Multi-LCC Mississippi River Basin Gulf Hypoxia Initiative

ScienceBase and Data Basin User Guide

Data delivery for the Gulf Hypoxia Initiative is carried out through the use of two websites: ScienceBase and Data Basin. ScienceBase is a website maintained by the USGS that serves as a repository for storing data and generates map services from uploaded spatial data that can then be viewed on mapping platforms such as Data Basin, ArcGIS Desktop, or other GIS software. As ScienceBase currently lacks mapping capability, a site like Data Basin is required to view map layers and compile them into maps suitable for decision support. All data compiled and developed during the project was uploaded to ScienceBase and then linked to Data Basin where appropriate. Users wishing to delve into the metadata for particular datasets will find ScienceBase better suited for that process. While it is not necessary to be registered to use ScienceBase, users wishing to utilize the full capabilities of Data Basin must be registered. There is no fee for registering with Data Basin. The report that describes the collection and development of data for this project can be found in the Documentation folder on the Data Basin site.

Text colored red in this document represents activities that will be covered in the Evening Mapping Session.

ScienceBase
Site URL: https://www.sciencebase.gov/catalog/item/54e37c9ce4b08de9379b51e3

Project data on the ScienceBase site is located on three main directories – Data, Documents, Maps:

- **Data** - Datasets intended to support development of the Multi-LCC Mississippi River Basin/Gulf Hypoxia Initiative's Conservation Blueprint 1.0.
- **Documents** – Documents and reports intended to support development of the Multi-LCC Mississippi River Basin/Gulf Hypoxia Initiative's Conservation Blueprint 1.0.
- **Maps** – Maps and illustrations intended to support development of the Multi-LCC Mississippi River Basin/Gulf Hypoxia Initiative's Conservation Blueprint 1.0.

Within the "Data" directory there are a number of subdirectories grouped by category or theme:

- **Basemap** - Base data layers (e.g., land cover, imagery and boundaries).
- **Conservation Designations** - Data layers pertaining to the management, restoration, or acquisition designations of state, federal, and non-government organizations (e.g., Focus Areas, Opportunity Areas, Priority Areas, Outstanding Natural Areas) along with the conservation estate (i.e. protected lands) within the Mississippi River Basin.
- **Ecological Systems** - Data layers related to ecological habitat systems as defined for use by the Multi-LCC Mississippi River Basin/Gulf Hypoxia Initiative (i.e., headwater row crop fields; upland prairies; mid-sized riparian streams; mainstem floodplains in the upper and lower Mississippi River Basin).
- **Geophysical** - Data layers related to geophysical characteristics e.g., slope, soil characteristics, and topographic position.
- **Habitats** - Data layers pertaining to habitats in the Mississippi River Basin (e.g., wetlands, and historic and presettlement vegetation).

- **Opportunities** - Implementation opportunities on agricultural lands identified by the Multi-LCC Mississippi River Basin/Gulf Hypoxia Initiative that may benefit wildlife, water quality, and agriculture.
- **Production Systems** - Data layers related to production systems (i.e., Corn/Soybeans, Cotton, Rice, Grazing Lands, and Bottomland/Floodplain Forest) as defined for use by the Multi-LCC Mississippi River Basin/Gulf Hypoxia Initiative.
- **Species** - Distribution models and ranges of species of interest to the Multi-LCC Mississippi River Basin/Gulf Hypoxia Initiative.
- **Water Quality Focus Areas** - Watershed-based data layers related to targeting implementation opportunities for improving both local water quality, and that of the Gulf of Mexico.
- **Supplemental Data** - Datasets that provide landscape context for evaluation of implementation opportunities on cropland or grazing land.

A list of all datasets uploaded to ScienceBase and Data Basin can be found in the Data Dictionary located at https://www.sciencebase.gov/catalog/item/5633ce39e4b048076347f03f. The "Theme" column relates to folders located on ScienceBase and Data Basin (see below).

