



## IUCN SSC Species Monitoring Specialist Group

# Database of Global Data Sources for Biodiversity Conservation Monitoring

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**For more information** and the criteria used for selecting data sources see: Stephenson, P.J. & Stengel, C. 2020. An inventory of biodiversity data sources for conservation monitoring. *PLoS ONE*, 15(12): e0242923. <https://doi.org/10.1371/journal.pone.0242923>

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**Table 1. Global biodiversity data sources of potential value in monitoring biodiversity state.**

Those data sources where at least some data (or mapping of data) appear to be instantly, openly and freely available are flagged with an asterisk (\*). Those data sources on priority sites (AZE sites, G200 ecoregions, KBAs, etc) will usually need to be used in tandem with other data sources to be relevant to monitoring certain indicators (e.g. number/abundance of threatened species in priority areas).

Note that some data sources would need updating before they could be of use.

Data source managers are encouraged to send any additional information or updates to [SpeciesMonitoringSG@gmail.com](mailto:SpeciesMonitoringSG@gmail.com).

Data source	Lead agency	URL	Description
Alliance for Zero Extinction Sites	Alliance for Zero Extinction	<a href="https://zeroextinction.org/">https://zeroextinction.org/</a>	Information on AZE sites and the species they contain, each of which is the last remaining refuge of one or more Endangered or Critically Endangered species as defined in the IUCN Red List of Threatened Species. Summary data in maps; full data available on request.
AmphibiaWeb*	University of California, Berkeley	<a href="https://amphibiaweb.org/index.html">https://amphibiaweb.org/index.html</a>	Information on amphibian declines, natural history, conservation, and taxonomy.
Aqua Maps*	FishBase and SeaLifeBase	<a href="https://www.aquamaps.org/search.php">https://www.aquamaps.org/search.php</a>	Generates model-based, large-scale predictions of natural occurrences of marine and aquatic species. Derived from GBIF, OBIS, FishBase, SeaLifeBase & AlgaeBase.
Barcode of Life Data System*	Centre for Biodiversity Genomics, Canada	<a href="https://www.boldsystems.org">https://www.boldsystems.org</a>	BOLD is a cloud-based data storage and analysis platform. It consists of four main modules, a data portal, an educational portal, a registry of BINs (putative species), and a data collection and analysis workbench. One of the main reference libraries used to identify sequences from eDNA and therefore support the tool's use in monitoring. Allows access to private data; public data transmitted to GBIF.
BioCASE (Biological Collection Access Service)*	Botanic Garden and Botanical Museum, Berlin	<a href="http://www.biocase.org/index.shtml">http://www.biocase.org/index.shtml</a>	Links together specimen data from natural history collections, botanical/zoological gardens and research institutions worldwide to identify historical sites of species occurrence.
Biodiversity Habitat Index	CSIRO	<a href="https://www.bipindicators.net/indicators/biodiversity-habitat-index">https://www.bipindicators.net/indicators/biodiversity-habitat-index</a>	Translates the observed spatial distribution of habitat loss and degradation into expected impacts on retention of terrestrial biodiversity. Data available on request.
BioTIME*	University of St Andrews, UK	<a href="https://biotime.st-andrews.ac.uk/download.php">https://biotime.st-andrews.ac.uk/download.php</a>	Raw data on species identities and abundances in ecological assemblages through time. Contains over 12 million records of almost 50,000 species from over 600,000 locations from land and sea territories. It helps to understand and predict biodiversity change by filtering data by biomes and taxa.

Data source	Lead agency	URL	Description
Birdlife Datazone*	BirdLife International	<a href="http://datazone.birdlife.org/home">http://datazone.birdlife.org/home</a>	Distribution and abundance of bird species worldwide, mostly presented as content of IUCN Red List. Population data only show general trend (as per Red List). Distribution maps need to be requested.
CGMFC-21: Continuous Global Mangrove Forest Cover for the 21st Century*	Salisbury University	<a href="http://faculty.salisbury.edu/~sehami/ton/mangroves/">http://faculty.salisbury.edu/~sehami/ton/mangroves/</a>	Mangrove cover annually; needs updating.
Continuous Plankton Recorder Survey	Marine Biological Association	<a href="https://www.cprssurvey.org/">https://www.cprssurvey.org/</a>	Established in 1931, it claims to be the longest running, most geographically extensive marine ecological survey in the world. Monitoring plankton communities across basin scales over time helps recognise changes in marine environments. Data accessible on the website through a request process.
DATRAS*	ICES: International Council for the Exploration of the Sea	<a href="https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx">https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx</a>	This platform stores data collected primarily from bottom trawl fish surveys coordinated by ICES expert groups. Data available for 45 years and continuously updated by national institutions. Currently only covers the 20 ICES member states in the northern hemisphere.
DEIMS-SDR (Dynamic Ecological Information Management System - Site and dataset registry)*	Centre for Ecology and Hydrology, Natural Environment Research Council, UK	<a href="https://deims.org/">https://deims.org/</a>	Data from long-term ecosystem research sites.
Domestic Animal Diversity Information System (DAD-IS)*	FAO	<a href="http://www.fao.org/dad-is/dataexport/en/">http://www.fao.org/dad-is/dataexport/en/</a>	Data on domestic strains of animal per country for monitoring Aichi Target 13.
eBioAtlas Database	IUCN and NatureMetrics	<a href="https://ebioatlas.org/">https://ebioatlas.org/</a>	In development: Project recently launched to develop a global database of fish, birds, amphibians and land animal occurrences identified by eDNA at sampled freshwater sites around the world. Data on species diversity of potential use in monitoring community trends over time. The database will be freely available to non-commercial users.
eBird*	Cornell Lab of Ornithology	<a href="http://ebird.org/">http://ebird.org/</a>	Citizen science bird observations.

Data source	Lead agency	URL	Description
eMammal*	Smithsonian Institution	<a href="https://emammal.si.edu/">https://emammal.si.edu/</a>	Data management system and archive for camera trap research projects.
Ecologically or Biologically Significant Marine Areas*	Secretariat of the Convention on Biological Diversity	<a href="https://www.cbd.int/ebsa/">https://www.cbd.int/ebsa/</a>	As with KBAs and protected areas, the use of these area in monitoring is to identify sites of importance for conservation.
Ecosystem (or Ecoregion) Intactness Index*	University of Queensland	<a href="https://espace.library.uq.edu.au/view/UQ:f51cace">https://espace.library.uq.edu.au/view/UQ:f51cace</a>	Intactness scores for the world's terrestrial ecoregions; needs updating.
EDGE Database	Zoological Society of London	<a href="https://www.edgeofexistence.org/search/">https://www.edgeofexistence.org/search/</a>	Data available on request on species considered Evolutionarily Distinct and Globally Endangered (EDGE), such as population numbers and trends, range, threats, etc. Currently focused on vertebrates and corals.
FishBase BRUVS Portal*	FishBase consortium	<a href="https://fishbase.ca/bruvs/search.php">https://fishbase.ca/bruvs/search.php</a>	Dataset of diversity, abundance, size and biomass of pelagic fishes collected using BRUVS (baited remote underwater videos) with 140,000 geo-referenced records for 303 taxa from around 70 surveys and 34 global locations.
Global 200 Ecoregions*	WWF-US	<a href="https://www.worldwildlife.org/publications/global-200">https://www.worldwildlife.org/publications/global-200</a>	Data on 238 terrestrial, freshwater, and marine ecoregions that harbour exceptional biodiversity and are representative of ecosystems.
Global Biodiversity Information Facility*	GBIF	<a href="http://www.gbif.org/">http://www.gbif.org/</a>	Houses over 1.6 billion species occurrence records from over 54,600 data sets (as of October 2020).
Global Environmental Flow Information System*	International Water Management Institute	<a href="http://gef.iwmi.org/">http://gef.iwmi.org/</a>	Interactive maps provide information related to Environmental Flows for current conditions and different Environmental Management Classes of a river system based on river health indicators.
Global Marine Environment Datasets – GMED*	GEOBON	<a href="http://gmed.auckland.ac.nz/index.html">http://gmed.auckland.ac.nz/index.html</a>	Climatic, biological and geophysical environmental layers of both present day, past and future environmental conditions. For use with species distribution modelling software like Maximum entropy (MaxENT) and for any other marine environment visualisation exercise.
Global Forest Change*	Global Land Analysis and Discovery (GLAD) laboratory, University of Maryland	<a href="https://glad.earthengine.app/view/global-forest-change">https://glad.earthengine.app/view/global-forest-change</a>	Global forest change data from 2000 onwards. Based on the Hansen et al. datasets, the database presents results from time-series analysis of Landsat images characterizing forest extent and change.
Global Forest Watch* (including	World Resources Institute	<a href="http://www.globalforestwatch.org/">http://www.globalforestwatch.org/</a>	Near-real-time data and tools for monitoring forests. Offers weekly GLAD deforestation alerts that show where tree cover loss is happening in the

