CONCEPTUAL MAP FOR SUSTAINABLE CITY-REGION DEVELOPMENT http://regionalworkbench.org/images/conceptualmap_susdev.jpg

SYSTEMS	COMPONENTS OF CITY-REGION DEVELOPMENT	DOMAINS FOR THEORY-BUILDING & PRACTICE	CHALLENGES OF SUSTAINABLE DEVELOPMENT(1)	RWBC PROJECTS and related research	PLANNING & DECISION SUPPORT TOOLS(2)
Environmental	*Natural Capital and Environmental Services*: Hydrosphere (Water) Lithosphere (Land) Atmosphere (Air) Biosphere (Life)	Environmental Policy and Planning, Air Basin and Coastal Management, Watershed Planning, Fishery and Wildlife Management, Parks and Outdoor Recreation, Forestry, Landscape ecology, Solid and Hazardous Waste Management	**Environmental Stewardship** • Minimizing use/waste of non-renewable resources (fossil fuels, minerals, biodiversity) • Sustainable use of renewable resources (aquifers, freshwater, wetlands, soils, biomass, human beings) • Keeping within absorptive capacity of local, regional, global sinks (air, land & water)	• Water Quality (Toxics & Watershed Management) • Geomorphology and Ocean Floor Mapping • Asian Brown Cloud, Aerosols • Multiple Species Conservation Planning (MSCP)	Environmental Informatics, Integrated Ecological Assessment, Cal(IT)2 Living Laboratory (Environment and Civil Infrastructure), 3D Terrain/Bathymetry Model, Panoram Theatre, RWBC
Social and Cultural	*Social Capital, Human and Cultural Capital:* Civil Society, People, Families, Community Groups, Cultural Diversity and Heritage, Knowledge Networking	Social and Community Development (including. dynamics of class, race & gender), Public Health and Human Services, Historic and Cultural Preservation, Education and Training	**Equity and Quality of Life** • Flourishing civil life in association with others • Affordable health care & adequate social safety net • Access to affordable housing, including a secure, healthy environment with adequate basic services & community facilities • Fulfilling present generation needs without undermining the ability of future generations to meet their needs too	• Community Collaboratives: Risk & Preventative factors for Public and Environmental Health • Redlining in San Diego • Comparative Immigration • Affordable Housing • Colonia 10 de Mayo • San Diego Historical Resources • Student Mentoring/Training	Quality of Life Indicators and On-line Interactive Mapping, Sociology Workbench, RWBC
Economic (including financial and manufactured/ built capital)	*Economic Capital:* Cash, Investments and Monetary Instruments; Job Markets, Systems of Innovation, Networked Infrastructures (transport, water, streets, telecommunications, energy), Housing and Community Facilities	Economic Development, (interlocking local, regional & global systems of production, distribution and exchange), Corporate Environmental Management, Public Finance, Labor Force Development, Land Use Planning, Housing, Transport & Public Infrastructure	**Economic Efficiency** • Efficiency in systems of production, distribution, exchange and consumption • Adequately remunerated work • Dealing effectively with spatial patterns of urban and regional growth • Infrastructure for a "learning region" fostered by high quality education, workforce development, and knowledge-networking across digital divides	• Industrial Ecology • Industrial Clusters and Innovation as Collective Action • Living Wage • Water Supply and Infrastructure • Digital Divide • Ecotourism • Solar Energy	Cal(IT)2 Living Laboratory (Transportation and Telematics) SANDAG's RIS RWBC
Political	*Political Capital:* Political Community, Legal and Institutional Organization, Means of Administration, Regional Information Systems and Digital Government	Governance, Public Policy and Management, Regulation and Enforcement, Law and Criminal Justice, Participatory Democracy, Planning and Decision Support Systems	**Good Governance & Regional Stewardship** • Participatory democracy and planning that is accountable, transparent, socially just and equitable, respectful of human rights and diversity) • Enhancing Regional Security, Reducing Vulnerability, and Increasing Self-Sufficiency • Intercity Collaborative Networks	• Comprehensive Regional Planning and City-Region Governance • Total Maximum Daily Loads (TMDLs) and Non-point source pollution regulation • EMS and Regulatory Innovation • Homeland Security	Groupware and Collaboration Tools for Conflict Mediation, Negotiation, & Consensus Building SANDAG's RIS RWBC

(1). To integrate the challenges of sustainable development, the RWBC draws together insights and tools from New Regionalism, Sustainability Science, ICT, and the Humanities.

