

# Council Monitoring and Assessment Program (CMAP)

## User Guide for the Gulf Coast Monitoring and Assessment Portal

A joint collaboration between

National Oceanic and Atmospheric Administration and the U.S. Geological Survey

December 2020

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## Introduction

### Background

The Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act Final Rule at 31 C.F.R. Part 34) was signed into law on July 6, 2012. The RESTORE Act calls for a regional approach to restoring the long-term health of the valuable natural ecosystem and economy of the Gulf Coast region. The RESTORE Act dedicates 80 percent of civil and administrative penalties paid under the Clean Water Act, after the date of enactment, by the responsible parties in connection with the Deepwater Horizon oil spill to the Gulf Coast Restoration Trust Fund (Trust Fund) for ecosystem restoration, economic recovery, and tourism promotion in the Gulf Coast region. In addition to creating the Trust Fund, the RESTORE Act established the Gulf Coast Ecosystem Restoration Council (RESTORE Council or Council). The Council includes the Governors of the states of Alabama, Florida, Louisiana, Mississippi and Texas, the Secretaries of the U.S. Departments of Agriculture, the Army, Commerce, Homeland Security, and the Interior, and the Administrator of the U.S. Environmental Protection Agency. The Council plays a key role in developing strategies and implementing projects that help ensure the Gulf of Mexico's natural resources are sustainable and available for future generations.

The Council Monitoring and Assessment Program (CMAP) was approved as a Gulf-wide investment by the Council in the 2015 Initial Funded Priorities List and is administered jointly by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Geological Survey (USGS). Funded activities include the organization of basic, foundational components for a Gulf-wide monitoring network to measure the efficacy of investments in Gulf restoration by the Council. The program, in coordination with the Gulf of Mexico Alliance (GOMA) and through collaboration with the Gulf States, federal and local partners, academia, non-governmental organizations, and business and industry, has leveraged existing resources, capacities, and expertise and built on existing monitoring programs and their data.

### Purpose

Under the RESTORE Act, the Council is required to report on the progress of funded projects and programs. Systematic monitoring of restoration at the project-specific and programmatic levels (watershed and Gulf of Mexico) enables consistent reporting and gives the public confidence that the investments in restoration selected by the Council will be evaluated accordingly and adaptively managed. Monitoring information that has been collected at different spatial and temporal scales can be used as the foundation to illustrate progress toward comprehensive ecosystem restoration goals and objectives that promote holistic recovery in the Gulf of Mexico.

The best available science is required to make informed decisions to effectively manage ecosystem resources at multiple geographic scales across the Gulf of Mexico. However, knowing what data are being collected where is a daunting challenge. Thus, a spatially and temporally comprehensive environmental monitoring network for habitat monitoring, water quality monitoring, and mapping is a foundational element that can support scientifically sound decision-making regarding the health and viability of the Gulf of Mexico ecosystem. In the context of Gulf of Mexico protection and restoration, a coordinated compilation of existing environmental monitoring programs will provide essential

information to support the development, selection, and application of effective management and restoration alternatives, and inform adaptive management decisions at local, state, and regional levels.

Currently, governmental agencies (federal, state and local), universities, private industry, and non-governmental organizations are conducting extensive monitoring activities around the Gulf. In addition, each Council-funded project will, at a minimum, perform project-specific monitoring. The CMAP project team has inventoried and documented descriptive metadata on these monitoring activities to highlight opportunities for efficiencies and collaborative review of performance with other Gulf ecosystem recovery efforts. Additionally, baseline assessments conducted throughout the Gulf of Mexico were compiled into a comprehensive catalog to assist with restoration planning, development, and performance monitoring. The CMAP monitoring program inventory and assessment catalog, available through the Gulf Coast Monitoring and Assessment Portal (“portal”), were designed to improve discovery and accessibility of existing data and support management decision-making.

### Access

The portal is free to use and publicly available as a component of the Council website (<https://restorethegulf.gov/cmap>). JavaScript is required to use certain portions of the portal, including the search tool, the statistics tool, and the program/assessment footprint map. A modern web browser (e.g., Mozilla Firefox, Google Chrome, Microsoft Edge, etc.) is preferred.

### Overview

The portal consists of three tools that can be used to explore both the inventory of Gulf of Mexico habitat monitoring, water quality monitoring, and mapping programs and the catalog of assessments compiled by the CMAP (collectively, the “dataset”). The faceted search tool allows users to find and view detailed information about relevant programs and assessments by filtering the dataset against more than three dozen spatial, temporal, and other classification criteria. The statistics tool offers an overall look at the dataset through a series of graphs summarizing content by focus area, jurisdiction, data accessibility, and collected parameters. The document library tool links users to published reports, data, and additional resources related to the development of the dataset and the portal. Each tool is covered in detail in the following sections.

### Navigation

Two means of navigation are provided for users of the portal: (1) a set of quick links on the home page (Fig. 1), and (2) a single-level dropdown menu located on the right side of the header of each page (Fig. 2). The dropdown menu is hidden by default and can be opened by hovering or clicking on the persistent *MENU* link in the header. Both the quick links and the menu items will navigate a user to the landing page of the selected tool.