Data source	Lead agency	URL	Description
GFW Climate, GFW Commodities, GFW Fires)			tropics. Includes several related tools: GFW Climate (data on forest carbon); GFW Commodities (data on forest change, concessions, mills, etc to assess supply chain risks); GFW Fires (near real-time information on forest and land fires).
Global Mangrove Watch*	Aberystwyth University (U.K.), solo Earth Observation (soloEO; Japan), Wetlands International, UNEP-WCMC, Japan Aerospace Exploration Agency (JAXA).	<a href="https://www.globalmangrovetwatch.org/">https://www.globalmangrovetwatch.org/</a> <a href="https://gma-panda.opendata.arcgis.com/">https://gma-panda.opendata.arcgis.com/</a>	Data and maps on mangrove extent and biomass in the tropics and subtropics (contributing to Ramsar Global Wetlands Observing System).
Global Reef Record*	Underwater Earth and partners	<a href="http://www.globalreefrecord.org/">http://www.globalreefrecord.org/</a>	Database was designed to provide a tool for analysing the current state of coral reef ecosystems on a local, regional and global scale and monitoring changes that occur over time. Provides access to data on over 300 reefs worldwide. Database was designed with the University of Queensland with additional data and analysis from World Resources Institute, SCRIPPS and NOAA.
Global Seabird Data Portal*	World Seabird Union	<a href="http://axiom.seabirds.net/maps/js/seabirds.php">http://axiom.seabirds.net/maps/js/seabirds.php</a>	An interactive map that displays seabird colony, population, and diet records throughout the world. Under development.
Globe Observer*	NASA	<a href="https://observer.globe.gov/get-data">https://observer.globe.gov/get-data</a>	Citizen science platform supported by NASA's Global Program that provides data from more than 120 countries on: land cover; tree observations; mosquito habitat mapper; and clouds observations. Accepts upload of new observations.
iNaturalist*	California Academy of Sciences and National Geographic Society	<a href="https://www.inaturalist.org/">https://www.inaturalist.org/</a>	Citizen science nature observations.
IUCN Red List of Ecosystems*	IUCN	<a href="https://iucnrl.org/">https://iucnrl.org/</a>	Status of a number of ecosystems.
IUCN Red List of Threatened Species*	The Red List Partnership – 10 organisations led by IUCN	<a href="https://www.iucnredlist.org/">https://www.iucnredlist.org/</a>	Extinction risk of species with data on range, population trends, habitat use, life history traits, use and trade, threats, conservation actions currently in place and conservation actions needed.

Data source	Lead agency	URL	Description
Living Planet Index*	WWF, Zoological Society of London	<a href="http://www.livingplanetindex.org/data_portal">http://www.livingplanetindex.org/data_portal</a>	Trends in over 27,000 populations of more than 4,700 vertebrate species.
Map of Life*	Yale University, University of Florida	<a href="https://mol.org/datasets/">https://mol.org/datasets/</a>	Accesses data on plants and animals from multiple sources (local inventories, regional checklists, expert range maps such as IUCN Red List, gridded surveys, point observations and Wikipedia).
Movebank*	Max Planck Institute for Ornithology	<a href="https://www.movebank.org/">https://www.movebank.org/</a>	Animal tracking data.
National Snow & Ice Data Center*	Cooperative Institute for Research in Environmental Sciences at the University of Colorado Boulder	<a href="https://nsidc.org/home">https://nsidc.org/home</a>	Global as well as national data on frozen ground, glaciers, ice sheets, ice shelves, sea ice, snow and soil moisture.
Ocean Health Index*	National Center for Ecological Analysis and Synthesis (NCEAS) and Conservation International	<a href="http://ohi-science.org/">http://ohi-science.org/</a> <a href="https://oceanhealthindex.org/">https://oceanhealthindex.org/</a>	Annual national scores for biological, physical, economic, and social aspects of ocean health since 2014.
Ocean Tracking Network Data Portal*	Dalhousie University, Canada	<a href="http://members.oceantrack.org/">http://members.oceantrack.org/</a>	Data from the tracking of aquatic animals
PlantLife Important Plant Areas Database*	PlantLife International	<a href="http://www.plantlifeipa.org/home">http://www.plantlifeipa.org/home</a>	Data on Important Plant Areas, including species, habitats, IPA criteria, threats, land use, and protection, as well as textual accounts of the sites.
Seabird Tracking Database	BirdLife International	<a href="http://www.seabirdtracking.org/">http://www.seabirdtracking.org/</a>	Largest collection of seabird tracking data bringing together data from species and families. Aim is to help further seabird conservation work and support the tracking community. Access to the data via a request process.
SWOT – The State of the World’s Sea Turtles*	Partnership including Oceanic Society, IUCN SSC Marine Turtle Specialist Group, Duke University's OBIS-SEAMAP	<a href="https://www.seaturtlestatus.org/online-map-data">https://www.seaturtlestatus.org/online-map-data</a>	Data collated on marine turtles (e.g., nesting data, satellite telemetry data, species distributions, Regional Management Unit boundaries, genetic data, etc.). No time-series population data.

Data source	Lead agency	URL	Description
ThreatSearch*	Botanic Gardens Conservation International	<a href="https://tools.bgci.org/threat_search.php">https://tools.bgci.org/threat_search.php</a>	Database of conservation assessments of plants.
TurtleNet: Turtle Nesting Distribution Abundance and Migration*	Queensland's Department of Environment and Science & the Convention on the Conservation of Migratory Species of Wild Animals	<a href="https://apps.information.qld.gov.au/TurtleDistribution/">https://apps.information.qld.gov.au/TurtleDistribution/</a>	Interactive portal that shows nesting and feeding sites and migration routes of marine turtles.
Water Quality Index for Biodiversity	United Nation's Environment Programme's Global Environment Monitoring System for Water (GEMS/Water)	<a href="https://www.bipindicators.net/indicators/water-quality-index-for-biodiversity">https://www.bipindicators.net/indicators/water-quality-index-for-biodiversity</a> <a href="https://www.unep.org/explore-topics/water/what-we-do/monitoring-water-quality">https://www.unep.org/explore-topics/water/what-we-do/monitoring-water-quality</a>	Data on water quality over time, apparently collated by UNEP from national reports.
Waterbird Populations Portal*	Wetlands International	<a href="https://wpp.wetlands.org/">https://wpp.wetlands.org/</a>	The Waterbird Populations Portal (WPP) online database provides current and historic estimates, trends and 1% thresholds for over 800 waterbird species and 2,300 biogeographic populations worldwide.
Water-related Ecosystems*	UNEP	<a href="https://www.sdg661.app/">https://www.sdg661.app/</a>	National, sub-national, basin and sub-basin aggregated data on water extent.
Wetland Extent Trends (WET) Index database	UNEP-WCMC	<a href="https://www.bipindicators.net/indicators/wetland-extent-trends-index">https://www.bipindicators.net/indicators/wetland-extent-trends-index</a> <a href="https://www.sciencedirect.com/science/article/abs/pii/S0006320715301476">https://www.sciencedirect.com/science/article/abs/pii/S0006320715301476</a>	Time-series data (available on request) on change in area of natural wetland
Wildlife Insights database*	Wildlife Insights/CI	<a href="https://wildlifeinsights.org/team-network">https://wildlifeinsights.org/team-network</a> <a href="https://app.wildlifeinsights.org/explore">https://app.wildlifeinsights.org/explore</a>	Camera trap data on nearly 1,000 species.
World Database on Key Biodiversity Areas	Managed by BirdLife International for the KBA Partnership	<a href="http://www.keybiodiversityareas.org/home">http://www.keybiodiversityareas.org/home</a>	Information on KBAs (available on request for non-commercial purposes).

Data source	Lead agency	URL	Description
World Ocean Database*	National Centers for Environmental Information at NOAA - US National Oceanic and Atmospheric Administration	<a href="https://www.ncei.noaa.gov/products/world-ocean-database">https://www.ncei.noaa.gov/products/world-ocean-database</a>	Claims to be the world's largest collection of uniformly formatted, quality controlled, publicly available ocean profile data. Potentially useful data to monitor the distribution of different types of plankton, as well as other ocean variables; updated every 5 years.
Zoological Information Management System (ZIMS)	Species 360	<a href="https://www.species360.org/products-services/zims-for-husbandry/">https://www.species360.org/products-services/zims-for-husbandry/</a>	Data available to members on animal accessions and dispositions, animals wanted and available, behavioural observations, feed logs, etc. Generates information needed for CITES and other permitting uses. Data on generation time important for IUCN Red List assessments.



