

CHAPTER 1 INTRODUCTION

The Sustainable Water Resources Roundtable (SWRR) brings together participants from diverse sectors – federal, state, corporate, non-profit, and academic – to advance knowledge and support the decision-making needed to sustain the quality and availability of the nation's water resources.

Just as the participants in the SWRR represent a wide range of interests and responsibilities related to water resources, we hope that this report is useful to a wide audience including organizations responsible for management of water resources, organizations that depend on them and individuals and organizations that are researching the field. The report is not designed to be highly technical but some of the relationships in the systems in which water is a part are indeed complex.

The SWRR is one of four natural resource roundtables advising the efforts of the White House Council on Environmental Quality to develop a comprehensive set of national environmental indicators. The other roundtables address critical issues and indicators for the management of forests, rangelands, and minerals and energy. The SWRR is also a subgroup of the Advisory Committee on Water Information (ACWI), which advises federal agencies responsible for managing water resources.

The SWRR has hosted multi-stakeholder meetings on research and indicators from December 2002 through June 2005. SWRR receives funding from public agencies and the private sector.

Water Resources Management for Achieving Sustainability

The most widely known definition of sustainable development was put forth by the Brundtland Commission in 1987 as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs.” Sustainability is a complex subject and clear definitions of key terms such as sustainability, stability, equilibrium, limits, thresholds, and needs can enable a common understanding. Rather than choosing a strict definition of sustainability all the multiple SWRR partners could agree on, whether the Brundtland definition or developing an alternative, the SWRR proposed a set of four sustainability principles for water resources management:

1. ***The value and limits of water.*** Water resources are the basis of life and provide great value. While water is abundant, people need to understand and appreciate the limits of water resources in many regions, the environmental and economic costs of damaging water resources, and the risks to people and ecosystems of unbounded water and land use.
2. ***Shared responsibility.*** Because water does not respect political boundaries, its management requires shared consideration of the needs of people and ecosystems up- and downstream and throughout the hydrologic cycle.
3. ***Equitable access.*** Sustainability suggests fair and equitable access to water, water dependent resources and related infrastructure.
4. ***Stewardship.*** Managing water to achieve sustainability challenges us, while meeting today’s needs to address the implications of our decisions on future generations and the ecosystems upon which they will rely.

As part of its mission, the SWRR also developed a framework for tracking and understanding changes to the health of its fresh and coastal waters, surface and ground water, wetlands and watersheds. We also worked on a methodology to understand the implications of long-term changes for ecosystems, communities, and industry.

In developing its framework, the SWRR asked its members two key questions: How can we define the most important water issues, and how can we determine indicators suitable for tracking these issues over time?

Water issues are broad and diverse. Water quality and availability issues can include water budgets for very large regions as well as surface and ground water supplies at the local level. Water quality issues include physical, chemical and biological concerns that are interconnected and complex. This complexity is compounded by extreme hydrologic events represented by floods and droughts. Water use issues also illuminate the competition between human needs (such as agriculture and public water supply), and the needs of fish, wildlife and flora.

Water sustainability is characterized by the capacity of water resources to meet human and ecosystem needs both in the present and over the long-term. Only by monitoring and understanding changes in the system can we tell if we are on the right track; if not, we must be able to take action to maintain capacities and reduce risk. A water budget may provide a useful model that focuses on the water itself. A water budget provides an accounting of the amount of water that flows into a given watershed and is taken out for various purposes. It may also account for the extent to which allocation of water meets or exceeds availability. A sophisticated water budget would illustrate how factors critical to water quality and quantity, such as climate change, impact natural resources and social systems. Appendix A contains a theoretical water budget.

What Are Indicators of Sustainability?

Indicators are natural, everywhere, part of everyone's life. Intuitively we all use indicators to monitor complex systems we care about or need to control. Indicators are a necessary part of the stream of information we use to understand the world, make decisions, and plan our actions.

What do you keep an eye on, to be sure your home or workplace or community is in good shape? What would you ask about a place you might move to, to find out if you would like to live there? What would you want to know about your society fifty years from now, to be sure your grandchildren are living good lives?

Indicators and Information Systems for Sustainable Development by Donella Meadows, September 1998

As Donella Meadows eloquently describes, indicators are a natural part of life. They help us think about the long-term implications of our actions. By identifying key factors of complex phenomena, they help us understand complex systems and system interconnections. They help us realize what outcomes are likely to be sustainable, and where mid-course corrections are needed. Finally, indicators help people develop a common language about the issues that concern them, and to reach out to others about those issues.

At first glance, identifying indicators to achieve the sustainability of water resources might seem a reasonably straightforward task. But consider that water is the universal solvent, that it pervades nearly every place and everything on Earth, and that it is one of life's most essential ingredients. Consider also that sustainability involves the Earth's natural, social and economic systems, and that nothing is sustainable unless it respects the limits of each of these systems and nurtures them.

Contents of This Report

This report describes the preliminary results of the SWRR's efforts to date, which include:

- Development of principles, criteria and indicators to support decision-making;
- Identification of opportunities for collaboration on research needs; and
- Strategies to expand SWRR participation to states, non-profits, academia and corporations.

In addition, the appendices present a discussion of the water budget approach to management, a full list of candidate indicators, and the terms of reference (bylaws) of the SWRR.

The participants in SWRR intend that this report serves as a platform to continue our efforts to identify good information and effective indicators; promote collaboration on research; and increase public awareness about trends in water resources. Collectively, these efforts can support informed water management decisions that lead toward sustainability.

Water is the most critical resource issue of our lifetime and our children's lifetime. The health of our waters is the principal measure of how we live on the land.

Luna Leopold