USC Sea Grant's Best Practices for "Research to Application"

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University of Southern California (USC) Sea Grant invests and partners in research that has real-world impacts on communities, ecosystem health, and local management decisions. Although there is no one-size-fits-all "recipe" to ensure effective research-to-application, this document provides a high-level perspective on thoughtfully setting up a research project for successful implementation. This living document aims to be a helpful guide to potential applicants for USC Sea Grant funding opportunities.

The research-to-application best practices described below are cultivated from discussions at the 2024 virtual workshop, **"From Research to the Real World: USC Sea Grant's Unique Contribution to Science and Decision Making,"** as well as contributions from USC Sea Grant leadership and research coordination and extension teams. For more resources and information on the topics discussed in this document, visit: **https://bit.ly/R2A-USCSG**

(Photo credit: C. Stevenson)

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https://dornsife.usc.edu/uscseagrant/

How to
Scope a Project

Define the problem. What scientific problem are you aiming to solve? Consider attending agency meetings, reviewing strategic plans of relevant agencies and organizations, and tracking press coverage to assess what local environmental challenges are most relevant and timely.

Consider a broad suite of end users. Whom could your research findings serve? Brainstorm relevant end users through Stakeholder Analysis[1] (e.g., who is living, working, or playing nearby?) and consider affected communities that may be traditionally under-accessed or under-served.

Pinpoint information gaps. Attend public agency meetings; review available public documents; or solicit input from end users to understand specific areas of interest and information needs. Consider engaging boundary organizations,[2] like Sea Grant, for assistance in making direct connections with end users and identifying opportunities to bridge science-to-policy needs.

CASE STUDY: Safe to Surf

Antibiotic resistance bacteria (ARB) jeopardize our ability to effectively treat bacterial infections and associated diseases. According to the Centers for Disease Control, about 2 million people each year in the U.S. get an antibiotic-resistant infection. The marine environment plays an increasingly important role in disseminating ARB, particularly through stormwater runoff into recreational waters where beachgoers can become exposed to pathogens. Professor Jennifer Jay at the University of California, Los Angeles, explored the patterns of *Methicillin-resistant Staphylococcus aureus* (a.k.a. MRSA) concentrations before, during, and after the wet season when there is significant run-off from land. The project used surfers as study subjects since they are exposed to these waters year-round. Explore the Safe to Surf Project Page to learn more about how this project worked with those affected by an issue to help solve the problem.

(Photo credit: J. Jay)

How to
Produce Results

Consult end users early and often. Proactively engage end users throughout a project's lifecycle to build an efficient and trusted working relationship. Gather feedback to ground-truth research methods and preliminary findings.

Involve end users as research partners. Co-production[3] is a participatory process that convenes diverse actors to enhance trust and reciprocity, strengthen project approaches, and contextualize findings. This engaged approach can benefit projects that have appropriate resources (e.g., time, funding, relationships).

Ground research methodologies in management-relevant frameworks. Consider integrating research methods, frameworks, or models that are familiar to managers and decision-makers to aid in the uptake of research findings (e.g., see Case Study below). Consult end users to understand the limitations of existing methods and where development and/or cross-validation of new methodologies is valuable.

Plan project completion. Develop a succession plan to ensure partner engagement, technical assistance, and product/database/tool maintenance are sustained (with necessary funding) following project completion to maintain the quality/impact of the research output.

Invest in training the next generation. Sea Grant and other funding agencies consider mentorship and professional development of research trainees to have a critical broader impact.

CASE STUDY: Groundwater Guide

To produce CoSMoS (Coastal Storm Modeling System), which examined the potential hazards of sea level rise when coupled with the occurrence of oceanic storms, Dr. Patrick Barnard, U.S. Geological Survey (USGS), consulted key end users early in project development to gauge familiarity with methodologies, models, and frameworks. This ensured that CoSMoS modeling tool development aligned with the standard practices and information gaps of their targeted end-users: resource managers. Results of CoSMoS for coastal regions are available on the Our Coast Our Future website. Barnard also used this process to study the impacts of sea level rise on groundwater. Learn more at the Groundwater Guide Project Page.

(Photo credit: USGS)
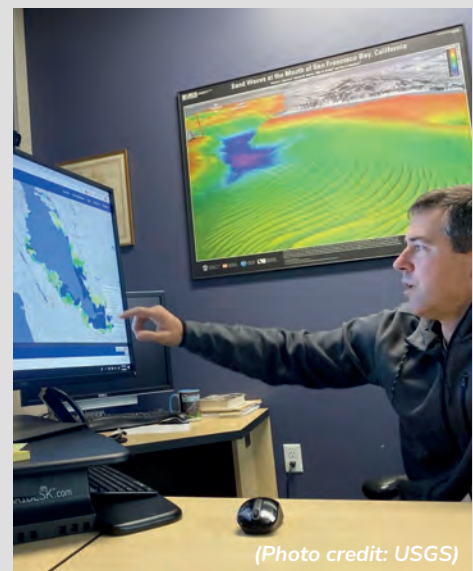
How to
Share Findings

Develop a dissemination strategy. Work with your Department or Institution's communications office and project partners (including Sea Grant Extension and Communications teams) to develop an outreach plan that spans project phases (e.g., launch, milestones, conclusion), platforms (e.g., social media, blogs), and voices (e.g., student trainees, project partners, or end users).

Allocate sufficient funding for communications efforts. Without adequate resources, research outputs may fail to reach the most relevant audience. Develop a project budget that considers what resources are needed to improve the reach, accessibility, and inclusiveness of your work (e.g., translation, ADA compliance).

Translate findings into tangible terms. Where possible, elucidate findings in terms of common metrics (e.g., dollars lost, lives at risk) and integrate visual aids to communicate real-world impacts.

Embrace public media engagement. Where possible, pursue opportunities with media (and non-media) outlets – particularly those accessed by your end users – to highlight ongoing research efforts and published findings. For more detailed tips on engaging with the media, read publications from organizations like the American Association for the Advancement of Science.[4]

References

[1] National Oceanic and Atmospheric Administration. (2015). "Introduction to Stakeholder Participation." coast.noaa.gov/data/digitalcoast/pdf/stakeholder-participation.pdf.

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[4] American Association for the Advancement of Science. (2024). "Working with Journalists." www.aaas.org/resources/communication-toolkit/working-journalists.