(2) The RWBC is developing a wide range of planning and decision support tools, including: Interactive web sites, Visualization, GIS, Simulation, Scenarios, Groupware and Collaboration Tools.

NEW REGIONALISM

Excerpt from: Nick Bollman (2002) "The New California Dream: Regional Solutions for 21st Century Challenges," CICG perspectives, February (California Institute for County Government). http://www.csus.edu/news/regionreport.pdf (pp. 6-8)

In the 21 st Century California is a state of regions. Issues once successfully addressed at a local or state level now must be addressed at a regional level. The world has changed and made our challenges regional. We compete in a global economy, region-to-region, not country-to-country. Our ethnic, racial, and income differences fragment us and isolate us from each other, and too many Californians are in dire, persistent poverty. These inequities and barriers to integrated communities are distributed unevenly across our regions. Our natural environmental resources, our air basins and watersheds and open space and habitat are at risk, and the conflict between conservation and development worsens. No purely local solutions are at a large enough scale to be effective and sustainable. On top of all this, our anticipated population growth in the decades to come, and regional and cross- regional settlement patterns, exacerbates all the problems mentioned, and stretches our current governmental processes beyond their capacity.

Though solutions must be regional, our state and local governments lack sufficient constitutional or legislative authority, or planning processes, or funding schemes, or even a degree of public trust, sufficient to tackle these problems successfully at the regional level. Though there are innovative and committed public servants and state and local public agencies willing to do so, most of the fundamental policies and practices that guide their work are from another time. They are inadequate at best and barriers to success at worst. Only a fundamentally different mode of governance, what we call regional stewardship, will be adequate to the challenge. Stewardship, that is collaboration among local and state government and the private and civic sectors, is the fundamental building block of 21 st century regionalism.

To regain and sustain the California dream in the years to come, we need a new 21st Century regionalism: better policies, practices, and governmental and civic institutions that are aligned to support essential, and promising, regional strategies to produce and sustain world-class communities. This new regionalism seeks to re-empower and re-engage local and state government in successful problem solving. 21st Century regionalism:

- Brings together different sectors—public, private, and non- profits— in new, more collaborative and entrepreneurial ways.
- Starts from "bottom-up" self-organizing and self-definition, using functional issues to define the scope and scale of regional problem-solving, such as commute patterns to define the jobs-housing imbalance problem (and solutions), or watersheds to define water supply and quality challenges or the conservation of aquarian habitat systems.
- Optimizes regional self-sufficiency and organizes effective extra-regional (even global) working relationships.
- Draws all citizens into broad and informed regional dialogues about the future of their communities and implementation strategies.
- Assures that all solutions are measured against social and economic equity standards.
- Supports the allocation of local and state revenues in a manner that reflects the true cost of providing local and regional infrastructure and services.
- Promotes resource efficiencies: energy, land, and materials.
- Advances the idea of better government, not more government, or extra layers of government.
- Holds all sectors accountable for results—public, private, and civic—measures progress—and learns for improvement.
- Acknowledges the need for sub-regional, inter- regional, and supra-regional strategies to address specific issues that are linked within smaller or larger geographic areas or that cross regions that have more definable boundaries.

SUSTAINABILITY SCIENCE

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http://sustsci.harvard.edu/keydocs.htm

Box 1: Core Questions of Sustainability Science

1. How can the dynamic interactions between nature and society – including lags and inertia – be better incorporated in emerging models and conceptualizations that integrate the Earth system, human development, and sustainability?12
2. How are long-term trends in environment and development, including consumption and population, reshaping nature-society interactions in ways relevant to sustainability?13
3. What determines the vulnerability or resilience of the nature-society system in particular kinds of places and for particular types of ecosystems and human livelihoods?14
4. Can scientifically meaningful "limits" or "boundaries" be defined that would provide effective warning of conditions beyond which the nature-society systems incur a significantly increased risk of serious degradation?15
5. What systems of incentive structures – including markets, rules, norms and scientific information – can most effectively improve social capacity to guide interactions between nature and society toward more sustainable trajectories?16
6. How can today's operational systems for monitoring and reporting on environmental and social conditions be integrated or extended to provide more useful guidance for efforts to navigate a transition toward sustainability?17
7. How can today's relatively independent activities of research planning, monitoring, assessment, and decision support be better integrated into systems for adaptive management and societal learning?

