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Forum

Measuring and Reporting on Seagrass as an Essential Ocean Variable for Science and Management

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Abstract

To effectively manage and protect ocean life and the people who depend on it, we need coordinated, comparable observations of ocean biodiversity. Seagrass cover and composition is an essential ocean variable (EOV) of the Global Ocean Observing System because seagrasses are the foundation of coastal ecosystems worldwide, and support diverse marine life and ecosystem services. We present guidelines for collecting and reporting seagrass data that fulfill specifications for the EOV, including three priority measurements to maximize compatibility among data sets: seagrass cover, species composition, and areal extent, with priority environmental variables for interpreting changes in status and condition. To promote interoperability, we present a standard format for seagrass EOV data and metadata. These guidelines will enable better monitoring and assessment of seagrass ecosystems, facilitate syntheses, inform the Kunming–Montreal Global Biodiversity Framework headline indicator "Extent of natural ecosystems," and support evidence-based conservation and sustainable development.

Keywords: biodiversity, data standards, Kunming–Montreal Global Biodiversity Framework (GBF), habitat, management

Seagrasses are the only flowering plants adapted to life submerged in seawater and include 72 recognized species that inhabit mainly shallow (less than 50 meters deep) marine and estuarine waters (Green and Short 2003, Short et al. 2011). Seagrasses are the foundation of many coastal ecosystems (Duarte et al. 2025) along all continents except Antarctica, from tropical to polar regions. They support production of invertebrates and fishes 5–15 times higher than that of unvegetated bottoms (Unsworth et al. 2018) and serve as nursery areas and habitat for many species, including threatened and endangered turtles, dugongs, manatees, and sharks (Heck et al. 2003, McDevitt-Irwin et al. 2016, Lefcheck et al. 2019, Sievers et al. 2019). Seagrass habitats also provide a wide range of ecosystem services to people, providing fishery benefits comparable to those of corals and mangroves (de la Torre-Castro et al. 2014) and contributing to livelihoods and food security (de la Torre-Castro and Rönnbäck 2004, Nordlund et al. 2016, 2018, Unsworth et al. 2018, UNEP 2020,). Dense seagrass stands are also reservoirs of blue carbon fixed and stored in seagrass biomass and underlying sediments (Fourqurean et al. 2012, Serrano et al. 2021) and have therefore emerged as potentially significant habitats in carbon accounting frameworks (Macreadie et al. 2021, Unsworth et al. 2022, Malerba et al. 2023, Krause et al. 2025). Seagrass meadows can improve the quality of coastal waters by serving as areas of active nitrogen cycling (Herbert 1999) and by reducing disease-causing pathogens in the water (Lamb et al. 2017) and in fish harvested for food (Dawkins et al. 2024).

The future of these services is uncertain because the extent and condition of seagrass meadows are changing, increasing in some areas but declining in many others (Waycott et al. 2009, Dunic et al. 2021). The trajectory of any particular seagrass meadow depends on its species composition and environmental factors.

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Therefore, effective seagrass management and conservation require understanding the factors driving change (Dunic et al. 2021).

For all these reasons, seagrass ecosystems are key targets of management and policy goals throughout the world (Miloslavich et al. 2018, UNEP 2020), including nationally determined contributions to the Paris Climate Accord, the Kunming–Montreal Global Biodiversity Framework's headline indicator A.2 "Extent of natural ecosystems," and national biodiversity strategies and action plans. Achieving those goals requires reliable information on the status and trends of seagrasses and the organisms that associate with them (Unsworth et al. 2019a). The most pressing needs are for spatially and temporally explicit estimates of seagrass extent and abundance and how they are changing. The global extent of seagrass is currently estimated at 160,000–266,000 square kilometers (McKenzie et al. 2020). The high uncertainty of this estimate makes it difficult to assess the changing status and value of seagrass ecosystems. Improving these estimates requires increasing the collection and integration of interoperable data on seagrass extent, including from remote sensing with in-water validation of seagrass cover and species composition (Neckles et al. 2012, Veettil et al. 2020, Malerba et al. 2023), as well as new approaches to mapping the large and remote areas of seagrass in deep or turbid water that cannot be detected via remote sensing (Fonseca et al. 2008).

Documenting seagrass status and trends in ways that can be combined for regional assessments faces several impediments. First, the specific seagrass variables measured and the methods for doing so vary widely, hampering comparisons across studies (Marbà et al. 2013, Roca et al. 2016, McKenzie et al. 2020). Second, critical information on location, date, and methods of sampling (metadata) often remain inaccessible. Historically, much seagrass (and other) data has been difficult to access because it was not published or publicly archived and/or is reported in a multitude of languages (McKenzie et al. 2020). For example, the European Union's Water Framework Directive uses seagrasses as indicators of good ecological status of coastal waters, yet the heterogeneity of seagrass data and indicators has prevented reliable synthesis (Marbà et al. 2013). Happily, the growing trend toward open data offers hope for addressing these challenges (Wilkinson et al. 2016, Tanhua et al. 2019). But combining such data for quantitative regional and global assessments usually requires that field observations meet shared standards that allow them to be networked (Duarte 2002, Duffy et al. 2013, Marbà et al. 2013, 2019). A key to achieving this is to align seagrass researchers and managers around a common approach for monitoring the same set of seagrass and environmental measurements, collected in the same or comparable ways, and reported in comparable formats.

Operationalizing the seagrass essential ocean variable: A hierarchical approach

We outline a shared set of measurements and data curation guidelines on the basis of consensus among numerous international seagrass workers that satisfy the requirements of the essential ocean variable (EOV) seagrass cover and composition. We follow the framework of the EOVs promoted by the Global Ocean Observing System (GOOS) of the Intergovernmental Oceanographic Commission. GOOS advanced the concept of EOVs as the key set of ocean variables needed to assess ocean state and variability for important global ocean phenomena, and to provide essential data for applications that support societal benefit. The EOVs are derived from sustained measurements or combinations of measurements that can be undertaken at global scale in a repeatable and cost-effective manner and aim to provide standards for collecting and reporting ocean data that are interoperable (i.e., that can be combined across data providers to facilitate synthesis; Lindstrom et al. 2012, Miloslavich et al. 2018). Implementing these guidelines will support more reliable local research, better-informed management, and aggregation of observations for data products such as essential biodiversity variables (Pereira et al. 2013, Muller-Karger et al. 2018) and regional and global seagrass assessments (Short and Coles 2001, Nelleman 2009, Miloslavich et al. 2018, McKenzie et al. 2020, Pittman et al. 2022).

In this article, we describe the GOOS seagrass cover and composition EOV, outlining the subvariables (GOOS terminology for the key measurements used to estimate the EOV), supporting variables (optional measurements to provide scale or context for the subvariables), approaches to measuring them, and relations to other EOVs. For each EOV, there is a specification sheet that guides the standardized collection of the EOV measurements. The seagrass EOV specification sheet (https://goosocean.org/document/17513) provides additional detailed information, including a definition, derived products, observing specifications, and data management. We also provide a data dictionary and schema (supplemental material) to facilitate seagrass EOV data management by translating field data into a format that complies with Darwin Core vocabulary, ensures global interoperability, and enables data submission to the Ocean Biodiversity Information System (OBIS) and the Global Biodiversity Information Facility (GBIF).

A secondary goal of this article is to advance a general model for defining specifications for biological and ecosystem EOVs. The GOOS Biology and Ecosystems Panel drafted specification sheets for several EOVs (Miloslavich et al. 2018) that provide guidance on key kinds of measurements, resolution, and data management. We extend this guidance with practical recommendations for prioritizing variables and recommending standardized protocols for measuring them in the field. Making this connection more explicitly for seagrasses can provide useful guidance for other biological or ecological EOVs.

Specifications for the seagrass EOV: Three core subvariables

Seagrass cover and composition is one of the biology and ecosystems EOVs (Miloslavich et al. 2018). We describe specifications for the seagrass EOV that include measuring, curating, and reporting data on three priority metrics of seagrass status, considered subvariables of the EOV in GOOS terminology (i.e., those used to estimate the EOV): seagrass percentage cover, the percentage of the substrate covered by seagrass plants (box 1); seagrass species composition, the identities and relative abundances of seagrass species in an area (box 2); and seagrass areal extent, the horizontal extent of seagrass at the meadow or seascape scale (box 3). In the terminology of the GOOS, these represent the three subvariables of the seagrass EOV (figure 2, table 1), shown in the EOV specification sheet (https://goosocean.org/document/17513). Each of these provides useful information on its own, but our review indicates that combining these three subvariables provides the most generally useful assessment of seagrass status and change at landscape scales, addressing most scientific, management, and policy needs and targets, including a number of key indicators of global ecosystem health and sustainable development. Measurements of additional seagrass and environmental characteristics (supporting variables, in GOOS parlance; boxes 4 and 5) sharpen the evaluation of status and condition and are generally required to reli-

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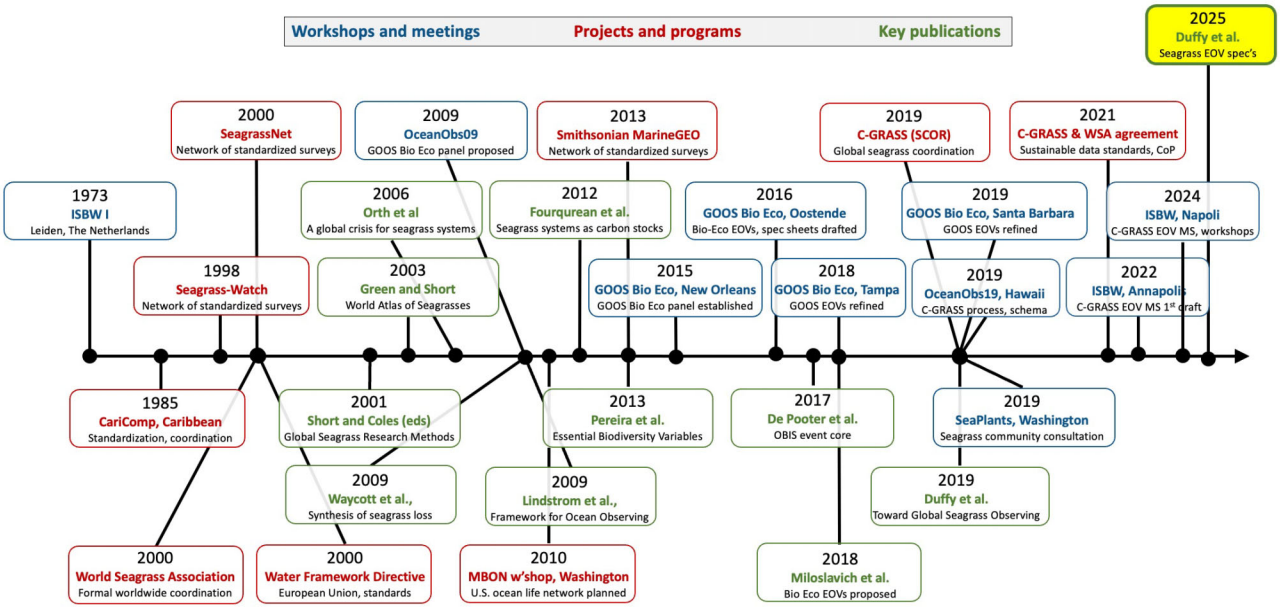

Figure 1. Summary timeline of key events in the evolution of standards and coordination for global seagrass monitoring.

