

## Ecosystems -- Requirements/Needs

- location and area of ecosystem and habitat types (forest, coral reefs, etc.)
- condition of ecosystem types
- fragmentation of ecosystems
- community composition (survey species lists, including benthos)
- fisheries trophic index (marine and freshwater)
- species interactions
- migratory pathways (SI add)
- ecosystem services (SI add)
- geographic distribution of species
- population number or abundance of selected species
- threatened and extinct species lists
- diversity of organisms used in medicine
- extent, intensity and cost of alien species invasion
- number of land races/cultivars/breeds in production systems
- genetic heterogeneity within populations of selected species
- leaf area index or greenness
- ocean, freshwater water color and chlorophyll content
- sea ice
- canopy architecture: height, cover
- biomass per unit area
- carbon fluxes: NPP, NEE and respiration
- water fluxes: evaporation
- max and min temperature (at or near surface)
- near-surface winds
- humidity (near surface)
- precipitation
- ocean currents and waves
- solar radiation (net and PAR)
- sea-level rise
- ocean acidity
- soil type (texture, depth)
- nutrient supply: nitrogen, phosphorus, micronutrients
- water and soil salinity
- soil moisture
- optical properties of water (ocean color)
- soil sediment and water column organic matter content
- human population density and growth rate, urban and rural
- harvest intensity (on land and oceans)
- nitrogen deposition
- extent of coastal and lake eutrophic zones
- burned area
- pest and disease outbreaks
- river discharge pattern
- status and trends in ecosystems services in ecoregions (EPA add)
- amount and quality of ecosystem goods and services (USGS add)
- invasive species (USGS add)
- general species distributions (USGS add)
- land change (USGS add)
- contaminant loads (USGS add)
- habitat complexity, i.e. complexity/heterogeneity of the plant structure in a community (EPA add)
- the diversity of animals, that are disease reservoirs, in geographical habitats (EPA add)
- habitat complexity overlaid with populations of disease vectors (EPA add)

## **Agriculture – Requirements/Needs**

Seasonal and longer-term trends of temperature and rainfall patterns are a great influence on agricultural, desert and range, and forestry sectors. Drought and extreme weather decrease food production, foster desertification, and harm forests. Improved observations, models, and predictions of critical parameters (such as weather, salinity, erosion and soil loss, fires, pests and invasive species) can help mitigate these effects on farms, ranges and forests.

- crop production (yield, by crop type)
- population density (rural and urban)
- soil type (depth, texture, stoniness, fertility, acidity)
- fishery areas, marine protected areas
- sea surface temperature
- ocean color and chlorophyll content
- Water availability and quality for irrigation and pastoralism
- wetland areas
- land use and land use change
- livestock number, types and offtake
- land cover and change; cultivated area, forest area, rangeland area
- within-season crop condition; greenness and water stress
- topography (digital elevation model)
- fuelwood supply
- drought risk
- active fire, burned area, and fire risk
- land quality and land quality change (degradation)
- nutrient status and balance
- area affected by salinisation, water erosion, wind erosion
- fishery production, by resource type
- fishing effort; vessels and activity
- aquaculture area and production
- fishing effort; vessels and activity
- irrigated area and quantity of water used for irrigation
- farming systems
- distance to market and transport infrastructure
- access to food (availability, infrastructure, income, physiology)
- production intensity (actual/potential)
- agricultural and forestry machinery
- plant pests (SI add)
- fertilizer and pesticide use
- hormone and anti-biotic use (EPA add)
- use of genetically modified organisms (EPA add)
- emerging or re-emerging diseases in agriculture, fish and domestic animals (EPA add)