

Two background docs in support of the Thursday, Dec. 7, 2006 ESI Flagship project development meeting

[1. October 17, 2006 : Letter to ESI Colleagues by Lisa Shaffer and Charlie Kennel.](#)

Dear ESI Colleagues:

This message is to report on the discussion at the recent ESI Advisory Committee meeting and the subsequent discussion Charlie Kennel and I had with Vice Chancellor Ellis about how to use the grant from the Legler Benbough Foundation. In the advisory committee meeting, the group thought it was best to earmark some amount of funds for student-related support (graduate and undergraduate) such as travel to conferences and workshops. And rather than invite a variety of proposals for seed funding, we should direct one “flagship” project and invest enough to have an impact and accomplish something tangible during the first year. There was a sense that a San Diego regional project to bring together disparate datasets, models and analytical tools into an integrated sustainability informatics/cyberinfrastructure capability would be a good initial project that could spawn new research in a variety of areas and build on the unique strengths of UCSD including Calit2 and SDSC. This also could build on work done on a post-Katrina data/visualization capability developed recently by UCSD under an NIEHS “superfund” grant.

In discussing this with Art Ellis and Marianne Generales, they recommended that we “kick it up a notch” and try to design a multi-dimensional effort that would attract extensive student involvement. The idea that emerged, building on the discussion in the advisory committee and the thinking we all did last year, was to build a program that would monitor, model, and visualize the UCSD campus as well as the broader region, on an interdisciplinary basis to be able to assess, explore, and predict different dimensions of sustainability.

We have prepared a “case statement” to solicit a matching \$100k or more for phase one of the UC San Diego Sustainability Innovation Fund. We propose to allocate the initial Legler Benbough funds and to seek matches in equal amounts as follows:

\$50k for the flagship project

\$15k for other research initiatives (could be complementary or separate from the flagship)

\$15k for sustainability education innovations

\$20k for student projects and travel

The flagship project could incorporate components such as:

- Existing monitoring programs for water quality, air pollution, meteorological conditions, coastal processes, etc. operated by UCSD for research purposes as well as monitoring programs run by operational “mission” agencies and other organizations

- Socioeconomic and demographic information
- Models and visualization tools such as the Regional Workbench, projects in Calit2 and SDSC
- Non-academic models and tools such as developed by SANDAG and other public agencies
- Simulations and “computer games” developed by students building on the components listed above and other capabilities and experiences
- Mechanisms to stimulate and nurture student innovation (some kind of sustainability incubator program?)
- Student service learning to conduct sustainability assessments of companies and other organizations in the San Diego region
- Student internships and research opportunities working with organizations that have datasets and/or models or monitoring programs to find what they have and help integrate it into the larger system
- User interfaces and human user assistance capabilities so that non-experts would learn about the system and make use of it to address decision-making needs specific to the user’s organization
- At least one major conference or workshop per year with stakeholders and potential research and operational users of the program
- A student sustainability conference or summit to build student support and encourage creative student sustainability initiatives.

The concept and its value might be best demonstrated by developing one or at most two specific issues first – for example, freshwater (including stormwater runoff, water quality, etc.) and/or energy supply and demand, rather than tackling all of sustainability in one bite.

We need small teams to transform these ideas into concrete plans, budgets, and actions. We propose the following teams:

- Flagship project: “San Diego regional sustainability decision-support system” [the team may come up with a better name]; we propose that a small steering group first create an initial project outline which they then review with a larger expert group. For the steering group, we suggest Ilya Zaslavsky (SDSC, co-Chair), Bill Hodgkiss(Calit2), Keith Pezzoli (Urban Studies, co-Chair), and David Schkade (Rady). They will consult with the larger group below:
 - Cyberinfrastructure: Calit2 (Ramesh Rao/Bill Hodgkiss to designate)
 - Coastal processes: Eric Terrill
 - Campus Runoff Project (TBD)
 - Biology/biodiversity: Walter Jetz
 - Climate: Dan Cayan
 - Urban studies – Keith Pezzoli
 - Atmosphere – Kim Prather, Mario Molina
 - Health sciences – Tim Rodwell
 - Student rep

