



Collaboration Meets Innovation

ENVIRONMENTAL VENTURE PROJECTS AND REALIZING ENVIRONMENTAL INNOVATION PROGRAM

Since 2004, Stanford Woods Institute for the Environment seed grants have played a vital role in realizing Stanford’s vision of a vibrant interdisciplinary academy that can generate solutions to the most pressing environmental problems of our time. The Environmental Venture Projects (EVP) and the Realizing Environmental Innovation Program (REIP) have a strong track record of kick-starting high-risk, high-reward interdisciplinary research. The reach of these programs is broad: the Institute has granted more than \$15 million to 103 research teams spanning all seven of Stanford’s schools and 34 of its departments. These projects have touched more than 29 countries around the globe.

EVP and REIP **catalyze promising research** that is too bold, early-stage, or outside-the-box to compete effectively for traditional forms of funding. Nearly 70% of EVP/REIP projects have led to external, follow-on funding—a three-fold return on the initial investment.

These programs **foster new kinds of collaborations** that bridge disciplines for creative solutions. EVP and REIP grants enable Stanford’s pioneering scientists to team up

with leading experts in law, policy, business and other fields to tackle challenges too complex to be solved by any one discipline alone.

EVP and REIP advance ideas that are at different stages in their development. EVP emphasizes early stage ideas that are ripe for initial progress. REIP is intended to help transform promising research into compelling solutions delivered at scale.

EVP Solutions Snapshots

A NEW PARADIGM FOR SCALABLE RESOURCE RECOVERY

A 2012 EVP grant started out as a faculty-led, proof-of-concept venture into wastewater treatment energy recovery. It has since become a model facility for scaling water resource recovery technologies for commercial use.

The William and Cloy Codiga Resource Recovery Center (CR2C), located on the Stanford campus, accelerates the development of promising technologies for resource recovery by testing and optimizing them at scale for commercial implementation. The venture has opened a new era for the sustainable recovery of clean water, nutrients, energy and renewable materials from wastewater. CR2C also contains a mobile laboratory that allows researchers to generate valuable public health information by testing for pathogens in sewer water.

CR2C embodies the bold spirit of Stanford as a living lab, bridging the gap between academic research and real-world, scalable application. It provides students and policymakers with training and information to develop sustainable infrastructure for water, wastewater and waste management. Staff director Sebastien Tilmans, a PhD in civil and environmental engineering, leads the facility in helping municipalities learn new models for meeting their long-term, sustainable water needs, as they replace their aging water treatment plant infrastructures.



COMBATting MOSQUITO-BORNE DISEASE IN AN AGE OF CLIMATE CHANGE

An EVP grant is allowing Erin Mordecai, an assistant professor of biology, to accelerate global efforts to curb mosquito-borne diseases, a public health concern that is worsening with climate change.

More than half of the world's population lives in areas where mosquitoes can transmit tropical illnesses like dengue, Zika, and chikungunya—a number that will only increase as the planet warms and the range of mosquito populations expands. This vast ecological change will challenge global health initiatives based on vaccination as a primary preventative tool.

Mordecai's team is addressing this shortcoming in global health efforts by examining the causal relationship between disease transmission and ecological shifts associated with climate change. The team uses satellite imagery to develop improved models for predicting where climate change will increase the likelihood of mosquito-borne disease transmission and better predict which populations are most at risk. This data will help NGOs and local governments make strategic decisions about allocating limited resources to combat the spread of tropical diseases that kill over one million people a year.



