support to accomplish the goal(s) identified above. As an alternative to providing your response in the space below, you can use the table provided in Appendix 1 to summarize this information.

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| The proposed project’s activities encompass an iterative three-phased approach: (1) evaluate insurable environmental risks to fisheries, (2) examine how insurance can lead to conservation outcomes, and (3) assess the potential supply and demand for a parametric fisheries insurance product. The desired outcome is to design a new parametric insurance product that is desirable to both fishers and insurers and, following its uptake, will lead to conservation outcomes. Because data availability is a critical factor in establishing credible parametric insurance index, this project focuses on data-rich U.S. West Coast fisheries to maximize learnings regarding the feasibility of parametric fisheries insurance while also generating insights applicable in more data-limited contexts. Appendix 1 provides details on these activities (e.g. subtasks, project partners involved, and timelines).  **Phase 1. Design potential parametric insurance products for a range of environmental risks to fisheries.** emLab, TNC, and WTW will work collaboratively to determine (i) environmental risks best suited for a parametric insurance product based on established insurance industry criteria, such as the availability of independent and real-time monitoring with sufficient historic data; (ii) types of environmental data and fisheries data required to establish indices that meet insurance industry standards for underwriting acceptability, and (iii) the characteristics of fisheries most well-suited to parametric insurance (e.g. life history traits of targeted species) across various risks. Building on recent TNC-led research on US federal fisheries disaster claims and climate change impacts on West Coast fisheries, TNC will put this theory to practice by identifying and evaluating specific environmental risks to fisheries (e.g. storms, marine heatwaves, harmful algal blooms) and assessing the predictability of environmental impacts on fisheries productivity. Next, 1-2 fisheries from the U.S. West Coast will be selected for an assessment of the viability of a parametric insurance product. WTW will then determine whether a credible parametric index and therefore a product, can be identified and designed for selected fisheries.  This Phase 1 effort will result in a technical term sheet for the most promising parametric insurance product(s), environmental data requirements, and guidance on characteristics of fisheries best suited to parametric insurance.  **Phase 2. Determine the potential for a fisheries parametric insurance product to incorporate incentives to drive conservation outcomes.** emLab, in collaboration with TNC, will lead the identification and theoretical evaluation of mechanisms for insurance to achieve conservation outcomes. Building on our current fisheries insurance work looking at the intentional incorporation of conservation-based moral hazard into an insurance product, the following preliminary list of mechanisms will be explored: (a) implicit incentives for individual behavior change; (b) external insurer requirements for behavior change or actions; and (c) collective action requirements or incentives (e.g., premium reductions). TNC will work with emLab to identify a range of potential conservation actions for evaluation, including actions that broadly increase fisheries resilience and sustainability and those that mitigate specific ecological and/or economic impacts of environmental risks identified in Phase 1. WTW will advise on the insurance aspects (such as requirements and risk appetite) using market knowledge and expertise. This evaluation will include assessment of key considerations, such as the efficacy of insurance as a conservation mechanism relative to other solutions such as Payment for Ecosystem Services schemes or management requirements, and the potential for adverse selection to work in favor of, or against, conservation goals.  Phase 2 will deliver guidance on the design principles for delivering conservation outcomes through parametric fisheries insurance products. Phase 2 may also illuminate a set of conditions under which insurance has no effect on behavior or causes maladaptive incentives.  **Phase 3. Evaluate the viability of the parametric insurance product(s) for fisheries resilience** by testing one or more conceptual models, informed by the findings of Phases 1 and 2 and refined through direct outreach with relevant fishery and insurance industry stakeholders. emLab will develop a methodology for assessing the demand for the parametric fisheries insurance product(s) given varying components (e.g., premiums, payout schedule, etc.) which most likely will be a version of a discrete choice experiment to elicit preferences. This will build on emLab’s parametric insurance user guide (currently under development) that sets the foundation for defining the factors that affect the viability of a parametric fisheries insurance product. In this case, insurance viability refers to both fishers being willing to purchase an insurance product and insurers being willing to provide the product. TNC will lead the demand assessment and conduct fishery stakeholder outreach based on emLab’s proposed approach. WTW will look at the supply side and lead insurance industry outreach with potential risk-takers and use market knowledge to ascertain potential underwriting acceptability. Phase 3 will deliver a methodology and an assessment of demand for an insurance product that explicitly considers conservation outcomes in its design. The final results from all three phases will be combined to determine the viability of a parametric insurance product that can deliver on conservation outcomes.  **Products:** High level findings and guidance for fishery practitioners and insurance industry experts interested in parametric insurance for fisheries will be summarized in a white paper, with promising detailed findings published in peer reviewed journal article(s), as appropriate. |

