ISH Technical Documentation - Description

# Application Deployment Environment

**OS:** Ubuntu 16.04

**Web Server:** Apache 2.4

**Mid-ware Server:** Node.js (Express Framework)

**Database Server:** MySql 7.8

**Data Visualization Platform:** WebWoldWind@NASA server kit

# Programming Languages Used

**Client Side:** HTML5/CSS/DOM/JQuery/Ajax

**Server Side:** Node.js

# Key Interactive Features

**Invasive Species Heatmap**

**Heatmap –** a new feature that is a two-dimensional representation of data in which values are represented by **colors**. The density heat maps provide an immediate visual summary of the concentration of placemarks.

**Heatmap Time Range –** users can set a time range of the heatmap they would like to view on the globe (data available for display from one date to another).

**Data Table –** a data table is located at the bottom of the page with all the data entries within viewing range (defaulted to show all). This contains an updating list of records saved, each one presented as a placemark on the globe. Selecting a row will zoom the globe out to highlight the placemark.

**Placemarks –** placemarks are selectable on the globe, zooming the user in to the location where it is situated. Certain locations can have several placemarks for the same field it was recorded in.

**Placemark Popups –** hovering the mouse over a placemark on the globe will provide a popup containing key information about the point location.

**Auto Layer Switch –** the feature takes advantage of using the altitude to automatically switch between the heat map and the placemarks.

**Manual Layer Switch –** this cancels the operation of auto switch and prevents the swapping between the heat map and placemarks based on altitude and reveals instead the **toggle switch**.

**Toggle Switch –** the toggle switch allows the user to view either the placemarks or the heatmap at any altitude.

**Notes –** to guide users through the application functions, there are several dynamically changing notes that provide instructions or reminders to users based upon their actions.

**Invasive Species Heatmap – User Home and Data History**

**Data Distribution Map –** in User Home and Data History pages, users can highlight records on the data tables to have its location point displayed on the data distribution map at the bottom of the page for a visual understanding of where the fields are.

# SERVER-SIDE Programs

To establish a strong, interactive communication bond between users and the application, server-side programs (also called mid-ware applications) are used to produce a response customized for each user's request to the website. This way, it is possible to provide a personally customized user interface based on the data stored in the database.

For example, users can signup for an account to access more features, including creating a new data entry to help locate areas that can have invasive species in the crop fields. Every entry submitted can be accessible to the user on their account, as well as a page to view other entries by different users.

On certain pages, users can search for specific saved data previously stored using the filter form options, matching all records that fit the set requirements.