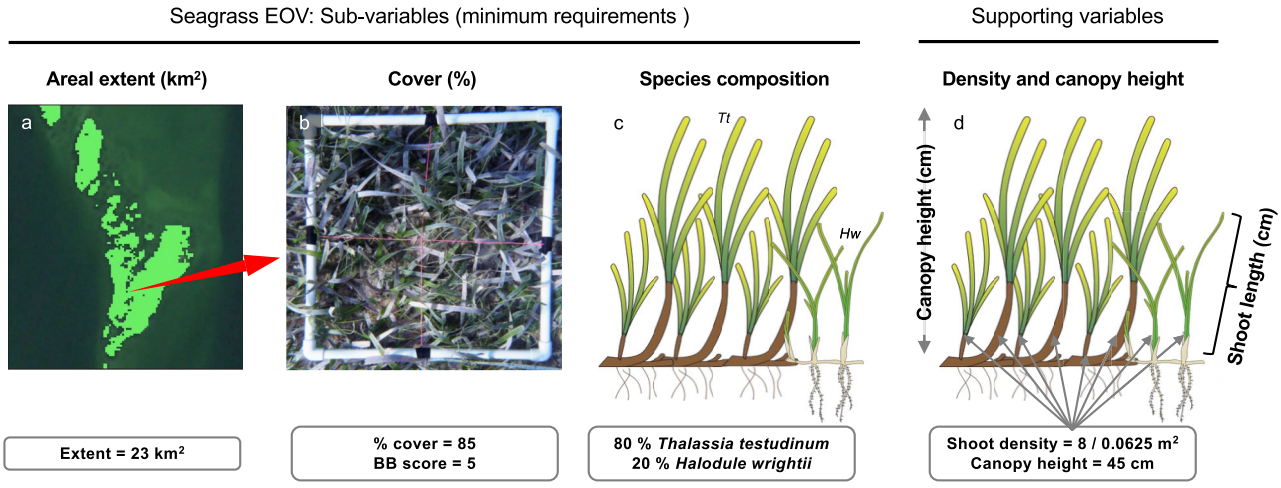

Figure 2. Measurements to characterize the seagrass EOV. (a) Seagrass areal extent is usually estimated from remotely sensed imagery, shown in green (lighter area) as pixels where spectral signature of seagrass was detected. Field surveys use (b) quadrats, drop-camera images, or other fixed-area plots to collect measures of seagrass percentage cover, species composition, and other aspects of abundance and seagrass physical structure. The priority information (subvariables) required to characterize the seagrass EOV (table 1) include (a) seagrass areal extent, (b) percentage cover, the proportion of sampled area occupied by live seagrass; and (c) species composition, in this case including two species *Thalassia testudinum* and *Halodule wrightii*. (d) Two of many potential supporting biological variables: canopy height (45 cm) and shoot density (8 shoots per 0.0625 square meters). *Source:* Images in (c) and (d) from Integration and Application Network's symbol library.

ably diagnose causes of change (Neckles et al. 2012). Implementing the seagrass EOV specifications broadly, including the minimum metadata and data management requirements (box 6), will remedy the problems of heterogeneity in seagrass indicators and poor metadata curation.

Seagrass (percentage) cover is a metric of seagrass abundance defined as the percentage of the substrate (e.g., in a field quadrat) that is covered by seagrass plants (figure 2, box 1). The percentage cover is therefore distinct from seagrass areal extent (see definition below), which is expressed in units of area (e.g., square kilometers) and generally measured at the scale of the seascape or larger region, rather than at the scale of an individual observer in the water. Approaches to measuring the percentage cover differ in spatial (box 1) and taxonomic (box 2) resolution. Measurements should be made at the highest resolution that is practical given available resources (box 1).

Seagrass species composition is the list of seagrass species detected within a defined sample plot (figure 2, box 2), preferably accompanied by the relative percentage cover of each (see the previous section). Species composition is a priority subvariable because seagrass species vary widely in size, life history traits, environmental tolerances, and response to disturbance, which, in turn, lead to variation in productivity, habitat value, and stability among habitats dominated by different seagrass species (Duarte 1991, Marba and Duarte 1998, Fourqurean and Rutten 2003, Kilminster et al. 2015, Turschwell et al. 2021). As a result,

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Table 1. Subvariables and selected supporting variables for the EOV seagrass cover and composition.

EOV variable type	Variable	Methods	Measurement type (definition)	Units
Subvariable (required)	Seagrass percentage cover	Box 1	Proportion of substrate in a specified sample area that is covered (substrate not visible) by seagrass	Percentage
Subvariable (required)	Seagrass species composition	Box 2	List of valid species names detected within a specified sample area	n/a
Subvariable (required)	Seagrass areal extent	Box 3	Total area occupied by seagrass habitat within designated spatial boundaries (e.g., national waters)	square kilometers
Supporting variable (biological)	Seagrass shoot length	Box 4	Mean length of a random sample of seagrass leaves from seabed to tip of the leaf	centimeters
Supporting variable (biological)	Seagrass canopy height	Box 4	Median vertical distance from the sediment surface to the highest reach of seagrass leaves in the water column	centimeters
Supporting variable (biological)	Seagrass shoot density	Box 4	The number of seagrass shoots per unit seabed area	Number per square meter
Supporting variable (environmental)	Water clarity	Box 5	A measure of how far down light can penetrate through the water column	meters
Supporting variable (environmental)	Depth	Box 5	Depth of collection in meters, indexed to some permanent benchmark (e.g., mean lower low water)	meters
Supporting variable (environmental)	Water temperature	Box 5	Temperature of water at a specified depth	degrees Celsius

Note: Citations to field protocols are found in the text boxes listed. See the supplemental material for more detail.

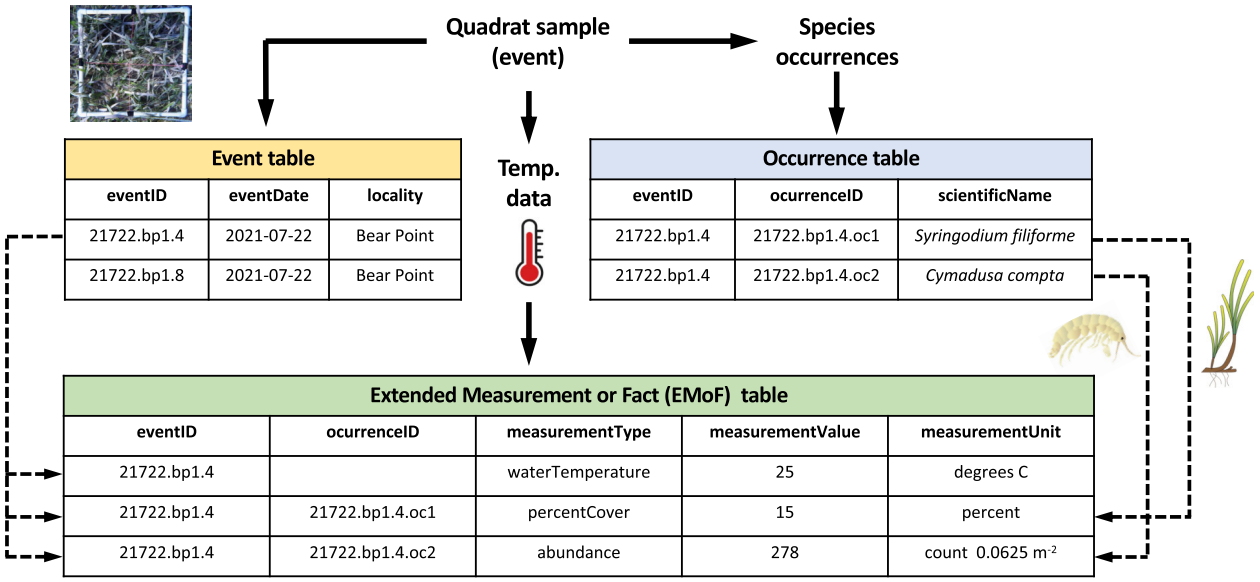

Figure 3. Data schema linking the three core data tables required for submission of seagrass EOV data to OBIS, with illustrative example data. The EMoF table includes data from one supporting environmental variable, water temperature; other useful environmental variables are described in table 1. Variable names follow Darwin Core standard and are defined in the supplemental material. Adapted from https://manual.obis.org/formatting.html#how-are-extensions-linked-to-core-tables-in-obis. Organism images are from the Integration and Application Network's symbol library.

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particular metrics can be more or less sensitive to change depending on which seagrass species dominate the habitat (Marbà et al. 2013). Seagrass species also differ substantially in the levels of ecosystem services they provide (Nordlund et al. 2016). In part for these reasons, particular aquatic plant species are used as bioindicators of stress or of good ecological status of coastal waters, and certain species are preferred for restoration of disturbed seagrass ecosystems (Foden and Brazier 2007, Marbà et al. 2013, McMahon et al. 2013, Congdon et al. 2023).

Seagrass areal extent is the horizontal spatial extent of seagrass as seen from above (i.e., the size of seagrass meadows at the landscape scale; figure 2, box 3; McKenzie et al. 2022). The areal extent is probably the most commonly acquired metric of seagrass ecosystem status across scales and the metric on which most resource managers depend (Orth et al. 2010, Costello and Kenworthy 2011, Neckles et al. 2012, McKenzie et al. 2022, Morris et al. 2022). The extent of vegetated habitat, including seagrass, is also central to national and international environmental policy because it provides a critical basis for countries accurately reporting on nationally determined contributions to the Paris Climate Accord, national biodiversity strategy action plans required by the Convention on Biological Diversity (CBD), and meeting targets for the CBD's Kunming–Montreal Global Biodiversity Framework (including the headline indicator: extent of natural ecosystems). Standardizing methods for estimating and reporting seagrass areal extent will therefore facilitate improved greenhouse gas inventories and biodiversity assessments. Seagrass areal extent is measured in a variety of ways via in-water and remote-sensing-based mapping (box 3).