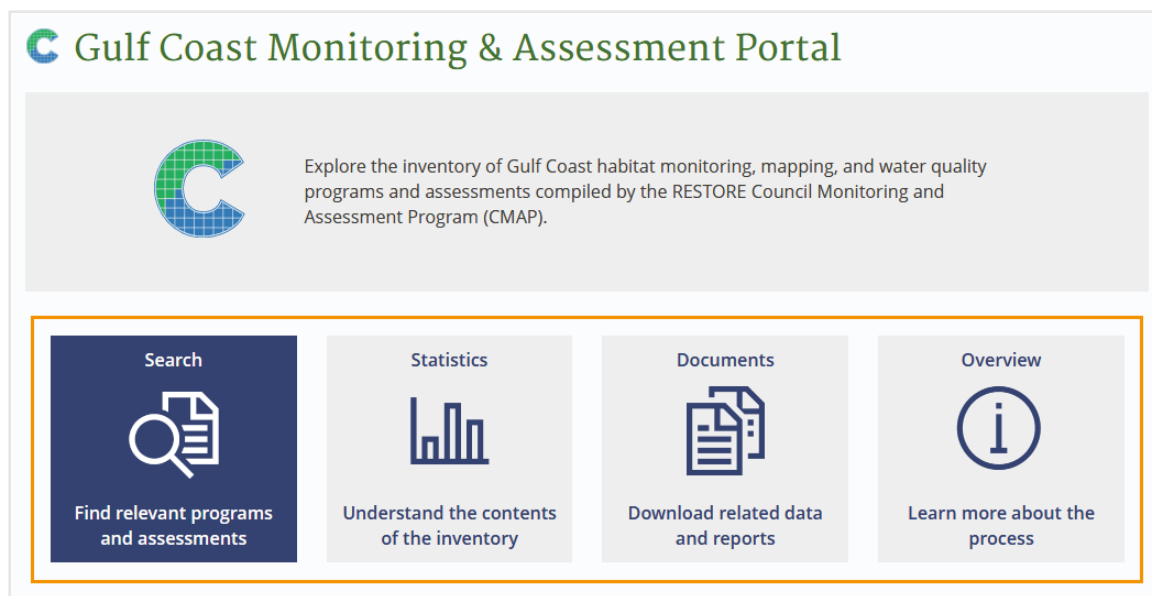


Fig. 1. Quick links (highlighted in the orange box) are displayed on the home page.



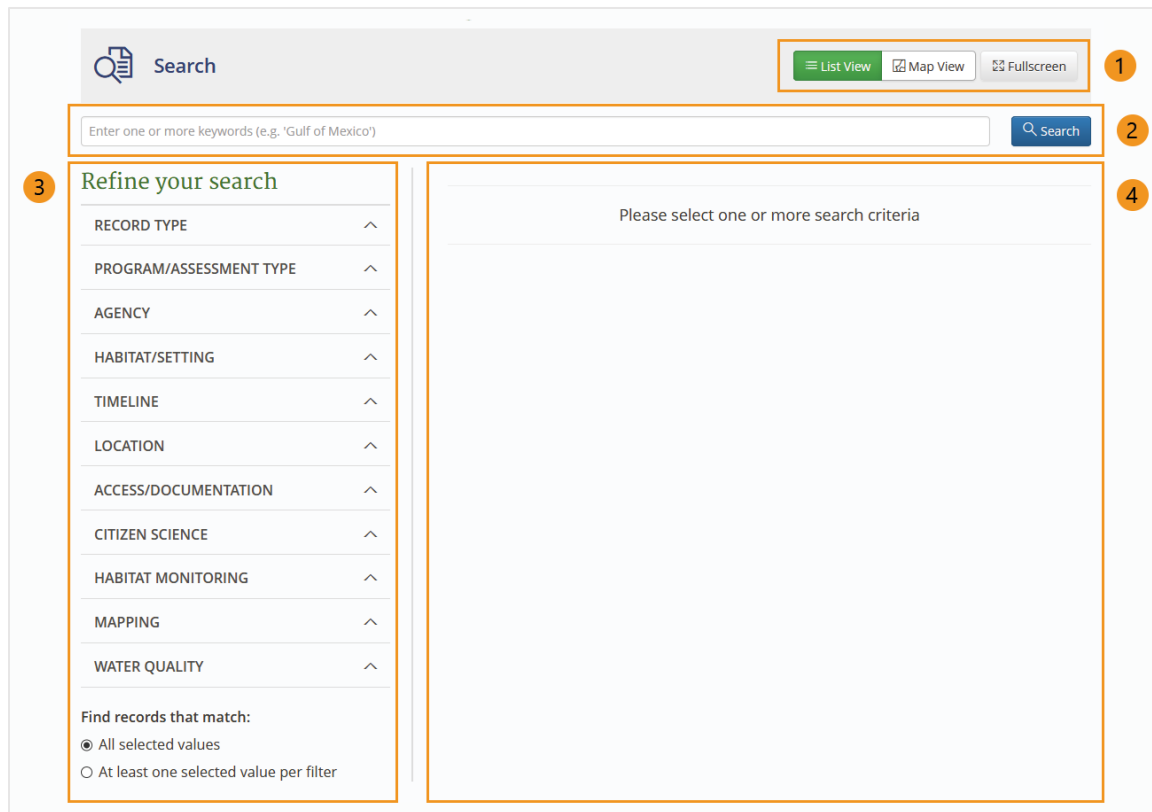
Fig. 2. The persistent dropdown menu has been expanded by clicking the MENU link.

## Search

The dataset contains 544 programs and 274 assessments (as of December 2020), each of which are documented by 30-50 descriptive attributes. The portal offers multiple features to help users search the dataset for programs and assessments relevant to their needs and interests.

### Search interface

The search tool is a dynamic, single-page interface with four main sections: (1) a view mode selector to toggle the display of search results between list and map views and to turn on full-screen presentation mode, (2) a free-text keyword search box, (3) an accordion-style, faceted attribute search control, and (4) an auto-updating results pane that displays search results in a list- or map-based format (Fig. 3).



*Fig. 3. Features of the search tool include: (1) view mode selection, (2) keyword search, (3) faceted search, and (4) display of search results.*

By default, the search tool displays an empty list of results. As the user specifies search criteria through either the keyword or faceted search controls, the results pane will automatically update to show the programs and/or assessments that meet those criteria. The result set can be viewed either in a list or on a map (Fig. 4). In the paged list view, the user is presented with the name, operating agency, description, and focus area of each result. In the map view, the spatial boundary of each result is depicted as a polygon on an interactive web map; clicking within a boundary polygon will open a map overlay with similar information to that of the list view. Both view modes are synchronized with the search criteria, such that a user can view the same result set in either mode at any point in the search process.

