## **🛰️ From Satellites to Seeds: Mapping the Future of Food**

**Theme:** Agriculture, Environmental Science, Climate Science, AI, GIS

**Audience:** Middle School Students (Title I schools, WCPSS, WCPL branches)

**Duration:** 90 minutes

### **🎯 Workshop Objectives**

By the end of this workshop, students will:

* Understand how AI and GIS support smarter farming and environmental decisions
* Explore real climate and soil data to choose where to grow crops
* Build spatial reasoning by mapping “climate-smart” farms
* React to environmental challenges using critical thinking and map skills
* Learn about careers in agriculture, data science, and sustainability

### **🧭 Workshop Agenda**

#### **1. Welcome & Warm-Up (5 min)**

**Prompt:** “Where does your food come from?”

* Interactive map activity or poll
* Share surprising origins of common crops

#### **2. AI in Education & Ethics (10 min)**

**Mini-Lesson: What is AI?**

* Benefits: prediction, access, tutoring
* Risks: bias, over-reliance, misinformation

**Discussion Prompt:**

* “Where should we trust AI — and where should humans stay in control?”
* Bridge to farming: *“Today, AI helps us map and predict — but we stay in charge of the farm.”*

#### **3. GIS Activities (45 min)**

**Real-World Farming 101 (5 min)**

* What do farmers need? (Sunlight, soil, water, etc.)
* Introduce the goal: Design your own resilient farm

**Climate Demo (5 min)**

* Show NC climate zones, soil types, rainfall maps using ArcGIS or paper visuals
* Introduce concept of crop suitability

**Activity – Map the Future Farm (10 min)**

Students choose a crop and location based on soil/climate layers:

* **Paper Option**
  + Materials
    - Small maps of NC with pre-colored zones for:
      * Soil type
      * Precipitation
      * USDA Plant Hardiness Zones
    - Crop parameter cards (strawberries, blueberries, sweet potatoes)
    - [Student Farm Planner Worksheet](https://drive.google.com/file/d/18ZtYnoJQSIkLTB0Gso_bhFHdFNvnhR_H/view?usp=sharing)
  + Process
    - Students have 5 minutes to discuss and place each of the crops with the markers.
    - Students circle an area where they’d grow their chosen crop (strawberries, blueberries, sweet potatoes)
    - *If time allows:*
      * Students will duplicate their team plan onto a bigger paper map to see if the class agrees. Good opportunity to discuss aggregating data and outliers.
* **Digital Option:**
  + A
  + B
  + C

**Environmental Risk Mini-Lesson (5 min)**

* Show overlays of flood zones, drought risk, hurricane tracks
* Ask: “How do these affect where you’d farm?”

**Activity – Disaster Strikes! (10 min)**

* Pass out [**Disaster Cards**](https://www.canva.com/design/DAGnGNAFvbs/3fPB0pZk5TNXZRWa-5o8-Q/edit?utm_content=DAGnGNAFvbs&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton)
* Students must move or redesign their farm
* Prompt: *“What would you change to protect your crops?”*

**AI Demo – Teachable Machine (5 min)**

* Show live image classification: healthy vs. sick crops
* Reflect: *“AI helps monitor crops — but farmers make the call.”*

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#### **4. Careers in Smart Agriculture (5 min)**

* Agronomist
* GIS Analyst
* AgTech Developer
* Climate Scientist

#### **5. How to Get Involved (5 min)**

* Wake 4-H GIS Team
* National 4-H Geospatial Team

📲 Distribute **QR flyers** for further learning and sign-ups

#### **6. Q&A + Exploration Time (10–15 min)**

* Students explore maps/tools
* Students ask questions
* Recruit interested students

### **🧰 Materials & Tools**

* **Teachable Machine** (AI demo)
* **ArcGIS Online** or **Felt Maps** (for climate, soil, and risk overlays)
* **NOAA/Esri Data Layers** (e.g., drought, temperature, floodplains)
* **Paper Map Templates** (climate/soil)
* **Disaster Scenario Cards** *(PDF or printed cutouts)*
* **Recruitment Flyer** (with QR codes)