The three subvariables are complementary, and together, they provide value greater than the sum of their parts. Geolocated observations of the EOV subvariables seagrass percentage cover and species composition complement estimates of seagrass extent. More specifically, measurements of cover and species composition at the plant scale can also provide valuable training data for developing AI models focused on interpreting and analyzing remote-sensing data, especially satellite platforms. Therefore, combining measurements of the three seagrass EOV subvariables, from plant to landscape scales, adds substantial value and should be prioritized for seagrass monitoring when possible.

Justification for the seagrass EOV subvariables

The design of a research or monitoring program will depend on its specific goals, and seagrass observing uses a wide variety of approaches (Short et al. 2002a, Fourqurean et al. 2002, McKenzie et al. 2003, Neckles et al. 2012, Marbà et al. 2013, Roca et al. 2016, Fourqurean et al. 2019). But any effort to protect or manage an ecosystem will have common elements, including attention to a range of spatial scales (Neckles et al. 2012). The specifications we describe are intended to capture these common elements and rest on a foundation built over decades (figure 1), beginning with the first calls for standardized and coordinated seagrass observing in the early 1970s, followed by a series of international workshops, a compendium of seagrass research methods (Short and Coles 2001), and the establishment of several comparative seagrass research and monitoring networks.

Prior work shows considerable consensus on the importance of seagrass percentage cover (Duarte and Kirkman 2001) and species composition (Kuo and Den Hartog 2001) as key variables. Among 49 seagrass indicators used in 42 European monitoring programs, shoot density and cover were the most commonly measured metrics, used in 24 and 18 of the 47 surveyed programs, respectively (Marbà et al. 2013). In a recent survey of seagrass monitoring methods used in 500 studies around the world (Rising et al. in press), seagrass percentage cover was the single most widely used of 77 seagrass metrics, with the three next most widely used being seagrass biomass, distribution (referred to in this article as *areal extent*), and species composition; the same study showed that the seagrass metrics considered most important by researchers were percentage cover, distribution, and species composition. When Australian seagrass managers were asked to identify healthy and unhealthy seagrass sites, the sites designated as healthy had greater percentage cover, biomass, shoot height, shoot density, or leaf area index, depending on the season (Wood and Lavery 2000, McMahon et al. 2013). These studies document wide agreement among researchers and monitoring programs that seagrass percentage cover, extent (distribution), and species composition are important priority measurements for characterizing seagrass status and condition.

The formal EOV specifications described in the present article are based on this consensus among researchers, aligning with the designation of "essential" ocean variables in biology and ecosystems as those variables needed to answer societally relevant questions (i.e, are impactful) and are feasible for sustained observation (Miloslavich et al. 2018). We further prioritize seagrass measurements that can be obtained without destructive sampling, such as cover and canopy height rather than biomass. Extending the general guidelines of the EOV to field practice additionally requires field protocols. Multiple programs and communities of practice have developed protocols, manuals, and training for surveying seagrass systems (Duffy et al. 2019). These several components were synthesized into the EOV specifications described in this article by the Coordinated Global Research Assessment of Seagrass Systems working group, supported by the Scientific Committee for Oceanic Research.

Hierarchical prioritization of measurements

To satisfy the EOV specifications, seagrass measurements should be prioritized hierarchically (table 1), with the three subvariables being of highest priority. Where capacity or resources are limited, plant-scale measurements should focus on seagrass percentage cover and species composition (boxes 1 and 2). The areal extent is key for understanding abundance and distribution at the landscape scale and can be estimated from either in-water mapping or from remote sensing as appropriate (box 3). More comprehensive surveys should always include these core measurements.

Additional seagrass measurements, such as seagrass shoot density, shoot length, canopy height (box 4), biomass (above- and below-ground), and epiphytic algal cover, are considered "supporting variables" of the seagrass EOV in the language of GOOS. They, along with measurements of the environment, provide scale or context for interpreting the subvariables (box 5). These supporting variables should always be paired with measurement of seagrass percentage cover and species composition, and wherever possible with seagrass extent. We recommend measuring seagrass percentage cover rather than biomass because the two variables usually are strongly correlated, but cover is more easily measured, nondestructive, and more directly related to remotely sensed estimates of seagrass areal extent.

Following this prioritized approach that includes a core set of common variables will ensure that seagrass data collected by different researchers are maximally compatible.

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Box 1. Seagrass cover and composition subvariable 1: Seagrass percentage cover.

Definition. Seagrass (percentage) cover (figure 2) is the percentage of the substrate in a defined sample area (e.g., a quadrat) that is covered by seagrass plants—that is, obscured from view by seagrass when observed from above.

Methods. Where conditions are favorable, the preferred and most commonly used method for measuring percentage cover is *in situ*, i.e., by observers in the water or at low tide using quadrats on the order of 0.25–1.0 square meters. Alternative methods for estimating cover include drop-camera deployments, video transects, aerial photographs, or high-resolution drone imagery. For all methods, a means of intercalibrating among observers is useful and can be achieved via calibration standards (Foden 2007), training exercises (Edgar and Stuart-Smith 2009), or automated annotation of photoquadrats (Beijbom et al. 2015). All sampling should be accompanied by metadata on the method used and the resolution or accuracy as appropriate. We recommend the following approaches, from best to the minimum acceptable for reporting the EOV.

Highest data quality. The percentage cover should be recorded separately for each seagrass species by an observer in the field, after which species cover measures are summed to provide total seagrass cover. Note that percentage bare substrate should be explicitly recorded, and that total cover may sum to more than 100% if species overlap such that more than one species is recorded under a given grid point. Several detailed protocols exist for measuring seagrass percentage cover (Short et al. 2002b, Fourqurean et al. 2001, Short and Coles 2001, McKenzie et al. 2003; MarineGEO: https://marinegeo.si.edu/protocols/seagrass-habitats), all of which are acceptable for reporting on the seagrass EOV as long as they produce reliable data expressed as percentage of a defined area occupied by seagrass and include the relevant metadata. Field observation allows the observer to move leaves and other objects for better identification and to better see understory species. Species can be quantified either on a continuous scale (0%–100%), by counting and identifying seagrass under each of a predefined grid of points (e.g., crossed monofilament lines within a field quadrat; Morris et al. 2022) or using broader abundance categories or bins. The most widely used such binning approach is an adaptation of the Braun-Blanquet method (Braun-Blanquet 1932, Kenworthy et al. 1993, Fourqurean et al. 2001) which bins cover into eight categories: 0.1 (solitary, with small cover); 0.5 (few, with small cover); 1 (less than 5% cover); 2 (5%–25% cover); 3 (25%–50% cover); 4 (50%–75% cover); 5 (more than 75% cover). If using grid points to estimate cover on a continuous scale, any seagrass species observed in the plot but not falling under a grid point and, therefore, not contributing to cover should be recorded as present, such as with an asterisk (*). Comparisons of marine field data with simulated data show that data collected with the eight-division Braun-Blanquet approach are relatively unbiased and perform well in parametric statistical tests designed for continuous data (Furman et al. 2018). The Braun-Blanquet approach also minimizes between-observer variation (Fourqurean et al. 2001). Therefore, we consider the continuous and binned Braun-Blanquet approaches roughly equivalent. However, higher-resolution cover measurements maximize interoperability of EOV observations because they can be binned into broader cover categories, such as Braun-Blanquet, whereas broad cover bins cannot be converted back into higher-resolution measurements. Therefore the resolution of a combined data set will be limited to the lowest resolution of any component survey.

Medium data quality. If field quantification of seagrass species cover is not feasible, cover should be quantified by capturing photoquadrats of each plot. Photoquadrats have the advantages of providing permanent records that can be evaluated by multiple observers or by machine learning in standardized ways (Langlois et al. 2023) and requiring less time in the field. But these advantages come at the cost of higher postfield labor to interpret the images and poor ability to capture rare or understory taxa compared with an *in situ* observer, who can manipulate plants in the field. The balance between these costs and benefits will vary with application, depending on the desired taxonomic resolution and local conditions. Cover of each species and total seagrass cover can be estimated using the point-counting or binning approaches described above, or via pixel-based classification (Roelfsema and Phinn 2010, Roelfsema et al. 2014).

Minimum data quality. The minimal data acceptable to fulfill the percentage cover subvariable of the seagrass EOV is an estimate of total seagrass percentage cover within plots (i.e., not separated by species), whether recorded by an observer in the field or captured via photoquadrat.

Estimates of seagrass cover are influenced by both seagrass characteristics (shoot density and length) and environmental conditions, notably water depth, and wave and current energy. Seagrass shoots will generally be flattened against the substrate at low tide, where covered by a quadrat grid, or in strong currents, but may be erect when cover is captured using photoquadrats. Estimates made under such distinct conditions will be similar at extremes of the spectrum (no or very sparse vs. very dense seagrass) but may differ at intermediate cover levels. Therefore, it is important to record the method used in the extended measurement-or-fact table under *samplingProtocol*.

Reporting. In the seagrass EOV data schema, seagrass percentage cover is reported using the Darwin core term *percentCover* in the extended measurement-or-fact table (supplemental material).

Supporting variables: Biological (EOV-related)

Seagrasses create important ecosystems by providing physical structure, supporting rich biological communities, and mediating biogeochemical and ecosystem processes (Duarte 1991, Nordlund et al. 2016, Miloslavich et al. 2018, Jones et al. 2021, Kennedy et al. 2022). Numerous biological aspects of seagrass plants and communities contribute to these processes and may be important in specific contexts. Our review identified several widely used measures to prioritize as supporting variables for the seagrass EOV (i.e., those useful to provide scale or context in interpreting the EOV; box 4, figure 2). Seagrass shoot length, the related estimate of canopy height, and shoot density all contribute to the aboveground biomass and structural complexity of seagrass meadows and influence the light regime, carbon storage, habitat use by animals, sediment stability and wave attenuation (Matheson et al. 1999, Hyndes et al. 2003, Gullström et al. 2008, Duarte

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Box 2. Seagrass cover and composition subvariable 2: Seagrass species composition

Definition. Seagrass species composition (figure 2) is the list of all seagrass species detected within the defined sample area. The list of species at a site can be assembled from the species detected while measuring the percentage cover as outlined in Box 1.

Methods. All sampling should be accompanied by metadata on the method used and the resolution or accuracy as appropriate. We recommend the following approaches, from best to the minimum acceptable for reporting the EOV.