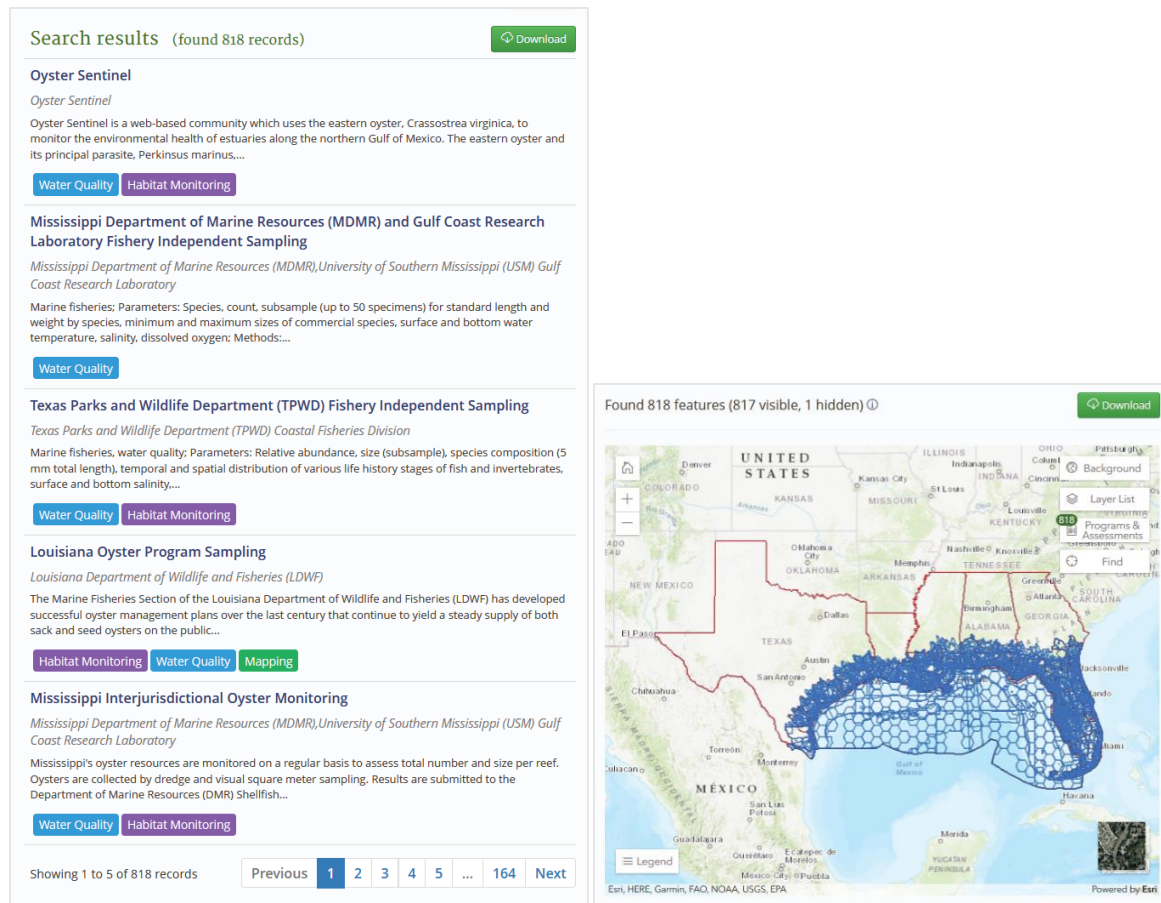


Fig. 4. Search results can be viewed as a paged list (left) or an interactive web map (right).

## Search process

The tool was designed to offer flexible search capabilities without sacrificing clarity or simplicity. This was done by leaving the search process largely up to the personal needs and preferences of the user. Search features can be used to filter the dataset in any order or combination and can be applied in sequence to iteratively refine the result set. For example, a user interested in water quality monitoring may choose to begin by entering related terms into the keyword search, scan the result set, and then narrow down the list of relevant programs and assessments by selecting specific habitat types and water quality parameters in the faceted search control. Alternatively, a user planning the construction phase of a restoration project may begin by selecting or drawing a custom bounding area on the map to find adjacent monitoring programs and assessments, then use the faceted search to limit the results to those with web-accessible data. Another user interested in data synthesis may use the timeline and program/assessment type filters within the faceted search to identify all mapping programs active within the last five years. In each case, the user can arrive at a filtered set of results relevant to their goals and objectives, which can then be further explored by viewing or downloading detailed information about each included program or assessment.

## Keyword search

With the keyword search feature, a user can filter the dataset by entering one or more terms of interest into the free text search box and clicking the *Search* button (Fig. 5). A basic text search is executed, comparing the entered keywords to each text-based attribute in the dataset—program or assessment title, operating agency, habitat type, collected parameters, etc. Multiple keywords can be entered at once, separated by spaces. This approach eliminates the need for a user to know exactly which field references the specified keyword(s), supporting the user’s ability both to explore the dataset for general themes and to narrow down search results in very specific terms. Additionally, the combination keyword search eliminates the need for multiple individual text search boxes, leading to a simpler, less cluttered interface.

A screenshot of a web interface for keyword search. It features a light gray rectangular container. Inside, on the left, is a white text input box with a thin gray border containing the text "Gulf of Mexico". To the right of the text box is a blue rectangular button with rounded corners, containing a white magnifying glass icon followed by the word "Search" in white text.

*Fig. 5. In this example, the sample phrase, “Gulf of Mexico,” has been entered into the keyword search box.*

## Faceted search

Whereas the keyword search operates against multiple attributes, the faceted search feature offers filters to narrow the result set based on individual attributes. Facets are organized by category into accordion controls and consist of 37 attributes of five different control types (Fig. 6):

- Radio group: a list of multiple options, only one of which can be chosen at a time;
- Checkbox list: a list of multiple options, one or more of which can be chosen at a time;
- Checkbox grid: a modal dialog containing a matrix of multiple options, one or more of which can be chosen at a time;
- Autocomplete: a drop-down list of many options which can be filtered by typing one or more letters into an associated text box; and
- Calendar: an interactive control to select a date.

The checkbox grid and autocomplete types are functionally equivalent to the checkbox list type, but present different visual interfaces to maximize understanding of relationships among options and minimize the screen space occupied by the faceted search feature.

1

Web accessible data

☐ Yes  
☐ No  
☐ Both

2

Metadata standard

☐ ISO  
☐ FGDC  
☐ Other

3

Habitat type

Water Column  
Oyster/Bivalve bed  
Emergent Marsh  
Forest  
Shrub/Grassland

4

Start date

December 2020

Su Mo Tu We Th Fr Sa  
29 30 1 2 3 4 5  
6 7 8 9 10 11 12  
13 14 15 16 17 18 19  
20 21 22 23 24 25 26  
27 28 29 30 31 1 2  
3 4 5 6 7 8 9

5

Aquatic setting

Select aquatic settings

	Upland	Riverine	Palustrine	Lacustrine	Estuarine	Marine Nearshore (0-30 m depths)	Marine Offshore (30-200m)	Marine Oceanic (>200m)
Water Column	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oyster/Bivalve bed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergent Marsh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shrub/Grassland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beach/Dune	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Barrier Island	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mangrove	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tidal flat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hard bottom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coral Reef	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soft Bottom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sargassum/Floating macroalgae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Deep sea benthic communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Artificial reef	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Karst/Barren	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Close

Fig. 6. Facet control types include (1) radio group, (2) checkbox list, (3) autocomplete, (4) calendar, and (5) checkbox grid with launch button (top) and modal dialog (bottom).