**Table 2. Global data sources of potential value in monitoring pressures and threats to biodiversity.**

Those data sources where at least some data (or mapping of data) appear to be instantly, openly and freely available are flagged with an asterisk (\*).

Note that some data sources would need updating before they could be of use.

Data source managers are encouraged to send any additional information or updates to [SpeciesMonitoringSG@gmail.com](mailto:SpeciesMonitoringSG@gmail.com).

Data source	Lead agency	URL	Description
<b>Multiple threats</b>			
BioScope: Biodiversity Input-Output for Supply Chain & Operations Evaluation*	Platform BEE (Biodiversity, Ecosystems and Economy), The Netherlands	<a href="https://bioscope.info/">https://bioscope.info/</a>	Platform that provides information from 43 countries (27 EU countries and large economies outside the EU), covering the largest part of global economic activities. Focuses on the impact of business on biodiversity by studying potential drivers such as: climate change; terrestrial acidification; freshwater eutrophication; terrestrial ecotoxicity; marine ecotoxicity; freshwater ecotoxicity; agricultural land occupation; and water scarcity.
Cumulative Human Impacts on Marine Ecosystems*	Halpern lab	<a href="https://www.nature.com/articles/ncommms8615#supplementary-information">https://www.nature.com/articles/ncommms8615#supplementary-information</a>	Recent change over 5 years in cumulative impacts to marine ecosystems globally from fishing, climate change, and ocean- and land-based stressors.
Ecosystem Services Valuation Database*	Foundation for Sustainable Development	<a href="https://www.esvd.net/">https://www.esvd.net/</a>	Database on economic welfare values related to ecosystem services measured in monetary units to provide information on the economic benefits of ecosystems and biodiversity, and the costs of their loss, to support decision-making. More than 6,700 records from over 950 studies from all biomes, ecosystems services and geographic regions. Could potentially be linked to indicators monitoring the costs of ecosystem loss.
Forest Atlases*	World Resources Institute - WRI	<a href="https://www.wri.org/our-work/project/forest-atlases">https://www.wri.org/our-work/project/forest-atlases</a>	Online information systems to visualize and analyse data on forest change, land use, and land cover.
Forest Landscape Integrity Index*	WCS with numerous partners	<a href="https://www.forestlandscapeintegrity.com/">https://www.forestlandscapeintegrity.com/</a>	Integrates data on observed and inferred forest pressures and lost forest connectivity to generate a globally-consistent, continuous index of forest integrity as determined by degree of anthropogenic modification.
Global Database on Sustainable Land Management*	United Nations Convention to Combat Desertification (UNCCD)	<a href="https://www.wocat.net/en/global-slm-database">https://www.wocat.net/en/global-slm-database</a>	Data to assess spatial coverage of land degradation and sustainable land management (the use of soil, water, vegetation and animals to produce goods and services).
Global Footprint Network's National	Global Footprint Network		Time-series data on the gap between human demand on nature (Ecological Footprint) and nature's capacity to meet that demand (biological capacity) for over 200 countries and regions from 1961.

Data source	Lead agency	URL	Description
Footprint Accounts*		<a href="http://data.footprintnetwork.org/?ga=2.22111038.422986948.1602489816-449568750.1602489816#/">http://data.footprintnetwork.org/?ga=2.22111038.422986948.1602489816-449568750.1602489816#/</a>	
History Database of the Global Environment (HYDE)*	PBL Netherlands Environmental Assessment Agency	<a href="https://themasites.pbl.nl/tridion/en/themasites/hyde/download/index-2.html">https://themasites.pbl.nl/tridion/en/themasites/hyde/download/index-2.html</a>	Data on human populations and land use change going back centuries.
Land Use Harmonization V2*	Global Ecology Laboratory, University of Maryland	<a href="https://luh.umd.edu/data.shtml">https://luh.umd.edu/data.shtml</a>	Modelled land use states for the globe from year 800 AD. Land use categories include: primary and secondary natural vegetation in forest and non-forest subtypes, pasture, and croplands.
PREDICTS Database (Projecting Responses of Ecological Diversity In Changing Terrestrial Systems)*	UNEP-WCMC, Natural History Museum (London)	<a href="https://www.nhm.ac.uk/our-science/our-work/biodiversity/predicts.html">https://www.nhm.ac.uk/our-science/our-work/biodiversity/predicts.html</a>	Global database of terrestrial species' responses to human pressures collated from existing spatial comparisons of local-scale biodiversity exposed to different intensities and types of pressures. Includes analyses of PREDICTS-generated indicators such as the Biodiversity Intactness Index and the Sampled Red List Index for Plants.
Resilience Atlas*	Conservation International	<a href="https://www.resilienceatlas.org/">https://www.resilienceatlas.org/</a>	Tool for understanding the extent/severity of stressors affecting rural livelihoods, production systems, and ecosystems and the ways different wealth and assets impact resilience. Includes data on pressures such as forest loss and pollution.
Several data sources relate to habitat loss which can be caused by many (arguably all) of the threats listed below. In addition, many of the databases for monitoring the state of habitats (Table 1) can also be used to monitor habitat loss.			
<b>Residential &amp; Commercial Development</b>			
Anthropogenic biomes in SEDAC*	NASA's Earth Observing System Data and Information System (EOSDIS) hosted by CIESIN at Columbia University	<a href="https://sedac.ciesin.columbia.edu/data/collection/anthromes/sets/browse">https://sedac.ciesin.columbia.edu/data/collection/anthromes/sets/browse</a> <a href="https://sedac.ciesin.columbia.edu/data/sets/browse?title=urban+extent">https://sedac.ciesin.columbia.edu/data/sets/browse?title=urban+extent</a>	Data on anthropogenic biomes and urban extent (Data source assessed in Table 4).
<b>Agriculture &amp; Aquaculture</b>			
Forest 500*	Global Canopy	<a href="https://forest500.org/data">https://forest500.org/data</a>	Ranks annually the most influential companies and financial institutions in forest risk commodity supply chains.

Data source	Lead agency	URL	Description
Global data on forest plantations resources*	FAO	<a href="http://www.fao.org/3/Y2316E/y2316e0b.htm">http://www.fao.org/3/Y2316E/y2316e0b.htm</a>	Area under plantation and species used. Needs updating.
OECD Agriculture Statistics*	OECD	<a href="https://www.oecd-ilibrary.org/agriculture-and-food/data/oecd-agriculture-statistics_agr-data-en">https://www.oecd-ilibrary.org/agriculture-and-food/data/oecd-agriculture-statistics_agr-data-en</a>	Agriculture data for OECD countries and non-members, including forecasts on the evolution of agricultural markets and commodities, estimates of policy support, and indicators of environmental performance of agriculture.
Trase*	Stockholm Environment Institute, Global Canopy with Vizzuality and the European Forest Institute	<a href="https://trase.earth/about">https://trase.earth/about</a>	Maps the links between consumer countries via trading companies to the places of production, showing how commodity exports are linked to agricultural conditions
<b>Energy production &amp; mining</b>			
Global Energy Monitor*	Global Energy Monitor	<a href="https://globalenergymonitor.org/">https://globalenergymonitor.org/</a>	Trend data at national level on the numbers of mines and plants and farms for coal and steel, oil and gas, renewables and heavy industry.
<b>Transportation &amp; Service Corridors</b>			
Global Roadkill Network Data	Global Roadkill Network	<a href="http://globalroadkill.net/programs/progress.html">http://globalroadkill.net/programs/progress.html</a>	National data on road kill. Under development; not yet ready for use.
IWC Global Ship Strikes Database	International Whaling Commission	<a href="https://iwc.int/ship-strikes">https://iwc.int/ship-strikes</a>	Information on reported ship strikes, both historic and current.
<b>Biological Resource Use</b>			
Bushmeat Database	CIFOR	<a href="https://www.cifor.org/bushmeat/resources/bushmeat-database/">https://www.cifor.org/bushmeat/resources/bushmeat-database/</a> <a href="https://www2.cifor.org/bushmeat/resources/bushmeat-data-map/">https://www2.cifor.org/bushmeat/resources/bushmeat-data-map/</a>	A repository of papers and reports providing access to data on an important driver of species loss.
CITES Trade Database*	Maintained by UNEP-WCMC on behalf of the CITES Secretariat	<a href="https://trade.cites.org/">https://trade.cites.org/</a>	Massive database showing trade records by country. Can also be used to assess conservation actions relating to trade. Linked to CITES Wildlife Trade View, an interactive data viewer ( <a href="https://tradeview.cites.org/en">https://tradeview.cites.org/en</a> )
Elephant Trade Information System - ETIS	TRAFFIC on behalf of CITES	<a href="https://etisonline.org/">https://etisonline.org/</a>	Information system to track illegal trade in ivory and other elephant products around the world. Data only available to data providers; summary reports produced for each CITES Conference of the Parties.