1. **Learning and Impact Measurement**
2. At a strategic level, what are you most interested in learning from the funded activities you describe in Section 2 that can help inform your work moving forward? **(Up to 500 characters)**

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| We have two main interests in this research. First, while there is growing interest in the application of fisheries insurance as a risk management tool, it has yet to be proven as a viable, scalable solution or evaluated across a range of environmental risks. Therefore, our first objective is to determine whether we can develop a credible parametric insurance product for fisheries on the U.S. west coast that is attractive to both fishers and insurers. Our second main interest is to assess the conservation implications of fisheries insurance. In particular, we seek to determine whether insurance can be designed to simultaneously be financially advantageous to fishers and insurers and to benefit conservation. If the project is successful, we hope to design a future randomized control trial to field-test the uptake and behavior change aspects of a real-world insurance product. |

1. For goal(s) you described in Section 2, what information are you planning to use to measure progress toward the goal(s) during the grant term, how much progress do you plan to make during the grant period, and how do you plan to collect that information? As an alternative to providing your response in the space below, you can use the table provided in Appendix 2 to summarize this information, or you can attach materials that your organization is already using to describe these efforts, such as a monitoring and evaluation plan, indicator plan, etc., as available. **(Up to 1,000 characters)**

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| See Appendix B for more information. |

1. **Collaborations (Optional) (Up to 500 characters)**

Who are the key organizations you are collaborating with and/or partnerships you have established for this funding request? Please clearly define their role in this collaboration. Include name of organization and 1-2 sentences.

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| emLab will leverage the unique expertise, experience, and track record of collaboration by working with The Nature Conservancy and WTW (formerly Willis Towers Watson) to advance these research efforts.  **The Nature Conservancy (TNC)** will leverage its extensive track record developing and implementing collaborative fisheries conservation solutions on the U.S. West Coast to lead the identification of relevant environmental risks,the vetting of conservation actions, and demand-side marketability assessment outreach for this project. TNC will build upon its recent scientific analysis of environmental impacts on more than 60 U.S. West Coast species and utilize its extensive network in the U.S. West Coast state and federal fisheries to conduct relevant outreach with industry stakeholders, including fishing communities and policymakers, to assess demand-side marketability. TNC also brings expertise in developing partnerships and implementing innovative financing solutions to a broad range of conservation challenges, including development of insurance products for wildfire and coral reef resilience.  **WTW (formerly Willis Towers Watson)** will lead the task of identifying and evaluating potential data sources that reliably and transparently document environmental conditions of interest, and design parametric indices based on the data that captures the consequential risks facing U.S. West Coast fishers. WTW will also liaise with insurance experts and undertake actuarial analysis of the historical datasets to evaluate the performance of each index (which forms the basis for evaluation of pricing), and validation of real-time data feeds to confirm the operational feasibility of the parametric product.  **Additional Partners** may be brought into the project team, as necessary, as a complement to emLab, TNC, and WTW’s expertise. For example, Chris Free, is a professional researcher that works collaboratively with emLab and TNC to identify new and innovative fisheries management strategies. |

1. **Commitment to Community (Up to 1000 characters)**

What is your target community? How do you plan to engage them?

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| This research and the design of an insurance product(s) is relevant to fishers and the fishing community globally. This project will start with a focus on data rich fisheries on the U.S. west coast. Starting in a data rich environment will help illuminate challenges that will be faced regardless of data availability but will also highlight potential opportunities for data limited fisheries. There are three main target communities for this work: (1) fishers (including associations of fishers) and fishery managers, (2) insurers, and (3) conservation practitioners. Guided by the findings in Phase 1, TNC will determine the target community/ies for assessing incentives and demand-side marketability of the insurance product in Phase 3 of the project. TNC will leverage its extensive existing network and working relationships within the target communities for outreach on the U.S. west coast to inform an assessment of demand-side marketability through a range of informal and formal outreach (e.g., informal interviews, focus groups, workshops, and/or surveys) . As a leading global advisory, broking, and risk solutions company, WTW will lead risk modeling and analytics for the potential parametric insurance solution as well as supply-side engagements within the insurance industry. Considering climate change has no boundaries and its effects can be felt globally, the applicability of this research has far reaching implications for fishing communities around the world who are increasingly in need of creative solutions to mitigate climate-inducing risks in their livelihoods. The conservation community will also benefit from this work in identifying a novel mechanism to drive conservation outcomes and encourage innovation in this space. TNC is an important player in this community and we will disseminate our findings to other practitioners in the conservation space and those interested in insurance as an innovative financing solution. For example, outreach will be done through engagement in ongoing dialogues around U.S. federal fisheries disaster financing and nature-based insurance opportunities in California and Hawaii, as well as internationally through the Ocean Risk and Resilience Action Alliance (ORRAA) network. WTW, as a pioneering broker in the innovative insurance development community, will disseminate the findings to players in the global insurance architecture, such as the Insurance Development Forum. |