Highest data quality. Identify all seagrasses in the defined sample area to species and deposit vouchers in a permanent repository. Accurately identifying seagrass species can be challenging and should prioritize *in situ* observations for several reasons. First, seagrass species growing beneath the canopy are difficult to see without manipulating plants in the field. Second, seagrasses are phenotypically plastic and many seagrass identification guides are based on plastic phenological traits rather than the well-defined flowers and reproductive structures generally used to identify plant species, which are often absent in seagrasses. Further, seagrass species identification often relies on subtle characteristics that cannot be reliably scored without close examination of the plant (Den Hartog 1970). Taxonomic monographs and identification guides (Den Hartog 1970, Phillips and Menéz 1988, Waycott et al. 2004, Bergstrom et al. 2006, Kuo et al. 2018) remain the gold standards for identification, as in other taxa. To validate identification and records of distribution, physical voucher specimens of each species should be deposited in permanent and accessible repositories (e.g., national museums; Culley 2013), along with tissue samples for DNA.

Medium data quality. Identify all seagrasses in the defined sample area to higher taxon or functional group. Seagrass identification can also be done, generally with lower accuracy and resolution, from photoquadrats. Where seagrasses cannot be identified to species level, they may be reported at higher taxonomic levels (e.g., genus, family) or by functional group (Althaus et al. 2015, Kilminster et al. 2015) or morphological category (e.g., strap-like, fern-like).

Minimum data quality. Identify the most abundant seagrass species present in the defined sample area.

Reporting. Reporting species data for EOVs follows the World Register of Marine Species (Vandepitte et al. 2018) as the authority on valid taxon names. In the seagrass EOV data schema, occurrence data for a species are reported via the *scientificNameID* column (which contains the WoRMS Life Science Identifier, LSID) in the Occurrence table (supplemental material).

Box 3. Seagrass cover and composition subvariable 3: Seagrass areal extent.

Definition. Seagrass areal extent (figure 2) is defined as the horizontal spatial extent of seagrass as seen from above, also known as 2D planar area (i.e., the size of a seagrass meadow or collection of meadows or patches at the landscape scale in square kilometers; Roelfsema et al. 2021).

Methods. Seagrass areal extent can be measured in several ways, as is detailed below, typically producing spatially explicit polygons that capture the distribution of seagrass in the area. In contrast to the quality levels suggested for the other two subvariables, the following approaches for mapping extent are somewhat complementary, trading off accuracy at small scales against ability to capture large-scale extent, and so are not prioritized here. For example, *in situ* observations can be integrated with satellite or drone imagery for training and validating mapping approaches, including via object-based and/or pixel-based classifiers and other spectral-based approaches, to create maps of seagrass areal extent (Roelfsema et al. 2013, 2014, 2015a, Dierssen et al. 2019, Lyons et al. 2024). All sampling should be accompanied by metadata on the method used and the resolution or accuracy as appropriate.

Option 1: Field perimeter mapping. Map seagrass extent by recording the perimeter of a seagrass meadow with a handheld GPS in the field. In this method an observer traces a distribution polygon by marking the perimeter of a seagrass meadow in the field using a GPS-enabled device (Orth et al. 2022, McKenzie et al. 2022). This is a common seagrass mapping method and is relatively reliable in that an observer in the field can distinguish, and often identify, seagrass as distinct from optically similar algae or other seabed structure, which can be difficult in remotely sensed imagery. However, such in-water measurements are time-consuming and generally not feasible for deep water, remote regions or large seagrass extents.

Option 2: Remote sensing. Seagrass extent estimates can also be obtained through remote sensing by imaging from airborne or spaceborne platforms, including aerial photographs, unoccupied aerial vehicles (UAVs), or satellite imagery (Wabnitz et al. 2008, Roelfsema et al. 2014, 2015b, Veettil et al. 2020, Lizcano-Sandoval et al. 2022), with several sources freely available, including Sentinel 2 via the European Space Agency/Copernicus, Landsat via NASA and the US Geological Survey, and cloud-based services such as Google Earth Engine and others (Deeks et al. 2024). Seagrass areal extent can be digitized from the resulting images using manual interpretation (Roelfsema et al. 2009, 2013), or via automated processes represented by assigning seagrass presence to an individual pixel or group of pixels (object) on the basis of the spectral and possible textural characteristics of the pixel. All methods have some caveats, including the difficulty of accounting for seagrass cover and patchiness in estimates of areal extent (Veettil et al. 2020). Mapping seagrass on the basis of remote sensing requires validation using field data from concurrent field studies (Coffer et al. 2023).

Another mapping approach useful in specific cases involves animal-borne cameras deployed on large free-ranging animals that reliably use seagrass habitats for feeding (e.g., dugongs) or breeding (e.g., tiger sharks; Gallagher et al. 2022).

Reporting. In the seagrass EOV data schema, seagrass areal extent can be reported using the Darwin core term *arealExtent* in the extended measurement-or-fact table (see the supplemental material); polygon data are added as footprintWKT (footprint well-known-text) strings to OBIS.

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Box 4. Supporting biological variables.

GOOS refers to these as *EOV-related supporting variables*. Here we describe three metrics of seagrass physical structure recommended for a detailed characterization and that complement the priority EOV subvariables described above. These are listed as priority supporting variables in the EOV specification sheet, with nomenclature described in the data dictionary and schema (see the supplemental material).

Seagrass shoot length

Definition. Seagrass shoot length (figure 2) is a property of the plant and measures the potential vertical dimension of a meadow when buoyant, unfouled leaves are suspended in a calm water column (units = cm).

Methods. Shoot length is estimated in practice as the median length of a sample of seagrass shoots from the base of the shoot to its tip, measured either *in situ* or in the lab. Because leaf length often varies substantially within a seagrass meadow, we recommend measuring a randomly selected sample of leaves from multiple shoots, so that outliers exert less influence on the estimate.

Reporting. In the seagrass EOV data schema, shoot length is reported using the Darwin core term *shootLength* in the extended measurement-or-fact table (supplemental material).

Seagrass canopy height

Definition. Seagrass canopy height (figure 2) is a measure of the realized vertical dimension of the seagrass meadow (in centimeters) in the field.

Methods . Seagrass canopy height is estimated *in situ* from a sample of measurements of the distance from the sediment surface to the highest reach of leaves in the water column. Early protocols recommended estimating canopy height as the "height above the bottom of 80% of the seagrass shoots" (Duarte and Kirkman 2001), which removes the influence of long outliers. We recommend instead reporting the median height of a sample of shoots, which similarly reduces the influence of outliers but is less subjective and does not require an arbitrary threshold. Realized canopy height is a product of both seagrass shoot length and environmental conditions, notably water movement, tidal height, and the fouling load on the leaves. These environmental conditions influence whether leaves extend vertically in the water column or are pressed against the substratum, and can vary through time. Therefore, median shoot length approximates realized canopy height under calm conditions but overestimates it when seagrass leaves are in a flattened position, e.g., exposed at low tide or when leaves are heavily fouled. Where possible, we encourage concurrent measurement of leaf length and canopy height for maximal compatibility with other studies.

Reporting. In the seagrass EOV data schema, canopy height is reported using the Darwin core term *canopyHeight* in the extended measurement-or-fact table (supplemental material).

Seagrass shoot density

Definition. Seagrass shoot density (figure 2) is the number of seagrass shoots in a defined sample area (e.g., a field quadrat; usually measured per meter). Shoot density is a measure of seagrass abundance and, along with canopy height, influences animal abundance, wave attenuation, water flow, suspended particle trapping, and spectral reflectance (color). It is usually closely correlated with above-ground biomass within a site.

Methods. Shoot density can be measured nondestructively by counting shoots *in situ*, but this is time consuming in communities with multiple seagrass species, and in deeper water where divers have limited bottom time. Where shoot density is high, it is often measured in a smaller section of the quadrat than that used to measure cover. Alternatively, shoot density can be measured in the lab, such as the number of shoots in a sample of known bottom area returned from the field (e.g., in samples collected for biomass measurement).

Reporting. In the seagrass EOV data schema, shoot density is reported using the Darwin Core term *shootDensity* in the extended measurement-or-fact table (in the supplemental material).

et al. 2013). Seagrass shoot length, density, and canopy height can also be sensitive indicators of stress or disturbance (Congdon et al. 2023). Other supporting variables often measured include seagrass belowground biomass as an indicator of carbon storage and resilience to stressors (Collier et al. 2021, Krause et al. 2025), elemental and stable isotopic composition (carbon, nitrogen, phosphorus, the carbon isotope $\delta^{13}C$, the nitrogen isotope $\delta^{15}N$, etc.; Fourqurean and Rutten 2003, Fourqurean et al. 2019) and epiphytic algae cover (Wood and Lavery 2000) as indicators of nutrient or trophic status, and seagrass physiological properties and morphological traits (e.g., branching properties, leaf area index; Duarte 1991).

Supporting variables: Environmental

Measurements of environmental parameters are essential to interpret drivers of change in seagrass status and condition and, therefore, for assessing management effectiveness (Orth et al. 2017). We focus on the following as most likely to be useful across regions and environments (box 5).

The extent, abundance, and condition of seagrasses and other benthic primary producers are strongly influenced by the availability of photosynthetically active radiation (Dennison et al. 1993, Lee et al. 2007). Light availability is a function of water depth and water clarity, the latter depending on the quantities of suspended sediment, phytoplankton, and colored dissolved organic matter in the water. These are influenced by runoff from land, currents, and wind mixing. In particular, coastal development and land clearing increase sediment and nutrient runoff, resulting in degraded water clarity that is a principal predictor of seagrass decline worldwide (Dennison 1987, Fourqurean et al. 2003, Kemp et al. 2004, Burkholder et al. 2007, Turschwell et al. 2021). For these reasons, water clarity (or its inverse, turbidity) is a priority supporting variable for the seagrass EOV, along with water depth.

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Box 5. Supporting environmental variables.

The most important environmental variables for interpreting seagrass extent and condition include water clarity, water depth, water temperature, and salinity. Tidal stage and current velocity are especially important in influencing both canopy height and the observer's assessment of percentage cover; therefore, they are important for interpreting these EOV components.

Water clarity

Definition. Water clarity is the measure of how far light can penetrate through water, indicating the presence of suspended particles, algae, or dissolved organic matter.

Methods. Water clarity can be measured using Secchi depth (in meters), light attenuation, or beam attenuation, light back-scattering, or turbidity measured as light side-scattering (Turner et al. 2022), although in some cases turbidity may not accurately measure light availability to the seagrass plant (Sofonia and Unsworth 2010). Probably the metric of light availability used most commonly by seagrass researchers is the percentage of surface incident light at depth, which can then be related to published light requirements of seagrass species (Lee et al. 2007).