RESEARCH STRATEGIES

The sustainability science that is necessary to address these questions differs to a considerable degree in structure, methods and content, from science as we know it. In particular, sustainability science will need to (i) span the range of spatial scales between such diverse phenomena as economic globalization and local farming practices; (ii) account for both the temporal inertia and urgency of processes like ozone depletion; (iii) deal with functional complexity such as is evident in recent analyses of environmental degradation resulting from multiple stresses; and (iv) recognize the wide range of outlooks regarding what makes usable knowledge within both science and society. Given the magnitude of these challenges, it is clear that incomplete knowledge, and limitations in our ability to utilize it, will permanently challenge sustainability science as it tries to link research to action and to reconcile scientific excellence with social relevance.

What does this mean for the organization of the scientific fabric? It means, in particular, that sustainability science research must be created through processes of co-production in which scholars and stakeholders interact to define important questions, relevant evidence, and convincing forms of argument. The pertinent actions are not ordered linearly in the familiar sequence of scientific inquiry, where action lies outside the research domain. Rather, these are combined in entangled patterns relating to the problem to be tackled and the practical constraints of inquiry. The climate change issue illustrates this entanglement. In it, all stages of scientific exploration and practical application (e.g., predictive models and preventive action, scenario exploration of the future and impacts analysis of the past, government review of science and scientists commenting on policy) are occurring simultaneously and influencing each other.19

A more recent Sustainability Science Workshop was held in Mexico City.
http://sustsci.harvard.edu/ists/synthesis02/output/ists_mexico_summary.pdf
The organizers issued this invitation:

Shaping a Partnership on S&T for sustainable development: The participants in the Mexico City Workshop invites others to join with them in a decade-long partnership to address the critical challenges of sustainable development. We propose three initial foci for this partnership:

a) *Strengthen the ability of locally-based initiatives to harness science and technology from around the world in support of their efforts to solve their most urgent sustainable development problem*s. Much of the opportunity for advancing sustainable development is centered at the sub- national scale, in particular regions, places and enterprises. Problem-solving efforts centered at such scales must nonetheless address the impacts and opportunities of cross-scale interactions. Several experiments in collaboration among scientists and problem-solvers in addressing such globally embedded but locally centered problems are already in place. We propose to build on these existing institutions and arrangements and – in collaboration with regional partners -- to foster the process of local dialogue, to create funding opportunities, and to collaborate in the research and development needed to support local action over the long term.

b) *Facilitate engagement of young scientists and technologists in efforts to support environmentally sustainable human development around the world.* The capacity for science and technology to contribute to sustainable development depends greatly on whether today's young scientists and engineers can find ways to contribute. Around the world, these graduate students, new job seekers, post-docs, and entry- level doctors, engineers, and professors face a range of obstacles that inhibit their contributions. To address the needs of this generation we will strengthen programs to train young individuals from the developing world in interdisciplinary research and assessment approaches central to harnessing science and technology for sustainable development. For young scientists and engineers everywhere, we will invite them to join us in creating workshops and other opportunities that can facilitate their full engagement in cutting-edge efforts to apply science and technology to sustainable development.

c) *Building a global community of scientists and engineers for sustainable development.* Scientists and engineers around the world working on sustainable development problems have no natural forum in which to learn from one another through exchange of experiences and debate of ideas. To help provide such a forum, we will promote a biennial conference in which young scientists, doctors and engineers can interact with senior scholars and practitioners engaged in linking S&T to sustainable development. We will also expand the virtual forum, library, and bulletin board of the web-based "Forum on S&T for Sustainability" (sustainabilityscience.org).

LINKS—New Regionalism
Collaborative Regional Initiative Network
http://www.calregions.org/
Civic Navigator is the on-line communications vehicle for the network of California's Collaborative Regional Initiatives (CRIs). These CRIs are relatively new, or newly refocused, regional civic organizations. As private sector organizations (though often with public sector leadership and/or participation), CRIs take a "stewardship" responsibility for the economic, environmental, and social equity future of their regions and their communities. With a new, entrepreneurial leadership style, the CRIs determine the most important challenges facing their communities; develop practical, effective strategies to address those challenges; and mobilize the leadership and other resources necessary to carry out those strategies. They hold themselves accountable for results, and, often, through Community Indicator reports, measure the progress of their regions across a broad range of indices.

LINKS—Information and Communications Technology
Planning and Informed Regional Choices: How California's Regional Organizations are Applying Planning and Decision Tools (November 2000)
Based on a statewide scan of 18 regional organizations, this report, presents new information about regions' needs for technology-based planning and decision tools and provides examples of how some organizations have successfully applied these tools. Sponsored by the California Center for Regional Leadership with The James Irvine Foundation.

