

# INSTITUTE of SUSTAINABILITY SCIENCE, TECHNOLOGY AND POLICY

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## **Background**

Hawaii, with all its natural beauty, is fragile. Nearly all the energy needed to sustain our population is imported. Our food is largely imported as are the materials we need for the construction of our homes, buildings and our infrastructure. Our supplies of water are limited and approaching an unsustainable rate of use while our population continues to grow.

Man's footprint is large in Hawaii. All the ills of urban living, traffic congestion, crumbling infrastructure, saturation of our capacity to accommodate our waste, are now staples of the daily news. The open vistas that we cherish are disappearing under the pressure of housing development. Our land is limited and our land-use policies still favor profits over open space. The ecosystems that arose here before man arrived have eroded dramatically, with a rate of loss of native species unequalled elsewhere in America.

If these problems admit of solutions, they are to be found in a systematic application of the technical knowledge and intellectual strength of our University's faculty. Currently, however, faculty members from science, engineering, and the health and social sciences are, in the usual way of faculty research and education, working as individuals or in small groups. A larger framework, an Institute of Sustainability Science, one that makes synergistic use of these talents, is proposed here.

## **Mission**

**To apply the knowledge and talents of the University to the practical problems that our society faces in supplying ourselves with the resources of energy, water, food that a growing population requires from a diminishing resource base. We in Hawaii need first to be aware that we are a microcosm, an example of the global crisis that we will experience first, being critically dependent on imported resources. How we deal with these problems can save our unique society in these islands from further deterioration in the quality of life here and, at the same time, provide a beacon to the rest of the world.**

## **Summary**

The Institute of Sustainability Science, Technology and Policy (ISSTP) will need to draw upon the technological, communication and educational talents of a faculty that cherishes the life style of our islands. The institute will build on the vision of sustainability science – a transdisciplinary method of organizing research to deliver meaningful contributions to critical issues of resource management and rigorous policy

analysis. A prototypical example is sustainable water resource management – mauka to makai. Watershed management is informed by several disciplines, including hydrology, conservation biology, terrestrial and marine ecology, soil science, forestry management, and economics. Collaborating researchers can develop and illustrate methodologies for establishing priorities among conservation and restoration alternatives, including invasive species management. Transdisciplinary research would similarly inform alternative adaptation strategies for climate change, e.g. improved water management in the face of more erratic rainfall patterns and engineering/rezoning alternatives for sea-level rise. Communication and education outreach will be required to engage with stakeholders for these projects and with those in a position to translate the results of research into effective action.

The Institute will need to address problems for which solutions can be found, not just pursue studies for their intellectual interest alone. The rest of the University is well equipped for that.

Its faculty will need to encompass talents from the University that can provide technologically sound and intellectually rigorous assessments of existing and proposed policies aimed at making Hawaii's life style and economy more sustainable.

The Institute's faculty are to be those who, by inclination and training, are adept at identifying critical problems, organizing relevant research, and contributing their knowledge in the public arena.

The Institute's leadership must have the communication skills to engage the larger community and to articulate the critical issues so well that the Institute becomes, in the eyes of the State's government and its political leadership, an invaluable and trusted resource. Outside politics yet skilled at dealing with political realities, its Director must be knowledgeable and adept in arenas that are not required of ordinary academic leaders.

We are agreed that a strong graduate degree program needs to be integral to the mission of the Institute. While faculty from the Social Sciences, Engineering, SOEST, Natural Sciences, Architecture, the School of Medicine and CTAHR may be drawn upon for teaching responsibilities and oversight of dissertation research, the degree offered must be a degree in Sustainability Science.

The University needs to underwrite the new Institute with funds and faculty positions. It will not succeed by simply re-shuffling existing units. More importantly, and because of this imposition on the resources of the UH budget, there will need to be a clear statement of intent and support from the Chancellor and the President. The spark of ignition needs to come from above. We believe that a call to arms on their part will have an electrifying effect. No single issue unites the faculty and students of the University like this one.

### **The Need and the Challenge**

The issues addressed in the Background statement above are hardly new ones. Nor have UH faculty and Administrators ignored them. The College of Engineering's Department of Civil and Environmental Engineering, for example, is composed of engineers who, in a sense, are devoted to dealing with maintaining the infrastructural integrity of society in an environmentally desirable manner. Many are members of interdisciplinary research teams attached to the Water Resources Research Center (WRRC) for specific projects. The WRRC itself is composed of faculty whose positions

are shared with Civil and Environmental Engineering, with Geology and Geophysics, and with Economics.