1. **Management/Key People Involved (If applicable)**

Briefly list one to three key people managing this proposal and provide relevant experience.

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| Name and Role (if applicable) | Relevant experience |
| Dr. Chris Costello, PI | Chris Costello is the Research Director of emLab, and a professor of Environmental and Resource Economics at the Bren School of Environmental Science & Management at UC Santa Barbara. His research is in natural resource management under uncertainty, incomplete property rights for natural resources, and applied bioeconomics for management and conservation. Chris earned his M.A. from Oregon State University and a Ph.D. from UC Berkeley. |
| Dr. Andrew Plantinga, PI | Andrew Plantinga is an emLab Research Associate and Professor of Resource Economics and Policy in the Bren School of Environmental Science & Management at UC Santa Barbara. Andrew’s research focuses on the economics of ecosystem services, with an emphasis on empirical modeling of markets and analyses of environmental policies that affect resource-use decisions. He received a B.A. from Grinnell College, an M.S. in Forestry from the University of Wisconsin-Madison, and a Ph.D. in Agricultural and Resource Economics from UC Berkeley. |
| Erin O’Reilly, Project Manager | Erin O’Reilly is the Projects and Operations Manager at emLab where she works closely with the team to provide project management, communications, and program coordination support. Erin was the project manager for the last phase of emLab/Builder’s Initiative fisheries insurance research and will continue as the project manager in this next phase of the research. She has a MESM in Coastal Marine Resources Management and Strategic Communication from UC Santa Barbara’s Bren School of Environmental Science & Management, and a B.A. in Marine Affairs and Ecosystem Science and Policy from the University of Miami. |

1. **Lessons Learned (up to 1000 characters) (Optional)**

If this is part of an ongoing or long-term effort, what are some key learnings you have accounted for in this proposal?

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| The predecessor to this project sought to (1) examine the feasibility of index insurance in fisheries and (2) identify theoretically a range of options for behavior change to achieve conservation outcomes. The biggest challenge we encountered over the course of this project was bridging the more applied question (#1) with the more theoretical question (#2). Given the novel nature of this work, our team discovered that it was necessary to first outline a solid theoretical foundation identifying the range of potential triggers, associated data requirements, and risks associated with parametric fisheries insurance. This work was a critical step towards answering both questions but especially tied into our work identifying pathways by which an insurance product could motivate conservation benefits. Though the insights developed in these first phases were crucial for thinking through the feasibility of applying index insurance to fisheries, efforts to connect with and receive feedback from partners working in the insurance space were challenging because the theoretical nature of our insights did not match up with their needs for assessing feasibility on the ground. To overcome this challenge, we came up with the idea of adapting our insights into a “playbook” for practitioners that could serve as a more accessible product and better answer the first question. Since the three phases of this project will be iterative and build off of each other, we have learned from the first project and have therefore outlined a similar parallel structure for the proposed project in which the theoretical work can inform the applied work and vice versa. While outcomes from theoretical and applied research will likely have a greater impact in the near term, a long-term impact is providing additional conservation measures for fisheries that better link them to global risk markets. |

1. **Applicant self-assessment of risks to success (Up to 1000 characters)**

Identify and list any risks to the success of this funding request and explain how you plan on mitigating those risks.