REIP Solutions Snapshots

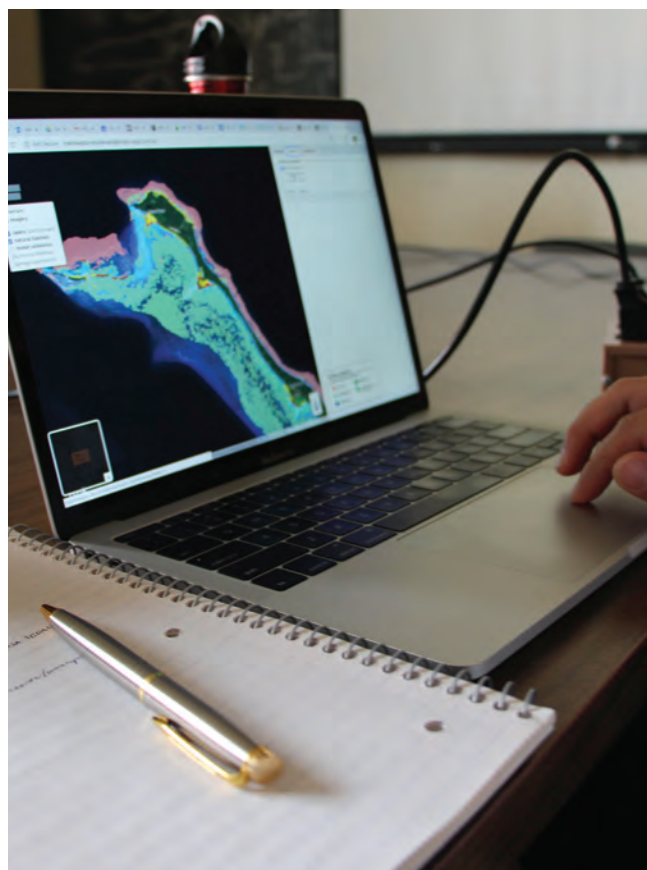


NEW TECHNOLOGY FOR CURBING WILDFIRE THREATS

A 2018 REIP-funded endeavor promises a near-miracle cure that could prevent wildfires from growing and drastically reduce the cost of fighting them.

The approach consists of an environmentally benign cellulose-based hydrogel that, when applied to fire-prone areas, remains a powerful prophylactic through a typical 9-month fire season. The hydrogel can be applied at wildfire hotspots such as mountain passes, where human-caused fires typically originate.

“You can put 20,000 gallons on an area of prevention, or 1 million gallons for suppression later,” said Eric Appel, a principal investigator on the project and assistant professor of materials science and engineering. Appel’s team collaborates with the California Department of Forestry and Fire Protection, the Desert Research Institute and the U.S. Forest Service to pilot, optimize, and validate this game-changing technology. The potential reward is great: lives saved and billions of dollars in damages avoided, allowing state and national agencies to re-focus financial resources on their broader missions.



DEVELOPING DIGITAL TOOLS FOR ENHANCED LAND MANAGEMENT

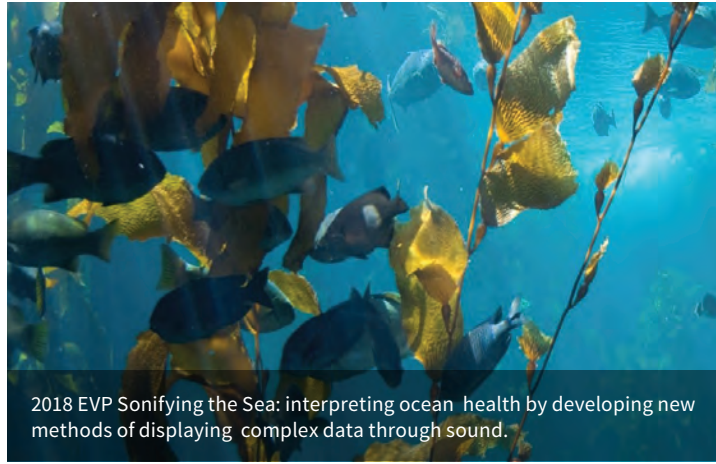
The Natural Capital Project (NatCap) and Stanford’s Center for Ocean Solutions (COS), both units of the Stanford Woods Institute for the Environment, are collaborating on a new interactive modeling tool that will allow land managers to identify the best tactics for protecting vulnerable coastlines from the impact of climate change.

