

Eco-Logical is an interactive, web-based tool created to coordinate long-range transportation planning with ecosystem preservation efforts.

What is Eco-Logical?

Eco-Logical is an interactive, web-based tool created to coordinate long-range transportation planning with ecosystem preservation efforts. H-GAC's 2010 release of the tool identified broadly defined regions of ecological importance adjacent to transportation projects. The 2020 release introduces an updated Ectype map and considerably expands the application's functionality, making the tool a valuable resource for research in a wide range of interests.

The tool now tracks current and projected landuse, the location of announced developments, important

community resources and infrastructural assets, hazardous sites, characteristics of the vulnerable population, employment, and other information useful to project impact assessments, PEL studies, and transportation corridor analyses. The tool also offers additional ways to view and analyze the Ectype resources within the H-GAC metropolitan planning area.

Follow this quick user guide to become immediately productive using this powerful tool.

Access Eco-Logical

Visit datalab.h-gac.com/EcologicalGIS.

Desktop review of project to widen Highway I-45 S. (From 2045 Regional Transportation Plan).

The screenshot displays the Eco-Logical web application interface. The top navigation bar includes the application name and a search field. The main map area shows a satellite view of Houston with a red outline indicating a project area. A 'Layer List' panel on the left shows various layers, with 'H-GAC 2045 RTP Projects' and 'Roadway Projects' selected. A 'Red Flag Report' panel on the right lists various facilities and their counts. At the bottom, a data table provides details for selected roadway projects.

MPOID	CSJNumber	CountyName	Sponsor	Street	FromLimit	ToLimit	ProjectDescription	LENGTH	FiscalYear	ConformYr	TOTALCOST	ProjectStatus
18,185		Multiple	H-GAC	IH 45 S	NASA 1 Bypass	S of SH 146	Construct two-way reversible lanes	24.55	2,040	2,045	867,734,620.00	RTP 2045
18,186		Harris	H-GAC	IH 45	Downtown	Nasa 1 Bypass	Conversion of existing one-way reversible HOV lane in IH-45 Gulf from downtown to NASA 1 Bypass to two-way, all-day facility	20.70	2,040	2,045	122,465,554.00	RTP 2045