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| We see no major risks to the success of this effort. It is possible that we will determine that parametric fisheries insurance is not a great solution to drive conservation results, but even that would be an important finding to help inform a future suite of innovative financial tools to drive real-world impact and achieve long-term conservation outcomes. The questions we intend to address regarding parametric fisheries insurance will build upon the results of our previous study, and the requisite data we need to conduct our analyses is accessible to us. As we refine how to develop this financial tool, we will measure the risks and likely outcomes from alternative options as part of our analyses. WTW will identify useful data sets, as well as industry insight and expertise in the assessment and development of viable parametric fisheries insurance products. Our partnership with TNC provides the network within the fishing community to vet and conduct outreach with fishers to assess demand-side marketability.  A potential risk to the success of the project’s ultimate goal could be that we are unable to link insurance applications for fisheries conservation but the findings of that assessment will still be highly valuable for future assessments. Mitigating this risk will be difficult but it can be transformed into a learning opportunity for fisheries, conservation and insurance practitioners. |

1. **Grant Budget -** Please complete the attached form.
2. **Financial Narrative/Sustainability (Up to 500 characters)**

If this is an ongoing effort, how do you plan on addressing financial sustainability after the grant period? If this is a short-term effort, how do you plan on securing any outstanding funding?

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| The supply and demand assessment will help to assess the long-term financing sustainability of a parametric insurance program. In the U.S., fisheries insurance has attracted interest as a potential market-based alternative to the Federal Fisheries Disaster Relief Assistance Program, which is taxpayer funded, administratively burdensome, and fails to provide timely relief to fishermen[[1]](#footnote-1). Outside of the U.S., there are often fewer services and resources available to help fishing communities recover from disaster-driven financial losses and incentivize fisheries management agencies to invest in resilience and risk mitigation. This work will further support the advancement of parametric insurance for fishers, which can be supported by future impact investments and government investments in such types of products and institutions. |

*The following information will not be a considering factor in your application proposal. We are constantly evolving our work to better reflect the communities we work with and ensure that our funding is accessible to communities of every race, gender, and class. Your responses will help us better understand our gaps and where we can improve.*

1. **Justice, Equity, Diversity, and Inclusion (JEDI)**

A. What is the organization’s commitment to justice, equity, diversity, and inclusion? What has the organization done in the last two to three years toward this commitment? What are its plans for the next two to three years? (Up to 2500 characters)

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| The core mission of the University of California is to serve the interests of the State of California. Therefore, the University aims to achieve diversity among its student bodies and among its employees as a representation of the diversity of the people of California. The State and the University have a compelling interest in making sure that people from all backgrounds perceive that access to the University is possible for talented students, staff, and faculty from all groups. The knowledge that the University of California is open to qualified students from all groups, and thus serves all parts of the community equitably, helps sustain the social fabric of the State. To these means, the University is currently working on removing barriers to the recruitment, retention, and advancement of talented students, faculty, and staff from historically excluded populations who are currently underrepresented.    emLab supports the University’s diversity goals through specific initiatives within emLab. As a research team within the UCSB system, emLab endeavors to foster a vibrant and diverse intellectual community that inspires the collaborative development of new ideas within and beyond UCSB. For example, the core values that are foundational to our work and support a healthy, positive work culture include: (1) an open, generous, and collaborative approach (2) incorporation of diverse backgrounds and perspectives, and (3) trust, empathy, and mutual respect. These core values, as they relate to diversity and an inclusive work environment, are communicated and executed through our code of conduct and operations manual. We are continuously working to put these values to practice and further these efforts for the future. While we have many ideas and goals we are working on, one of the primary ways in which we are delivering on our diversity commitments is through fair and transparent hiring practices to achieve a more diverse group of researchers at emLab. We have also recently applied for grant funding to develop a mentorship and professional training program for underrepresented undergraduate and graduate students to improve access to the academic pipeline and ultimately diversify faculty within the University of California system. |

B.Has your Board of Directors reviewed and approved the organization’s commitment to justice, equity, diversity, and inclusion? Choose an item. Yes.

C.Please enter the numbers for the following demographic information.

emLab does not currently collect this information as an organization.