LINKS—Sustainability Science
Forum on Science and Technology for Sustainability
http://sustsci.harvard.edu/intro.htm
The Forum on Science and Technology for Sustainability seeks to facilitate information exchange and discussion among the growing and diverse group of individuals, institutions, and networks engaged in the field of science and technology for sustainability. It seeks to provide access to emerging ideas, relevant activities, key documents and web sites. The Editors welcome contributions and suggestions for posting to the Forum. The Forum will cover evolving discussions over the *core questions* and challenges for knowledge and action of science and technology for sustainability, *documents* that chart the field's aims and progress, *events* of special interest to the community, and *programs and institutions* that are playing a special role in the evolution of the field. It also includes relevant *commentary* on posted documents and core questions.

The concept of this web site grew out of discussions at the Friibergh Workshop on Sustainability Science, held in Sweden on 10-14 October 2000. It was initially envisioned as a means of providing access to the Workshop documents, deliberations, and conclusions, and for the subsequent regional consultations to be held in 2001. However, upon further reflection the organizing committee for the workshop began to envision a broader role that such a site might play. Information on sustainable development per se can be found on existing web sites, most of them accessible through the Sustainable Development Gateway. But it has been more difficult to find a central location for information relating to the role of science in sustainable development. We hope that the Forum will serve this function.

Other links relevant to linking science and technology to policy and planning for sustainable development:

UNITED NATIONS System-Wide Web Site on National Implementation of the Rio Commitments
http://www.un.org/esa/agenda21/natlinfo/
Recommendations for Improving the Scientific Basis for Environmental Decision-making
http://www.cnie.org/2000conference/

This report contains the recommendations of more than 450 scientists and decisionmakers who participated in the first National Conference on Science, Policy and the Environment on December 7 and 8, 2000. The conference was sponsored by the National Council for Science and the Environment and was held at the National Academy of Sciences in Washington, DC. The conferees included individuals from more than 45 states and the District of Columbia, as well as Canadians and Europeans. They came from a broad range of disciplines and perspectives in the natural sciences, social sciences, and engineering (from agriculture to zoology), as well as the information technology and policy sectors. The unifying focus of the conference was on setting a well-conceived agenda for science for environmental decisionmaking in the 21st Century that is built on a new interdisciplinary "science of sustainability." The organizing principle used by the Council in developing the conference mission was that stakeholder-informed science is the most powerful means to building consensus for solving the serious environmental problems facing the United States and the world community.

The over-arching theme of the recommendations is the need for this nation and the world community to achieve a level of sustainability that integrates three basic elements: economic security, ecological integrity, and social equity. The concept of sustainability is typically viewed as having simultaneous and interdependent scientific, economic, social, political, psychological, ecological, ethical, and technical dimensions.

Council of Scientific Society Presidents

http://www.science-presidents.org
CSSP Policy Statement: A Sustainable Future
"As a national priority, we must make public investments in all areas of fundamental research that can lead to more sustainable systems. The nation's top political and corporate leaders, working closely with scientists, must develop and implement an action plan to achieve a sustainable future that involves all levels of government, academia, NGOs, and the private sector. * The full text of this and other policy statements can be viewed at http://www.mdsg.umces.edu/CSSP/home.html

National Council for Science and the Environment
http://www.cnie.org
The NCSE works to improve the scientific basis for environmental decisionmaking. Guided by the needs of stakeholders, NCSE educates society about the importance of comprehensive scientific programs that integrate cross-cutting research with knowledge assessments, education, information dissemination, and training. The NCSE aims to facilitate stakeholder actions to develop a shared understanding of science, science needs and priorities, and efforts to link science with decisionmaking. The NCSE is providing and creating an online information dissemination system that allows all users to find understandable, science-based information about the environment.

New Report Unveils Eight Grand Challenges in Environmental Sciences
Grand Challenges in Environmental Sciences Committee on Grand Challenges in Environmental Sciences, Oversight Commission for the Committee on Grand Challenges in Environmental Sciences
http://www.nap.edu/books/0309072549/html/
To help the U.S. government identify new environmental science projects that should receive high priority, a new report from the National Academies' National Research Council identifies eight important areas of environmental research for the next generation. The committee that wrote the report solicited nominations for "grand" challenges in the environmental sciences in a letter circulated to thousands of scientists in the United States and abroad.
