sophie prize winner 2008
Gretchen C. **Daily**

Sofie-stiftelsen
THE SOPHIE FOUNDATION

The value of nature and nature of value

2008: GRETCHEN C. DAILY

PROFESSOR IN BIOLOGY, USA, BORN 1964

The Sophie Prize 2008 is awarded to professor Gretchen C. Daily, Stanford University. Prof. Daily is a world pioneer in the fi eld of sustainable development and conservation of biological diversity. As a scientist, she has shown that there are different ways to put a value on nature, and that there are also valid economic arguments for conserving species and eco-systems. Much of her work aims to show how this dimension can be included in political decisions. She is an outstanding scientist with a personal strength and spirit that has contributed with new insights into the value of eco-systems.

The motto of the 10th anniversary of the Sophie Foundation in 2008 was "From know how – to do now!" This year's laureate unites these aspects. Daily has a remarkable ability to translate scientifi c fi ndings into practical recommendations and action. In the book The New Economy of Nature (2002) she presents examples of how to move the economy in a more sustainable direction and the economic advantages of doing so. We learn how local communities can be rewarded for nature conservation, stewardship of natural resources, how natural capital approaches can secure pure drinking water and fl ood control, build sustainable eco-tourism and protect cultural heritage.

Daily works with these issues on a global scale, helping to solve challenges and develop tools for mapping ecosystem services and incorporating these into decision-making processes. She chairs the Natural Capital project whose aim is to align economic incentives with conservation. The project is working in contrasting sites around the world where biodiversity is threatened such as China, Colombia, Ecuador, Mexico, Tanzania, and in the United States. She cooperates with groups from across society, including economists, lawyers, businesses and government agencies.

Gretchen C. Daily's radical and constructive engagement, her ability to communicate with a diverse audience, her extensive knowledge and scientifi c achievements make her an important and worthy recipient of the Sophie Prize. She shows courage by exploring new scientifi c arenas and interdisciplinary linkages. Through this, she brings us closer to a more sustainable world. It is individuals like her who give us the understanding of what it takes to change the world and the tools and courage to do so!

"The Sophie Prize is drawing attention to a dramatic transformation now underway in the way people think about the environment. The Prize is helping to build momentum and to attract the participation needed to carry ideas through to action, into a new way of valuing nature and ensuring both human and environmental well-being.

Together, the many participants in this effort are reaching for a future that none of us could hope to achieve alone. Awarding the Sophie Prize for this collective effort recognizes many people. Certainly my work has been possible only thanks to the help of many mentors and supporters, who provide ideas, inspiration, powerful demonstration of new approaches, practical advice, and financial support."

GRETCHEN C. DAILY

A RENAISSANCE IN ACHIEVING CONSERVATION AND HUMAN DEVELOPMENT

An appreciation of ecosystems as capital assets has emerged as one of the biggest new ideas in conservation in the last decade. If nature is properly valued, then we can greatly enhance investments in conservation and promote human welfare at the same time. This idea is being implemented in pioneering efforts worldwide, with new investments in natural capital designed to enhance biodiversity, climate stabilization, flood control, water purification, tourism, scenic beauty and other cultural and societal benefits. The challenge ahead is to replicate, scale up, and sustain these pioneering efforts, to give natural capital real weight in decisions. This requires major advances in the scientific understanding of natural capital, as well as in the design and implementation of finance mechanisms, and supporting policies and institutions, needed to safeguard it.

Even in the face of intensifying pressures and risks on the global environmental front, there is a growing feeling of Renaissance in the conservation community. This flows from the promise in reaching – together with a much more diverse and powerful set of collaborators than in the past – for new approaches that align economic forces with conservation. And this promise is flowering thanks to the efforts of pioneers worldwide who are explicitly linking human and environmental well-being. They are lighting the way by catalyzing new finance and policy mechanisms that channel investments into natural capital, to benefit both people and nature.