Dataset Title	Metadata Description	Theme/ScienceBase Data Directory	ScienceBase Item URL	Data Basin Item URL
Biofuel Switchgrass Potential - 2030 (MRB)	Potential yields and harvested area, by county, within the Mississippi River Basin, of switchgrass planted for biofuel in the year 2030 from the USDOE Billion Ton Update baseline scenario at a farmgate price of $60/dry ton or less. Source: USDOE Billion Ton Update, Scenario: BLY+EC1_BLT (Baseline Yield with 1% Increase in Energy Crops); Year: 2030.	Basemap	https://www.sciencebase.gov/catalog/item/56337ebee4b048076347ef3c	http://databasin.org/datasets/35a3aabf396c446183a160c42ae9a527
Common Resource Areas (MRB)	NRCS Common Resource Areas (CRA), version 1.2. A Common Resource Area is defined as a geographical area where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a CRA. Features have been conflated with land cover attributes pertinent to the MRB/GHI e.g. cropland, forest, prairie, etc.	Basemap	https://www.sciencebase.gov/catalog/item/55df4006e4b0518e354e099f	http://databasin.org/datasets/65b0c26ed0fc46aba5fe6a9b50f28f63
Conservation Reserve Program - Acreage by County	This dataset represents the cumulative acreage of farmland by county enrolled in the Farm Service Agency's Conservation Reserve Program in 2004. To create this dataset, the Conservation Biology Institute (CBI) obtained the cumulative acreage by county summary table from the Farm Service Agency (FSA) for 2004 (the latest year available in such form).	Basemap	https://www.sciencebase.gov/catalog/item/537f6c85e4b021317a872b1e	http://databasin.org/datasets/69826c5d16c24057ac590529f493913a
Joint Venture Boundaries	Joint Ventures (JVs) are collaborative, regional partnerships of government agencies, non-profit organizations, corporations, tribes, and individuals that conserve habitat for priority bird populations. JVs bring these diverse partners together under the guidance of national and international bird conservation plans to design, implement, evaluate, and improve landscape-scale	Basemap	https://www.sciencebase.gov/catalog/item/4fbbda49e4b0ee66f48f6703	http://databasin.org/datasets/0c927ca0a1e847d89a3bd8e2b59b065a
Landscape Conservation Cooperatives (MRB/GHI)	Boundaries of Landscape Conservation Cooperatives participating in the Multi-LCC Mississippi River Basin/Gulf Hypoxia Initiative.	Basemap	https://www.sciencebase.gov/catalog/item/56155c46e4b0ba4884c612b7	http://databasin.org/datasets/5ef95ebd9b074283b15e42a00180ed16

ScienceBase offers users the ability to find data through typical browsing or searching functions. There are three ways or "views" users can find data: Item View, Folder View, Search View. The first two can be accessed through the link provided at the top of this section, while the "Search" view can be accessed through the link listed below. The Item View is the easiest way to quickly browse the data holdings. The Data Dictionary can be used to help identify which folder the data is located in. In Item View click on the "+" to view the contents of a given folder.   The Folder View provides a brief description of the contents of each folder, whereas the Item View does not. Users wishing to search for particular datasets should start here: https://www.sciencebase.gov/catalog/items?q=&parentId=55b7cf34e4b09a3b01b5fb67&. Alternatively, you can click on "ScienceBase-Catalog" at the top left of the page to search for data not included in the Gulf Hypoxia Initiative's portal.

Browsing for Data

1) Navigate to tinyurl.com/MRB-GHI-ScienceBase
2) On main page, click "Data"
3) Choose "Item View" from "View" dropdown menu
4) Choose directory of interest
5) Select item of interest

A ScienceBase Item contains a brief description of the data, contact information, tags, and links to the metadata and GIS files. Geospatial data located in ScienceBase can be downloaded directly to your computer or used as a map service in ArcGIS or other GIS software. Most of the datasets on ScienceBase are in zip format, but other datasets are stored as "Service Definition" files. These are file packages used to serve map services, such as those used in Data Basin. The service definition files (file extension = .sd) can be unzipped using the WinZip program. The unzipped data will contain an ArcGIS map document (.mxd) and the associated GIS data used in the map document. The map document is in directory ("same name as SD file")\v101 e.g., the Conservation_Designations map document is located in the directory: Conservation_Designations\v101.

Using ScienceBase Map Services within ArcGIS

1) Copy WMS URL from ScienceBase item of interest (Spatial Services section/ArcGIS WMS Service) by clicking on Clipboard icon
2) Open ArcCatalog
3) Open "GIS Servers" in table of contents
4) Click " Add WMS Server"
5) Paste URL into ArcCatalog dialog box
6) Click "Get Layers" to verify successful connection
7) Click "OK'
8) Drag layer from ArcCatalog into ArcMap
   a) Using ArcCatalog to set up the service will store the service in the "GIS Servers" section of ArcCatalog

Data Basin
Site URL: http://databasin.org/groups/d52de40d017e4ce98c3914dba1bc4ee7

Datasets stored in Data Basin are organized into subfolders in the same fashion as in ScienceBase.