Reporting. GOOS provides metrics for water clarity under the Ocean Color EOV (specification sheet: https://goosocean.org/document/19959). In the seagrass EOV data schema, we use the term *waterClarity* in the extended measurement-or-fact table; units will differ for different methods (e.g., Secchi disk depth in meters, light attenuation coefficient per meter; supplemental material).

Water depth

Definition. Water depth is the vertical distance from the surface of a body of water to its bottom. It is measured as a straight, perpendicular line downward from the water's surface to the substrate.

Methods. Water depth can be measured in various ways. At the shallow depths typically supporting seagrasses, depth is usually measured by a weighted plumb line, transect tape, or scuba depth gauge, although various remote-sensing approaches for depth measurement are developing (He et al. 2024).

Reporting. In the seagrass EOV data schema, water depth can be reported as verbatim depth, reported at the time of observation, or as the minimum and maximum values of a depth range (in meters) in the extended measurement-or-fact table (see the supplemental material). Depths should be reported in reference to local chart datum because water depth at a given location can vary widely where tidal range is large.

Water temperature

Definition. Water temperature is technically a measure of the kinetic energy of water, and in practice a measure of how hot or cold the water is.

Methods. GOOS provides specifications for the EOVs Sea surface temperature (specification sheet: https://goosocean.org/document/17466) and Subsurface temperature (specification sheet: https://goosocean.org/document/17467), although satellite and oceanic shipboard measurements may be inaccurate near the coasts.

Reporting. In the seagrass EOV data schema, water temperature can be reported as sea surface temperature or subsurface temperature (both in degrees Celsius).

Water depth interacts with water clarity to influence light penetration to the bottom where seagrass grows. For this reason, the depth limit of seagrass distribution is commonly used as an indicator of environmental quality in coastal and estuarine systems (Dennison et al. 1993, Marbà et al. 2013). Water depth also fundamentally influences wave and current regime, the vertical dimension of the seagrass meadow, and accessibility to animals, particularly larger ones.

Temperature fundamentally affects biological processes from molecular to ecosystem levels, shaping distribution and species composition of aquatic habitats (Tittensor et al. 2010, Sunday et al. 2012), including those of seagrasses (Den Hartog 1970, Short et al. 2001). Many seagrass populations near their equatorward range limits have been declining in recent decades in the face of rising sea temperatures (Duarte et al. 2018), which often synergize with declining water quality (Lefcheck et al. 2017).

Other supporting environmental variables are useful for more specific goals. Salinity, sediment characteristics (grain size distribution, bulk density, organic content), dissolved oxygen concentration, and concentrations of dissolved nutrients in the environment (nitrate, phosphate, etc.) further characterize the environmental suitability for seagrass and associated organisms. Indicators of stressors, such as land runoff, fishing pressure, coastal development, and tourism pressure are important to interpreting the causes of trends in seagrass meadow extent, status, and condition (Turschwell et al. 2021). Temperature, salinity, nutrients, dissolved oxygen, and multiple other parameters are also GOOS EOVs (specification sheets: https://goosocean.org/what-we-do/framework/essential-ocean-variables).

Other EOVs important in seagrass systems

The condition and value of seagrass ecosystems can be strongly and bidirectionally related to the abundance and composition of associated flora and fauna (Heck and Orth 1980, Orth et al. 1984, Valentine and Duffy 2006, Duffy et al. 2014). The biology and ecosystems EOVs most relevant to seagrass include the following.

Epiphytic and macroalgae (specification sheet: https://goosocean.org/document/17515) can be important competitors with seagrasses for light and nutrients (Duarte 1995), as well as important food sources for seagrass-associated animals (Edgar and Shaw 1995, Valentine and Duffy 2006).

Fishes (specification sheet: https://goosocean.org/document/17510) can affect seagrass ecosystems both by direct grazing on seagrasses and by consuming invertebrates that graze their algal competitors (Heck and Valentine 2006, Eriksson et al. 2011, Östman et al. 2016). Fishes also support important artisanal, recreational, and commercial fisheries (Nordlund et al. 2018, Unsworth et al. 2018).

Many kinds of sea turtles (https://goosocean.org/document/36268), seabirds (https://goosocean.org/document/36267), and marine mammals (https://goosocean.org/document/36266), includ-

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ing several threatened and endangered species, also depend on seagrass habitats (Fourqurean et al. 2019, Sievers et al. 2019).

Finally, two pilot biological EOVs are focused on the abundance and distribution of benthic invertebrates (specification sheet: https://goosocean.org/document/36269) and on the biomass and diversity of microbes (specification sheet: https://goosocean.org/document/36264). Epifaunal invertebrates can be beneficial or harmful to seagrasses, depending on whether they feed primarily on seagrasses or fouling algae, and are key food sources for seagrass-associated animals (Heck and Valentine 2006, Duffy et al. 2014). Microbes mediate many biogeochemical processes within seagrass ecosystems (Fahimipour et al. 2017, Tarquinio et al. 2019, Beatty et al. 2022).

The data schema: Specifications for managing and reporting seagrass data

The EOVs are designed to ensure that data are maximally interoperable, combinable, and ingestible by public data repositories. Reporting reliable measurements and interpreting them requires appropriate metadata—descriptions of how, when, where, and by whom they were collected. This is facilitated by standardized terminology for variables, data formats, and organization of data and metadata. Linking EOV requirements with formats for data and metadata streamlines processing and curation, which facilitates the rapid availability of information in response to requests and more timely management actions (Benson et al. 2018) and more effective reporting. We present a data dictionary and schema for the seagrass EOV (i.e., a standardized template and vocabulary for organizing data and metadata; box 6, supplemental material). The schema is designed for submitting data to OBIS, recognized by GOOS as the official repository for data on biology and ecosystems EOVs. We developed the seagrass data schema using the Darwin Core OBIS-ENV-DATA schema (De Pooter et al. 2017), which facilitates data submission to the repository and comparability among data sets (box 6, figure 3)

Implementing the seagrass cover and composition EOV as a global standard

The EOV specifications are focused on measurements needed to characterize and track seagrass status and condition. Their effectiveness also depends on the broader design of the study or monitoring program, including the spatial distribution, replication, and frequency of sampling and importantly the desired minimum detectable difference among samples (Duarte 2002, Schultz et al. 2015). Most seagrass survey protocols are designed with such goals in mind (Finkbeiner et al. 2001, Fourqurean and Rutten 2003, Neckles et al. 2012, Fourqurean et al. 2019, Hall et al. 2021), but a formal comparison of standard operating procedures for seagrass data collection is an important goal for future studies. Experience in several regions has produced recommended design features for monitoring seagrass that address these issues and include tiered approaches combining remote sensing with in-water measurements of seagrass and key environmental parameters, power analyses of replication needs, and combinations of fixed point and randomized field sampling (Neckles et al. 2012, Mascaró et al. 2013, Schultz et al. 2015, Unsworth et al. 2019b, Congdon et al. 2023).

The timing of sampling can also have a major influence on assessments of status, condition, and change. Even in tropical and subtropical regions (Fourqurean et al. 2001), many seagrass habitats show highly seasonal dynamics. In some regions, seagrasses disappear during parts of the year (Hammerstrom et al. 2006, Bartenfelder et al. 2022). Studies comparing seagrass characteristics across broad geographies have attempted to minimize this variation by targeting the season of peak seagrass productivity at each site (e.g., Duffy et al. 2022), but any single sampling period constitutes only a snapshot of a dynamic system. In seasonal environments, seagrass measurements should ideally be taken at multiple seasons to account for such variability (Bartenfelder et al. 2022, Davies et al. 2024).

Incentivizing broad adoption of the seagrass EOV

The value of the seagrass EOV specifications lies in standardizing and making interoperable a set of measures of seagrass status and condition. Realizing that value requires that EOV data are useful for answering locally relevant management questions (e.g., assessing the role of marine protected areas in conserving seagrasses or carbon storage; Duarte et al. 2025). We aimed to foster buy-in through broad community engagement, building on existing foundations, a hierarchical approach to data quality, and coupling field protocols with guidelines for data curation that facilitate reliable sharing.

A key incentive for data holders to publish and share their data is receiving appropriate attribution and recognition by referencing the data set citation, license, and ideally a persistent digital object identifier (DOI) for the data set as a condition of use specified in the data set license (e.g., CC BY). Repositories such as GBIF and OBIS provide DOIs for data sets as a free service. If data obtained from such repositories form a substantial contribution to a particular use case, users should consider asking the original data providers to collaborate as coauthors, both in recognition of their contributions and to take advantage of their detailed knowledge of the data and the context in which it was collected. Many funding organizations and journals already require that data be made public. The EOV specifications are intended to promote and streamline compliance with these requirements by providing common, interoperable formats, and eventually open-access tools and tutorials to facilitate data upload (see the supplemental material). Finally, many global assessments and syntheses require transparency in use of information and therefore cannot include data that are not publicly available. Therefore, data holders who do not make their data public will have less impact than those who do so (Bax et al. 2016). The OBIS data policy (https://manual.obis.org/policy.html) specifically supports this by encouraging adherence to the FAIR guiding principles (for *findable*, *accessible*, *interoperable*, and *reusable*; Wilkinson et al. 2016) and, for indigenous data and information, the CARE principles (for *collective benefit*, *authority to control*, *responsibility*, and *ethics*; Sterner and Elliott 2023).

Future directions

The seagrass EOV specifications are guidelines and can be achieved using several of the seagrass field protocols currently in use (boxes 1–4). The EOV approach is intentionally flexible in accepting particular protocols, which invariably differ among contexts. Instead the EOVs focus on ensuring that the same priority variables are measured in comparable units across studies to facilitate comparison and synthesis. A high priority going forward is to engage a broad community of researchers and practitioners to review existing protocols with the aim of consensus on a set of standard operating procedures, field and lab protocols that

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Box 6. Seagrass cover and composition data schema

The data schema (supplemental material) organizes field data on seagrass cover, species composition, extent, and supporting variables into three tables for submission to OBIS.

Metadata. OBIS requires that a data set have a title, citation (which can be autogenerated on submission), contact person or organization that curates the resource, and an abstract. The data set should also specify data ownership, a data use license, and project and funding information. The file describing these metadata is stored in XML using the Ecological Metadata Language (EML) standard and is part of the Darwin Core Archive package. The Integrated Publishing Toolkit (IPT), developed and maintained by GBIF provides a user interface to add EML metadata.

The event table. This table includes information describing the sampling events that produced the seagrass and associated data. The required fields in the core event table are the same for all OBIS records and include: the latitude (*decimalLatitude*) and longitude (*decimalLongitude*) where samples were collected, expressed in decimal degree format and with the geodetic datum specified (*geodeticDatum*); sampling date (*eventDate*), and a unique event ID (*eventID*) that links the information on this sampling event to the species observed (occurrences) and associated data, which are recorded in the other two tables described below. The supplemental material lists several other Darwin Core terms as columns in the table, which are recommended to provide context for the seagrass sampling event, including habitat type, depth, sampling protocol, field notes, and names of those who hold rights to the data.