Data source	Lead agency	URL	Description
Estimates of Global Fishery Bycatch and Discards*	FAO	<a href="http://www.fao.org/3/t4890e/T4890E02.htm">http://www.fao.org/3/t4890e/T4890E02.htm</a>	Qualitative and quantitative data on the character and magnitude of discards occurring in various fisheries of the world.
Fisheries and Aquaculture database*	FAO	<a href="http://www.fao.org/fishery/statistics/collections/en">http://www.fao.org/fishery/statistics/collections/en</a>	Multiple fisheries datasets. The ones relevant to fishing and monitoring overfishing include: Global Production, Global Capture Production, Global Tuna Catches by Stock, Global Aquaculture Production, Atlas of Tuna and Billfish Catches, Global Number of Fishers, Fishery Commodities and Trade, Consumption of Fish and Fishery Products.
Global Fishing Watch*	Oceana, SkyTruth, Google	<a href="https://globalfishingwatch.org/map-and-data/">https://globalfishingwatch.org/map-and-data/</a>	Tool to visualise, track and share data on global fishing activity in near real-time.
ICES Datasets*	International Council for the Exploration of the Sea	<a href="https://www.ices.dk/data/dataset-collections/Pages/default.aspx">https://www.ices.dk/data/dataset-collections/Pages/default.aspx</a>	Datasets on the marine environment, including fish stocks and catches.
Sea Around Us*	University of British Columbia	<a href="http://www.seaaroundus.org/">http://www.seaaroundus.org/</a>	Present fisheries and fisheries-related time series data at spatial scales that have ecological and policy relevance, such as by Exclusive Economic Zones, High Seas, or Large Marine Ecosystems. Includes the Mean Trophic Index for all Large Marine Ecosystems, a measure of whether fish stocks are being overexploited or sustainably managed. Data derived from FAO and other sources.
The ROUTES Dashboard*	USAID ROUTES Partnership including the Center for Advanced Defense Studies (C4ADS), Freeland, International AirTransport Association (IATA), TRAFFIC and WWF.	<a href="http://www.routesdashboard.org/">http://www.routesdashboard.org/</a>	Graphics on wildlife trafficking through airports.
Vulnerable Marine Ecosystems Database*	FAO	<a href="http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/vme.html">http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/vme.html</a>	Global inventory of fisheries measures to protect vulnerable marine ecosystems in areas beyond national jurisdictions.
Wildlife Trade Portal	TRAFFIC	<a href="https://www.wildlifetradeportal.org/#/login">https://www.wildlifetradeportal.org/#/login</a>	Database related to illegal wildlife trade allowing access to the open-source area of TRAFFIC'S wildlife trade incident database. Suited for

Data source	Lead agency	URL	Description
			threat/pressure indicators research. Data accessible through a request process.
<b>Natural System Modifications</b>			
Global Dam Watch*	Global Dam Watch	<a href="http://globaldamwatch.org/">http://globaldamwatch.org/</a>	Portal to data from three databases on dams: GLObal geOreferenced Database of Dams (GOOD2), Global Reservoir and Dam Database (GRanD), and Future Hydropower Reservoirs and Dams (FHReD).
<b>Invasive &amp; Problematic Species, Pathogens &amp; Genes</b>			
Global Register of Introduced and Invasive Species (GRIIS)	Led by the IUCN SSC Invasive Species Specialist Group for the Global Invasive Alien Species Information Partnership.	<a href="http://griis.org/">http://griis.org/</a>	Annotated and verified national inventories of introduced and invasive species (under development).
Invasive Species Compendium*	CAB International	<a href="https://www.cabi.org/ISC/">https://www.cabi.org/ISC/</a>	Range of science-based information to support decision-making in invasive species management worldwide.
IUCN Global Invasive Species Database (GISD)*	IUCN SSC Invasive Species Specialist Group	<a href="http://www.iucngisd.org/gisd/">http://www.iucngisd.org/gisd/</a>	Data on alien and invasive species that negatively impact biodiversity.
Threatened Island Biodiversity (TIB) Database*	TIB partnership: Island Conservation, University of California at Santa Cruz, BirdLife International, IUCN SSC Invasive Species Specialist Group.	<a href="http://tib.islandconservation.org/">http://tib.islandconservation.org/</a>	Global database of threatened island species at risk from invasive vertebrates.
<b>Pollution</b>			
Global Health Observatory Data Repository*	World Health Organisation	<a href="http://apps.who.int/gho/data/node.main.152?lang=en">http://apps.who.int/gho/data/node.main.152?lang=en</a>	Includes data on exposure to ambient air pollution, which will be just as relevant to wildlife as people. Needs updating.
Global Pollution Map*	Global Alliance on Health and Pollution	<a href="https://www.pollution.org/">https://www.pollution.org/</a>	Data on air pollution and contaminated sites.

Data source	Lead agency	URL	Description
Litterbase*	Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research	<a href="https://litterbase.awi.de/">https://litterbase.awi.de/</a>	Results from over 2,000 scientific studies on marine litter in global maps and figures. Includes data on the amount and distribution of litter and microplastics, and Interactions between aquatic life and marine litter.
Loss of Reactive Nitrogen to the Environment	York University	<a href="https://www.bipindicators.net/indicators/trends-in-loss-of-reactive-nitrogen-to-the-environment">https://www.bipindicators.net/indicators/trends-in-loss-of-reactive-nitrogen-to-the-environment</a>	The reactive nitrogen loss for different countries as a result of the production and consumption of food and the use of energy; data need updating and need to be requested.
Nitrogen Deposition Indicator	York University	<a href="https://www.bipindicators.net/indicators/trends-in-nitrogen-deposition">https://www.bipindicators.net/indicators/trends-in-nitrogen-deposition</a>	Shows where energy and food production have resulted in increased ammonia and nitrogen oxide emissions, with subsequent increase in nitrogen depositions. Data need updating and need to be requested.
<b>Climate change</b>			
Carbon Disclosure Project Data Portal*	CDP	<a href="https://data.cdp.net/">https://data.cdp.net/</a>	Carbon-related data for cities and regions including greenhouse gas (GHG) emissions, renewable energy, water resources, etc.
Climate Change Indicators*	US Environmental Protection Agency	<a href="https://www.epa.gov/climate-indicators">https://www.epa.gov/climate-indicators</a>	A diversity of climate-related data including GHG emissions, temperatures, bird wintering ranges, sea surface temperatures, etc.
Climate Change Initiative*	European Space Agency	<a href="https://www.esa-landcover-cci.org/?q=node/158">https://www.esa-landcover-cci.org/?q=node/158</a>	Maps on land cover, land use change and water bodies.
Climate Watch*	World Resources Institute - WRI	<a href="https://www.climatewatchdata.org/">https://www.climatewatchdata.org/</a>	Data on GHG emissions and countries' Nationally Determined Contributions.
Coral Reef Watch*	NOAA – US National Oceanic and Atmospheric Administration	<a href="https://coralreefwatch.noaa.gov/satellite/index.php">https://coralreefwatch.noaa.gov/satellite/index.php</a>	Satellite data to provide current reef environmental conditions to quickly identify areas at risk for coral bleaching. Includes Daily Global 5km Satellite Coral Bleaching Heat Stress Alert Area (real-time monitoring of coral bleaching heat stress)
Earth HQ*	Global Commons Alliance	<a href="https://globalcommonsalliance.org/alliance-projects/earth-hq/">https://globalcommonsalliance.org/alliance-projects/earth-hq/</a>	Provides data and data visualizations for extreme events, including extreme rainfall, fires, storms and coral reef bleaching. Derived from multiple datasets.
GHG Data from UNFCCC*	UNFCCC	<a href="https://unfccc.int/process/transparency-and-reporting/greenhouse-gas-data/ghg-data-unfccc">https://unfccc.int/process/transparency-and-reporting/greenhouse-gas-data/ghg-data-unfccc</a>	GHG emissions by country
Global Climate Change*	NASA	<a href="https://climate.nasa.gov/vital-signs/carbon-dioxide/">https://climate.nasa.gov/vital-signs/carbon-dioxide/</a>	Data on carbon dioxide levels, global temperatures, Arctic sea ice minimum, ice sheets and sea level.

