

# ONLINE GAP DATA EXPLORER TOOL

## An Open Source GIS Decision Support Tool for Gap Analysis Data

[www5.basic.ncsu.edu](http://www5.basic.ncsu.edu)

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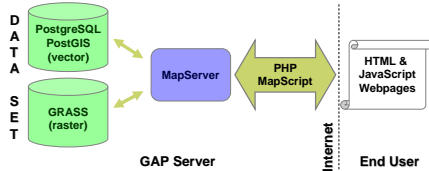
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### Premise

Gap Analysis is currently developing and delivering regional datasets that far surpass the average end users hardware capabilities. For example, the Southwest Regional GAP dataset is over 300 gigabits in size. In addition, the end user also needs GIS software in order to utilize the datasets, software that is at times expensive and almost always difficult for part-time GIS users to effectively implement.

We have developed an open-source solution that delivers GAP datasets and analytical capabilities to any user with a modern browser and an internet connection. End users are presented with a menu driven interface that facilitate the selection of an area of interest, the ability to select a single or set of species, and quantitative tools to summarize land cover, predicted habitat or protection status.

### Architecture



#### LAPS Server Architecture (Linux, Apache, PHP, PostgreSQL)

Debian – operating system  
Apache – web server  
PHP/MapScript – scripting language used to control MapServer  
PostgreSQL – database  
PostGIS – spatial extension to PostgreSQL (backend vector GIS)

#### Open Source Software

MapServer – spatial data rendering engine for internet  
GRASS – Geographic Resources Analysis Support System (backend raster GIS)  
PROJ.4 – cartographic projections library  
GEOS – Geometry Engine Open Source  
GDAL/OGR – Geospatial Data Abstraction Library and OGR simple feature library

### Functionality

1

**User Interface Design**

**Control Frame** - three tabs are presented in the main dialog frame- View Layers, Define AOI (Area Of Interest), and Legends. It provides the user control over what the map contains through a series of dialogs once an AOI is selected.

**Main Map Frame** - contains the main map as well as several map tools (pan, zoom, query, etc.).

**List Frame** - contains the list of species that occur within the AOI.

**Tools Frame** - contains the tools for individual species once one is selected from the List Frame.

**Inset Map Frame** - contains full extent view with a polygon depicting where the Main Map located.

2

**Setting the View Layers**

The user can alter the map by selecting the layers presented on the View Tools tab. For example, adding River Basins and Counties.

To continue the user then must select the Define AOI tab.

3

**Defining an Area of Interest (AOI)**

Three methods are provided to allow the user to define their area of interest.

- Selection of predefined polygon boundary data (i.e. county, subwatershed, management, bird conservation region, etc.).
- Import existing shape file to define the AOI.
- Onscreen digitizing to create a custom AOI

4

**AOI Summary Tools**

Once the AOI selection is submitted, the Main Map will zoom to the AOI. The ability to quantify four GAP data layers (Land Cover, Management, Ownership, and GAP Status) are presented. By selecting "calculate" for any of these data sets, a report is generated summing the acres, hectares and percentages of each class present in the AOI.

The user is also presented with the Select Species button to continue their session.

5

**Selecting Species**

At this point, the "Define AOI" tab becomes the "Select Species" tab. All the species that have their known range intersect the AOI are identified and are tallied in the following categories - All Species, Federally Listed, State Listed, NatureServe Priority (< 4) and Partners In Flight Priority (> 23). Any combination of subcategories can be selected through the use of AND/OR logical operands.

Once the user has selected what list to continue with, they select "Submit"

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**Viewing and Quantifying Species Data**

**Single Species Mode:** Once a species has been selected from the Species List Frame the selected species predicted distribution map is displayed by default. Several other species specific tools are presented in the Tool frame including Habitat Type, Known Range, Stewardship, Species Reports and Listing Status Information.

In addition, the user can quantify several of those data layers for the selected AOI.

**Multiple Species Mode:** Allows the user to develop custom species richness maps for the AOI.

### Current Status and Future Directions

Currently, there are 4 data sets being served through the Online GAP Tool Interface. North Carolina GAP served as the initial prototype, Southwest Regional GAP, Southeast Regional GAP (land cover and stewardship data only), and soon to be released, Puerto Rico GAP.



#### Future developments:

- Ability to save a user's session including AOI's, selected species lists, etc.
- Data download capabilities - 'clip-n-zip' to allow users to download data from their area of interest complete with metadata and supporting files.

Please contact us if you have any suggestions or would like to know more information about the Online GAP Tool.

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