|  |  |  |
| --- | --- | --- |
|  | **Method** | **Description** |
| **Field Methods** | Acoustics | Used active or passive acoustics such as echosounders, hydrophones, etc. |
| Biologging | Relied on Instruments attached to animals to record position, environmental data, or a combination of the two |
| Experiment | Field or lab-based, a study that conducted an experiment related to hotspots |
| Fishery | Analyzed observer data, bycatch records, or other fishery dependent data |
| Paleontology | A study that used paleontology to identify hotspots |
| Radar | A study that used radar to identify hotspots |
| Social Survey | A study that interviewed participants |
| Survey | A study that used any form of field-based survey from ships, aircraft, drones, gliders, or personnel ashore |
| **Non-Field-Methods** | Database | Utilized a previously existing collection of data such as stranding network databases |
| Lab | A study largely carried out in lab with samples usually collected from the field |
| Model | A study that built or used previously existing models primarily to identify hotspots |
| Review | A literature review |
| Satellite | A study that used satellite imagery |

|  |  |
| --- | --- |
| **Taxa** | **Description** |
| Fish | Bony and cartilaginous fishes |
| Invertebrates | Crustaceans, mollusks, worms, and other miscellaneous invertebrates |
| Krill | Euphausiids |
| Mammals | Cetaceans, pinnipeds, fissipeds, sirenians, and jaguars |
| Microbes | Microscopic organisms |
| Misc. | A mixture of many taxa usually from a global scale study |
| None | Studies that focused on the physical environment, pollution, etc. |
| Plankton | Phyto- and zooplankton |
| Plants & Seaweed | Mangroves and macroalgae |
| Reptiles | Sea turtles and sea snakes |
| Seabirds | Seabirds and shorebirds |

|  |  |
| --- | --- |
| **Driver** | **Components** |
| Distance to physical features | land, icebergs, river mouth, shelf break, fronts, feeding areas, tidal channels, ice, edge of slope, |
| Circulation | wind, upwelling, currents, eddies, SSH, SSHA, MLD, shear stress, tide, waves, wave exposure, thermal stratification, current velocity, gulfstream north wall, SLA, swell, ekman transport, forcing, wind stress, gravitational sinking |
| Bathymetry & Topography | depth, slope, seamounts, aspect, canyons, shelf break, rugosity, islands, jetties, fjords, icebergs |
| Substrate | grain size, bottom type, reef structure, rhizome layer depth, roughness |
| Fishing | fishing pressure, gear type, wood debris |
| Hydrology & Climate | precipitation, monsoons, PDO, ENSO, El Niño, La Niña, alkalinity, pH, sedimentation, ice coverage, cloud coverage, climate |
| Water biogeochemistry | iron, silica, nitrates, particulate organic carbon, carbon cycling, POC, PIC, sediment organic content, aragonite saturation, pCO2 |
| Physical habitat structure | habitat complexity, type, wave exposure, canopy height, land area, reef area, structure |
| Shipping | traffic, vessel density, vessel speed, vessel type, visitation rate, proximity, ballast water, vessel track, vessel disturbance |
| Human activity | human impact, anthropogenic mortality, population, aquaculture, recreation, consumer demand, economic value, subsistence value, disturbance, live trade, plastic production, tourism, reclamation, desalinization, dredging, urban areas, climate change, Intrinsic importance, pristineness, threat type |
| Temperature | SST, temperature, isothermality |
| Salinity | salinity, density |
| Pollution | litter, oil, heavy metal, fishing gear, eutrophication, oil release rates, dumping, ship breakage, agriculture, deforestation, sewage, PCB exposure, heavy metal effluent, bulk discharge, noise |
| Primary Productivity | chl-a, NPTZ, nitrogen fixation, HAB |
| Species attributes | range size, life history, taxanomic group, social group size, wean size, taxa, behavior, body length, body shape, migratory behavior, enzymatic responses, colony location, colony size, physiological status, trophic level, ecological niche, dispersal mechanisms, sensitivity, diet, physiology, disease, DVM, Jansen-connell effects, intraspecific interactions, recruitment, nest distribution, abundance, distribution, body size, habitat, mortality, biomass, capture success, predator avoidance, grazing pressure |
| Misc water properties | Light (day length, light), pressure |

Use this table

|  |  |
| --- | --- |
| **Driver** | **Components** |
| Distance to physical features | land, icebergs, river mouth, shelf break, fronts, feeding areas, tidal channels, ice, edge of slope, |
| Circulation | wind, upwelling, currents, eddies, SSH, SSHA, MLD, shear stress, tide, waves, wave exposure, thermal stratification, current velocity, gulfstream north wall, SLA, swell, Ekman transport, forcing, wind stress, gravitational sinking |
| Bathymetry & Topography | depth, slope, seamounts, aspect, canyons, shelf break, rugosity, islands, jetties, fjords, icebergs, grain size, bottom type, roughness, substrate, seabed composition |
| Fishing | fishing pressure, gear type, wood debris |
| Hydrology & Climate | precipitation, monsoons, PDO, ENSO, El Niño, La Niña, alkalinity, pH, sedimentation, ice coverage, cloud coverage, climate |
| Water biogeochemistry | iron, silica, nitrates, particulate organic carbon, carbon cycling, POC, PIC, sediment organic content, aragonite saturation, pCO2, pressure, DO |
| Physical habitat structure | habitat complexity, habitat type, wave exposure, canopy height, land area, reef area, structure, reef structure, rhizome layer depth, wood debris |
| Shipping | traffic, vessel density, vessel speed, vessel type, visitation rate, proximity, ballast water, vessel track, vessel disturbance |
| Human activity | human impact, anthropogenic mortality, population, aquaculture, recreation, consumer demand, economic value, subsistence value, disturbance, live trade, plastic production, tourism, reclamation, desalinization, dredging, urban areas, climate change, Intrinsic importance, pristineness, threat type |
| Temperature | SST, temperature, isothermality |
| Salinity | salinity, density |
| Pollution | litter, oil, heavy metal, fishing gear, eutrophication, oil release rates, dumping, ship breakage, agriculture, deforestation, sewage, PCB exposure, heavy metal effluent, bulk discharge, noise |
| Primary Productivity | chl-a, NPTZ, nitrogen fixation, HAB |
| Species attributes | range size, life history, taxanomic group, social group size, wean size, taxa, behavior, body length, body shape, migratory behavior, enzymatic responses, colony location, colony size, physiological status, trophic level, ecological niche, dispersal mechanisms, sensitivity, diet, physiology, disease, DVM, Jansen-connell effects, intraspecific interactions, recruitment, nest distribution, abundance, distribution, body size, habitat, mortality, biomass, capture success, predator avoidance, grazing pressure |
| Light | day length, light |