The available facets are listed below, along with their control type, in the order and category in which they appear on screen.

- Category: Record type
  - Type of record—program, assessment, or both (radio group)
- Category: Program/assessment type
  - Focus area—habitat monitoring, mapping, or water quality (checkbox list)
- Category: Agency
  - Executing agency (autocomplete)
  - Executing agency type (checkbox list)
  - Funding agency (autocomplete)



- Category: Habitat/setting
  - Habitat type (autocomplete)
  - Aquatic setting (checkbox grid)
- Category: Timeline
  - Start date (calendar)
  - End date (calendar)
  - Status—active, inactive (checkbox list)
- Category: Location
  - Coverage (checkbox list)
  - State (checkbox list)
  - County (autocomplete)
  - Ecoregion—EPA Level IV Ecoregions (autocomplete)
  - HUC 10—a unique, ten-digit hydrologic unit code (autocomplete)
  - Watershed (autocomplete)
- Category: Access/documentation
  - Web accessible data—yes, no, or both (radio group)
  - Machine readable data format—yes, no, or both (radio group)
  - Metadata available—yes, no, or both (radio group)
  - Metadata standard (checkbox list)
  - Documented collection procedures—yes, no, or both (radio group)
  - Documented analytical procedures—yes, no, or both (radio group)
  - Documented quality assurance (QA) protocol—yes, no, or both (radio group)
- Category: Citizen science
  - Uses volunteer/citizen science—yes, no, or both (radio group)
- Category: Habitat monitoring
  - Parameter (checkbox list)
  - Measurement schedule (radio group)
  - Measurement frequency (checkbox list)
- Category: Mapping
  - Parameter (checkbox list)
  - Technology (checkbox list)
  - Activity (checkbox list)
  - Classification scheme (checkbox list)
  - Platform type (checkbox list)
- Category: Water quality
  - Parameter (checkbox list)
  - Measurement schedule (radio group)
  - Measurement frequency (checkbox list)
  - Medium (checkbox list)
  - Data units clearly labeled—yes, no, or both (radio group)

In addition to the various search facets already presented, below the categorized accordion controls, the user is presented with an option to find records that match either all selected values (the “AND” condition) or at least one selected value (the “OR” condition) per filter (Fig. 7). The “AND” condition is

selected by default, limiting search results to records that match all options specified by a user. For example, if the user selects three distinct parameters from the habitat monitoring parameters checkbox list, the result set will only include programs and/or assessments that collect or report on all three parameter types. If instead, the user selects the OR condition, the result set will also include any program and/or assessment that collects or reports on only one or two of the selected parameter types.

The image shows a 'Refine your search' panel with a list of filters, each with an upward arrow icon: RECORD TYPE, PROGRAM/ASSESSMENT TYPE, AGENCY, HABITAT/SETTING, TIMELINE, LOCATION, ACCESS/DOCUMENTATION, CITIZEN SCIENCE, HABITAT MONITORING, MAPPING, and WATER QUALITY. Below this list is a section titled 'Find records that match:' with two radio button options: 'All selected values' (which is selected) and 'At least one selected value per filter'.

*Fig. 7. The “AND/OR” search condition controls how strictly the faceted search tool limits the result set based on options selected by the user.*

## Spatial search

Along with other descriptive attributes, each program and assessment record in the dataset was categorized at multiple spatial scales, beginning with a footprint of the study area. Monitoring program footprints were represented by a custom polygon or bounding box, whereas assessment footprints were limited to state boundaries. Each footprint was then intersected against standard reference polygons to determine which HUC 10s, counties, states, ecoregions, and watersheds to associate with the record. Finally, the record was assigned a coverage, or a general description of the scale of a program or assessment, with levels including local, statewide, multistate, Atlantic, Gulf-wide, nationwide, and international.

As with other attributes, these spatial representations can be used to search the dataset for programs and assessments. Unlike other attributes, however, there are several ways to conduct a spatial search. Based on feedback from members of the Gulf Coast scientific community and beta testers, the search tool was designed to enable spatial searches not only from within the faceted search (i.e., the *Location* category), but also by using visual tools built into the map view mode of the search results pane. Location facets operate in the same way as other facets, except for one feature: besides being triggered directly by the user, spatial search facets will also be automatically triggered and updated when the user

employs one of the visual tools described below. (E.g., if the user selects a state with the visual *Find by layer* tool, the checkbox for that state will also be checked in the *State* search facet.)

The map view contains several interactive tools to aid a spatial search of the dataset (Fig. 8). Many of these features are common among interactive web maps, including pan and zoom controls, a button to return to the default map view, a legend, a background layer switcher, and an attribution display. A custom layer list provides a list of available program, assessment, and reference layers, allowing the user to hide or show individual layers on the map. A second, more detailed control provides complete lists of programs and assessments, grouped by states or watersheds, with which the user can toggle the display of footprints and overview information for individual records. Lastly, a custom *Find* control exposes geoprocessing tools that can be used to identify programs and assessments within an area of interest.



Fig. 8. Overview of map view controls, including: (1) default zoom, zoom in, and zoom out buttons; (2) a legend; (3) attribution; (4) custom tools; and (5) a background layer switcher.

The *Find* control comprises three tools to find programs and assessments by area or layer (Fig. 9). First, in the *Find by area* section, the user can choose to find all records within the current map extent, or viewport. The tool will intersect the bounding coordinates of the viewport with all program and assessment footprints and return those records that occur at least partly within those bounds. Second, instead of accepting the current map extent in the *Find by area* section, the user can draw a custom

polygon to use as the boundary for a similar search. Once the draw tool is selected, the user single-clicks the map at each vertex of the desired bounding area, and then double-clicks to create the final vertex, close the polygon, and execute the search (Fig. 10). Third, the user can enable a clickable version of the state or watershed reference layer in the *Find by layer* section, then click one of the displayed polygons on the map to find related programs (Fig. 11). This acts as a visual complement to the state and watershed controls in the faceted search tool, aiding a user who may be able to identify an area of interest visually, but not by name.