We also propose setting up additional teams as follows:

- Other sustainability research:
 - Humanities/arts – Georgios Anagnostopoulos, Chair
 - Engineering – Paul Linden
 - Social sciences – Clark Gibson or Ted Groves
 - Sciences – Greg Mitchell
- Education:
 - Gabriele Wienhausen, chair
 - George Tynan, JSOE
 - Vish Krishnan, Rady
 - Bruce Dunn/Extension rep
 - Student rep
- Student projects and travel
 - Lisa Shaffer
 - Susan Smith, Chair
 - Graduate and undergraduate student

The task for each team is to develop a specific plan for using the allocated funds from the Legler Benbough grant and any matching donor funds that we obtain, to design and implement activities that will lay the foundation for a growing campus-wide sustainability program. In the case of the flagship project, many of its attributes are proposed in this document. In the case of the other topics, the team should define a specific goal and process for allocating funds, such as a call for proposals or a workshop or whatever they deem most appropriate. Their goal statements will aid us in raising external funding from donors.

The teams should report back to the ESI steering committee by November 17 on their progress to date. Through Calit2 and the VC Research office, we expect to be able to provide administrative support as needed to the teams. Lisa and Charlie will serve as *ex officio* members of all the teams and should be copied on all communications so they can participate as appropriate.

[2. First Flagship project team meeting, summary notes](#)

Environmental Sustainability Initiative, Room 361, Pepper Canyon Hall,
Friday Oct. 27, 9:00am - 10:30 am.

Goal: To discuss flagship project and define next steps

Participants: David Schkade, Bill Hodgkiss, Keith Pezzoli, Ilya Zaslavsky, and Hiram Sarabia

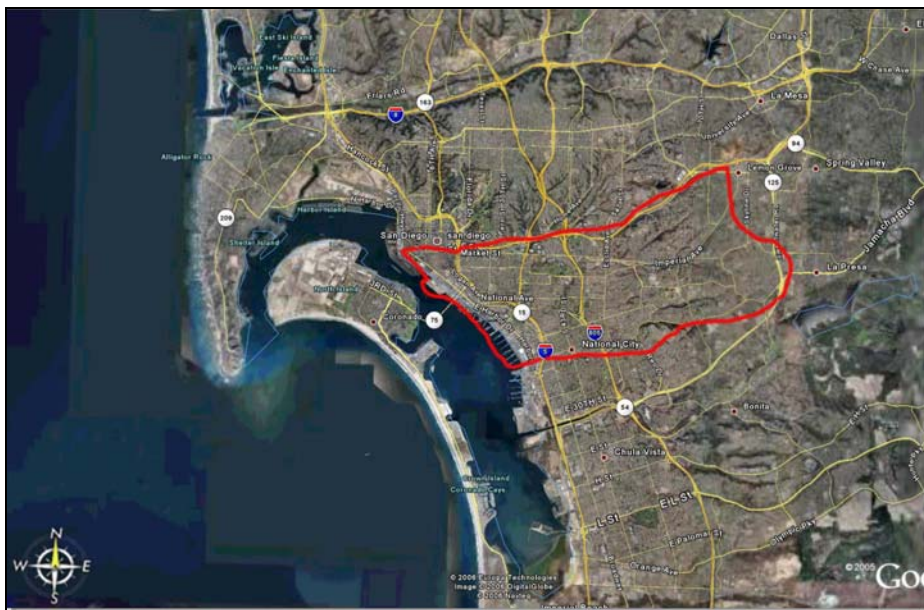
Agenda:

* Prior to Friday’s Flagship meeting, Ilya Zaslavsky, Keith Pezzoli, Hiram Sarabia and David Cleveland (TELESIS) met for two hours on Thursday, Oct. 26, 2006 to generate an initial concept. This initial concept, referred to as the “Sustainability Science Workbench” served as the focus of discussion.