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| --- | --- | --- | --- |
|  | Executive Director (or Head of Org) | Leadership Team | Board |
| Total |  |  |  |
| **Race and Ethnicity** | Executive Director | Leadership Team | Board |
| Does your organization collect this data?  If yes, please complete below. | Yes | No | Yes | No | Yes | No |
| American Indian/ Alaska Native |  |  |  |
| Asian |  |  |  |
| Black or African American |  |  |  |
| Biracial/ Multiracial |  |  |  |
| Hispanic or Latino |  |  |  |
| Middle Eastern, Arab, or Northern African |  |  |  |
| Native Hawaiian or Pacific Islander |  |  |  |
| Other |  |  |  |
| White |  |  |  |
| Prefer not to Disclose |  |  |  |
| Total |  |  |  |
| **Gender Identity** | | | |
| Does your organization collect this data?  If yes, please complete below. | Yes | No | Yes | No | Yes | No |
| Female – including transgender female |  |  |  |
| Male – including transgender male |  |  |  |
| Gender Nonconforming |  |  |  |
| Other |  |  |  |
| Prefer not to Disclose |  |  |  |
| Total |  |  |  |
| **Sexual Orientation** | | | |
| Does your organization collect this data?  If yes, please complete below. | Yes | No | Yes | No | Yes | No |
| Self-identify as LGBTQIA+ |  |  |  |
| Do not self-identify as LGBTQIA+ |  |  |  |
| Prefer not to Disclose |  |  |  |
| Total |  |  |  |
| **Disability & Veteran Status** | | | |
| Does your organization collect this data?  If yes, please complete below. | Yes | No | Yes | No | Yes | No |
| Self-identify as having a disability |  |  |  |
| Do not self-identify as having a disability |  |  |  |
| Prefer not to Disclose |  |  |  |
| Total |  |  |  |
| Does your organization collect this data?  If yes, please complete below. | Yes | No | Yes | No | Yes | No |
| Self-identify as a veteran |  |  |  |
| Do not self-identify as a veteran |  |  |  |
| Prefer not to Disclose |  |  |  |
| Total |  |  |  |

D. Is there anything else about your organization background that makes you diverse in this particular context? (Up to 250 characters) (Optional)

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| For more information about UCSB’s commitment to diversity, see the [University of California Diversity statement](http://regents.universityofcalifornia.edu/governance/policies/4400.html) which underscores the importance of educating our diverse population.  To support the University’s diversity commitment, emLab has developed a variety of programs and initiatives that foster a dynamic and diverse intellectual community. One of emLab’s programs that demonstrate diversity values include the recently launched Arnhold Environmental Diversity Fellows Program which provides research support and training for URM students working on joint projects with emLab and Conservation International. emLab piloted and developed materials and processes for this program including best practices for non-bias recruitments, project management and research support, multi-level mentorship, summer professional development training, and community-building events. emLab also works closely with UCSB and the Bren School to strategize on and share learnings from DEI initiatives within the two organizations. There are many exciting, complementary programs happening at the Bren School. For example, the Environmental Diversity Leaders and Internship Program is designed to advance diversity, and catalyze environmental careers for particularly promising students in the environmental and natural sciences. This program has established learning communities, career exploration, skills workshops, and paired internship opportunities with graduate students, to build a pipeline of underrepresented students trained for success as graduate students and in the workforce. The Bren School has also established the Michael Mantell Fellowship which pairs URM graduate students with summer internship opportunities in the environmental field. UCSB also recently received a National Science Foundation grant establishing the Center for Equitable Environmental Sciences (CEES), led by the Bren School’s Associate Dean of Diversity, Equity, and Inclusion, Dr. Sarah Andersen. Housed in UCSB’s Chicano Studies Institute, CEES will serve 1,000 students annually, including hundreds of mentorships and internships. |

*\*Please note that Builders Initiative has a fund to support partners with JEDI learning opportunities up to $15k. Please talk to your Program Officer if you have any questions or have a learning opportunity for consideration.*

