|  |  |
| --- | --- |
| Table 1: Environmental classes and subclasses assigned from the FEGS-Classification System (Landers and Nahlik 2013). Coral reef class and subclass bolded in the table. | |
| Environmental Class | Environmental Subclass |
| **Aquatic** | |
|  | Rivers and Streams |
|  | Wetlands |
|  | Lakes and Ponds |
|  | **Near Coastal Marine** |
|  | Open Ocean and Seas |
|  | Groundwater |
| Terrestrial | |
|  | Forests |
|  | Agroecosystems |
|  | Created Greenspace |
|  | Grasslands |
|  | Scrubland / Shrubland |
|  | Barren / Rock and Sand |
|  | Tundra |
|  | Ice and Snow |
| Atmospheric | |
|  | Atmospheric |

|  |  |
| --- | --- |
| Table 2: Beneficiaries in the FEGS classification system (Landers and Nahlik 2013). Beneficiaries of Coral Reef Ecosystems chosen for this study are bolded in the table. | |
| *Beneficiary Class* | *Beneficiary Subclass* |
| **Agricultural** |  |
|  | Irrigators |
|  | Concentrated animal feeding operation (CAFO) |
|  | Livestock Grazers |
|  | Agricultural Processors |
|  | **Aquaculturists** |
|  | Farmers |
|  | Foresters |
|  |  |
| **Commercial/Industrial** |  |
|  | **Food Extractors** (Commercial fishermen) |
|  | **Timber, Fiber and Ornamental Extractors** |
|  | Industrial Processors |
|  | Industrial Dischargers |
|  | Electric and other Energy Generators |
|  | Resource-Dependent Businesses |
|  | **Pharmaceutical and Food Supplement Suppliers** |
|  | Fur / Hide Trappers and Hunters |
|  |  |
| **Government, Muni-cipal, & Residential** |  |
|  | Municipal Drinking Water Plant Operators |
|  | Waste Water Treatment Plant Operators |
|  | **Residential property owners** |
|  | Military / Coast Guard |
|  |  |
| Commercial/Military Transporters |  |
|  | Transporters of Goods |
|  | Transporters of People |
|  |  |
| **Subsistence** |  |
|  | Water Subsisters |
|  | **Food Subsisters** |
|  | Timber, Fiber, and Fur / Hide Subsisters |
|  | Building Material Subsisters |
|  |  |
| **Recreational** |  |
|  | **Experiencers and viewers** (Non-Use) |
|  | Food Pickers and Gatherers |
|  | Hunters |
|  | **Anglers** (Catch and release) |
|  | **Anglers** (Catch and keep) |
|  | **Waders, swimmers, and divers** |
|  | **Boaters** |
|  |  |
| **Inspirational** |  |
|  | **Spiritual and ceremonial** |
|  | **Artists, Photographers, Videographers** |
|  |  |
| **Learning** |  |
|  | **Educators and students** |
|  | **Researchers** |
|  |  |
| **Non-use** |  |
|  | **People who care (existence)** |
|  | **People who care (option/bequest)** |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Table 3: FEGS attribute classification system as developed into two hierarchal tiers (Sharpe et al. in review; US EPA in review) derived from both FEGS-CS and NESCS-PLUS (Newcomer-Johnson et al. in review). Only Tier 1 and Tier 2 Attribute columns are contained in the classification system. The sub-attribute column was defined by metrics developers and all shown in table were applicable to Coral Reef Ecosystems. Each attribute used in metrics analyses for Coral Reef Ecosystem is bolded. | | | |
| **FEGS Attribute Definitions for Hierarchal Tiers** | | | |
| Basic components of all ecosystems that comprise all aspects of any ecosystem, except for "composite" and "extreme event" Tier 1 attributes, they are all distinct from one another. "Composite" and "extreme event" attributes draw upon multiple categories. Tier 1 attribute level is what beneficiary is interacting with and related to the user role. | | Aspects of each basic component that the beneficiaries are directly concerned with. All aspects of each component should be reported. Tier 2 attributes are related to how beneficiary is interacting with Tier 1 attribute. This level is related to the use itself. | Specific examples of the Tier 2 attribute for which metrics can be developed. |
| **Tier 1 Attribute**  **(coarse scale)** | | **Tier 2 Attribute**  **(coarse scale)** | **Sub-attribute**  **(fine scale)** |
| **Water** | | **Water quality** | **chemicals and contaminants** |
| **pathogens and parasites** |
| **clarity** |
| **visibility** |
| salinity |
| **temperature** |
| Water quantity | water depth |
| water level |
| water flow |
| **Water movement** | **wave intensity** |
| **wave duration** |
| **wave magnitude** |
| **currents** |
| **Air** | | Air quality |  |
| **Weather** | | Wind strength/speed |  |
| Precipitation |  |
| Sunlight |  |
| Temperature |  |
| **Soil and substrate** | | Soil quantity |  |
| Soil quality |  |
| **Substrate quantity** |  |
| **Substrate quality** |  |
| **Natural materials** | | Fuel quality |  |
| Fuel quantity |  |
| Fiber material quantity |  |
| Fiber material quality |  |
| Mineral/chemical quantity |  |
| Mineral/chemical quality |  |
| Presence of other natural materials for artistic use or consumption (e.g. shells, acorns, honey) |  |
| **Flora** | | **Flora community** | **species richness/composition** |
| **measure of abundance or com-munity function/wholeness?** |
| **presence of invasive/nuisance species** |
| **Edible flora** | **Is it present? % cover? Sufficient abundance for ecosystem function? Sufficient abundance for extractive use? Condition?** |
| **Medicinal flora** |
| **Keystone flora** |
| **Charismatic flora** |
| **Rare flora** |
| **Commercially important flora** |
| **Spiritually/culturally important flora** |
| **Fungi** | | Fungal community | species richness/composition |
| measure of abundance or community function/wholeness |
| presence of invasive/nuisance species |
| Edible fungi | Is it present? % cover? Sufficient abundance for ecosystem function? Sufficient abundance for extractive use? Condition? |
| Medicinal fungi |
| Rare fungi |
| Commercially important fungi |
| Spiritually/culturally important fungi |
| **Fauna** | | **Fauna community** | **species richness/composition** |
| **measure of abundance or community function/wholeness** |
| **presence of invasive/nuisance species** |
| **Edible fauna** | **Is it present? % cover? Sufficient abundance for ecosystem function? Sufficient abundance and condition for extractive use?** |
| **Medicinal fauna** |
| **Keystone fauna** |
| **Charismatic fauna** |
| **Rare fauna** |
| Pollinating fauna |
| Pest predator/depredator fauna |
| **Commercially important fauna** |
| **Spiritually/culturally important fauna** |
| **Extreme events** | **Flooding** | **Risk of flooding** |  |
| Fire | Risk of fire |  |
| Extreme weather events | Risk of extreme weather events |  |
| Earthquakes | Risk of earthquakes |  |
| **Composite** | **Environmental aesthetics** | Sounds |  |
| Scents |  |
| **Viewscapes** |  |
| Phenomena (e.g., sunsets, northern lights, etc.) |  |
| **Naturalness** | **Ecological condition** |  |
| Open space | Acreage |  |