The occurrence table. This table lists the species (*scientificName*) of organism recorded from the sampling event, including seagrasses, fulfilling the species composition subvariable of the seagrass EOV, as well the names of any other organisms sampled. Other required terms (columns) are again standard for OBIS and include the following. The *eventID* is copied from the event table and links the species occurrences to the sampling event where they were observed. The *basisOfRecord* summarizes how the species occurrence was documented (e.g., "human observation" in the example occurrence table included in the supplemental material). The *occurrenceID* is a globally unique identifier for that record of the organism's occurrence, such as a URI or UUID. In the absence of a globally unique identifier, one can be constructed from other identifiers (institution, data set, sample) in the record. The *occurrenceStatus* takes the values "present" or "absent" for that taxon observation (usually present but some surveys record the absence of a species). The *scientificName* records the full scientific name of the organism, with authorship and date information if known. Finally, *scientificNameID* is a globally unique identifier for that scientific name, ideally taken from a nomenclator such as the WoRMS LSIDs (recommended), International Plant Names Index, or ZooBank. Additional recommended terms include *identificationQualifier*, where there is uncertainty in identification; *recordedBy*, which lists the individuals who collected the data; and *vernacularName*, listing the common name used locally.

The extended-measurement-or-fact table. The OBIS Event core and extended measurement-or-fact extension tables (De Pooter et al. 2017) provide a place to record ecological and environmental information related to the species observed in the occurrence table, including the seagrass EOV subvariables percentage cover and areal extent, as well as supporting variables (figure 2, table 1). GBIF also supports these types of data (GBIF registered extensions: https://rs.gbif.org/extensions.html). The following are required terms in the OBIS extended measurement-or-fact table (figure 3, supplemental material). The *eventID* and *occurrenceID* link the extended measurements such as percentage cover to the associated sampling event and taxon record, respectively. The *measurementType* describes the kind of measurement reported (e.g., percentage cover). The *measurementUnit* and *measurementValue* record the units of measurement (e.g., as a percentage) and the actual number (e.g., 15%) recorded for that observation.

align with the seagrass EOV and that produce reliable observations across the global range of conditions and environments.

Another high priority is to advance the linking of georeferenced, *in situ* measurements of seagrass percentage cover and species composition with remotely sensed imagery of seagrass areal extent as a standard, routine part of seagrass observing. Doing so will add substantial value to both types of data. Measuring areal extent is often less practical for small field teams than seagrass percentage cover and species composition are. Remote-sensing approaches to mapping seagrass and other shallow-water habitats are continuously improving in resolution, coverage, and accessibility to researchers and managers (Kutser et al. 2020, Dierssen et al. 2021). Hyperspectral imaging, innovations in machine learning, and growth in satellite platforms provide almost daily coverage and higher temporal resolution can better represent temporally variable seagrass presence (Lizcano-Sandoval et al. 2022, 2025). But the challenges remain of detecting deep-water seagrass meadows beyond the reach of satellites and other surface observations and of mapping in turbid water where seagrasses are invisible, indistinguishable from optically similar habitats, or unidentifiable. Potential solutions include underwater acoustic methods (Gumusay et al. 2019), autonomous underwater vehicles and remotely operated underwater vehicles (Roelfsema et al. 2015a, Williams et al. 2010), and animal-borne sensors (Kaidarova et al. 2023, Mann et al. 2024).

New technologies are also revolutionizing observations of biodiversity and ecosystems in other ways (Besson et al. 2022, Rubbens et al. 2023). These include environmental DNA, which is supplementing and, in some cases, likely to replace traditional biomonitoring, particularly in environments that are difficult to sample (Reef et al. 2017, Gold et al. 2022, Suarez-Bregua et al. 2022). Passive acoustics (Sethi et al. 2020) and baited remote underwater video (Harvey et al. 2021) are increasingly used to monitor fishes and mammals nondestructively. Machine learning can now estimate seagrass species composition, cover, and extent from photographs, and this promises to accelerate progress in seagrass observing (Lizcano-Sandoval et al. 2022, Tahara et al. 2022, Langlois et al. 2023). All of these approaches have limitations, as do existing approaches, but they are improving, so approaches to seagrass observations will evolve and adapt to contribute to EOVs and global standards (McKenzie et al. 2020, Pittman et al. 2022), which will also evolve. This inevitable evolution is another reason why the EOVs are focused on kinds of variables rather than on specific protocols.

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Although the details of methodology will continue to evolve, the central theme that will advance more effective characterization of seagrass systems is less about methodology than about building a culture of cooperation, involving the hard work of reaching agreement on approaches that work across systems, and working to implement them by communicating their value and providing help to those who need it. Implementing the seagrass EOV approach described in the present article will help advance those goals.

Supplemental material

Supplemental data are available at *BIOSCI* online.

Dedication

This article is dedicated to the memory of our friend, colleague, and coauthor Professor Miguel Dino "Mike" Fortes, of the University of the Philippines, a pioneering leader in seagrass biology, particularly in southeast Asia, an energetic champion for a global seagrass community of practice, and an inspiration to many.

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Author Contributions

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Data dictionary for GOOS EOV: Seagrass Cover and Composition

This version: 19 December 2025

This data dictionary and schema provide definitions and units for variables used in reporting the Global Ocean Observing System's (GOOS) Essential Ocean Variable (EOV) 'Seagrass Cover and Composition' (see the Seagrass cover and composition EOV specification sheet here: https://goosocean.org/document/17513). The data are organized into the three tables required for submission of EOV data to the Ocean Biodiversity Information System (OBIS): Event, Ocurrence, and Extended-Measurement-or-Fact (EMoF) tables. The variables use a standard format compliant with Darwin Core vocabulary and include terms required by OBIS for sampling events, occurrences, and taxonomy, a well as a set of recommended terms specific to seagrass systems presented in the OBIS Extended Measurement-or-Fact (EMoF) module. Taxonomy of organisms is expected to follow standards of the World Register of Marine Species (WoRMS).

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The data package required for submission of a seagrass EOV dataset to OBIS consists of three csv files: event core, occurrence, and EMoF.

Tab	Explanation
READ ME	Explanation of the components of the data schema.
Terms and tables	List and definitions of variables in the three core tables (files) for a data package submitted to OBIS, including those required and recimmended for the seagrass EOV.
Extended Measurement-or-Fact	List and definitions of variables specific to the seagrass EOV and included in the Extended Measurements or Facts (EMoF) table.
Example event	Example of empirical data for sampling events in seagrass habitats of the Indian River Lagoon, Florida, USA. The example is illustrative, containing only a subset of the data collected during these events (see OBIS: https://obis.org/dataset/beab1dcb-8235-4072-85cd-d8c3373e4ae0)
Example occurrence	Example of empirical data for occurrences of seagrass and associated organisms from the seagrass sampling events in the Indian River Lagoon, Florida, USA.
Example Extended Measurement-or-Fact	Example of empirical data for abundances of seagrass and associated organisms from the seagrass sampling events in the Indian River Lagoon, Florida, USA.

