NASA World Wind is a free, open-source API that allows developers to easily create interactive visualizations of the world in four dimensions. The NASA World Wind 2017 Intern team has designed an educational web application to visualize the effects of climate change on different parts of the world using the open-source Web World Wind API.

The team utilized technologies including HTML5, CSS, and JavaScript to develop AgroSphere, incorporating and analyzing spatial data for agriculture and atmosphere, plus wind and solar energy. Data in various formats are organized, analyzed and visualized on the globe. The geo-comparison feature allows users to compare agricultural output, yield, and other types of data for each country visually, as it colorizes all countries that have said data available. Additionally, this feature displays the numerical value for its data, generating a three-dimensional bar whose height corresponds to the value. The user can also automatically view the top 10 countries for each data type, with the globe traveling to each country on the list. Users can click on weather or country placemarks for statistical data specific to that country’s history for atmosphere and agriculture throughout a specified time frame. The data can also be added to a separate tab in order to analyze the graphs in relationship to each other, either separately or on the same axes. WMS/WMTS layers can be visualized on the globe, adjustable by time and opacity. The WMS, geo-comparison, and data graph comparison functions can all be done simultaneously. Additionally, a wide variety of other features are available, such as viewing the weather for any location, traveling to any location by coordinates or name, simulating star movements, and more. Users may also download the raw data for their use. The application can be used on mobile, although the load times are slightly longer, and some functionalities may be more difficult to use.

This web application is intended for use in the classrooms by teachers, science centers and home schoolers, as well as citizens of the world. Children and adults alike will be able to learn about climate issues by exploring the data according to their interests. Users will learn firsthand about real effects of climate change and pesticides on agriculture, livestock, precipitation, agricultural yield, and the economy.