**Appendix 1: Activity Plan**

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| **Activity** | **When will this Activity start?**  (Note: Use separate rows to identify different activities.) | **When will this Activity be completed?** | **To complete and include in partner’s Annual Report:**  **What is the status of this activity as of this reporting period?** |
| Determine environmental and fisheries data requirements to inform indices (emLab + TNC + WTW) | February 2023 | March 2023 |  |
| Identify and evaluate environmental risks and their impact on fisheries productivity (and revenue) (emLab + TNC) | April 2023 | August 2023 |  |
| Guidance on characteristics of fisheries most well-suited to parametric insurance (emLab) | February 2023 | March 2023 |  |
| Select fisheries (emLab + TNC + WTW) | August 2023 | August 2023 |  |
| Design/viability of 1-2 parametric solutions (WTW) | September 2023 | November 2023 |  |
| Develop technical term sheet (WTW) | November 2023 | November 2023 |  |
| Identify target conservation actions and outcomes/objectives (emLab + TNC) | February 2023 | March/April 2023 |  |
| Evaluate insurance mechanisms (i.e. implicit incentives, quid pro quo, collective action) to achieve conservation outcomes (emLab + TNC) | March 2023 | November 2023 |  |
| Examine the efficacy of insurance as a conservation mechanism relative to other solutions such as PES schemes or management requirements (emLab) | March 2023 | November 2023 |  |
| Develop guidance on the design principles for incorporating conservation in parametric fisheries insurance products, including outlining conditions under which insurance does not impact behavior or causes perverse incentives (emLab) | December 2023 | January 2024 |  |
| Advise on insurance aspects (WTW) | March 2023 | January 2024 |  |
| Develop methodology for assessing the demand for parametric fisheries insurance (emLab) | December 2023 | February 2024 |  |
| Demand assessment / direct outreach with fisheries (TNC) | February 2024 | May2024 |  |
| Supply side analysis / insurance industry outreach (WTW) | February 2024 | April 2024 |  |
| Draft publication on key findings (emLab) | January 2024 | July 2024 |  |
| White paper reporting on findings (emLab + TNC + WTW) | ongoing as phases finish | July 2024 |  |

**Appendix 2: Impact Measurement Plan**

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| **Goal(s)** | **What information will be used to measure progress toward this goal?\***  (Note: Use separate rows to outline different information points.) | **How will you collect the information, and from whom?** | **How much progress do you plan to make by the end of the grant?** | **To complete and include in partner’s Annual Report:**  **What evidence of progress have you gathered over the reporting period?** |
| Assess the potential for developing a credible index for a parametric fisheries insurance product | Availability of dependable, transparent and independent data sources for environmental risks and fisheries  Identification of an index that serves as a good proxy for the impacts we are trying to capture | We will leverage previous TNC research on climate impacts on U.S. west coast fisheries,including stock assessment output collated in the RAM Legacy Stock Assessment Database, and , environmental data, such as sea surface temperature data from historical temperature data from the COBE SST dataset,  and additional sources such as NOAA and ERA5. | Guidance on the types of environmental risks best suited to parametric fisheries insurance and data needs to establish a credible index  Development of technical term sheets for 1-2 fisheries |  |
| Determine under what conditions parametric fisheries insurance can lead to conservation outcomes | Exploration of four behavior change pathways: (1) intentional incorporation of conservation-based moral hazard, (2) implicit incentives for individual behavior change, (3) external insurer requirements for behavior change or actions, and (4) external insurer requirements for behavior change or actions  Comparison of the efficacy of insurance as a conservation tool relative to payments for ecosystem services or management requirements | We will conduct a literature review on moral hazards in insurance and economic theory on incentives. We will develop economic theory model(s) to explore the different pathways.  We will summarize a range of potential conservation actions that may be implicitly or explicitly incentivized in a parametric fisheries insurance product | Guidance on the design principles for incorporating conservation in parametric fisheries insurance products, including a set of conditions where insurance has no effect on behavior or when it causes perverse incentives |  |
| Evaluate the viability of a fisheries parametric insurance product | On the demand side: development of a methodology for assessing demand for the parametric fisheries insurance product, which will then be implemented in the field.  On the supply side: insurance industry outreach and interviews | emLab will utilize past work on discrete choice experiments to inform the demand assessment methodology.  TNC will leverage their strong network of connections with west coast fishing communities to conduct the demand-side marketability assessment (e.g., through surveys, interviews, focus groups, and/or workshops)  WTW will use their market knowledge to identify relevant supply side actors and ascertain potential underwriting acceptability. | Demand- and supply-side assessment to determine overall insurance viability. |  |

\*This column should identify the information (synonyms: indicators, metrics, markers, signals) that your organization will use to understand and demonstrate progress toward the goal(s) of your grant. Information can be qualitative (e.g., evidence of collaboration, feedback from community members, etc.) or quantitative (e.g., amount of produce grown, amount of GHGs avoided, reduced or sequestered, # of strategic litigation cases launched and won, etc.).

1. Bellquist L, Saccomanno V, Semmens BX, Gleason M, Wilson J. The rise in climate change-induced federal fishery disasters in the United States. PeerJ. 2021 Apr 22;9:e11186. doi: 10.7717/peerj.11186. PMID: 33981495; PMCID: PMC8071068. [↑](#footnote-ref-1)