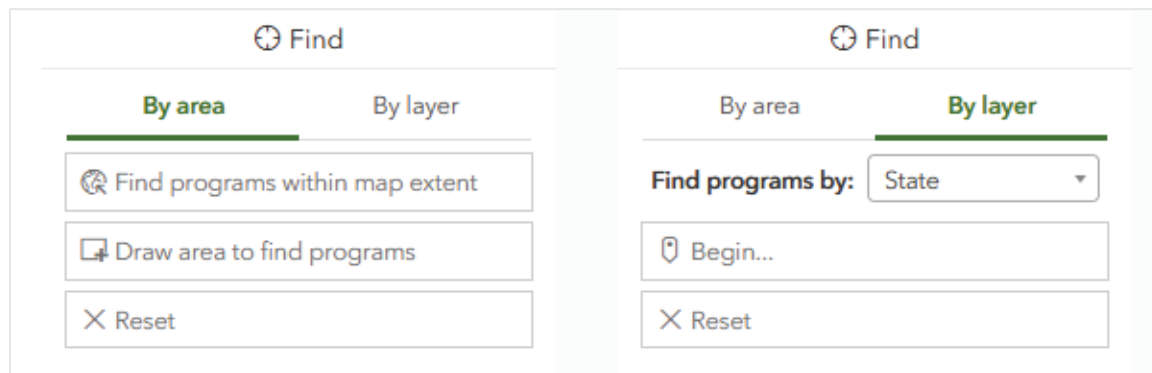


Fig. 9. Custom map tools enable users to find programs and assessments by area or layer.

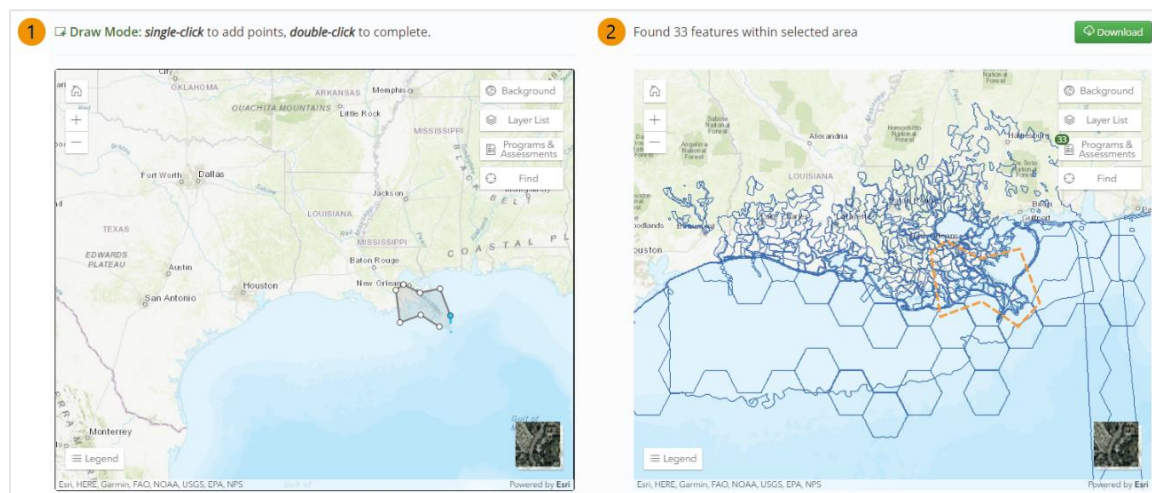


Fig. 10. The custom area find tool allows a user to (1) draw a custom bounding polygon and (2) view intersecting footprints.