UPDATED ECOTYPE MAP

QUICK GUIDE TO THE WIDGETS



Legend



Layer List



Project Location



Add Data



Ecotype Density Contour Query



Ecotype Acre Query



Swipe



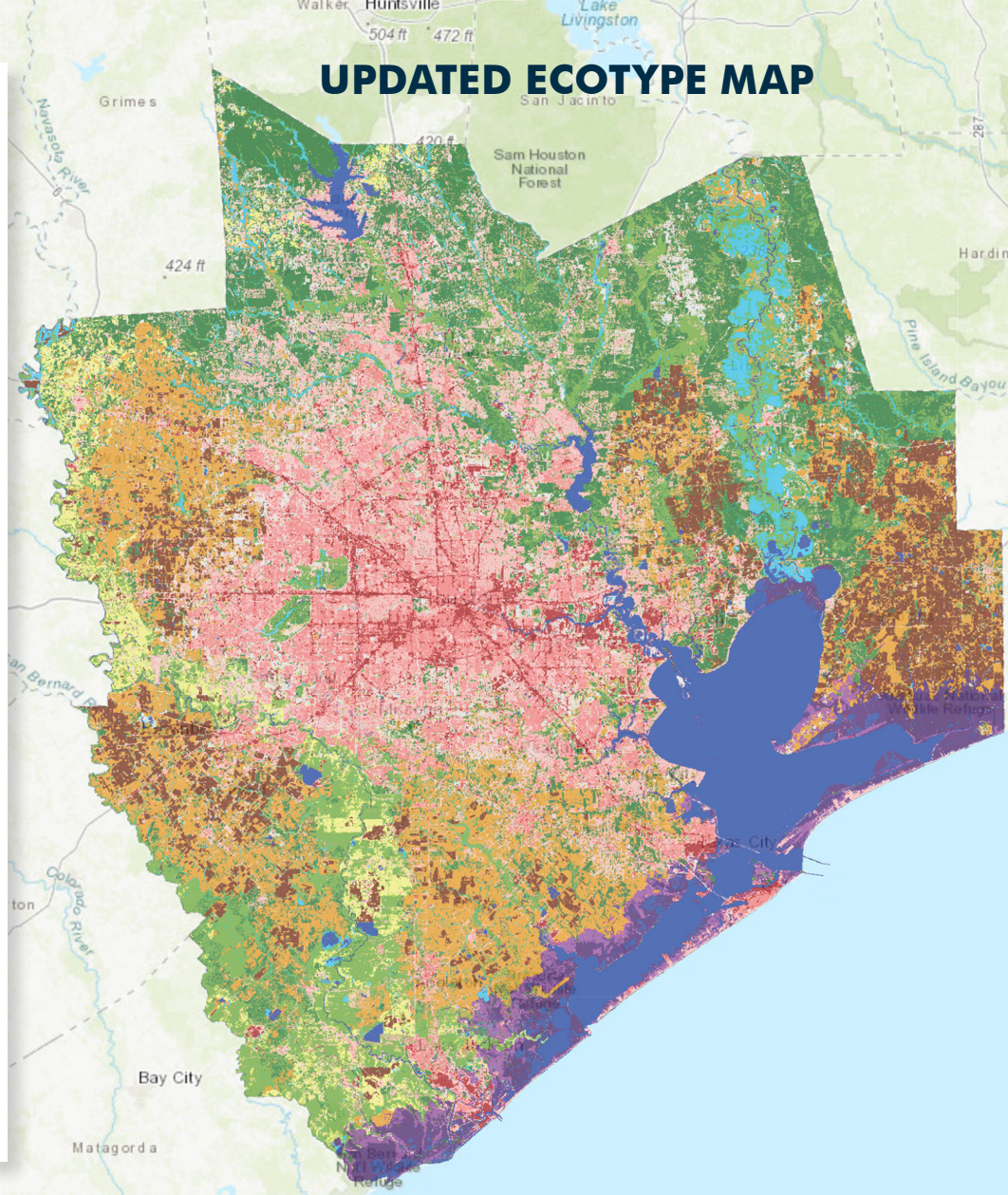
Bookmark



Default Extent



Basemap Gallery



Eco-Logical Land Cover



Upland Forest

Bottomland Forest

Prairies

Tidal Prairies

Non-Prairie Grasslands

Freshwater Wetlands

Tidal Wetlands

Barren Lands

Row Crops

Open Water

Developed High Intensity

Developed Medium Intensity

Developed Low Intensity

Developed Open Spaces

Get Started

PROJECT IMPACT ASSESSMENT

Identify where your project coincides with vital resources

1. Add Your Project Extents to the Application – You have three options:

- a. Draw in your project using the “**Project Location**” widget.
- b. Import a zipped Shapefile using the “**Add Data**” widget.
- c. Insert your project from an ArcGIS Online source using the “**Add Data**” widget.

2. Run a Query

- a. Select the project then click on the ellipses [...] at bottom of the popup box.
- b. Select “**Open Red Flag Report**” or “**Set Location**,” insert a buffer distance and hit “**Enter**.”
 - i. To view the Red Flag Report, select “**Report**” then click the “**Print**” icon.
 - ii. For Set Location results, click the tabs to display the socio-ecological data.
- c. To clear the selections, click “**Start Over**.”

3. What you learn from the Queries

- a. The existing and forecasted landuse in a study area.

- b. The natural, cultural, and human resources within a study area.
- c. A preview of issues relevant to the environmental impact assessment of a project.

4. Potential Uses of the Data

- a. Discussions of existing conditions in a planning or environmental study.
- b. A source for assessing the indirect and cumulative impacts of transportation projects.
- c. Support for efforts to preserve and restore the region’s wetland, grassland, and forest resources.

PRACTICAL USER TIPS

- Your buffer distance could be zero if the study area is a polygon.
- Use the “**Find Address or Place**” function to zoom to the location when drawing a project manually and if needed, temporarily turn off the “**Eco-Logical Land Cover**” layer in the “**Layer List**” for visual clarity.
- Before printing a Report, turn off the “**Red Flag Indicator**” layer in the “**Layer List**” and if desired, change the background in the “**Basemap Gallery**.”

ECOSYSTEM MANAGEMENT

Analyze Ecotype resources in the region

1. Examine Ecotype Distribution by Density

[Identify where Ecotype stands exceed a specified landcover percentage]

- a. Select a density percentile for your Ecotype search using the **"Eco-Type Density Contour Query"** widget.
- b. Scroll through the Results table or zoom to an area of interest to examine the Ecotype stands.
- c. To clear the selection, click the ellipses [...] then select **"Remove this result."**
- d. To start a new query, click on **"Tasks"** and then the back arrow.

2. Examine Ecotype Distribution by Size

[Discover contiguous Ecotype stands that exceed a specified acreage]

- a. Enter a minimum acreage for your Ecotype search using the **"Eco-Type Acre Query"** widget.
- b. Scroll through the Results table or zoom to an area of interest to examine the Ecotype stands.
- c. To clear the selection, click the ellipses [...] then select **"Remove this result."**
- d. To start a new query, click on **"Tasks"** and then the back arrow.

i. Visualize Ecotype Resource Loss

[See where 2010 Ecotype stands have been converted to developed land]

- b. Turn off the **"Eco-Logical Land Cover"** layer in the **"Layer List."**
- c. Turn on the **"Eco-Types (2010)"** and **"Eco-**

Type (2010) Changed to Developed" layers.

