

Box 2.10 Taking Stock of Coastal Ecosystems



Highlights

- Almost 40 percent of the world's population lives within 100 km of a coastline, an area that accounts for only 22 percent of the land mass.
- Population increase and conversion for development, agriculture, and aquaculture are reducing mangroves, coastal wetlands, seagrass areas, and coral reefs at an alarming rate.
- Fish and shellfish provide about one-sixth of the animal protein consumed by people worldwide. A billion people, mostly in developing countries, depend on fish for their primary source of protein.
- Coastal ecosystems have already lost much of their capacity to produce fish because of overfishing, destructive trawling techniques, and destruction of nursery habitats.
- Rising pollution levels are associated with increasing use of synthetic chemicals and fertilizers.
- Global data on extent and change of key coastal habitats are inadequate. Coastal habitats are difficult to assess from satellite data because areas are small and often submerged.

Key

Condition assesses the current output and quality of the ecosystem good or service compared with output and quality of 20–30 years ago.

	Excellent	Good	Fair	Poor	Bad	Not Assessed
Condition						

Changing Capacity assesses the underlying biological ability of the ecosystem to continue to provide the good or service.

	Increasing	Mixed	Decreasing	Unknown
Changing Capacity				

Scores are expert judgments about each ecosystem good or service over time, without regard to changes in other ecosystems. Scores estimate the predominant global condition or capacity by balancing the relative strength and reliability of the various indicators. When regional findings diverge, in the absence of global data weight is given to better-quality data, larger geographic coverage, and longer time series. Pronounced differences in global trends are scored as “mixed” if a net value cannot be determined. Serious inadequacy of current data is scored as “unknown.”

Conditions and Changing Capacity

FOOD PRODUCTION

Global marine fish production has increased sixfold since 1950, but the rate of increase annually for fish caught in the wild has slowed from 6 percent in the 1950s and 1960s to 0.6 percent in 1995–96. The catch of low-value species has risen as the harvest from higher-value species has plateaued or declined, masking some effects of overfishing. Approximately 75 percent of the major fisheries are fully fished or overfished, and fishing fleets have the capacity to catch many more fish than the maximum sustainable yield. Some of the recent increase in the marine fish harvest comes from aquaculture, which has more than doubled in production since 1990.

WATER QUALITY

As the extent of mangroves, coastal wetlands, and seagrasses declines, coastal habitats are losing their pollutant-filtering capacity. Increased frequency of harmful algal blooms and hypoxia indicates that some coastal ecosystems have exceeded their ability to absorb nutrient pollutants. Although some industrial countries have improved water quality by reducing input of certain persistent organic pollutants, chemical pollutant discharges are increasing overall as agriculture intensifies and industries use new synthetic compounds. Furthermore, while large-scale marine oil spills are declining, oil discharges from land-based sources and regular shipping operations are increasing.

BIODIVERSITY

Indicators of habitat loss, disease, invasive species, and coral bleaching all show declines in biodiversity. Sedimentation and pollution from land are smothering some coastal ecosystems, and trawling is reducing diversity in some areas. Commercial species such as Atlantic cod, five species of tuna, and haddock are threatened globally, along with several species of whales, seals, and sea turtles. Invasive species are frequently reported in ports and enclosed seas, such as the Black Sea, where the introduction of Atlantic comb jellyfish caused the collapse of fisheries.

RECREATION

Tourism is the fastest-growing sector of the global economy, accounting for \$3.5 trillion in 1999. Some areas have been degraded by the tourist trade, particularly coral reefs, but the effects of tourist traffic on coastal ecosystems at a global scale are unknown.

SHORELINE PROTECTION

Human modification of shorelines has altered currents and sediment delivery to the benefit of some beaches and detriment of others. Coastal habitats with natural buffering and adaptation capacities are being modified by development and replaced by artificial structures. Thus, the impact from storm surges has increased. Furthermore, rising sea levels, projected as a result of global warming, may threaten some coastal settlements and entire small island states.

Data Quality

FOOD PRODUCTION

Global data on fish landings are underreported in many cases or are not reported by species, which makes assessing particular stocks difficult. Data are fragmentary on how many fish are unintentionally caught and discarded, how many boats are deployed, and how much time is spent fishing, which obscures the full impact of fishing on ecosystems. Many countries fail to report data on smaller vessels and their fish landings.

WATER QUALITY

Global data on extent and change of wetlands and seagrasses are lacking, as are standardized and regularly collected data on coastal or marine pollution. Monitoring of nutrient pollution by national programs is uneven and often lacking. Current information relies heavily on anecdotal observation. Effective national programs are in place in some countries to monitor pathogens, persistent organic pollutants, and heavy metals, but data are inconsistent. No data are available on oil pollution from nonpoint sources.

BIODIVERSITY

Detailed habitat maps are available for only some areas. Loss of mangrove, coastal wetlands, and seagrasses are reported in many parts of the world, but little is documented quantitatively. Species diversity is not well inventoried, and population assessments are available only for some key species, such as whales and sea turtles. Data on invasive species are limited by difficulty in identifying them and assessing their impact. Few coral reefs have been monitored over time. Information on the ecological effects of trawling is poorly documented.

RECREATION

Typically, only national data on tourism are available, rather than data specific to coastal zones. Not all coastal countries report tourism statistics, and information on the impacts of tourism and the capacity of coastal areas to support tourism is very limited.

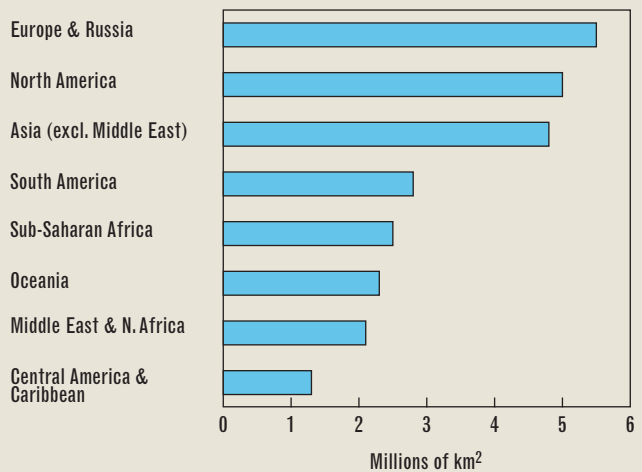
SHORELINE PROTECTION

Information on conversion of coastal habitat and shoreline erosion is inadequate. Information is lacking on long-term effects of some coastal modifications on shorelines. Predictions of sea level rise and storm effects as a result of climate change are speculative.

Scorecard

	Agro	Coast	Forest	Fresh-water	Grass-lands
Food/Fiber Production	↘	↘	↗	↕	↘
Water Quality	↘	↕	↘	↘	↔
Water Quantity	↘	↔	↘	↘	↔
Biodiversity	↘	↘	↘	↘	↘
Carbon Storage	↕	↔	↘	↔	↘
Recreation	↔	?	↔	↔	↘
Shoreline Protection	↔	↘	↔	↔	↔
Woodfuel Production	↔	↔	?	↔	↔

Area within 100 km² of a Coast



Population within 100 km² of a Coast