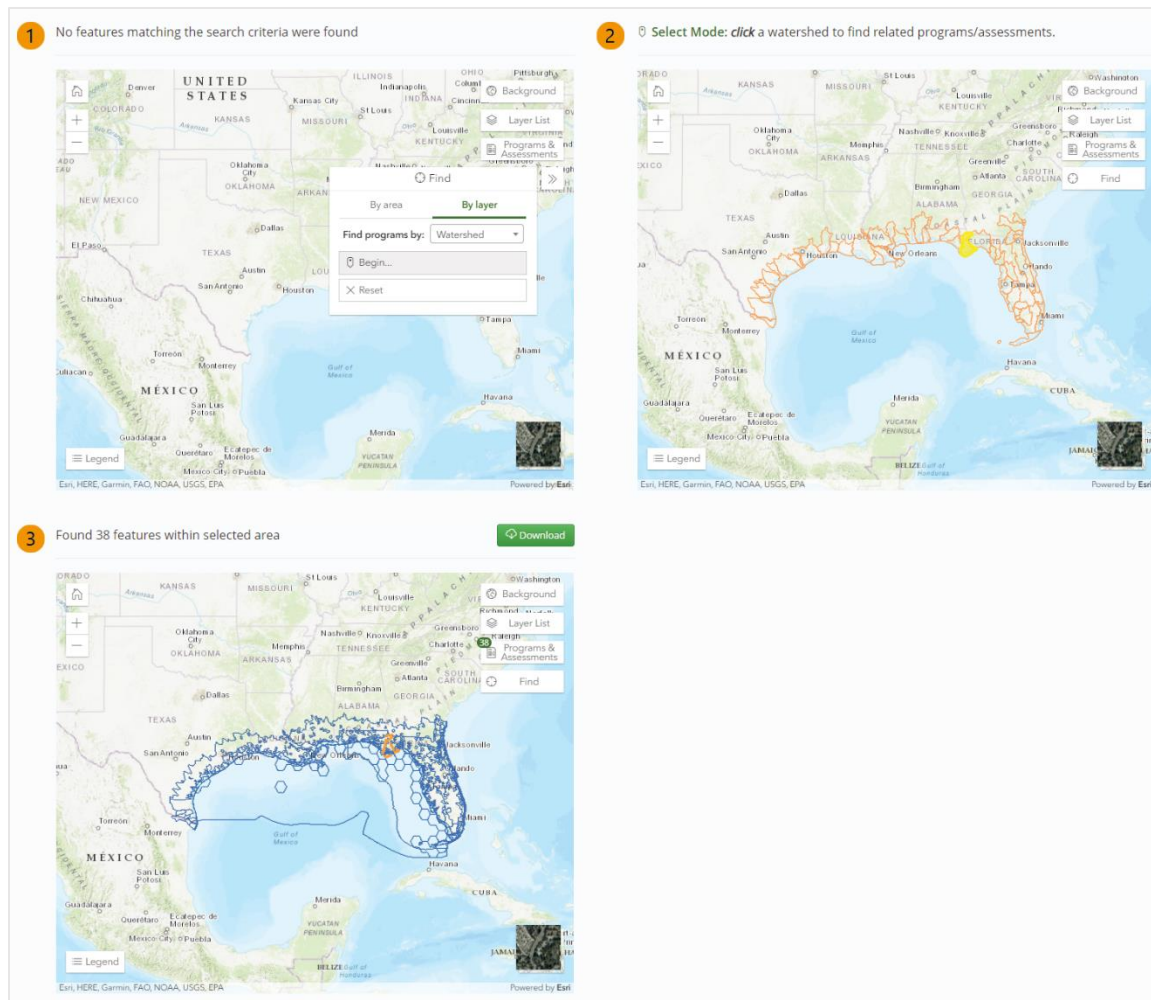


Fig. 11. Example of the find by layer tool to find program footprints intersecting a watershed. The user (1) opens the tool, (2) clicks to select a visible polygon, and (3) views intersecting footprints.

## Program/assessment details

Detailed information about each record in the dataset is available through the search tool. Both the list and map view modes include links for each search result to a fact sheet-style web page. In list view, each list item contains a linked program/assessment title (Fig. 12(a)). In map view, clicking on a visible footprint will highlight the selected record and expose a map overlay containing the program/assessment title and several tools to interact with the record; the link to the details page is at the bottom center of this overlay (Fig. 12(b)). A similar link can be found in the modal dialog opened by clicking the *View details* button at the top center of the map when a program/assessment footprint is selected (Fig. 12(c)).



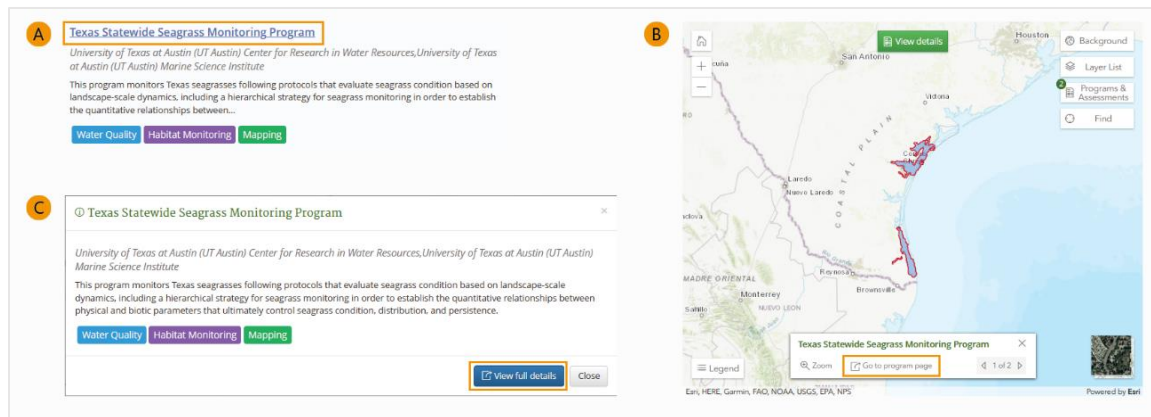


Fig. 12. (a) Program/assessment titles are linked to the details page in list view.  
 (b) In map view, the link is found in the overlay control when a footprint is selected.  
 (c) The link is also available in the modal dialog opened by the View details map button.

The details page displays information collected by the CMAP from public sources and program representatives, including links to external program/assessment websites and a high-resolution footprint map (Fig. 13). When opened from a link in the search tool, the details page will open in a separate browser tab or window. This way, a user can navigate the search tool and open one or more details pages without affecting the current search context and result set.

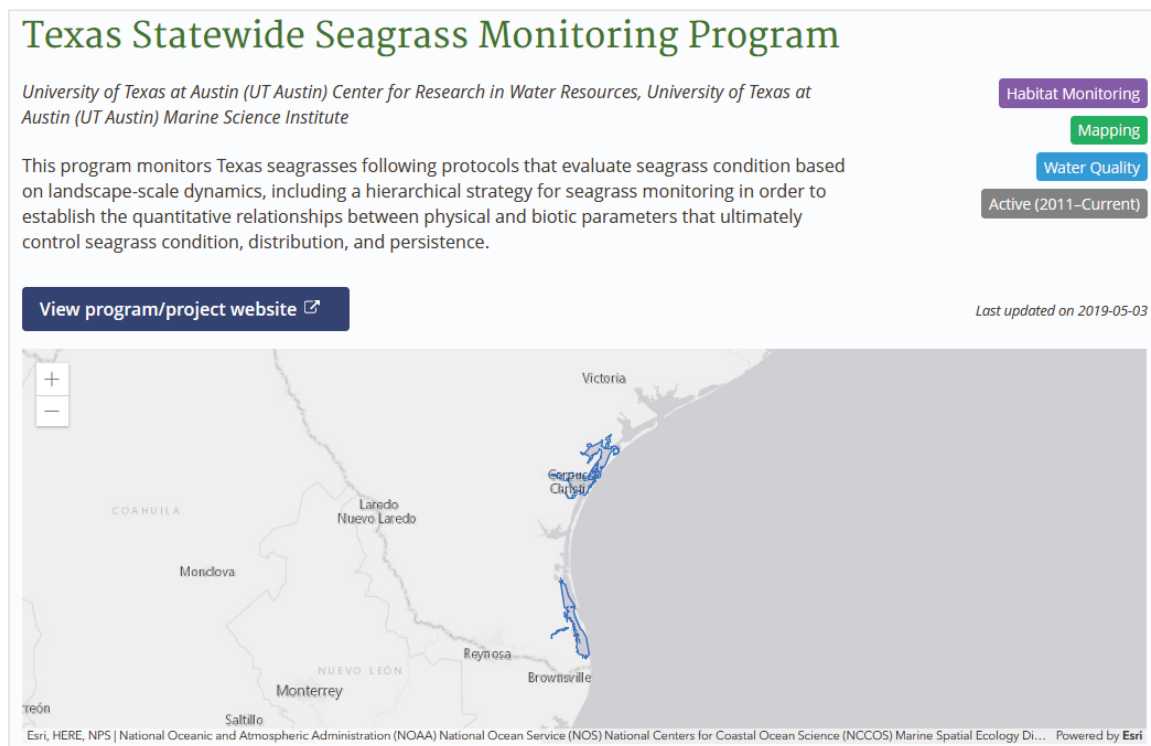


Fig. 13. The details page begins with orienting information, such as in this example, before displaying more specific characteristics of a program or assessment.

