Box 4.5 Filling the Information Gap

Ecosystem	Characteristic	Principal Information Needs
All ecosystems 	Extent and land use	Satellite imagery has improved knowledge of the extent of various ecosystems, but available data are rarely precise enough to use at the national or subnational levels or to support all the needs of international environmental conventions. More frequent interpretations, improved data resolution, more systematic classification processes, and innovative approaches to ground-truthing are needed.
	Soil degradation	The only comprehensive global source of information on soil degradation (GLASOD) was undertaken in the late 1980s; a supplemental study, using more detailed information, only covered Asia (ASSOD). Needs include longer-term monitoring of soil organic matter, more detailed data on soil nutrient balances, and more work on indicators that show the link between soil quality and ecosystem goods and services.
	Biodiversity	Information on biodiversity is poor across ecosystems. Only an estimated 15-20 percent of species have been identified, although the Global Taxonomy Initiative is trying to address this issue. Even for known species, information on population trends and invasions is lacking. The Global Invasive Species Programme and the World Conservation Union are assembling databases on invasives, and considerable data exist among scientists, museums, or plant collections in all countries, but effort is needed to assemble them into a form that can inform national planning.
	Water quantity and quality	Better information on water resources can immediately benefit nations because of its direct link to human health and well-being. In most parts of the world (except OECD countries), water quality monitoring is rudimentary, and most efforts leave out important biological information. Groundwater data are not readily available at a global or continental scale.
Agroecosystems 	Condition	Food production and yield statistics are copious, but less is recorded about the underlying condition of agricultural systems, much less about differences in farming systems and land management practices. Reasonably detailed land use data are needed to predict the impact of agriculture on soil fertility, water quality, and habitats. Current data on soil degradation, water quality, and biodiversity are qualitative and often controversial.

Ecosystem	Characteristic	Principal Information Needs
Coastal Ecosystems 	Biodiversity	Availability of global biodiversity data for coasts and oceans remains limited; even data on the distribution of habitat types are lacking for most areas, except for coral reefs and mangroves. Because most coastal habitats are small and submerged, local surveys, such as the Global Coral Reef Monitoring Network, are still more reliable than remote sensing in determining extent and condition.
	Fisheries	Outside of North Atlantic fisheries, only 50-70 percent of landings are now reported by species, which precludes efforts to evaluate the impact of fishing on specific species. Population information on fish stocks, which is needed to assess whether harvests exceed sustainable levels, is still more fragmentary.
	Water quality	Remote sensing can help to fill information gaps about occurrence and duration of algal blooms, oil spills, turbidity, and sea surface temperature, but on-site monitoring is needed to evaluate many coastal water quality parameters, such as eutrophication, coliform bacteria, and persistent organic pollutants, as well as to monitor disease outbreaks among marine organisms. The Global Ocean Observing System established by the United Nations could compile such data.
Forest Ecosystems 	Condition	Extraordinarily poor data on woodfuel production and consumption will be difficult to supplement, since monitoring will be costly in most developing countries. Key data needs related to timber production are the relative rates of growth and harvest in production forests. Improved deforestation estimates will require both better satellite coverage and corroboration on the ground.
Freshwater Ecosystems 	Water quantity	Rain and stream gauges around the world are disappearing, victims of loss of funding for monitoring programs. Better basic hydrological information about river discharge, flood frequency, dry season flows, condition of wetlands, and location of dams would help planners meet the growing human demand for water.
	Fisheries	Improved data on inland fisheries, essential to ensure their sustainability, will require improved or new monitoring networks, since much of the catch is consumed locally and unrecorded.
Grassland Ecosystems 	Condition	High resolution satellite data measuring the productivity of grasslands, combined with on-the-ground measures of rainfall, livestock densities, and management systems could greatly increase our understanding of desertification and help national governments better manage rangelands.