Meeting highlights:

Creating a “Sustainability Science Workbench” (for science-to-science and science-to-society integration)

1. There was not sufficient time to get into specifics, but everyone agreed in principle that the “*Sustainability Science Workbench*” concept offers a good starting point. The group agreed to meet again sometime between December 4th and Dec. 9th to hammer out specifics and next steps.
2. The Sustainability Science Workbench will build on existing initiatives (leveraging the efforts of SDSC, Calit2, SIO, the Regional Workbench Consortium (RWBC), **Superfund Basic Research Program**, and the IT systems of TELESIS, Inc –a non-profit partner of the RWBC that builds decision support portals for environmental health in San Diego and the larger US-Mexico border region.
3. The Sustainability Science Workbench offers a strategic vision with near, medium, and long term goals. In the near term, we suggest focusing our energy on an area of Southeast San Diego. There are many reasons (scientifically, economically, socially, and culturally) for selecting this particular area (as opposed to, say, the UCSD campus –which can be factored in later).



Map 1. Seven neighborhoods in Southeast San Diego: An initial target area for the Sustainability Science Workbench

4. The area inside the red polygon on Map 1 is composed of seven neighborhoods in Southeast San Diego. This part of the city has serious and well documented environmental, economic and social problems. The contaminated water bodies, air pollution, toxic sediments and brownfields in this area are subject to close scrutiny by

the San Diego Regional Water Quality Control board, the San Diego Coastkeeper, the Environmental Health Coalition, University research groups, Industry groups and others. The area is also one of the poorest parts of San Diego. All of this makes it a powerful test bed for sustainability innovation—including tech transfer of new technologies coming out of UCSD. And the issues are not just local or regional. Global climate change, international immigration and multicultural diversity, among other dynamics associated with globalization, are clearly relevant.

5. In addition to presenting a compelling geographical area—given its desperate need for good civically-engaged environmental science, this particular area has the richest legacy database of community and environmental variables of any area in San Diego. TELESIS, one of the initial partners who formed UCSD’s award-winning Regional Workbench Consortium, led a project in this part of South East San Diego. Partnering with the Annie E. Casey Foundation and the San Diego Council of Neighborhood Coalitions, TELESIS (with input from UCSD and SDSC) created a finely grained community asset map of the area. TELESIS purchased forty thousand dollars of high-end pen table computers and GIS/GPS equipment to do the work (funded by the Foundation and the County of San Diego). They hired and trained community residents to map 185 variables within the seven distinct neighborhoods show in Map 1. The area covers approximately fifteen square miles and a population of approximately sixty thousand people. During data collection, community coalitions were engaged in each step of the process. At the end of each day, staff downloaded the data from field equipment and brought it back to the office for cleaning and analyses. The data was converted into tables, charts and maps that produced a unique view of each neighborhood down to the parcel level. The end products have been used in many different planning and learning environments.
6. TELESIS agreed to work with us and provide access to all this data. TELESIS is also willing to provide access to all their hardware (e.g., pen tablets, GPS equipment) and community-based methods of data collection (e.g., networking techniques, evaluation, quality control and training approaches). So, we can begin the Flagship project with a rich legacy database (six years old) for initial targeted area. We can supplement this historical data with additional historical data to build one of the most comprehensive datasets for any part of San Diego.
7. The idea is to go in and recapture the most crucial variables collected in 2001 and then begin a time series database that joins environmental, built environment, and quality of life variables. But the point is not to simply build a data collection. The data are grist for the Sustainability Science Workbench –the creation of which raises all sorts of profound challenges not only in science-to-society integration, but also science-to-science integration. If we do this well, we’ll have a model worth exporting around the world. And there are ready made networks to tap into for this purpose—including: the Sustainability Science Network based out of Harvard, the Global Planning Education Association Network (a consortium of all the world’s regional associations of university-based planning schools), and the Global Planning Grid (a nascent effort led by a team at UCSD—Reagan Moore, Richard Marciano and Keith Pezzoli).

