Precision Agriculture

Lesson 1, Part B

Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF

Components of Precision Agriculture

- A ***GPS Receiver***
- Equipment with ***sensors***
- Equipment with ***meters***
- A ***monitor***
- ***Software***

Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF

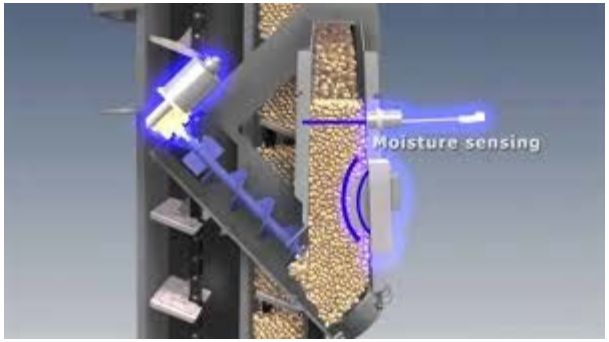
GPS Receiver

- Tracks the equipment location in a field

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Equipment with Sensors

- “Sense” the conditions in which you are farming
- “Sense” the operation of the equipment
- Take readings about each area of the field



High Rate Seed Sensor

Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF

Equipment with Meters

- Control the amount of inputs
  - Seed, fertilizer, pesticides, water, etc.
- Can steer the equipment
  - Aids in precise field placement

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Monitors

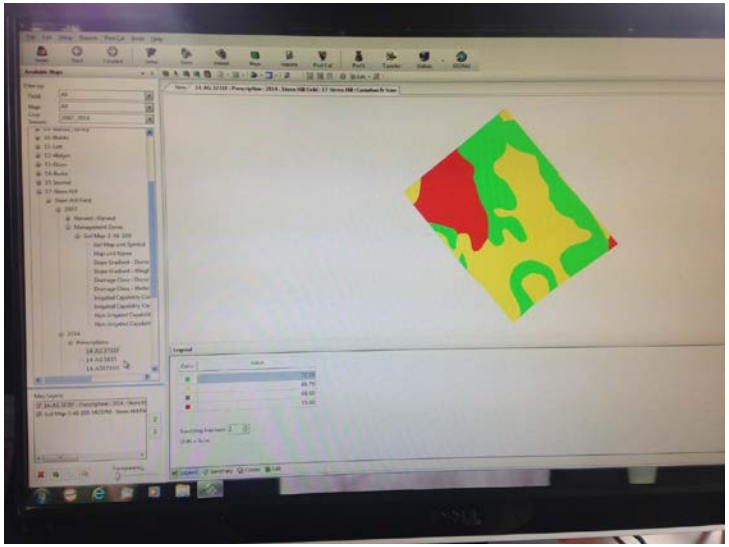
- Indicate the rate inputs are being applied.
- Tells the operator if equipment is working at peak performance.
  - Gives off a warning if not working properly.
- Acts as a user interface.
  - Operator can make adjustments on the go.
- Records all information gathered by GPS, sensors and meters.
  - Used later to help with decision making.

Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF

Software

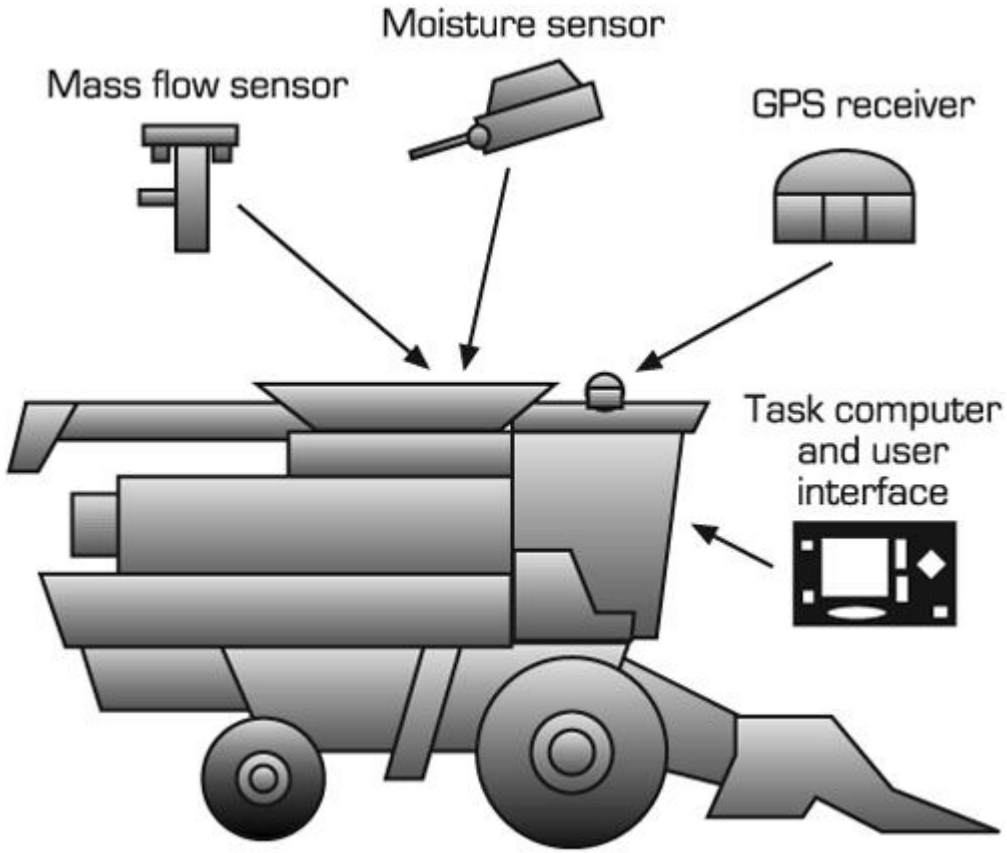


- Keeps track of information gathered.
  - Throughout the season
  - Across multiple years

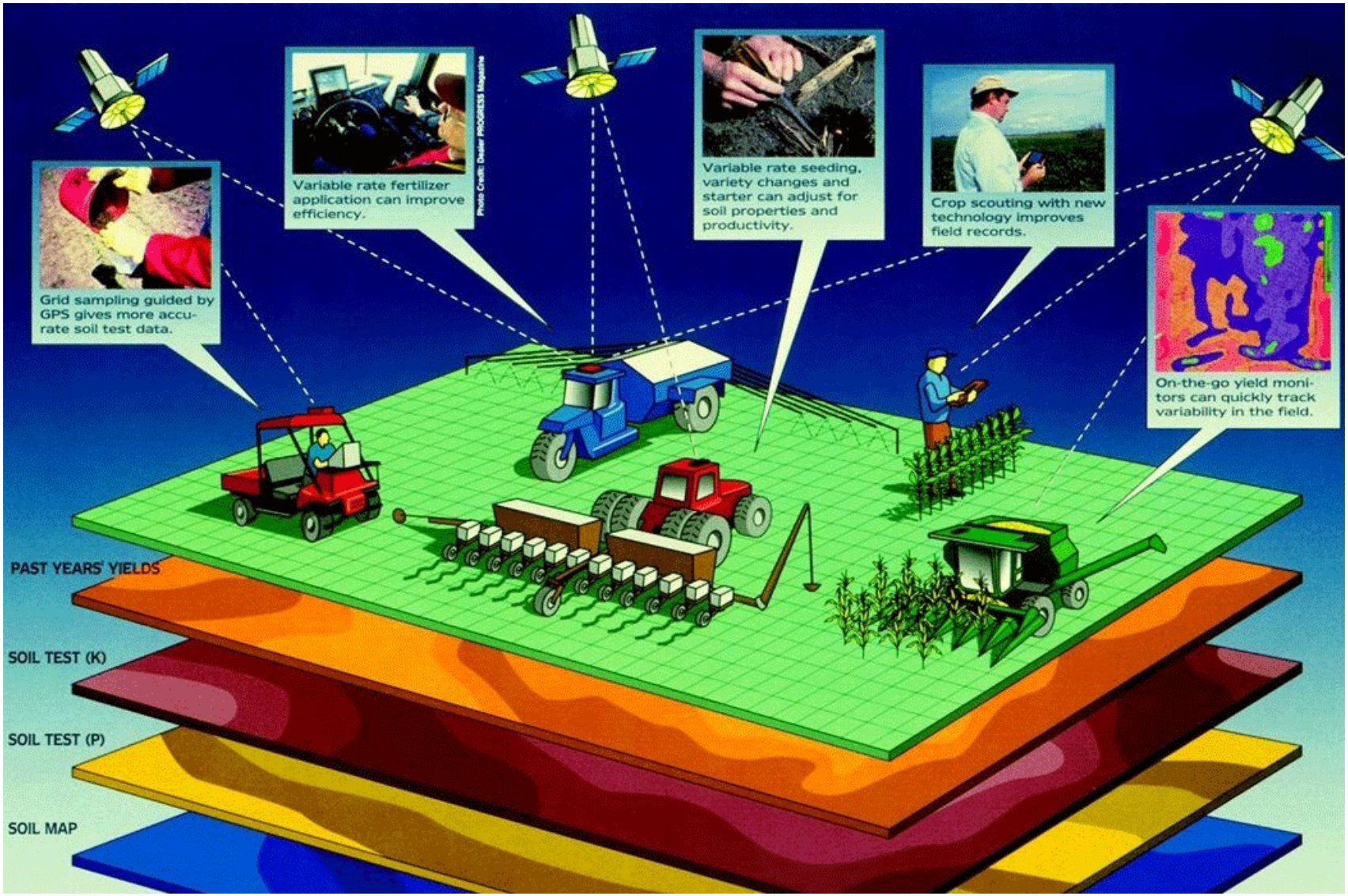
- Allows operator to
  - Analyze data
  - Make informed decisions to improve production
    - “minimize” inputs to “maximize” outputs and profit