Data source	Lead agency	URL	Description
Notre Dame Global Adaptation Index (ND-GAIN)*	University of Notre Dame Global Adaptation Initiative	<a href="https://gain.nd.edu/our-work/country-index/">https://gain.nd.edu/our-work/country-index/</a>	An annual index of climate change adaptation composed of a vulnerability score and a readiness score.
OECD Inventory of Support Measures for Fossil Fuels*	OECD - Organisation for Economic Co-operation and Development	<a href="http://www.oecd.org/fossil-fuels/data/">http://www.oecd.org/fossil-fuels/data/</a>	Online inventory of support measures for fossil fuels, which identifies, documents, and estimates the value of support arising from more than 1,000 individual policies that encourage the production or consumption of fossil fuels.
Water Information Network System - IHP-WINS*	UNESCO	<a href="http://ihp-wins.unesco.org/">http://ihp-wins.unesco.org/</a>	Water-related information ranging from groundwater to urban water through gender issues, from local to global scale. Includes data on level of water stress (SDG Indicator 6.4.2) and Environmental Water Stress in Transboundary River Basins.
World Weather and Climate Extremes Archive*	Arizona State University for the World Meteorological Organisation	<a href="https://wmo.asu.edu/#global">https://wmo.asu.edu/#global</a>	Data on world weather extremes.

**Table 3. Global data sources of potential value in monitoring conservation responses to biodiversity loss.**

Those data sources where at least some data appear to be instantly, openly and freely available are flagged with an asterisk (\*).

Note that some data sources would need updating before they could be of use.

Data source managers are encouraged to send any additional information or updates to [SpeciesMonitoringSG@gmail.com](mailto:SpeciesMonitoringSG@gmail.com).

Data source	Lead agency	URL	Description
<b>Land/Water Management</b>			
Atlas of Forest Landscape Restoration Opportunities*	World Resources Institute in collaboration with the University of Maryland and IUCN (as a contribution to the Global Partnership on Forest Landscape Restoration)	<a href="https://www.wri.org/our-work/project/global-restoration-initiative/methodology-about-atlas-forest-landscape-restoration">https://www.wri.org/our-work/project/global-restoration-initiative/methodology-about-atlas-forest-landscape-restoration</a>	Global approximation of where degraded forest lands have the potential to be restored. Includes maps on current forest cover, potential forest cover, forest condition, restoration opportunities and human pressure.
Restor*	Crowther Lab, ETH Zurich	<a href="https://restor.eco/map">https://restor.eco/map</a>	Data platform on restoration projects where information can be sorted by biomes, countries, type of interventions, post-restoration land cover and support sought. Could help monitor number and type of responses to habitat restoration.
Restoration Evidence*	Cambridge Conservation Initiative Endangered Landscape Programme	<a href="http://www.restorationevidence.org/">http://www.restorationevidence.org/</a>	Evidence for the effectiveness of ecological restoration management actions. Contains summaries of scientific research on the effects of actions to restore habitats, categorized by the target habitat or species
The Bonn Challenge Barometer*	IUCN and partners	<a href="https://infoflr.org/bonn-challenge-barometer">https://infoflr.org/bonn-challenge-barometer</a>	Action on Bonn Challenge commitments for Forest Landscape Restoration, including data on success factors, and results & benefits. Limited global coverage so far.
<b>Species Management</b>			
Database of Island Invasive Species Eradications*	Island Conservation, University of California at Santa Cruz, IUCN SSC Invasive Species Specialist Group, University of	<a href="http://diise.islandconservation.org/">http://diise.islandconservation.org/</a>	Data from historical and current invasive vertebrate eradication projects on islands (mostly focused on invasive mammals) including: island location and characteristics, details about the eradication (focal species, methods, outcome, etc), and links and contacts.



Data source	Lead agency	URL	Description
	Auckland, Landcare Research New Zealand		
PlantSearch*	Botanic Gardens Conservation International	<a href="https://tools.bgci.org/plant_search.php">https://tools.bgci.org/plant_search.php</a>	Global database of living plant, seed and tissue collections.
Zoo and Aquarium Statistics*	Association of Zoos & Aquariums	<a href="https://www.aza.org/zoo-and-aquarium-statistics">https://www.aza.org/zoo-and-aquarium-statistics</a>	Data on species held in captivity, including populations, life expectancy, etc.
<b>Livelihood, Economic &amp; Moral Incentives</b>			
Area of forest under sustainable management through FSC*	Forest Stewardship Council	<a href="https://fsc.org/en">https://fsc.org/en</a> <a href="https://fsc.org/en/facts-figures">https://fsc.org/en/facts-figures</a>	Figures on area of forest under FSC certified production.
Area of forest under sustainable management through PEFC*	Programme for the Endorsement of Forest Certification	<a href="https://www.pefc.org/discover-pefc/facts-and-figures">https://www.pefc.org/discover-pefc/facts-and-figures</a>	Figures on area of forest under PEFC certified production.
ASC Certification Updates*	Aquaculture Stewardship Council	<a href="https://www.asc-aqua.org/news/certification-update/">https://www.asc-aqua.org/news/certification-update/</a>	Monthly update on the progress of the ASC programme (number of sites, production volume, etc).
BCI Key Facts*	Better Cotton Initiative	<a href="https://bettercotton.org/document-library/">https://bettercotton.org/document-library/</a>	Data on numbers of farms under sustainable cotton production, tonnes and hectares produced, etc.
Gini Index*	World Bank	<a href="https://data.worldbank.org/indicator/SI.POV.GINI">https://data.worldbank.org/indicator/SI.POV.GINI</a> <a href="https://resourcewatch.org/data/explorer/GINI-Index">https://resourcewatch.org/data/explorer/GINI-Index</a>	The extent to which the distribution of income within an economy deviates from a perfectly equal distribution.
Human Development Index*	UNDP	<a href="http://hdr.undp.org/en/content/human-development-index-hdi">http://hdr.undp.org/en/content/human-development-index-hdi</a> <a href="http://hdr.undp.org/en/data">http://hdr.undp.org/en/data</a>	Average achievement in dimensions of human development: long and healthy life, being knowledgeable; having a decent standard of living.
LandMark*	World Resources Institute - WRI	<a href="https://www.landmarkmap.org/">https://www.landmarkmap.org/</a>	Includes maps of community and indigenous lands acknowledged and not acknowledged by governments; this could potentially be used to develop direct or proxy indicators of the degree to which indigenous rights or governance has changed.
Multidimensional Poverty Index*	UNDP	<a href="http://hdr.undp.org/en/2021-MPI">http://hdr.undp.org/en/2021-MPI</a>	Deprivations at the household and individual level in health, education, and standard of living.

Data source	Lead agency	URL	Description
RSPO Certification*	Roundtable on Sustainable Palm Oil	<a href="https://rspo.org/impacts">https://rspo.org/impacts</a>	Data on the area of land under RSPO certified production.
RTRS Certified Volumes and Producers*	Round Table for Responsible Soy Association	<a href="https://responsiblesoy.org/?lang=en">https://responsiblesoy.org/?lang=en</a>	Data on the production of soy that follows the RTRS Standard for Responsible Soy Production. Also calculates soy footprint.
MSC Certified Catch*	Marine Stewardship Council	<a href="https://www.msc.org/what-we-are-doing/our-collective-impact">https://www.msc.org/what-we-are-doing/our-collective-impact</a>	Data on proportion of fisheries under MSC and details of specific fisheries.
Proportion of fish stocks within biologically sustainable levels*	FAO	<a href="http://www.fao.org/sustainable-development-goals/indicators/1441/en/">http://www.fao.org/sustainable-development-goals/indicators/1441/en/</a>	Time-series data presented on proportion of fish stocks within biologically sustainable levels.
In addition to the data sets mentioned, other organisation involved in the sustainable production of commodities also provide data on volumes of certified crops produced and the hectares under sustainable management. Examples include: Bonsucro (sugar); Rainforest Alliance (cattle, cocoa, coffee, cut flowers, palm oil, tea); Roundtable on Sustainable Biomaterials (bio-based feedstock, biomass-derived material and any advanced fuel or product); UTZ (cocoa, coffee hazelnuts, tea).			
<b>Conservation Designation &amp; Planning</b>			
DOPA - the Digital Observatory for Protected Areas*	JRC	<a href="https://dopa.jrc.ec.europa.eu/en/mapsanddatasets">https://dopa.jrc.ec.europa.eu/en/mapsanddatasets</a> <a href="https://dopa-explorer.jrc.ec.europa.eu/">https://dopa-explorer.jrc.ec.europa.eu/</a>	As well as PA details extracted from Protected Planet, DOPA Explorer has tabs showing IUCN Red List species whose range maps overlap with the protected area.
Global Database on Protected Area Management Effectiveness (GD-PAME)*	UNEP-WCMC	<a href="https://pame.protectedplanet.net/">https://pame.protectedplanet.net/</a>	Results of management effectiveness assessments for protected areas.
Important Marine Mammal Areas*	IUCN WCPA Marine Mammal Protected Sreas Taskforce	<a href="https://www.marinemammalhabitat.org/">https://www.marinemammalhabitat.org/</a>	Data on Important Marine Mammal Areas (IMMAs) which are “discrete portions of habitat, important to marine mammal species, that have the potential to be delineated and managed for conservation”. Includes the IMMA eAtlas (an interactive map showing currently identified IMMAs) and the IMMA database (containing the details of each identified IMMA).
Marine Protection Atlas*	Marine Conservation Institute	<a href="http://www.mpatlas.org/">http://www.mpatlas.org/</a>	Data on level of protection and implementation of the world's marine protected areas.

