

Pre-Serve—A Web-Based GIS System for Pesticide Mitigation

Stone worked with Monsanto Company to design and build Pre-Serve (www.pre-serve.org), a web site to protect threatened and endangered plant species from potential impacts resulting from the agricultural use of herbicides that contain glyphosate.

Rapid Determination of Necessary Mitigations

Through a simple four-step process, Pre-Serve quickly helps licensed growers of crops containing the Roundup Ready trait determine which, if any, pesticide mitigations are required based upon the specific location of their fields. Pre-Serve is publicly available and does not require a login or password.

The Pre-Serve site guides users through a series of steps to determine which, if any, mitigations are necessary for their location. This multi-step strategy is a clear and simple process, which allows many growers to exit Pre-Serve in the first few steps.

In the initial steps, users are asked about their application methods and rates, as well as the state and county where their fields are located (see Figure 1).



Figure 1: Pre-Serve mitigation instructions, Step 1.

If a user indicates that the fields planned to receive the application of a glyphosate agricultural herbicide are located in a county containing glyphosate use limitation areas (ULAs), then the user is directed to an interactive mapping application that allows the comparison of the locations of the specific fields and the ULAs.

The mapping application provides a background map to help users identify their field locations using “Google Maps-like” navigation. Once a user has zoomed in on the field a location, a report is available that provides detailed use limitations, including a description of the species habitats to be aware of within the ULAs.

Interactive Mapping Application

At the core of the Pre-Serve system is the interactive mapping application. It uses ESRI’s ArcGIS Server technology to map, process, and analyze data stored in an ArcSDE database that runs on MS SQL Server and contains both the spatial and non-spatial data used by the system.

Spatial data includes boundaries of the ULAs, township-range-sections from the Public Land Survey System (PLSS), geopolitical boundaries for states and counties, as well as cities, roads, lakes, streams, and many other manmade and natural features. The tabular data includes tables that relate ULAs to the specific species present, habitat descriptions of each species, as well as detailed geographical descriptions developed for all ULAs not based on PLSS boundaries.

The system retrieves all of this data to process spatial queries and generate information which is provided to the grower in a use limitation report presented in Adobe pdf format. In addition to the spatial data in the ArcSDE database, the ArcGIS server application takes advantage

Step 1:
[Select your state](#)

Step 2:
[Find your field](#)

Step 3:
[Compare to use limitation areas](#)

Step 4:
[Print map and instructions](#)

Areas in or near Osceola County, Florida

Use Limitation Areas

Using the map navigation tools below, zoom to the intended glyphosate use area, and continue to Step 4.

Note: Because Internet response times may vary, avoid multiple mouse clicks.



* If you do not have Adobe Reader, see instructions below.

Area represented on the map:



* Adobe Acrobat or Adobe Reader is required to read and print the instructions in Step 4. If you experience problems continuing to Step 4, please download the most recent version of Adobe Reader by

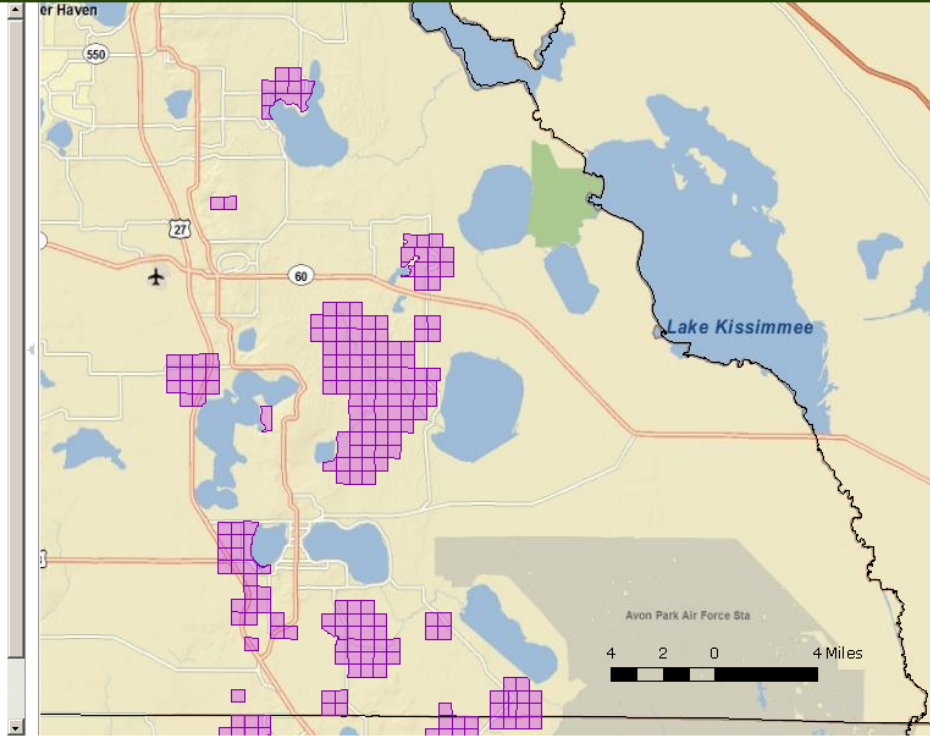


Figure 2: Pre-Serve mitigation interactive mapping application.

of cached map services to provide faster map rendering speeds and the capability of smoothly panning through the map without the need to wait for frequent map refreshing. This feature includes both locally cached map services that contain the ULAs, as well as the background map provided by ArcGIS Online.

Numerous Applications

Stone envisions that systems like Pre-Serve will become more common as a method for disseminating spatially oriented information to users of crop protection products. The applications for similar web-based mapping approaches in the protection of threatened and

endangered species, communication of label restrictions, and pesticide application management are numerous.

Stone looks forward to continued advancement in web-mapping technologies and to implementing those technologies to develop spatially oriented systems that enhance practices within the agrochemical industry.

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