- d. Zoom to areas of interest for a qualitative view of habitat loss.

3. Compare New Ecotype Basemap with 2010 Basemap

[Examine current basemap against 2010 Ecotype delineations]

- a. Launch the comparison window by selecting the **"Swipe"** widget.
- b. Open the Legend to display layer descriptions.
- c. Zoom to areas of interest to view the Ecotype resources.

4. What you learn from the Queries

- a. The geographical distribution of habitat types in the region.
- b. The location of Ecotype resources that may be priorities for preservation.
- c. Areas where development pressure is impacting the regions' ecosystems.

PRACTICAL USER TIPS

- Save a map view for future reference using the **"Bookmap"** widget.
- Place a reference marker on a selected polygon. Click on the ellipses [...] in popup window.
- Use the **"Imagery with Labels"** background for the Ecotype Density and Size queries.
- After zooming in, use the **"Default Extent"** widget to return to the full map extent.



EXPLORE MAP LAYERS AND BACKGROUNDS

Harness the flexibility of Eco-Logical

1. Survey Landuse Change by Overlaying Map Layers

- a. In “**Layer List**,” turn on the “**Planned Developments**” layer and turn off “**Eco-Logical Land Cover**.”
- b. Change transparency of the “**Planned Developments**” layer to 50% by clicking on the ellipses [...] in “**Layer List**.”
- c. In “**Basemap Gallery**,” change background to “**Imagery with Labels**.”

- d. Open the “**Legend**” to display layer descriptions.
- e. Examine the landuse change in progress.

2. Examine Potential to Promote Development

- a. In “**Layer List**,” turn on the “**H-GAC 2045 RTP Projects**” and “**Planned Developments**” layers.
- b. In “**Basemap Gallery**,” change background to “**Imagery**.”
- c. Open the “**Legend**” to display layer descriptions.
- d. Analyze associations between Announced Developments and the transportation projects.



Picture of a Bottomland Hardwood Forest.

DESIGN YOUR OWN SURVEY

Explore the expandability of Eco-Logical through ArcGIS Online

1. Watershed Protection

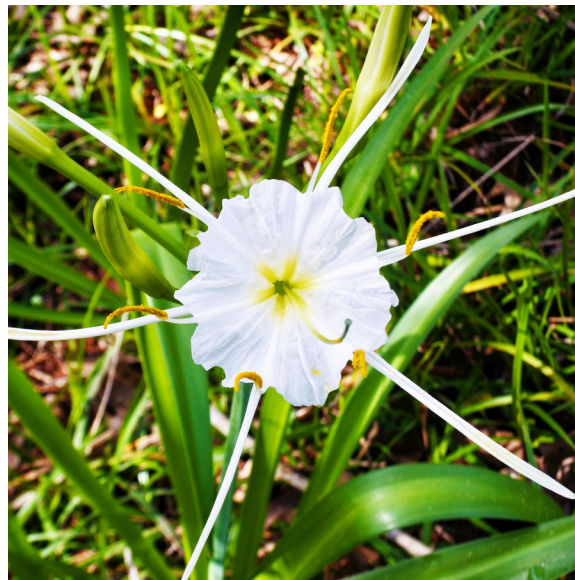
- a. Using the **"Add Data"** widget, search for **"HCFCD Regional Watersheds"** and add the **"Regional_Watersheds"** layer to the map.
- b. In **"Basemap Gallery,"** switch the background to **"USGS National Map."**
- c. Select a Watershed and run **"Set Location"** and **"Red Flag"** queries for socio-ecological data.

2. Neighborhood Planning

- a. Using the **"Add Data"** widget, search for **"COH Super Neighborhoods"** and add the layer to the map.
- b. In **"Basemap Gallery,"** switch map background to **"USA Topo Maps."**
- c. Select a Neighborhood and run the **"Set Location"** query for socio-ecological data.

3. Emergency Services/Safety Planning

- a. Using the **"Add Data"** widget, search for **"Nursing Homes"** and add the layer to the map.
- b. In **"Basemap Gallery,"** switch background to **"Topographic."**
- c. Select a Facility and run the **"Red Flag"** Query.
- d. In Layer List, turn off all layers combined under **"Red flag Indicator"** except **"Floodplains (WAT)."**
- e. Examine the facilities within the Flood Hazard Zones.



The Texas Spring Spider Lily is a native plant.

PRACTICAL USER TIPS [Advanced]

- For a layer with unneeded features, apply a filter to limit the universe.
- Click on the ellipses [...] in Layer List and select **"View in Attribute Table."**
- From the **"Options"** dropdown menu, select **"Filter."**
- Define selection expressions that display only the desired feature(s).

¹ The examples provided are for demonstration only. Users can base their query on any geospatial relationships they chose.

² H-GAC does not warranty the accuracy of data from online sources.



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