Data source	Lead agency	URL	Description
Protected Planet – World Database on Protected Areas*	Lead: UNEP-WCMC with IUCN and UNEP	<a href="https://www.protectedplanet.net/">https://www.protectedplanet.net/</a>	Data on the world's protected areas. Now also includes data on Other Effective Area-Based Conservation Measures.
Protected Area Connectedness Index - PARC-Connectedness	CSIRO, GEO BON, GBIF, Map of Life	<a href="https://www.bipindicators.net/indicators/protected-area-connectedness-index-parc-connectedness">https://www.bipindicators.net/indicators/protected-area-connectedness-index-parc-connectedness</a>	Data on the extent to which terrestrial protected areas form “well-connected systems of protected areas ... integrated into the wider landscape”. Need to ask for data.
Protected Area Representativeness Index - PARC-Representativeness	CSIRO, GEO BON, GBIF, Map of Life	<a href="https://www.bipindicators.net/indicators/protected-area-representativeness-index-parc-representativeness">https://www.bipindicators.net/indicators/protected-area-representativeness-index-parc-representativeness</a>	Data on the extent to which terrestrial protected areas are “ecologically representative”. Need to ask for data.
ProtectedSeas Navigator*	ProtectedSeas	<a href="https://protectedseas.net/mpa-mapping">https://protectedseas.net/mpa-mapping</a>	Database on marine protected areas and their regulations and level of protection.
Ramsar Sites Information service*	Ramsar Secretariat	<a href="https://rsis Ramsar.org/?pagetab=2">https://rsis Ramsar.org/?pagetab=2</a>	Data on number of Ramsar sites and area covered.
<b>Legal &amp; Policy Frameworks</b>			
Climate Change Laws of the World Database*	London School of Economics	<a href="http://www.lse.ac.uk/GranthamInstitute/climate-change-laws-of-the-world/">http://www.lse.ac.uk/GranthamInstitute/climate-change-laws-of-the-world/</a>	Database of climate and climate-related laws, as well as laws and policies promoting low carbon transitions.
Policy Instruments for the Environment (PINE) Database	OECD - Organisation for Economic Co-operation and Development	<a href="https://www.oecd.org/environment/indicators-modelling-outlooks/policy-instrument-database/">https://www.oecd.org/environment/indicators-modelling-outlooks/policy-instrument-database/</a>	Information on policy instruments relevant for environmental protection and natural resource management.
Species+*	UNEP-WCMC, CITES Secretariat	<a href="https://www.speciesplus.net/species">https://www.speciesplus.net/species</a>	Data on species currently listed in the Appendices of CITES, CMS and other conventions (taxonomy, distribution, trade restrictions, etc).
The Policy Climate Interactive*	Climate Policy Initiative	<a href="http://www.thepolicyclimate.org/">http://www.thepolicyclimate.org/</a>	Policy issues in key countries relevant to climate change with evidence on emissions trends, emissions drivers, and policy activity.
<b>Research and Monitoring</b>			
UIS Database*	UNESCO Institute of Statistics	<a href="http://data.uis.unesco.org/">http://data.uis.unesco.org/</a>	Includes data on funds invested in research and development.
<b>Institutional Development (including financing)</b>			

Data source	Lead agency	URL	Description
Classification of Functions of the Government (COFOG)	OECD - Organisation for Economic Co-operation and Development	<a href="https://datahub.io/core/cofog#data">https://datahub.io/core/cofog#data</a> <a href="https://www.oecd-ilibrary.org/governance/government-at-a-glance-2017/classification-of-the-functions-of-government-cofog_gov_glance-2017-94-en">https://www.oecd-ilibrary.org/governance/government-at-a-glance-2017/classification-of-the-functions-of-government-cofog_gov_glance-2017-94-en</a>	Includes data on biodiversity expenditure.
Financing for Sustainable Development*	OECD	<a href="http://www.oecd.org/dac/financing-sustainable-development/">http://www.oecd.org/dac/financing-sustainable-development/</a>	Data on official and private resource flows.
FundingTheOcean.Org	Foundation Maps	<a href="https://maps.foundationcenter.org/#/map/">https://maps.foundationcenter.org/#/map/</a>	Ocean conservation funding. Data for sale.
World Carbon Market Database*	Carbon Market Data	<a href="https://www.carbonmarketdata.com/en/products/world-ets-database/presentation">https://www.carbonmarketdata.com/en/products/world-ets-database/presentation</a>	Includes information on carbon trading schemes.

**Table 4. Global data sources with multiple uses for biodiversity monitoring**

Those data sources where at least some data seem to be instantly, openly and freely available are flagged with an asterisk (\*).

Note that some data sources would need updating before they could be of use.

Data source managers are encouraged to send any additional information or updates to [SpeciesMonitoringSG@gmail.com](mailto:SpeciesMonitoringSG@gmail.com).

Data source	Lead agency	URL	Description
Aquastat*	FAO	<a href="http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en">http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en</a>	Huge dataset on water resources and water use by country.
Aqueduct*	World Resources Institute - WRI	<a href="https://www.wri.org/our-work/project/aqueduct">https://www.wri.org/our-work/project/aqueduct</a>	Data on water risks.
A.P.E.S WIKI*	Section on Great Apes (SGA) of the IUCN SSC Primate Specialist Group and the Max Planck Institute for Evolutionary Anthropology, Germany	<a href="https://apeswiki.eva.mpg.de/index.php/Main_Page">https://apeswiki.eva.mpg.de/index.php/Main_Page</a>	A platform for site-level information on ape research and conservation. With a total of 149 tracked regions (66 in West Africa, 52 in Central Africa, 16 in East Africa and 15 in Asia), it gives information about apes population status, the threats they are facing, conservation policies and current research on the topic.
Biodiversity Indicators Partnership Dashboard*	UNEP-WCMC & NatureServe	<a href="https://bipdashboard.natureserve.org/SelectCountry.html">https://bipdashboard.natureserve.org/SelectCountry.html</a>	Provides access to data from a range of sources that measure BIP indicators for themes such as terrestrial habitats, marine & freshwater habitats, policy & conservation actions, species, pollution, sustainable use of natural resources and land, finance, research and knowledge, and agriculture.
Biological Diversity and Ecological Forecasting Data Pathfinder*	NASA	<a href="https://earthdata.nasa.gov/learn/pa-thfinders/biodiversity">https://earthdata.nasa.gov/learn/pa-thfinders/biodiversity</a>	Platform on NASA's Earth Data website that provides information to assess Essential Biodiversity Variables and Sustainable Development Goals. Information is divided into four sections: vegetation characteristics and processes data; biodiversity-related spectroscopy data; human impacts data; and species distribution modeling data.
Data Basin*	Conservation Biology Institute	<a href="https://databasin.org/">https://databasin.org/</a>	A mapping and analysis platform linked to over 20,000 environmental datasets.
DataONE*	Data Observation Network for Earth	<a href="https://www.dataone.org/">https://www.dataone.org/</a>	Access to over 820,000 Earth and environmental data sets across multiple repositories (including citizen science data).
EarthNet2021*	Christian Requena-Mesa, Vitus Benson,	<a href="https://www.earthnet.tech/">https://www.earthnet.tech/</a>	Dataset containing target spatio-temporal Sentinel 2 satellite imagery at 20 m resolution matched with high-resolution topography and mesoscale (1.28