8. There are immediate uses for such a comprehensive dataset if made accessible inside something like a Sustainability Science Workbench portal. Our discussion at the meeting focused on examples.
9. One example includes a full documentation of all known data sources on pollution, toxic hot spots, and brownfields. With this kind of info, we can strategically direct the efforts of the San Diego Superfund Basic Research Program (Research Translation and Outreach Cores) to focus on areas of highest priority. The SBRP is developing new tools for testing contaminated sediments and water.
10. While contaminated sediments and water quality immediately provides a focus for the Sustainability Science Workbench, the Southeast San Diego target is pregnant with many other intriguing possibilities that could benefit from UCSD's strengths in new biology, atmospheric chemistry, engineering, management, social science, humanities, and cyberinfrastructure.

The TELESIS site with existing data on this area can be viewed at:

<http://map.telesis.org/website/casey2/viewer.htm>

Place-based analysis of information brings order to mixed data, creates relevancy, and enables the integration of many fields of knowledge. Geographers have a long tradition of attempting to understand how different processes and phenomena interact at the same location. Now the power of place-based evaluation is evident in a much wider range of disciplines throughout the natural sciences, social and public health research. Innovation along such lines is likely to be fundable, as well as significant in terms of scientific advancement and the utility of such scientific advances for the common good.

Additional Info:

Questions we discussed

- 1) what is the audience for this project
- 2) what results (in a month, in 6 months, in a year) would ensure continuous funding.
- 3) what types of output we shall generate
- 4) what are the sustainability measures we want to explore
- 5) shall the project focus on a) education/student projects, b) summary/database/visualization of available environmental sustainability studies or measures, c) taking some sustainability measure and trying to show its dynamics (create a nice viz) with local data, d) create a glue product to connect different sustainability perspectives, e) analyze regulatory framework w.r.t. science advances, f) explore a concept of sustainability server.

Instructions we got from Lisa Shaffer and Charlie Kennel:

1. Agree on a definition of what this "flagship" project should be and decide on a name for it.
2. Identify some next steps to move forward, mindful of everyone's busy schedules in the next few weeks. More elaboration is below, copied from my earlier message to you.

Basically, we want to build on much work already done or underway related to water - integration of data about availability, quality, and possible remediation techniques. The

new ESI idea is to build on that to downscale and focus in on the UCSD campus and broader San Diego area to create a prototype information/decision-support system, using retrospective data, to show visually and quantitatively changes over time (historically) regarding water availability and quality in San Diego, in the context of lots of other parameters like population, building density, climate, regulations, etc. This would demonstrate the potential of such a system that had the capability of projecting into the future with various scenarios, both "natural" like climate change and "human" like different deals for water sharing between urban and agriculture or changes in water pricing. The ultimate goal is to create that future-looking capability to support both research and operational decision-making.

If we can get agreement on that concept next Friday, then the real work can begin. Ilya has a major commitment through Nov. 17 and Keith is organizing a big conference here in early December so they can't do much on this until after that. The goal is to have enough done by next August in the form of a prototype to demonstrate the potential and attract funding and continued and expanded interest. The challenge is to define the bigger effort and know who needs to be involved and how much it would cost and what could be achieved on what time scale. We thought we'd probably need to organize one or two workshops in the first half of next year - perhaps one on water (supply and demand) and climate - what do we know, what data exist, what capabilities do we already have to model and visualize, what are we missing, etc.; and one focused on water quality and health, building on the NIEHS Katrina activities, beach water issues in San Diego, toxics in SD Bay, etc. Both workshops would include a very deliberate discussion of potential major funding sources - Keith and Ilya know the toxics and "new biology" related potential funders; Dan and Bill might know better the climate and hydrology sources. We would need to engage with partners in the workshops and in the pursuit of funding, including the City, Port of SD, and regional groups as well as the state and federal agencies.

The Legler Benbough foundation that gave us the seed money didn't say we needed to have full external funding by the end of year one, but we need to demonstrate progress toward that end.