Rising sea levels and an increase in extreme weather events are changing the face of coastlines and threatening the lives and livelihoods of coastal residents. A 2015 REIP has allowed NatCap and COS to engage campus and community partners, such as Stanford Law School and state-level coastal agency staff, to create an online visualization tool that identifies vulnerable coastal sites and offers legal/regulatory, financial and infrastructure-based climate adaptation strategies.

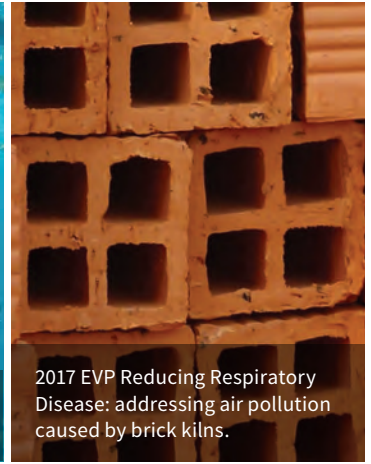
The digital tool leverages NatCap’s flagship InVEST modeling software to allow users to visualize and map the value provided by natural ecosystem services. The tool is scaled so decision makers at local, county and state levels can assess sustainable and cost-effective alternatives to a concrete and metal-reinforced coastline.



2011 EVP Developing High-Impact Eco-tourism: transforming nature-based tourism into a platform for motivating and sustaining pro-environmental behaviors.



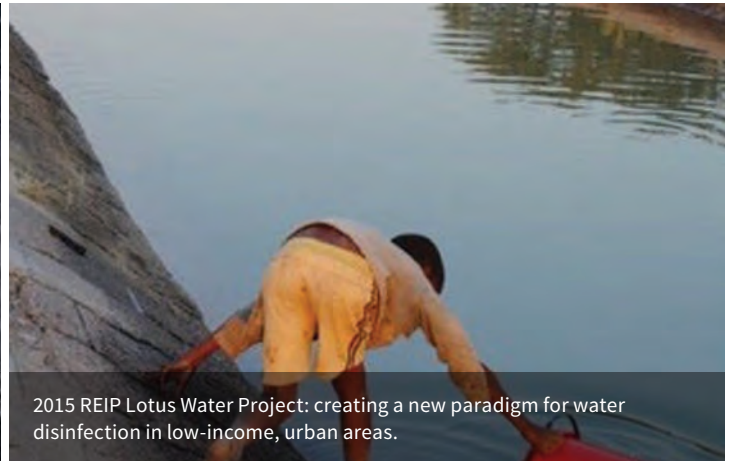
2018 EVP Sonifying the Sea: interpreting ocean health by developing new methods of displaying complex data through sound.



2017 EVP Reducing Respiratory Disease: addressing air pollution caused by brick kilns.



2016 REIP Climate Change & Extreme Weather: building tools to analyze how global warming influences extreme weather events.



2015 REIP Lotus Water Project: creating a new paradigm for water disinfection in low-income, urban areas.

Gift Opportunities In Support of Innovative Environmental Solutions

Interdisciplinary Faculty Seed Grants, provided through the Stanford Woods Institute for the Environment, seek to catalyze transformative environment and sustainability research that will produce scalable, applied solutions. EVP and REIP award individual grants of up to \$200,000 over two years.

Although these programs support a rapidly growing interdisciplinary community, their potential has not been fully realized. **Total and maximum funding for individual projects has been flat since 2004, and the number of excellent proposals is dramatically outpacing available**

funding—only about a third of teams that apply are awarded funding.

Supporting the growth of these programs will help ensure that Stanford’s world-class faculty and researchers realize their full potential as they create new tools, resources, and knowledge to solve urgent environmental problems.

The goal is to support the perpetuity of these seed grants through individual gifts.

For more information on supporting EVP and REIP or to learn more about the Stanford Woods Institute for the Environment, please contact Clare Wildenborg, Senior Associate Director of Development for Energy and Environment Institutes at (650) 736-0340 or clarekw@stanford.edu.



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