Data source	Lead agency	URL	Description
	Markus Reichstein, Jakob Runge & Joachim Denzler (different German Institution)		km) weather variables. Primarily for climate uses, but with applications in crop yield prediction, forest health assessments, biodiversity monitoring, coastline management or more general estimations of vegetation state.
Environmental Performance Index*	Yale University, Columbia University	<a href="https://epi.envirocenter.yale.edu/">https://epi.envirocenter.yale.edu/</a>	Every 2 years, ranks countries on 24 performance indicators across 10 issue categories (air quality, water quality, heavy metals, biodiversity, forests, fisheries, climate & energy, air pollution, water resources, agriculture). Includes the Species Habitat Index - the proportion of suitable habitats for a country's species that remain intact, relative to a baseline set in the year 2001 (see <a href="https://epi.yale.edu/epi-results/2020/component/shi">https://epi.yale.edu/epi-results/2020/component/shi</a> ).
EOSDIS Earthdata*	NASA	<a href="https://earthdata.nasa.gov/">https://earthdata.nasa.gov/</a>	Raw land and atmosphere data for use by GIS specialists. Includes daily updates on fires.
Environmental Data Explorer*	UNEP	<a href="http://geodata.grid.unep.ch/">http://geodata.grid.unep.ch/</a>	Data on more than 500 variables used to produce Global Environment Outlooks, on themes like Freshwater, Population, Forests, Emissions, Climate, Disasters, Health and GDP. Needs updating.
Environmental Sustainability Index*	Yale Center for Environmental Law and Policy, Center for International Earth Science Information Network at Columbia University, World Economic Forum	<a href="https://ec.europa.eu/jrc/en/publication/articles-books/environmental-sustainability-index-esi">https://ec.europa.eu/jrc/en/publication/articles-books/environmental-sustainability-index-esi</a>	The ESI integrates 76 variables into 21 indicators of environmental sustainability for 146 countries in 5 categories: environmental systems, reducing environmental stresses, reducing human vulnerability to environmental stresses, societal and institutional capacity to respond to environmental challenges, and global stewardship. Needs updating.
FAOSTAT*	FAO	<a href="http://www.fao.org/faostat/en/#data">http://www.fao.org/faostat/en/#data</a>	Huge database with several useful environmental datasets. Includes Land Use which includes area of land under primary forest, agriculture, fisheries, livestock, etc. Some data out of date.
FishBase*	FishBase consortium	<a href="http://www.fishbase.org/">http://www.fishbase.org/</a>	A global biodiversity information system on finfishes: taxonomy, biology, trophic ecology, life history & uses, and historical data going back 250 years. Links to several other marine data sources.
GEOBON Essential Biodiversity	GEOBON	<a href="https://portal.geobon.org/">https://portal.geobon.org/</a>	EBV data including changes in: forest cover (from Landsat), species diversity (from PREDICTS) and bird diversity (using countryside species-area relationship models from PREDICTS).

Data source	Lead agency	URL	Description
Variables Data Portal*			
The Global Earth Observation System of Systems (GEOSS) Portal*	GEOSS	<a href="http://www.geoportal.org/">http://www.geoportal.org/</a>	Various data overlays, including habitat types and threatened species.
GloVis*	US Geological Survey	<a href="https://glovis.usgs.gov/">https://glovis.usgs.gov/</a>	Visualization of satellite-based remote sensing datasets.
IBAT - Integrated Biodiversity Assessment Tool*	IBAT Alliance: BirdLife International, CI, IUCN, UNEP-WCMC	<a href="https://www.ibat-alliance.org/">https://www.ibat-alliance.org/</a>	Platform to access and analyse data from IUCN Red List of Threatened Species, World Database on Protected Areas and World Database of Key Biodiversity Areas. Data on the Species Threat Abatement and Restoration Metric has recently been added. Companies required to pay a corporate subscription for data access.
Impact Observatory	Impact Observatory	<a href="https://www.impactobservatory.com/">https://www.impactobservatory.com/</a>	Platform to visualize data on land use and land cover, carbon, and habitats.
IOC Ocean Data and Information System Catalogue of Sources*	International Oceanographic Data and Information Exchange (IODE) Programme of the Intergovernmental Oceanographic Commission (IOC) of UNESCO	<a href="https://catalogue.odis.org/">https://catalogue.odis.org/</a>	Online browsable and searchable catalogue of ocean related web-based sources/systems of data and information as well as products and services. It will also provide information on products and visualize the landscape (entities and their connections) of ocean data and information sources.
Map X*	University of Geneva, UNEP-GRID, UNEP	<a href="https://www.mapx.org/">https://www.mapx.org/</a>	An online platform for managing geospatial data on natural resources and the environment.
Mountain Portal*	Global Mountain Biodiversity Assessment	<a href="http://www.mountainbiodiversity.org/explore">http://www.mountainbiodiversity.org/explore</a>	Data on mountain biodiversity inked to Map of Life. Includes data on species ranges from various sources (including IUCN Red List, eBird, etc).
NatureServe Dashboard*	NatureServe	<a href="http://dashboard.natureserve.org/">http://dashboard.natureserve.org/</a>	Dashboard that presents data derived from multiple sources on biodiversity states (e.g. forest cover, water quality, genetic diversity of livestock) pressures (e.g. human footprint, forest cover loss) responses (e.g. ASEAN Heritage parks, GBIF records) and benefits (carbon sequestration, freshwater provision).

Data source	Lead agency	URL	Description
Ocean Action Hub*	UNDP	<a href="https://www.oceanactionhub.org/sdg-14-targets-context-and-indicators">https://www.oceanactionhub.org/sdg-14-targets-context-and-indicators</a>	Data on each of the SDG 14 Life Below Water indicators. Also has list of other relevant marine databases.
Ocean Biogeographic Information System – OBIS*	Intergovernmental Oceanographic Commission of UNESCO	<a href="https://obis.org/">https://obis.org/</a>	Huge global database on marine species linked to GBIF. Over 164 million records of over 137,000 species from more than 3,300 datasets (as of October 2020).
OBIS-SEAMAP*	Duke University	<a href="http://seamap.env.duke.edu/">http://seamap.env.duke.edu/</a>	Spatially referenced database aggregating marine mammal, seabird, sea turtle and ray & shark observation data.
Ocean Data Viewer*	UNEP-WCMC	<a href="http://data.unep-wcmc.org">http://data.unep-wcmc.org</a>	Includes data on global patterns and predictors of marine biodiversity across taxa and several species richness and cetacean distribution maps.
Ocean+ Habitats*	UNEP-WCMC, GEOBON & Proteus	<a href="https://habitats.oceanplus.org/">https://habitats.oceanplus.org/</a>	Data on the health, distribution and change of marine habitats around the world; includes calculations of % of habitat types in protected areas.
Ocean+ Library*	UNEP-WCMC	<a href="https://library.oceanplus.org/">https://library.oceanplus.org/</a>	An overview of global marine and coastal datasets of biodiversity importance.
PANGAEA*	Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research, and the Center for Marine Environmental Sciences, University of Bremen	<a href="https://www.pangaea.de/">https://www.pangaea.de/</a>	A data publisher for earth & environmental science. Large diversity of data sets available.
Reefbase – A Global Information System for Coral Reefs*	ReefBase	<a href="http://www.reefbase.org/global_database/default.aspx">http://www.reefbase.org/global_database/default.aspx</a>	Country-level data on coral reef resources, status, threats and management. Needs updating.
Resource Watch*	World Resources Institute (WRI) and 35 partners	<a href="https://resourcewatch.org/">https://resourcewatch.org/</a>	Data visualization platform (currently in Beta) with over 300 data sets on topics ranging from climate change to human migration, deforestation to air quality, food and agriculture to energy and more. Links to several biodiversity-related databases such as Protected Planet. Dashboards can be accessed for energy, forests, oceans (Ocean Watch), food, climate and water.
SDG Indicators Metadata Repository*	UN Statistics Division	<a href="https://unstats.un.org/sdgs/metadata/">https://unstats.un.org/sdgs/metadata/</a>	Data and statistics for the Tier I and II indicators in the global indicator framework for the SDGs.