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Putting it all Together



This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF

Source: American Farm Bureau Federation, 2015

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

What is the Goal of Precision Ag?

- Primary goal = identify ***variability*** in the field.
  - Differences in the field

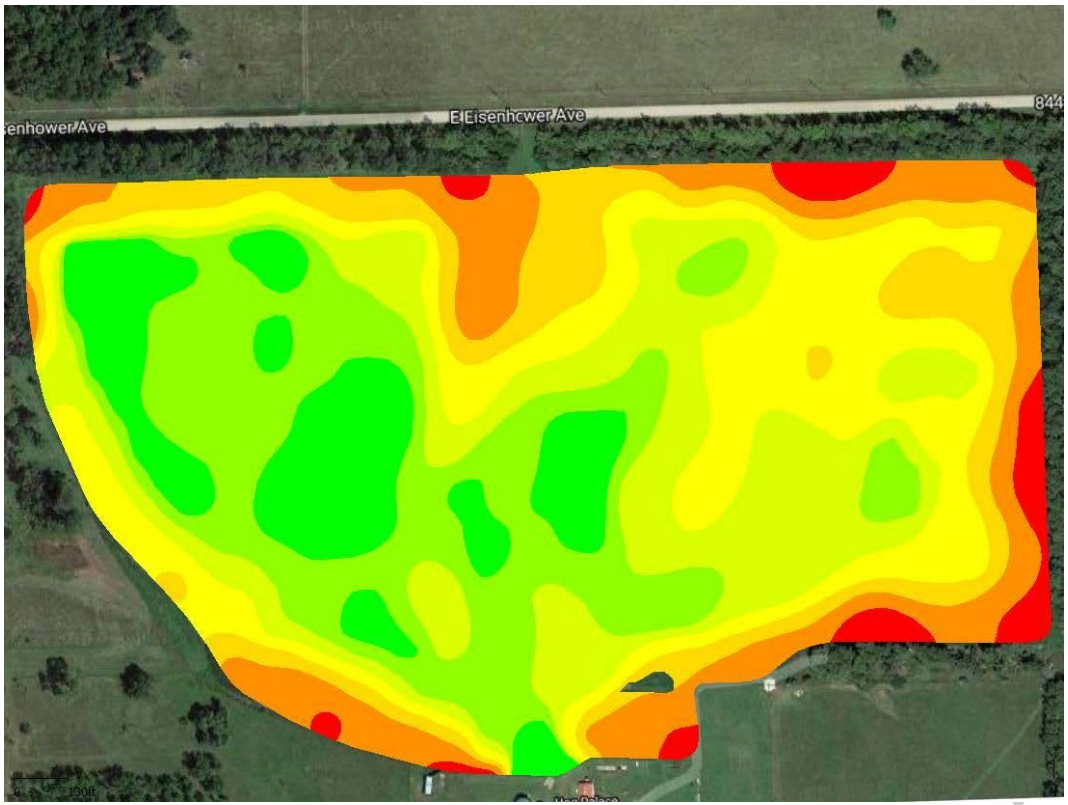
- Allows an operator to adapt management practices to the different areas of a field.

Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF

Yield Map



Dark Green – Highest

Med. Green – 2nd Highest

Light Green – 3rd Highest

Yellow – 4th Highest

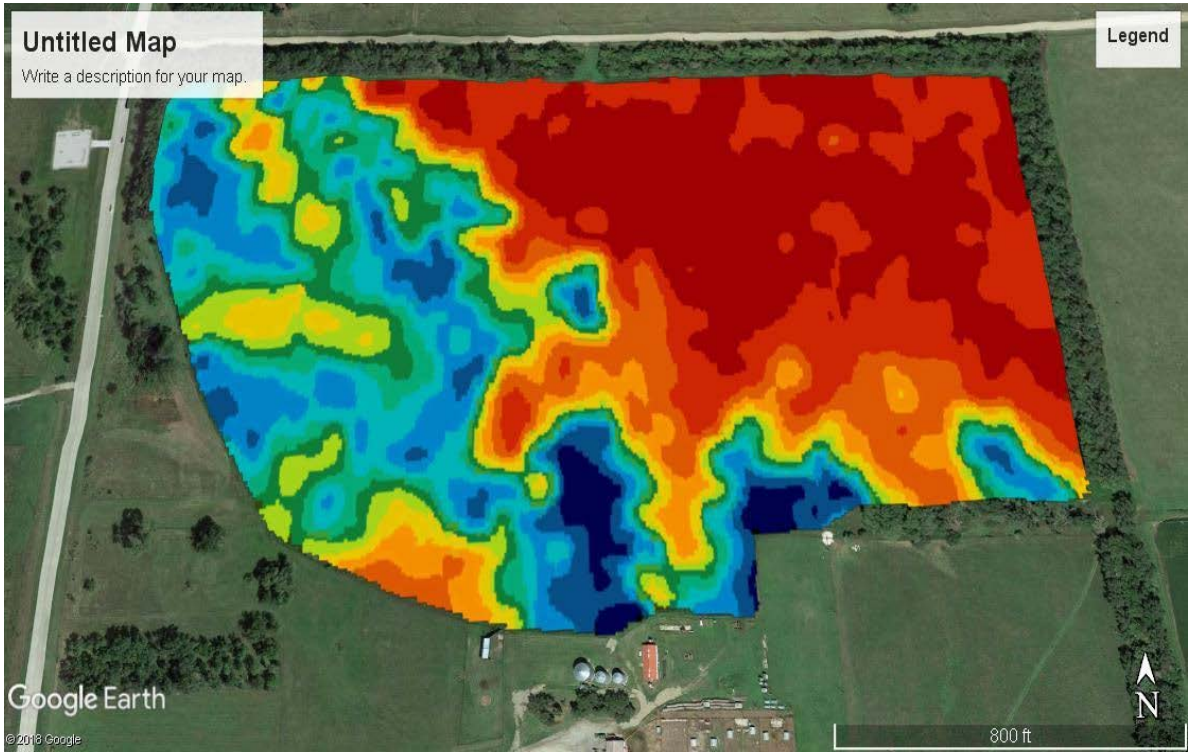
Gold – 5th Highest

Orange – 6th Highest

Red - Lowest

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Corresponding Soil Quality Map



Dark Blue – Best

Medium Blue – 2nd Best

Light Blue – 3rd Best

Dark Green – 4th Best

Med Green – 5th Best

Light Green – 6th Best

Yellow – 7th Best

Light Orange – 8th Best

Dark Orange – 9th Best

Red - Poorest

Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF

Analyze the Maps (Mingle/Pair/Share)

- Compare the Soil Quality and Yield Maps
  - What similarities are there?
    - What could account for the similarities?
  - What differences are there?
    - What could account for the differences?

Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF

Why is Precision Ag and Management Used?

- Resource Management!
  - Management on a ***granular*** scale.
    - Look at small portions of a field
    - Manage its unique characteristics
    - Place inputs accordingly for that portion
  - Saves money on seed, chemicals, water, time, etc.
  - Add the right inputs at the right time, in the right place at the right rate!
  - Can increase profitability.
    - Put less inputs where the field is less productive no matter what you do.
    - Apply the most and best product to the most productive areas.
    - Be more precise with input placement.
      - Example: ***Singulation***

Northeast community college

This material is based upon work supported by the National Science Foundation under Grant No. 1700680. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NSF