|  |  |  |
| --- | --- | --- |
| Category | Component | Covariate |
| Dynamic Physical | Temperature | bottom temperature, SST, temperature |
| Dynamic Physical | Circulation | currents, current speed, current velocity, downwelling, NPTZ, eddies, EKE, Ekman transport, gyres, hydrographic forcing, surface currents, tidal current, tide, upwelling, water flow, rivers |
| Dynamic Physical | Atmospheric | climate, hydrology, La Niña, cloud coverage, precipitation, pressure, El Niño, ENSO, PDO, storms, shear stress, wind, wind speed, wind stress |
| Dynamic Physical | Distance to features | distance from edge of slope, distance from estuary mouth, distance from shelf break, distance from shore,distance to coast, distance to continental slope, distance to eddies, distance to estuary mouth, distance to fronts, distance to iceberg, distance to ocean, distance to plume, distance to shelf break, proximity to estuary, proximity to rivers, proximity to tidal channels |
| Dynamic Physical | Ice | ice, ice coverage, icebergs, glaciers |
| Dynamic Physical | Sea State | dynamic height, sea level anomaly, SSH, SSHA, swell, wave action, wave exposure, wave velocity, waves, tsunamis, fetch |
| Dynamic Physical | Water column structure | Gulfstream North Wall, fronts, mixed layer thickness, mixing, mixing line, isothermality, mixed layer depth, pycnocline depth, stratification, thermal stratification, density, turbidity |
| Dynamic Physical | Misc Dyphys | day length, light, moon illuminance, gravitational sinking, island mass effect, protrusion of surf zone, tectonic events |
| Bathy & Topo | General bathy/topo | bathymetry, depth, bottom depth, topography, land area, continental width, islands |
| Bathy & Topo | Seabed characteristics | ridges, roughness, rugosity, seabed composition, slope, substrate, sediment grain size, aspect, bottom type, wood debris |
| Bathy & Topo | Bathy structures | banks, canyons, fjords, guyots, seamounts, shelf break, shelfs |
| Biogeochem | Nutrients | nitrate, nitrogen, nutrients, silica, silicate, silicon, phosphate, phosphorous, pCO2, nitrogen fixation |
| Biogeochem | Carbon cycle | carbon cycling, particulate organic carbon, sediment organic content, DIC, PIC, POC |
| Biogeochem | Oxygen & Acidification | dissolved oxygen, DO, alkalinity, aragonite saturation, conductivity, dissolution, pH, salinity, oxygen, oxygen saturation |
| Species Attributes | Life history | dispersal mechanisms, life history, life stage, reproduction rate, wean mass, prey recruitment |
| Species Attributes | Physio & morph | enzymatic responses, phytoplankton fluorescence, animal sensitivity, body length, body shape, diet, prey size, heat wave stress |
| Species Attributes | Behavior | behavior, migratory behavior, DVM, social cues |
| Species Attributes | Demography | population size, range size, prey mortality, social group size |
| Species Attributes | Misc Spp | taxonomic group |
| Ecological | Habitat components | habitat, habitat complexity, habitat quality, habitat type, adult cover, canopy height, reef area, reef structure, rhizome layer depth, prey habitat, habitat structure |
| Ecological | Community composition | biodiversity, community composition, taxa, species composition, ecological niche, relative nekton density-distribution |
| Ecological | Primary production | chl-a, chlorophyll, phytoplankton, phytoplankton biomass, primary productivity, productivity, proximity to phytoplankton |
| Ecological | Misc interactions | intraspecific interactions, disease |
| Ecological | Predation | predator abundance, predator density, predators, prey abundance, prey biomass, prey density, prey distribution, prey type, trophic category, distance to feeding areas |
| Anthropogenic | Fishing | aquaculture, fishing, fishing gear, fishing gear type, fishing pressure, gear material, live trade, trawl depth |
| Anthropogenic | Production | agriculture, desalinization, industry, reclamation |
| Anthropogenic | Habitat alteration | biofouling, deforestation, dredging, climate change, climate velocity |
| Anthropogenic | Shipping | vessel track, vessel type, ship breaking, shipping, shipwrecks, ballast water, proximity to ports, visitation rate, port proximity, recreational boating |
| Anthropogenic | Pollutants | bulk discharge, dumping, eutrophication, heavy metal effluent, heavy metal exposure, sewage, sewage discharge, industrial effluent, litter, metal pollution, noise, oil pollution, oil release rates, PCB exposure, plastic density, pollution |
| Anthropogenic | Misc human | city, consumer demand, human activity, human impact, human population, proximity to urban areas, threat type, tourism |