Depending on the focus area of a monitoring program and the availability of the information, the details page may show some or all of the following attributes:

- Title
- Operating agencies
- Description
- Areas of focus—habitat monitoring, mapping, water quality
- Start and end dates
- Status—Active, inactive
- Date of last record update
- External program website link
- High-resolution footprint map
- Spatial coverage
- Related states
- Related counties
- Related ecoregions
- Related waterbodies
- Related watersheds
- Related HUC 10s
- Habitat types and associated aquatic settings
- National Resource Damage Assessment (NRDA) keywords
- Volunteer/citizen science involvement
- Funding agencies
- Funding sources
- Data accessibility method (and link, if available)
- Machine readability
- Metadata availability (and link, if available)
- Publications availability (and link, if available)
- Collection procedures documentation level (and link, if available)
- Analytical procedures documentation level (and link, if available)
- Quality Assurance (QA) protocol documentation level (and link, if available)
- Habitat monitoring parameters
- Habitat monitoring measurement schedule
- Habitat monitoring measurement frequency
- Mapping parameters
- Mapping technology
- Mapping activity
- Mapping classification scheme
- Mapping platform type
- Mapping spatial resolution
- Mapping temporal resolution
- Mapping product dates
- Water quality parameters
- Water quality measurement schedule

- Water quality measurement frequency
- Water quality medium
- Water quality units of measure
- Program representative contact information

Likewise, some or all of the following attributes may be displayed on the details page for assessments:

- Title
- Operating agencies
- Description
- Areas of focus—habitat monitoring, mapping, water quality
- Start and end dates
- Reporting/publication date
- Date of last record update
- Assessment frequency—once or reoccurring
- Related records in the monitoring program inventory (with a link to each one)
- External assessment website link
- High-resolution footprint map
- Spatial coverage
- Related states
- Related watersheds
- Habitat types and associated aquatic settings
- Authors
- Publications availability (and link, if available)
- Digital Object Identifier (DOI)
- Recommended citation
- Habitat monitoring parameters
- Habitat monitoring metric index—whether the assessment reports on one or more habitat monitoring parameters
- Mapping parameters
- Mapping metric index—whether the assessment reports on one or more mapping parameters
- Mapping comments
- Water quality parameters
- Water quality metric index—whether the assessment reports on one or more water quality parameters

### Downloading results

Instead of viewing information about programs and assessments individually on the details page, a user may choose to download a data file containing information about all records in the search result set. When the search results pane is not empty, a green *Download* button can be found in the top left corner of both the list and map view modes (Fig. 4). Clicking this button will open a modal dialog in which the user can select from three download formats: comma-separated values (.csv), Microsoft Excel (.xls), or JavaScript Object Notation (.json). The user can then click the *Download* button and save the resulting file to their computer or open the file in the appropriate program.



Downloaded files contain the same information displayed on the details page, with one row or object for each program or assessment in the search result set. Such files can be useful for further analysis of program/assessment information, as well as for maintaining an offline record of the search results before the user ends a search session.

### Search history (and removing search criteria)

The search tool keeps track of the search context, including keywords, facets, and results, through an entire user session. The user can navigate away from the search tool to other pages of the portal or other websites in the same browser tab; while the tab stays open, returning to the search tool will set it back to its most recent state. There are several ways to remove applied search criteria and reset the search tool to a previous state. First, the user can close the browser tab and/or open the search tool in a new tab. In this case, the search tool will open in its default (empty) state. More simply, the search tool can be reset without leaving the page by clicking the *Clear all search filters* button that appears beneath the faceted search when one or more search criteria have been applied (Fig. 14). After confirming the action in a modal dialog, the search tool will discard all applied criteria and results. Finally, the tool also tracks up to the 20 most recent search criteria applied and offers an undo button to revert those criteria in reverse order. The undo button appears to the left of the faceted search heading when one or more criteria have been set; clicking the button will revert the interface to the previous search context. In addition, a count of active facets is displayed next to each faceted search category when the count is greater than zero (Fig. 14). These counts may help the user track the impact of reverting to an earlier search context.

Refine your search

RECORD TYPE 1

PROGRAM/ASSESSMENT TYPE 2

AGENCY

HABITAT/SETTING

TIMELINE

LOCATION

ACCESS/DOCUMENTATION

CITIZEN SCIENCE

HABITAT MONITORING

MAPPING

WATER QUALITY

Find records that match:

☒ All selected values

☐ At least one selected value per filter

Clear all search filters

Fig. 14. Search history controls can be found in the faceted search tool, including the undo button (top right), active facet counts (middle), and the Clear all search filters button (bottom).

## Statistics

The statistics tool provides an overall look at the contents of the dataset. A selection of premade graphs illustrates the types of programs and assessments, where they are located, what habitat types they work in, what parameters they collect, and how their data can be accessed.

The list of available graphs is located on the left side of the page and is separated by monitoring programs and assessments. Users can click on an option to view the corresponding graph. For example, selecting the option *By state/federal jurisdiction* under *Monitoring Programs* leads the user to a graph showing the number of programs in the dataset that collect data in each state and in federal waters (Fig. 15). Some graphs may also use multiple colors to show a breakdown of programs or assessments by area of focus or by habitat parameter type (i.e., abiotic, plants/macroalgae, and submerged habitat building animals).

