

Unit 8: Precision Agriculture

Unit Summary: This unit covers the basics of GPS and GIS, the foundational technology which modern precision agriculture utilizes to improve efficiency and reduce input costs. In addition to being more economical, these technologies reduce the emission of greenhouse gasses.

Teaching Time: It is anticipated that this unit and its related activities will take a minimum of five 50-minute class periods to complete. Depending on the number of readings utilized, this could be longer. Also the depth of utilization of the laboratory activities and the desired level of student mastery can add considerable time to the length of the unit. Supplementing actual GPS & GIS related activities will also increase the length of time required to teach this unit.

Audience: 9-12 Science & Agriculture Students

Unit's placement in the overall course: This unit can be utilized at any time and does not depend upon knowledge from other units. It will work great as a precursor unit to the Crop Pest unit as students can use the knowledge gained in this unit to map and locate real or simulated agricultural pests including weeds and insects, two focus areas in the Crop Pest unit.

Goals: The primary goal for this unit is for students to explore GPS and GIS applications through hands-on activities and then transfer that knowledge to the field of precision agriculture.

Description of the unit: Teacher notes are supplied with most slides to help guide class discussion. The PowerPoint presentation has three sections with related activities. Some activities will require website logins. These can be obtained by contacting Dr. Kattlyn Wolf at kwolf@uidaho.edu.

Using this unit: Within the PowerPoint for this unit are hidden slides. On these slides are embedded Microsoft Word Documents. These documents provide the additional resources needed to deliver this unit. A standards document is provided which includes the relevant Next Generation Science Standards, Common Core State Standards for Math and ELA, and Agriculture, Food, & Natural Resources Standards. The standards included may be only introduced through this curriculum, and the teacher will need to decide the level at which they want to augment the provided instruction in relation to these standards. Readings associated with the unit are in a separate zipped PDF file. This document includes all the readings in one zipped file so teachers can select those readings most appropriate for their classrooms.

Related Readings for Meeting CCSS in ELA: These readings are not overly technical, however teachers reported some difficulty using them with students on IEP's. To accommodate these students it is recommended teachers choose a portion of the readings and run it through an application like <http://www.rewordify.com> which can adjust the reading levels as needed.

Required Supplies:

Lab activities require computers with internet access and Google Earth. In addition, cameras with GPS tagging abilities will enhance the activities (most smart-phones have this ability). GPS units may also be used with standard digital cameras.