The primary utility of Data Basin is the ability to create and export maps for users without desktop GIS software. Users with desktop GIS software may find it easier to load the map services from ScienceBase in to their desktop system.

Data and maps pertaining to the Gulf Hypoxia Initiative are compiled in a group named "Mississippi River Basin/Gulf Hypoxia Initiative". To find this group you can either use the website address (URL) provided above or search for "gulf hypoxia", select "Groups", and then click on the group name. While

it is not necessary to be registered to use Data Basin, you must register in order to save maps and bookmarks, and access restricted data. While non-users can find and access the Gulf Hypoxia Initiative's data and maps, you must register in order to access the data organized by category. Non-registered users are only allowed to view the group Public Profile, thus they are not able to access the group's content from the group page. However, they can access the content either through searching for specific layers or adding the data layer URL found in the Data Dictionary. Search results are grouped into tabs or categories e.g. "Datasets" displays all of the data layers matching the search criteria. Tutorials on various topics can be found at http://databasin.org/help.

Navigating within the Gulf Hypoxia Initiative Data Basin Group

All of the Gulf Hypoxia Initiative data and maps can be accessed by clicking on the "Content" link. Within the Content page you will see a group of thumbnails that represent links to all the pre-made maps that have been created for the project. Below these maps is a set of folders where all of the data is stored. These folders and the content within in them are organized in the same manner as the source data in the ScienceBase site. Note that these are primarily links to the data stored on ScienceBase, in order to view the complete metadata for a data layer; you must access it on ScienceBase. In the Details tab of a Data Basin record there is a "View Record" button that provides access to the source record on ScienceBase.

Any datasets or maps of interest to a user can be bookmarked within their own profile and these bookmarks can be organized into folders.

Clicking on a map or data layer will open up a page that displays more information about the data or map. Moving your cursor over the map image will cause an "Open in Map" button to appear. Clicking on this button will open up a map in a new window. Within the map there are a number of options for adding layers, navigating around the map, and exporting layouts.

Working with Maps in Data Basin

1) Navigate through the subdirectories in the "Content" tab to find a layer of interest
2) Mouse-over thumbnail until window pops up > Click "Actions" (top right corner of window)> Click "Open in Map"
3) When the map opens in a new window the user can add alternate basemaps, additional layers, and navigate around the map
4) Basemaps are the base layers of a map and are used for orientation e.g., imagery or topo or street maps. These can be added or removed to meet the needs of the user.
5) Basic Map Controls
   a) Enable Pan Mode - Pan/Move map to another location
   b) Enable Zoom Mode – Allows user to zoom in to selected area
   c) Zoom In/Zoom Out – Zooms map in or out at same location
   d) Locate - Navigate to a particular place by inputting place name or coordinates
   e) Identify – Provides attribute information for all features under cursor
   f) Measure – Measure distance on map
   g) Swiper – Allows user to view underlying layers
6) Adding additional layers

a) Click "Layers" tab on left side of map
b) Click "Add Datasets", most likely sources are "My Bookmarks" or "My Groups"
   i) My Bookmarks
   ii) My Groups
      (1) Mouse-over group of interest
      (2) Click "View Contents"
      (3) Select check-mark for layers you want to add
      (4) When finished, Click "Add Items" at bottom of screen
c) *Notes*
   i) *Some layers may not be visible when first added to a map. Users will either need to zoom in before they become visible, or in some cases layers will become invisible once you zoom in to a scale where viewing the layer is irrelevant, e.g. watershed boundaries. Zooming out will make these layers visible again.*
   ii) *Layer visibility can be quirky – the legend may not always match which layers are supposed to be visible. Turn layers in question off/on, until legend displays correctly.*
7) Layers can be moved up or down in Table of Contents
   a) Mouse over layer of interest, when cursor turns into cross with arrows, drag layer to desired location
8) Layer Options
   a) Zoom – Zooms to extent of layer
   b) Transparency – Sets transparency of layer
   c) Remove – Removes layer for map
9) Turning layers on/off
10) Saving
11) Exporting
12) Setting Permissions