File (Table)	Dataset component (DwC archives)	DwC term	OBIS: required	Seagrass EOV: required	Seagrass: recommended	Definition (DwC)
File 1: Event	Event (Core Event table)	eventID	required	required	required	An identifier for the set of information associated with an Event (something that occurs at a place and time). May be a global unique identifier or
File 1: Event	Event (Core Event table)	parentEventID			recommended	An identifier for the broader Event that groups this and potentially other Events.
File 1: Event	Event (Core Event table)	decimalLatitude	required	required	required	The geographic latitude (in decimal degrees, using the spatial reference system given in geodeticDatum) of the geographic center of a Location. Positive values are north of the Equator, negative values are south of it. Legal values lie between -90 and 90, inclusive.
File 1: Event	Event (Core Event table)	decimalLongitude	required	required	required	The geographic longitude (in decimal degrees, using the spatial reference system given in geodeticDatum) of the geographic center of a Location. Positive values are east of the Greenwich Meridian, negative values are west of it. Legal values lie between -180 and 180, inclusive.
File 1: Event	Event (Core Event table)	coordinateUncertaintyInMeters			recommended	
File 1: Event	Event (Core Event table)	footprintWKT			recommended	
File 1: Event	Event (Core Event table)	countryCode			recommended	The name of the country or major administrative unit in which the Location occurs.
File 1: Event	Event (Core Event table)	eventDate	required	required	required	The date-time or interval during which an Event occurred. For occurrences, this is the date-time when the event was recorded. Not suitable for a time in a geological context.
File 1: Event	Event (Core Event table)	bibliographicCitation			recommended	A bibliographic reference for the resource (e.g., journal article), if available
File 1: Event	Event (Core Event table)	datasetID			recommended	An identifier for the set of data. May be a global unique identifier or an identifier specific to a collection or institution.
File 1: Event	Event (Core Event table)	datasetName			recommended	The name identifying the data set from which the record was derived.
File 1: Event	Event (Core Event table)	fieldNotes			recommended	One of a) an indicator of the existence of, b) a reference to (publication, URI), or c) the text of notes taken in the field about the Event.
File 1: Event	Event (Core Event table)	habitat			recommended	A category or description of the habitat in which the Event occurred.
File 1: Event	Event (Core Event table)	institutionCode			recommended	The name (or acronym) in use by the institution having custody of the object(s) or information referred to in the record.
File 1: Event	Event (Core Event table)	institutionID			recommended	The identifier in use by the institution having custody of the object(s) or information referred to in the record.
File 1: Event	Event (Core Event table)	license			recommended	A legal document giving official permission to do something with the resource.
File 1: Event	Event (Core Event table)	maximumDepthInMeters			recommended	The greater depth of a range of depth below the local surface, in meters.
File 1: Event	Event (Core Event table)	minimumDepthInMeters			recommended	The lesser depth of a range of depth below the local surface, in meters.
File 1: Event	Event (Core Event table)	rightsHolder			recommended	A person or organization owning or managing rights over the resource.
File 1: Event	Event (Core Event table)	samplingProtocol			recommended	The names of, references to, or descriptions of the methods or protocols used during an Event.
File 1: Event	Event (Core Event table)	sampleSizeUnit			recommended	The unit of measurement of the size (time duration, length, area, or volume) of a sample in a sampling event.
File 1: Event	Event (Core Event table)	sampleSizeValue			recommended	A numeric value for a measurement of the size (time duration, length, area, or volume) of a sample in a sampling event.
File 2: Occurrence	Occurrence (Occurrence table)	eventID	required	required	required	This term is the same as that in the event file and serves to link the occurrence data to the event data.
File 2: Occurrence	Occurrence (Occurrence table)	occurrenceID	required	required	required	An identifier for the Occurrence (as opposed to a particular digital record of the occurrence). In the absence of a persistent global unique identifier, an occurrenceID may be constructed from a combination of identifiers in the record that will most closely make the occurrenceID globally unique.
File 2: Occurrence	Occurrence (Occurrence table)	scientificName	required	required	required	The full scientific name, with authorship and date information if known. When forming part of an Identification, this should be the name in lowest level taxonomic rank that can be determined. This term should not contain identification qualifications, which should instead be supplied in the IdentificationQualifier term.
File 2: Occurrence	Occurrence (Occurrence table)	scientificNameID	required	required	required	An identifier for the nomenclatural (not taxonomic) details of a scientific name.
File 2: Occurrence	Occurrence (Occurrence table)	basisOfRecord	required	required	required	The specific nature of the data record (e.g., human observation, machine observation, fossil specimen).
File 2: Occurrence	Occurrence (Occurrence table)	occurrenceStatus	required	required	required	A statement about the presence or absence of a Taxon at a Location.
File 2: Occurrence	Occurrence (Occurrence table)	identificationQualifier			recommended	A brief phrase or a standard term ("cf.", "aff.") to express the determiner's doubts about the dwc:Identification.
File 2: Occurrence	Occurrence (Occurrence table)	identifiedBy			recommended	A list (concatenated and separated) of names of people, groups, or organizations who assigned the Taxon to the subject.
File 2: Occurrence	Occurrence (Occurrence table)	recordedBy			recommended	A list (concatenated and separated) of names of people, groups, or organizations responsible for recording the original Occurrence. The primary collector or observer, especially one who applies a personal identifier (recordNumber), should be listed first.
File 2: Occurrence	Occurrence (Occurrence table)	vernacularName			recommended	A common or vernacular name.
File 2: Occurrence	Occurrence (Occurrence table)	kingdom				
File 2: Occurrence	Occurrence (Occurrence table)	phylum				
File 2: Occurrence	Occurrence (Occurrence table)	class				
File 2: Occurrence	Occurrence (Occurrence table)	order				
File 2: Occurrence	Occurrence (Occurrence table)	family				
File 2: Occurrence	Occurrence (Occurrence table)	genus				
File 2: Occurrence	Occurrence (Occurrence table)	taxonRank				
File 3: EMoF	Extended Measurement or Fact	eventID	required	required	required	This term is the same as that in the event file and serves to link the occurrence data to the event data.
File 3: EMoF	Extended Measurement or Fact	occurrenceID	required	required	required	This term is the same as that in the occurrence file and serves to link the extended measurement data to the occurrence data.
File 3: EMoF	Extended Measurement or Fact	measurementID			recommended	
File 3: EMoF	Extended Measurement or Fact	measurementType	required	required	required	The nature of the measurement, fact, characteristic, or assertion.
File 3: EMoF	Extended Measurement or Fact	measurementUnit	required	required	required	The units associated with the measurementValue.
File 3: EMoF	Extended Measurement or Fact	measurementValue	required	required	required	The value of the measurement, fact, characteristic, or assertion.
File 3: EMoF	Extended Measurement or Fact	measurementAccuracy			recommended	
File 3: EMoF	Extended Measurement or Fact	measurementDeterminedBy			recommended	A list (concatenated and separated) of names of people, groups, or organizations who determined the value of the MeasurementOrFact.
File 3: EMoF	Extended Measurement or Fact	measurementDeterminedDate			recommended	The date on which the MeasurementOrFact was made.
File 3: EMoF	Extended Measurement or Fact	measurementMethod			recommended	A description of or reference to (publication, URI) the method or protocol used to determine the measurement, fact, characteristic, or assertion.
File 3: EMoF	Extended Measurement or Fact	measurementTypeID			recommended	An identifier for the nature of the measurement, fact, characteristic, or assertion.
File 3: EMoF	Extended Measurement or Fact	measurementUnitID			recommended	An identifier for the units associated with the measurementValue.
File 3: EMoF	Extended Measurement or Fact	measurementValueID			recommended	An identifier for the value of the measurement, fact, characteristic, or assertion.

Variable type	Variable name (EMoF measurementType)	Definition	measurementUnit
Supporting variable	arealExtent	Area in km2 occupied by seagrass meadow within spatial boundaries of a specified area	km2
Sub-variable (required)	percentCover	Proportion of substrate in a sample area that is covered (substrate not visible) by seagrass	Percent
Supporting variable (biological)	canopyHeight	Median vertical distance from the sediment surface to the highest reach of seagrass leaves in the water column	cm
Supporting variable (biological)	shootDensity	The number of seagrass shoots per unit seabed area	Number per square metre
Supporting variable (biological)	shootLength	Mean length of a random sample of seagrass shoots from seabed to tip of the leaf	cm
Supporting variable (biological)	aboveGroundBiomass	Total dry mass of above-ground seagrass tissue (shoots and leaves) within the sample	g
Supporting variable (biological)	belowGroundBiomass	Total dry mass of below-ground seagrass tissue (roots and rhizomes) within the sample	g
Supporting variable (environmental)	depth	Depth of collection in meters, indexed to some permanent benchmark (e.g., mean lower low water)	m
Supporting variable (environmental)	waterClarity	A measure of how far down light can penetrate through the water column	m
Supporting variable (environmental)	waterTemperature	Temperature of water, typically measured in degrees C, using a thermometer or other sensor	degrees C
Supporting variable (environmental)	salinity	The concentration of dissolved salts in seawater, generally measured in Practical Salinity Units (PSU), a unit based on sea water conductivity, and equivalent to parts per thousand or (o/00) or g/kg.	Practical salinity unts (PSU, g salt 1000 g water-1)
Supporting variable (environmental)	sedimentGrainSize	Distribution of sediment grain sizes within a sample, usually measured by sieving and expressed on the Wentworth or Krumbein phi (φ) scale	Wentworth or Krumbein phi (φ) scale
Supporting variable (other EOV)	epifaunaAbundance	The number of mobile epifaunal invertebrates sampled from a quantity of seagrass (per seabed area, per g seagrass, or per cm2 seagrass leaf)	number m-2, number g-1 seagrass, or number cm-2 leaf
Supporting variable (other EOV)	fishAbundance	The number of fishes sampled from a quantity of seagrass (typically per seabed area)	number m-2
Supporting variable (other EOV)	macroalgaeBiomass	The dry mass of macroalgae sampled from a seabed plot of specified area	g m-2
Supporting variable (other EOV)	macroalgaeCover	Proportion of substrate in a sample area that is covered (substrate not visible) by macroalgae	Percent
Supporting variable (other EOV)	epiphyteDryMass	Dry mass of algae sampled from a quantity of seagrass	g g-1 macrophyte

eventID	parentEventID	decimalLatitude	decimalLongitude	geodeticDatum	coordinateUncertaintyInM	footprintWKT	countryCode	eventDate	bibliographicCitation	datasetID	datasetName	fieldNotes	habitat	institutionCode	institutionID	license	maximumDepthInMeters	minimumDepthInMeters	rightsHolder	samplingProtocol
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1		27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:20	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:20:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:20	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:20:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:20	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:24	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:24:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:24	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:24:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:24	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:24:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:24	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:28	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:28:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:28	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:28:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:28	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:32	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:32:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:32	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:32:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:32	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:32:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:32	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:36	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:36:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:36	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:36:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:36	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:40	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:40:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:40	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:40:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:40	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:40:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:40	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:44	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:44:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:44	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:44:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:44	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:48	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:48:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:48	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:48:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:48	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:48:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:48	27.4420255	-80.297301	EPSG:4326	30	LINESTRING (-80.297287 27.44225, -80.297315 27.441801)	US	2021-07-22			MarineGEO Global Seagrass Habitat Monitoring Data		seagrass	MarineGEO	MarineGEO	CC BY	3	1.5		https://doi.org/10.2527/seam.14925114