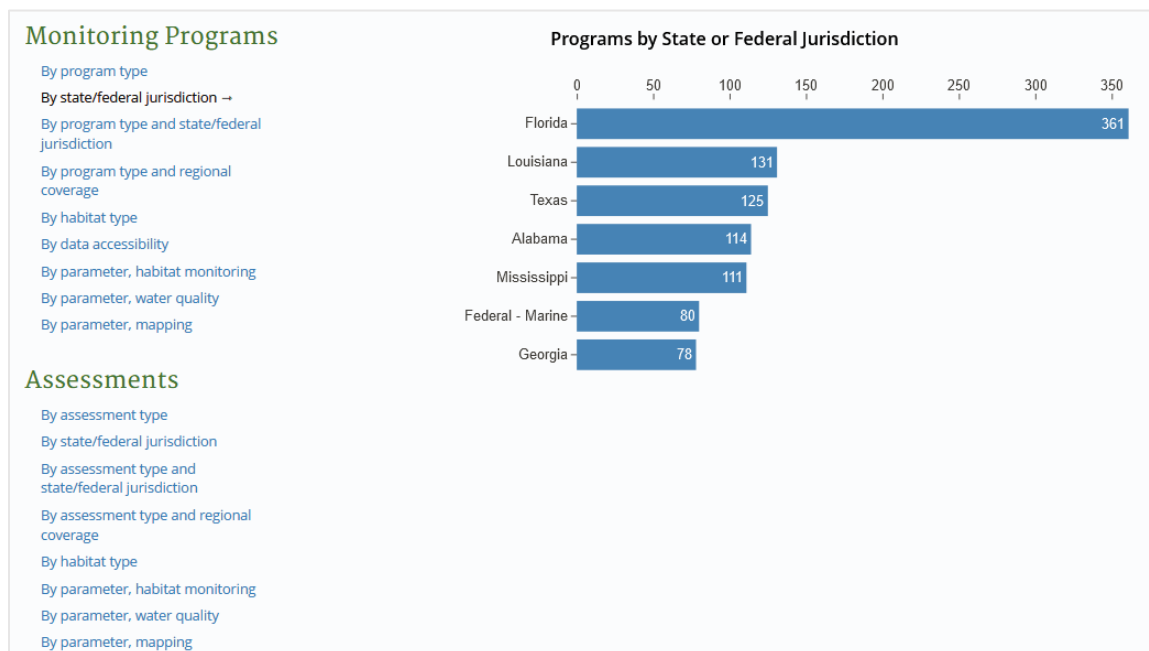


Fig. 15. The statistics tool enables categorical evaluation of the dataset through graphs, such as, in this case, the number of programs inventoried in each Gulf Coast state or federal jurisdiction.

## Documents

The document library contains links to CMAP products and other program resources. Developing the portal was one component of the larger CMAP project, and the program accomplished several other tasks that contributed to and built off information contained within the portal. These tasks included: (1) developing a comprehensive inventory of existing habitat and water quality observation, monitoring, and mapping programs in the Gulf of Mexico; (2) evaluating the suitability/applicability of each program and its existing and prospective data for use in restoration activities; (3) developing a process to use the inventory to conduct gap assessments; and (4) developing a catalog of baseline assessments conducted

in the Gulf of Mexico. Products related to these tasks are included in the document library to provide additional information and context for users of the portal.

The document library includes sections on reports, datasets, and additional resources. CMAP released four reports detailing the development and applications of the monitoring program inventory and assessment catalog. CMAP also released a data package containing datasets that supplement the reports and portal. Additional resources, including fact sheets, a CMAP project page on the NOAA National Centers for Coastal Ocean Science (NCCOS) website, and the Gulf of Mexico Monitoring Community of Practice webpage, also contain information related to CMAP. Users can navigate to a desired resource by clicking on the link.

## Additional resources

For more information about CMAP, interested users can visit the project page on the NOAA NCCOS website at <https://coastalscience.noaa.gov/project/restore-council-monitoring-and-assessment-program-building-a-comprehensive-monitoring-network/>. This page contains a summary of the program and its objectives, as well as links to CMAP products, datasets, and reports.

For questions about the portal, including those concerning technical difficulties and the contents of the dataset, please contact:

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## Acknowledgements

This report could not have been completed without the cooperation, time, and effort contributed by many. We would like to thank everyone who participated in this significant undertaking and the RESTORE Council for funding this effort.

The Gulf Coast Monitoring and Assessment Portal was developed by the U.S. Geological Survey (USGS), Wetland and Aquatic Research Center's Advanced Applications Team. The development team was led by Kevin Suir and included Anthony Kuczynski, Philip Quibodeaux, Sumani Chimmula, Cole Ruckstuhl, and Craig Conzelmann. Assistance with spatial data was provided by Nicholas Enwright, Heidi Burkart, and Hana Thurman. Alpha testing was conducted by Christina Hunnicutt and Cole Ruckstuhl. Beta testing was conducted by numerous volunteers, including Randy Clark, Nicholas Enwright, Sarah Hile, Heidi Burkart, Jake Howell, Katie Watson, Samuel Rendon, Julie Bosch, and Ali Robertson.

Guidance on development of the portal, along with the entire CMAP effort, was provided by Gregory Steyer, Steve Giordano, Mark Monaco, Mike Lee, Randy Clark, and Richard Rebich. Jessica Henkel and Brie Bernik of the RESTORE Council staff were instrumental in understanding the needs of end users. Additional guidance and assistance were provided by members of the CMAP Monitoring Community of

Practice, the Gulf of Mexico Alliance (especially Ali Robertson), GulfTREE (Mikaela Heming and Renee Collini); and the USGS Southeast Global Change Monitoring Portal program (Cari Furiness).

The user guide was compiled primarily by Kevin Suir and Hana Thurman, with contributions and reviews provided by Anthony Kuczynski, Philip Quibodeaux, Sumani Chimmula, Jake Howell, Heidi Burkart, Nicholas Enwright, Kari Cretini, and Mark McKelvy.

Finally, the portal would not be a reality without the countless hours spent by the CMAP project team in developing the underlying materials. We would like to thank the project team for their participation and expertise.

## Disclaimers

This report was prepared under a grant from the Gulf Coast Ecosystem Restoration Council to the Department of Commerce National Oceanic and Atmospheric Administration (NOAA) and the Department of the Interior, U.S. Geological Survey (USGS).

This report has been peer reviewed and approved for publication consistent with USGS Fundamental Science Practices (<https://pubs.usgs.gov/circ/1367/>).

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