These pioneers are moving, in the words of the Sophie Foundation, "from know how to do now." They are aligning economic and other incentives with protection and restoration of coral reefs on the Great Barrier Reef of Australia, of watersheds in the high Andes Mountains of Ecuador, of wetlands in Napa, California, and of forests from the lowlands of Costa Rica to the upper reaches of the Yangtze River Basin of China. Each of these conservation investments is being made to improve human well-being – and is being replicated elsewhere. Whether from local communities or global finance institutions, from the agricultural sector, universities, government agencies, conservation organizations, or development banks, the leaders of these efforts are in pursuit of a shared vision:

> *a world in which people and institutions appreciate natural systems as vital assets, recognize the central roles these assets play in supporting human well-being, and routinely incorporate their material and intangible values into decision-making*

This vision is built on the growing recognition that ecosystems are natural capital assets that supply a stream of societal benefits of tremendous value. These "ecosystem services" include the production of goods (e.g., seafood and timber), life support processes (water purification, flood control, and climate stabilization), and life fulfilling conditions (serenity and beauty), as well as the conservation of options (genetic diversity for future use).

The challenge is to turn this vision into effective incentives and institutions that will guide wise investments in natural capital, a problem no one has solved on a large scale. Relative to other forms of capital, assets embodied in ecosystems are poorly understood, scarcely monitored, and undergoing rapid degradation. Often the importance of ecosystem services is recognized only upon their loss, such as in the wake of Hurricane Katrina and the Asian Tsunami. Natural capital is typically undervalued, if indeed it is considered at all.

Two fundamental changes need to occur to replicate, scale up, and sustain the pioneering efforts underway, and to give ecosystem services real weight in decisions. First, the science of ecosystem services needs to be advanced rapidly. In promising a return (of services) on investments in nature, the scientific community needs to deliver knowledge and tools to quantify and forecast this return. Second, ecosystem services must be explicitly and systematically integrated into decision-making by individuals, corporations and governments. Without these advances, the value of nature will remain little more than an interesting idea captured in small, scattered, and idiosyncratic efforts.

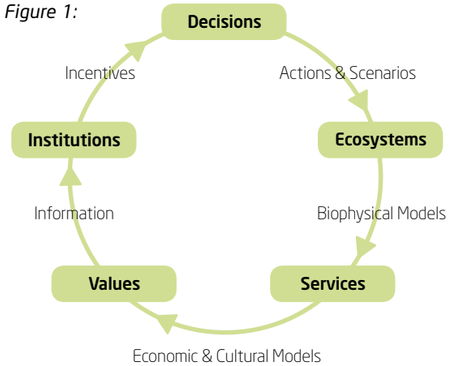
Here I propose a synthetic framework and key steps for integrating ecosystem services into decision-making, developed by the *Natural Capital Project* and others.

MAKING ECOSYSTEM SERVICES OPERATIONAL

In moving from theory to practical implementation, Figure 1 presents a framework of the role that ecosystem services can play in decision-making. Though Figure 1 is a continuous loop, the "decisions" oval is at the top to emphasize our focus on moving, under the motto of the Sophie Foundation, "from know how to do now." The results of decisions are human actions – relating to the use of land, water, and other elements of natural capital – that affect ecosystems and their provision of services.

Biophysical sciences are central to understanding the link between decisions and ecosystems (the effect of actions on ecosystems), and the link between ecosystems and services (biophysical models of "ecological production functions"). Social sciences are central to understanding the value of services to people ("economic and cultural models"). Because this value is multi-dimensional, it makes sense to use a diversity of economic and non-economic approaches to characterize it systematically.

Figure 1:



Finally, the value of ecosystem services provides information that can help design institutions to guide resource management and policy. Having the right institutions can create incentives so that the decisions of individuals, communities, corporations, and governments promote important and widely-shared values. The links between the "value", "institutions" and "decisions" ovals are much more the art and politics of social change than science; scientists can inform these debates if they target specific decisions and remain aware of social and political contexts.

Moving around the schematic, we can see how a focus on decisions can motivate the integration of ecosystem services into management and policy decisions, and inform an agenda to support this change.

A. DECISIONS - ECOSYSTEMS

The science needed to inform the arrow in Figure 1 connecting decisions and ecosystems is a huge challenge in itself. Decisions concerning changes in land cover and use, water and energy use, and infrastructure are complex. Their resulting actions span vast spatial scales, from production practices on family farms to regional water allocation and international climate policy, and temporal scales from transitory to long-lasting.

The scientific foundation for informing decisions that affect ecosystems could be greatly advanced by:

1. Collaborating with stakeholders to define important scenarios for analysis.
2. Better methods for assessing current conditions and for predicting future conditions in ecosystems.

B. ECOSYSTEMS - SERVICES

Ecological production functions translate the structure and function of ecosystems into the provision of important services. The Millennium Ecosystem Assessment was a powerful synthesis of existing knowledge, much at the global scale. There are also many fine-scale studies, typically focused on a single service.