Graduate degrees are offered in Ecology, Evolution and Conservation Biology, interdisciplinary specializations that offer graduate research opportunities in fields that use Hawaii's unique ecosystems as natural laboratories. There are other examples including the School of Ocean, Earth Science and Technology (SOEST) and the College of Tropical Agriculture and Human Resources (CTAHR) where interdisciplinary programs of education and research allow faculty from other units to join forces for applied research programs. Within the College of Social Sciences, Economics, Urban and Regional Planning, UHERO, and the Center for Public Policy can bring much to the table. The Colleges of Business Administration, Travel Industry management, Architecture and Law all have faculty and programs relevant to this effort. The UH faculty are believers in applied research and education. What we have not done is to give the subject of sustainable development a central focus, with an interdisciplinary faculty whose mission is the application of their research to the solution of problems of Hawaii and the Pacific Basin. Formation of ISSTP would be a significant step in that direction.

Financial support for practical, interdisciplinary research and graduate education is not the norm so that faculty lean toward projects with a narrower focus, ones that are more easily encompassed within the bounds of an agency's mission. WRRRC research covers everything from the economic incentives built into pricing of water to the coupling of ocean swells to ground water levels to aid in modeling aquifers, to waste water treatment. These are all independent projects with one or two faculty investigators, although many WRRRC projects have been and are multidisciplinary in nature. An Institute of, with financial support for staff and graduate assistants, can help break out of the narrow focus problem by assembling the array of interdisciplinary faculty needed to formulate broad attacks on the issues we have identified.

The most easily identified need, aside from finding a talented leader for the Institute, is discretionary funding. While some State support is needed for faculty and leadership positions, private sources of funds have been found for similar efforts at other Universities. Funds to pay the salaries of faculty on loan to the Institute and those on sabbatical from other universities are most important.

How likely are we to succeed in finding funds? More than 10 years ago, Frederick A. and Barbara M. Erb gave \$5 million to the University of Michigan to found the Erb Institute for Global Sustainable Enterprise. They have given an additional \$15 million since.

Similarly, Julie A. Wrigley, who has a home in Arizona, provided \$15 million for Arizona State's Global Institute of Sustainability, and this year gave an additional \$10 million to create a degree-granting School of Sustainability within the Institute. Columbia University's Earth Institute has also been generously endowed by PepsiCo and other donors.

The vast majority of the money for the Golisano Institute in Rochester came from B. Thomas Golisano, the founder of Paychex and one of the underwriters of the Clinton Global Initiative. Mr. Golisano, who donated \$10 million, said he expected the Institute to "produce the first generation of professionals with the vision and know-how to deliver on the promise of sustainability." Indeed, the Institute already offers courses on sustainability to all freshman and is asking students to submit ideas for projects.

In several other instances, businesses have made substantial, no strings attached, contributions. Four companies — ExxonMobil, General Electric, Schlumberger and Toyota — have anted up for the Stanford University Global Climate and Energy Project, which explores new energy technologies. The Shell Oil Foundation has been financing Rice University's Shell Center for Sustainability since 2002. Wal-Mart has promised money for an Applied Sustainability Center at the University of Arkansas.

All these institutes and centers have a strong focus on applied research. In the case of Arizona State University, the Global Institute for Sustainability has a dominant focus on the issues surrounding urbanization in a desert environment. Their leadership has frequent and close contact with community leaders so that the problems are identified collegially, not in the detachment of the academic hothouse.

We propose that the UH make fundraising for the new Institute its highest priority. The experience elsewhere suggests that the topic, if adequately staffed and led through such an Institute, will draw very substantial philanthropic interest.

## **Organization**

Initially, a few units within the University could form the core faculty of the Institute. WRRC is an obvious choice. The Environmental Center is another. While, for reasons having to do with federal or State mandates, these institutes need to maintain their identity, the Institute should be a home within which their efforts can be integrated with those of others. A few additional positions will be needed from the outset. It will be hard to convince potential recruits to the Director position that we are serious otherwise.

A graduate faculty drawn from other schools and colleges will be important. Graduate degrees in Sustainability Science are, in our view, essential to the success of the new Institute.

Contiguous space, a luxury here, is nonetheless extremely important to help create the kind of synergy that such a new enterprise requires.

The leadership of the new Institute needs to have considerable entrepreneurial skills in addition to experience in leading large research efforts in an academic environment. This enterprise, by its nature, requires for its success unusual ability to draw in the larger community, business in particular. The most successful of our university counterparts elsewhere have made it their business to work closely with their communities, formulating plans, assessing the effectiveness of policy aimed at finding sustainable solutions and, not least, finding the financial support.

## **Next Steps**

1. Finding a strong, experienced leader will be the most important first step. Once the Administrative comes to a decision on how it wishes to organize and support the Institute, a search should begin.
2. It would be especially useful to get early commitments of philanthropic funding to get the Institute started and to help lure strong candidates to the Director position.
3. The Regents and other friends of UH should be invited on board. An Advisory Committee of business people, philanthropists and other community leaders ought to be formed to help with formulating plans for the Institute.

4. Commitments by faculty of WRRC and any other units to be folded into the Institute will be needed as will the founding of a graduate faculty drawn from the really diverse faculty of UH.
5. The faculty Senate needs to hear this proposal before recessing for the summer and to review its potential impact on Manoa.