Data source	Lead agency	URL	Description
Socioeconomic Data and Applications Center (SEDAC)*	NASA's Earth Observing System Data and Information System (EOSDIS) hosted by CIESIN at Columbia University	<a href="http://sedac.ciesin.columbia.edu/theme/conservation/data/sets/browse">http://sedac.ciesin.columbia.edu/theme/conservation/data/sets/browse</a>	Includes a large diversity of data sets (some out of date), including anthropogenic biomes of the world, global species richness for mammals and amphibians, Global Human Influence Index, Human footprint and Environmental Performance Index.
UN Biodiversity Lab*	UNDP, UNEP	<a href="https://unbiodiversitylab.org/">https://unbiodiversitylab.org/</a>	Online platform to access global datasets relating to the Aichi Biodiversity Targets and nature-based Sustainable Development Goals.
Vigilife – the Global Life Observatory*	Vigilife partnership (including SPYGEN, Université de Montpellier, Beauval Nature, ETH Zürich).	<a href="https://www.vigilife.org/en/">https://www.vigilife.org/en/</a>	Platform focused on using eDNA data to monitor aquatic and terrestrial biodiversity and facilitate action. Vigilife Maps (under development) will provide a platform for sharing data. Includes invasive species.
World Environment Situation Room*	UNEP	<a href="https://wesi.unep.org/">https://wesi.unep.org/</a>	Captures data from numerous sources to provide an overview on multiple topics, including biodiversity and nature loss, climate change, pollution and waste, air, chemicals and waste, disasters and conflicts, ecosystems, forests, freshwater, mountains, oceans and coasts, energy, green economy, sustainable consumption and production, and more.

**Table 5. Reports synthesising large biodiversity data sets over time.**

Report compilers and data source managers are encouraged to send any additional information or updates to [SpeciesMonitoringSG@gmail.com](mailto:SpeciesMonitoringSG@gmail.com).

Report	Lead agency	URL
Atlas of Sustainable Development Goals	World Bank	<a href="https://blogs.worldbank.org/opendata/2018-atlas-sustainable-development-goals-all-new-visual-guide-data-and-development">https://blogs.worldbank.org/opendata/2018-atlas-sustainable-development-goals-all-new-visual-guide-data-and-development</a>
EarthPulse	National Geographic Society	<a href="https://www.amazon.co.uk/National-Geographic-EarthPulse-Society-2010-10-18/dp/B01FIWBH6A/ref=sr_1_13?keywords=earthpulse&amp;qid=1558797125&amp;s=books&amp;sr=1-13">https://www.amazon.co.uk/National-Geographic-EarthPulse-Society-2010-10-18/dp/B01FIWBH6A/ref=sr_1_13?keywords=earthpulse&amp;qid=1558797125&amp;s=books&amp;sr=1-13</a>
Ecological Footprint Report	Ecological Footprint Network	<a href="https://www.footprintnetwork.org/resources/publications/">https://www.footprintnetwork.org/resources/publications/</a>
Environmental Outlook	OECD - Organisation for Economic Co-operation and Development	<a href="http://www.oecd.org/environment/indicators-modelling-outlooks/outlooks.htm">http://www.oecd.org/environment/indicators-modelling-outlooks/outlooks.htm</a>
Fishery and Aquaculture Statistics	FAO	<a href="http://www.fao.org/fishery/statistics/programme/publications/all/en">http://www.fao.org/fishery/statistics/programme/publications/all/en</a>
Global Assessment of Animal Genetic Resources	FAO	<a href="http://www.fao.org/publications/sowangr/en/">http://www.fao.org/publications/sowangr/en/</a>
Global Biodiversity Outlook	Secretariat of the Convention on Biological Diversity	<a href="https://www.cbd.int/gbo/">https://www.cbd.int/gbo/</a>
Global Environment Outlook	UNEP	<a href="https://www.unenvironment.org/global-environment-outlook">https://www.unenvironment.org/global-environment-outlook</a>
Global Forest Review (including Global Forest Pulse)	World Resources Institute - WRI	<a href="https://research.wri.org/gfr/global-forest-review">https://research.wri.org/gfr/global-forest-review</a>
Global Wetland Outlook: State of the World's Wetlands and Their Services to People	Secretariat of the Ramsar Convention	<a href="https://www.ramsar.org/sites/default/files/flipbooks/ramsar_gwo_english_web.pdf">https://www.ramsar.org/sites/default/files/flipbooks/ramsar_gwo_english_web.pdf</a>
IPBES Global Assessment Reports including: Land Degradation and Restoration Pollinators, Pollination and Food Production Scenarios and Models of Biodiversity and Ecosystem Services.	The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services - IPBES	<a href="https://www.ipbes.net/assessment-reports">https://www.ipbes.net/assessment-reports</a>
Living Planet Report	WWF, Zoological Society of London	<a href="https://livingplanet.panda.org/en-us/">https://livingplanet.panda.org/en-us/</a>

Report	Lead agency	URL
OECD-FAO Agricultural Outlook	OECD, FAO	<a href="https://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-agricultural-outlook-2020-2029_1112c23b-en">https://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-agricultural-outlook-2020-2029_1112c23b-en</a>
Our World in Data (regular syntheses of research data on biodiversity, forests and deforestation, etc)	Our World in Data	<a href="https://ourworldindata.org/biodiversity">https://ourworldindata.org/biodiversity</a> <a href="https://ourworldindata.org/forests-and-deforestation">https://ourworldindata.org/forests-and-deforestation</a>
Protected Planet Report	UNEP-WCMC, IUCN, National Geographic Society	<a href="https://www.protectedplanet.net/en/resources/global-reports">https://www.protectedplanet.net/en/resources/global-reports</a>
Renewables Global Status Report	REN21	<a href="http://www.ren21.net/status-of-renewables/global-status-report/">http://www.ren21.net/status-of-renewables/global-status-report/</a>
State of Finance for Nature	UNEP	<a href="https://www.unep.org/resources/state-finance-nature-2021">https://www.unep.org/resources/state-finance-nature-2021</a>
The State of the World's Biodiversity for Food and Agriculture	FAO	<a href="http://www.fao.org/3/CA3129EN/CA3129EN.pdf">http://www.fao.org/3/CA3129EN/CA3129EN.pdf</a>
State of the World's Birds	BirdLife International	<a href="http://datazone.birdlife.org/2020-annual-update">http://datazone.birdlife.org/2020-annual-update</a>
State of the World's Fisheries and Aquaculture	FAO	<a href="http://www.fao.org/state-of-fisheries-aquaculture">http://www.fao.org/state-of-fisheries-aquaculture</a>
State of the World's Forests	FAO	<a href="https://www.fao.org/state-of-forests/en/">https://www.fao.org/state-of-forests/en/</a>
State of the World's Plants and Fungi	Royal Botanic Gardens Kew	<a href="https://stateoftheworldsfungi.org/">https://stateoftheworldsfungi.org/</a> <a href="https://www.kew.org/science/state-of-the-worlds-plants-and-fungi">https://www.kew.org/science/state-of-the-worlds-plants-and-fungi</a>
State of the World's Sea Turtles Report	SWOT - State of the World's Sea Turtles	<a href="https://www.seaturtlestatus.org/swot-report">https://www.seaturtlestatus.org/swot-report</a>
State of the World's Water	WaterAid	<a href="https://washmatters.wateraid.org/publications/the-water-gap-state-of-the-worlds-water">https://washmatters.wateraid.org/publications/the-water-gap-state-of-the-worlds-water</a>
Status and Trends of Coral Reefs	Global Coral Reef Monitoring Network	<a href="https://www.icriforum.org/document-types/icri-publications-reports-and-posters/">https://www.icriforum.org/document-types/icri-publications-reports-and-posters/</a>
Territories of Life Reports (on territories and areas conserved by Indigenous peoples and local communities)	The ICCA Consortium	<a href="https://report.territoriesoflife.org/wp-content/uploads/2021/09/ICCA-Territories-of-Life-2021-Report-FULL-150dpi-ENG.pdf">https://report.territoriesoflife.org/wp-content/uploads/2021/09/ICCA-Territories-of-Life-2021-Report-FULL-150dpi-ENG.pdf</a>
TRAFFIC Briefings	TRAFFIC	<a href="https://www.traffic.org/publications/">https://www.traffic.org/publications/</a>
Waterbird Population Estimates	Wetlands International	<a href="http://wpe.wetlands.org/lmaps">http://wpe.wetlands.org/lmaps</a>
World Ocean Assessments	United Nations	<a href="https://www.un.org/regularprocess/woa2launch">https://www.un.org/regularprocess/woa2launch</a>

Report	Lead agency	URL
World Ocean Review	Maribus	<a href="https://worldoceanreview.com/en/download/">https://worldoceanreview.com/en/download/</a>
World Resources Report	World Resources Institute - WRI	<a href="https://www.wri.org/our-work/project/world-resources-report/wrr">https://www.wri.org/our-work/project/world-resources-report/wrr</a>
World Wildlife Trade Report	CITES Secretariat	<a href="https://cites.org/eng/news/first-world-wildlife-trade-report">https://cites.org/eng/news/first-world-wildlife-trade-report</a>

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