eventID	occurrenceID	scientificName	scientificNameID	basisOfRecord	occurrenceStatus	kingdom	phylum	class	order	family	genus	taxonRank
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-cover:374715	Syringodium filiforme	urn:lsid:marinespecies.org:taxname:374715	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Syringodium	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-density:374715	Syringodium filiforme	urn:lsid:marinespecies.org:taxname:374715	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Syringodium	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:22496	Nereididae	urn:lsid:marinespecies.org:taxname:22496	HumanObservation	present	Animalia	Annelida	Polychaeta	Phyllodocida	Nereididae		family
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:158361	Hippolyte zostericola	urn:lsid:marinespecies.org:taxname:158361	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Decapoda	Hippolytidae	Hippolyte	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:1268	Sipuncula	urn:lsid:marinespecies.org:taxname:1268	HumanObservation	present	Animalia	Annelida		Sipuncula			order
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:877061	Phrontis vibex	urn:lsid:marinespecies.org:taxname:877061	HumanObservation	present	Animalia	Mollusca	Gastropoda	Neogastropoda	Nassariidae	Phrontis	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:1135	Amphipoda	urn:lsid:marinespecies.org:taxname:1135	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Amphipoda			order
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:102401	Ericthonius brasiliensis	urn:lsid:marinespecies.org:taxname:102401	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Amphipoda	Ischyroceridae	Ericthonius	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:421589	Cerapus cudjoe	urn:lsid:marinespecies.org:taxname:421589	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Amphipoda	Ischyroceridae	Cerapus	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:160102	Astyris lunata	urn:lsid:marinespecies.org:taxname:160102	HumanObservation	present	Animalia	Mollusca	Gastropoda	Neogastropoda	Columbellidae	Astyris	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:160174	Bittiolum varium	urn:lsid:marinespecies.org:taxname:160174	HumanObservation	present	Animalia	Mollusca	Gastropoda	Caenogastropoda incertae sedis	Cerithiidae	Bittiolum	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:160065	Acteocina canaliculata	urn:lsid:marinespecies.org:taxname:160065	HumanObservation	present	Animalia	Mollusca	Gastropoda	Cephalaspidea	Tornatinidae	Acteocina	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:420149	Prunum apicinum	urn:lsid:marinespecies.org:taxname:420149	HumanObservation	present	Animalia	Mollusca	Gastropoda	Neogastropoda	Marginellidae	Prunum	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:158082	Cymadusa compta	urn:lsid:marinespecies.org:taxname:158082	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Amphipoda	Ampithoidae	Cymadusa	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:419588	Caecum floridanum	urn:lsid:marinespecies.org:taxname:419588	HumanObservation	present	Animalia	Mollusca	Gastropoda	Littorinimorpha	Caecidae	Caecum	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:160228	Crepidula convexa	urn:lsid:marinespecies.org:taxname:160228	HumanObservation	present	Animalia	Mollusca	Gastropoda	Littorinimorpha	Calyptraeidae	Crepidula	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:208925	Halodule wrightii	urn:lsid:marinespecies.org:taxname:208925	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Halodule	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:374715	Syringodium filiforme	urn:lsid:marinespecies.org:taxname:374715	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Syringodium	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:211768	Acanthophora spicifera	urn:lsid:marinespecies.org:taxname:211768	HumanObservation	present	Plantae		Florideophyceae	Ceramiales	Rhodomelaceae	Acanthophora	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:145635	Hypnea spinella	urn:lsid:marinespecies.org:taxname:145635	HumanObservation	present	Plantae		Florideophyceae	Gigartinales	Cystocloniaceae	Hypnea	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots:374715	Syringodium filiforme	urn:lsid:marinespecies.org:taxname:374715	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Syringodium	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots:208925	Halodule wrightii	urn:lsid:marinespecies.org:taxname:208925	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Halodule	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover:208925	Halodule wrightii	urn:lsid:marinespecies.org:taxname:208925	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Halodule	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover:374715	Syringodium filiforme	urn:lsid:marinespecies.org:taxname:374715	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Syringodium	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-density:208925	Halodule wrightii	urn:lsid:marinespecies.org:taxname:208925	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Halodule	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-cover:208925	Halodule wrightii	urn:lsid:marinespecies.org:taxname:208925	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Halodule	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:877061	Phrontis vibex	urn:lsid:marinespecies.org:taxname:877061	HumanObservation	present	Animalia	Mollusca	Gastropoda	Neogastropoda	Nassariidae	Phrontis	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:1268	Sipuncula	urn:lsid:marinespecies.org:taxname:1268	HumanObservation	present	Animalia	Annelida		Sipuncula			order
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:138940	Bulla striata	urn:lsid:marinespecies.org:taxname:138940	HumanObservation	present	Animalia	Mollusca	Gastropoda	Cephalaspidea	Bullidae	Bulla	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:514508	Cuapetes americanus	urn:lsid:marinespecies.org:taxname:514508	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Decapoda	Palaemonidae	Cuapetes	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:160065	Acteocina canaliculata	urn:lsid:marinespecies.org:taxname:160065	HumanObservation	present	Animalia	Mollusca	Gastropoda	Cephalaspidea	Tornatinidae	Acteocina	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:1065	Arthropoda	urn:lsid:marinespecies.org:taxname:1065	HumanObservation	present	Animalia	Arthropoda					phylum
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:261817	Paracerceis caudata	urn:lsid:marinespecies.org:taxname:261817	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Isopoda	Sphaeromatidae	Paracerceis	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:160102	Astyris lunata	urn:lsid:marinespecies.org:taxname:160102	HumanObservation	present	Animalia	Mollusca	Gastropoda	Neogastropoda	Columbellidae	Astyris	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:160174	Bittiolum varium	urn:lsid:marinespecies.org:taxname:160174	HumanObservation	present	Animalia	Mollusca	Gastropoda	Caenogastropoda incertae sedis	Cerithiidae	Bittiolum	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:421589	Cerapus cudjoe	urn:lsid:marinespecies.org:taxname:421589	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Amphipoda	Ischyroceridae	Cerapus	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:419588	Caecum floridanum	urn:lsid:marinespecies.org:taxname:419588	HumanObservation	present	Animalia	Mollusca	Gastropoda	Littorinimorpha	Caecidae	Caecum	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:158082	Cymadusa compta	urn:lsid:marinespecies.org:taxname:158082	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Amphipoda	Ampithoidae	Cymadusa	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:1135	Amphipoda	urn:lsid:marinespecies.org:taxname:1135	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Amphipoda			order
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:102401	Ericthonius brasiliensis	urn:lsid:marinespecies.org:taxname:102401	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Amphipoda	Ischyroceridae	Ericthonius	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:420149	Prunum apicinum	urn:lsid:marinespecies.org:taxname:420149	HumanObservation	present	Animalia	Mollusca	Gastropoda	Neogastropoda	Marginellidae	Prunum	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:101	Gastropoda	urn:lsid:marinespecies.org:taxname:101	HumanObservation	present	Animalia	Mollusca	Gastropoda				class
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:22496	Nereididae	urn:lsid:marinespecies.org:taxname:22496	HumanObservation	present	Animalia	Annelida	Polychaeta	Phyllodocida	Nereididae		family
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:247538	Hargeria rapax	urn:lsid:marinespecies.org:taxname:247538	HumanObservation	present	Animalia	Arthropoda	Malacostraca	Tanaidacea	Leptochelidae	Hargeria	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:160228	Crepidula convexa	urn:lsid:marinespecies.org:taxname:160228	HumanObservation	present	Animalia	Mollusca	Gastropoda	Littorinimorpha	Calyptraeidae	Crepidula	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:211768	Acanthophora spicifera	urn:lsid:marinespecies.org:taxname:211768	HumanObservation	present	Plantae		Florideophyceae	Ceramiales	Rhodomelaceae	Acanthophora	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:145713	Halophila decipiens	urn:lsid:marinespecies.org:taxname:145713	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Hydrocharitaceae	Halophila	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:145634	Hypnea musciformis	urn:lsid:marinespecies.org:taxname:145634	HumanObservation	present	Plantae		Florideophyceae	Gigartinales	Cystocloniaceae	Hypnea	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:145635	Hypnea spinella	urn:lsid:marinespecies.org:taxname:145635	HumanObservation	present	Plantae		Florideophyceae	Gigartinales	Cystocloniaceae	Hypnea	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:208925	Halodule wrightii	urn:lsid:marinespecies.org:taxname:208925	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Halodule	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots:374715	Syringodium filiforme	urn:lsid:marinespecies.org:taxname:374715	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Syringodium	species
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots:208925	Halodule wrightii	urn:lsid:marinespecies.org:taxname:208925	HumanObservation	present	Plantae		Magnoliopsida	Alismatales	Cymodoceaceae	Halodule	species

eventID	occurrenceID	measurementID	measurementType	measurementUnit	measurementValue	n n measurementDeterminedDate	measurementMethod	measurementTypeID	measurementUnitID
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-cover:374715		percentCover	Percent	15	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/PCOV7736/	https://vocab.nerc.ac.uk/collection/P06/current/UPCT/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:4:seagrass-density:374715		shootDensity	Number per square	128	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/SDBIOL02/	https://vocab.nerc.ac.uk/collection/P06/current/UPMS/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:102401		epifaunaAbundance	number g-1 seagras	2.89	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:1135		epifaunaAbundance	number g-1 seagras	2.89	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:1268		epifaunaAbundance	number g-1 seagras	2.89	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:158082		epifaunaAbundance	number g-1 seagras	8.671	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:158361		epifaunaAbundance	number g-1 seagras	2.89	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:160065		epifaunaAbundance	number g-1 seagras	2.89	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:160102		epifaunaAbundance	number g-1 seagras	8.671	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:160174		epifaunaAbundance	number g-1 seagras	14.451	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:160228		epifaunaAbundance	number g-1 seagras	8.671	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:22496		epifaunaAbundance	number g-1 seagras	2.89	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:419588		epifaunaAbundance	number g-1 seagras	37.572	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:420149		epifaunaAbundance	number g-1 seagras	2.89	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:421589		epifaunaAbundance	number g-1 seagras	11.561	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-epifauna:877061		epifaunaAbundance	number g-1 seagras	2.89	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots:208925		shootLength	cm	11.05	2021-07-22	https://doi.org/10.25573/serc.14925114		http://vocab.nerc.ac.uk/collection/P06/current/ULCM/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:8:seagrass-shoots:374715		shootLength	cm	17.5	2021-07-22	https://doi.org/10.25573/serc.14925114		http://vocab.nerc.ac.uk/collection/P06/current/ULCM/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover:208925		percentCover	Percent	15	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/PCOV7736/	https://vocab.nerc.ac.uk/collection/P06/current/UPCT/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-cover:374715		percentCover	Percent	4	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/PCOV7736/	https://vocab.nerc.ac.uk/collection/P06/current/UPCT/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-density	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:12:seagrass-density:208925		shootDensity	Number per square	128	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/SDBIOL02/	https://vocab.nerc.ac.uk/collection/P06/current/UPMS/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-cover	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-cover:208925		percentCover	Percent	15	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/PCOV7736/	https://vocab.nerc.ac.uk/collection/P06/current/UPCT/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:101		epifaunaAbundance	number g-1 seagras	2.392	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:102401		epifaunaAbundance	number g-1 seagras	19.139	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:1065		epifaunaAbundance	number g-1 seagras	2.392	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:1135		epifaunaAbundance	number g-1 seagras	2.392	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:1268		epifaunaAbundance	number g-1 seagras	19.139	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:138940		epifaunaAbundance	number g-1 seagras	23.923	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:158082		epifaunaAbundance	number g-1 seagras	4.785	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:160065		epifaunaAbundance	number g-1 seagras	23.923	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:160102		epifaunaAbundance	number g-1 seagras	23.923	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:160174		epifaunaAbundance	number g-1 seagras	28.708	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:160228		epifaunaAbundance	number g-1 seagras	2.392	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:22496		epifaunaAbundance	number g-1 seagras	4.785	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:247538		epifaunaAbundance	number g-1 seagras	2.392	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:261817		epifaunaAbundance	number g-1 seagras	9.569	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:419588		epifaunaAbundance	number g-1 seagras	71.77	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:420149		epifaunaAbundance	number g-1 seagras	2.392	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:421589		epifaunaAbundance	number g-1 seagras	14.354	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:514508		epifaunaAbundance	number g-1 seagras	2.392	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-epifauna:877061		epifaunaAbundance	number g-1 seagras	4.785	2021-07-22	https://doi.org/10.25573/serc.14925114	https://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/	http://vocab.nerc.ac.uk/collection/P06/current/UNPG/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots:208925		shootLength	cm	15.25	2021-07-22	https://doi.org/10.25573/serc.14925114		http://vocab.nerc.ac.uk/collection/P06/current/ULCM/
MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots	MarineGEO:USA-IRL_seagrass_2021:Bear_Point_Seagrass:1:16:seagrass-shoots:374715		shootLength	cm	14	2021-07-22	https://doi.org/10.25573/serc.14925114		http://vocab.nerc.ac.uk/collection/P06/current/ULCM/