Advancing the science for translating ecosystem condition and function to services, and the use of this science, requires an interdisciplinary and user-oriented approach that includes:

1. Developing rigorous, transparent, and flexible models of ecological production functions that integrate over multiple services at the scale of decisions.
2. Testing and refining these models in contrasting places around the world.

C. SERVICES - VALUES

The promise of ecosystem service analyses are that they will make explicit the costs and benefits to people of alternative actions. Economic valuation methods take changes in the supply of ecosystem services as input and translate these into change in human welfare, in monetary terms.

New research is needed to build credibility of the ecosystem services approach, and to show the value of ecosystem services, by:

1. Creating easy-to-use, easy-to-understand, rigorous tools for valuing ecosystem services.
2. Developing systematic and transparent non-monetary methods for valuing cultural services, to give them weight in decisions.
3. Developing methods for capturing spatial and temporal dimensions of service provision in valuation (important when beneficiaries do not coexist with those making decisions affecting service provision).

D. VALUES - INSTITUTIONS

Valuation of ecosystem services can provide a sound basis for, and help spur, institutional and policy change. Reforming institutions, or building them anew, is in many ways the most important and challenging frontier that we face.

We can help encode in our institutions a view of ecosystems as capital assets by:

1. Piloting incentives for the provision of ecosystem services and fostering shifts in cultural norms to recognize the value of ecosystem services.
2. Determining the merits and limitations of alternative policy and finance mechanisms, in different social contexts, poverty levels, and governance systems.
3. Developing institutions that achieve representation and participation by relevant communities.

E. INSTITUTIONS - DECISIONS

In concrete terms, this arrow in Figure 1 represents financial flows and other tangible incentives. But this model of change begs an important question: what actually motivates changes in behavior? Monetary rewards, legal sanctions, guilt, approval by peers?

The complexity of social change, and the diversity of values and situations facing stakeholders worldwide, highlight the need for a multi-pronged approach.

Changing human behavior so that decisions reflect the value of natural capital is the ultimate goal of the Natural Capital Project. Efforts to accomplish this will be aided by:

1. Broad discussion and inquiry into what motivates people and how social norms evolve, especially in the context of nature.
2. Incorporating traditional knowledge and practices into modern conservation approaches.
3. Developing a broader vision and process for conservation that moves from confrontation to participatory efforts that seek a wide range of benefits.

CONCLUSION

Our challenge is to make the natural capital framework operational: credible, replicable, scalable, and sustainable. There are many nuances and challenges to implementing the agenda outlined in Figure 1. Our approach considers multiple ecosystem services over scales appropriate to local, regional, and national-level resource decisions; connects the science of quantifying services with valuation and policy work to devise payment schemes and management actions; and catalyzes replication and scaling up of successful models that spark both confidence and inspiration.

SOPHIE PRIZE LAUREATES

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2005	SHEILA WATT-CLOUTIER / Canada
2004	WANGARI MAATHAI / Kenya
2003	JOHN PILGER / Australia
2002	HANS HELLIGHET BARTHOLOMEUS, ERKEBISKOP AV KONSTANTINOPEL, DET NYE ROMA OG ØKUMENISK PATRIARK
2001	ATTAC / Frankrike
2000	SHERI LIAO / Kina
1999	THOMAS KOCHERRY / India og HERMAN DALY / USA
1998	ERA – ENVIRONMENTAL RIGHTS ACTION / Nigeria

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TODAY'S ECONOMIC SYSTEM is at odds with the limits set by nature. Too many decisions emphasise short-term profit for few selected groups rather than morally motivated fair distribution of the world's resources.

THE PURPOSE OF THE SOPHIE FOUNDATION is to award an annual international environmental and sustainable development prize of US $ 100 000,- (one hundred thousand US dollar). The Sophie Prize will for as long as the means allow, be awarded to one or several individuals, or to an organization, that in a pioneering or a particularly creative way has pointed to alternatives to the present development and/or put such alternatives into practice.

THE RECIPIENT of The Sophie Prize will have sought a challenging answer to urgent global challenging issues within sustainable development and thus contributed to setting them on the international agenda.

THE SOPHIE FOUNDATION was founded in 1997, by the Norwegian author Jostein Gaarder and Siri Dannevig.

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