Unlocking the Magic of GIS for use with STEM

Will Davis, GISP
Operations, Lake County Schools

Pondering Question:
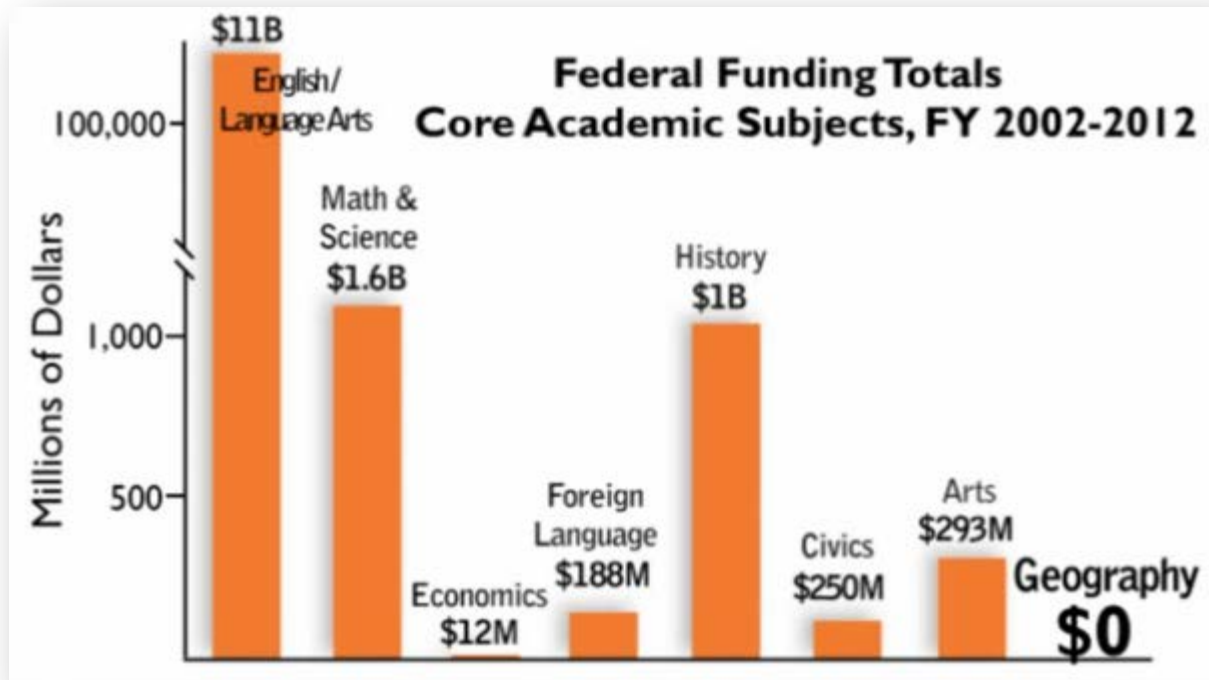
What is GIS and why is it important in education?

STEM:

Science

Technology

??????

Engineering

Mathematics

Federal Funding
of Core Academic Subjects

STGEM:

Science
Technology
Geography
Engineering
Mathematics

Question - Part 1:

What is GIS?

Geographic Information Systems

GIS is an abbreviation for geographic information systems which is a <u>set of tools</u> that captures, stores, analyzes, manages, and presents data that are <u>linked to locations</u>. In the simplest terms, GIS is the merging of cartography, statistical analysis, and database technologies to develop better solutions and <u>make better decisions</u>.

Geospatial Technology
from Penn State University
(Geospatial Revolution Project)

How does GIS fit into STEM?

- Critical thinking
- Cross-disciplinary problem solving
- Academic to real-world concepts
- Pathway for deciding best solutions
- Problem-based learning (PBL)
- Motivation with technology
- Builds workforce ready skills
- Growing demand in job market

Student Motivation with Technology

"I've rarely seen 100% engagement in any lesson activity as I have with ArcGIS Explorer Online. It was a great success!"

Diane Reid-Goolsby,
6th Grade Geography Teacher
Tavares Middle School

What are the components of GIS?

- Hardware

  computers, printers, servers

- Software

  programs, applications

- Data

  information, tables,
  spreadsheets, databases
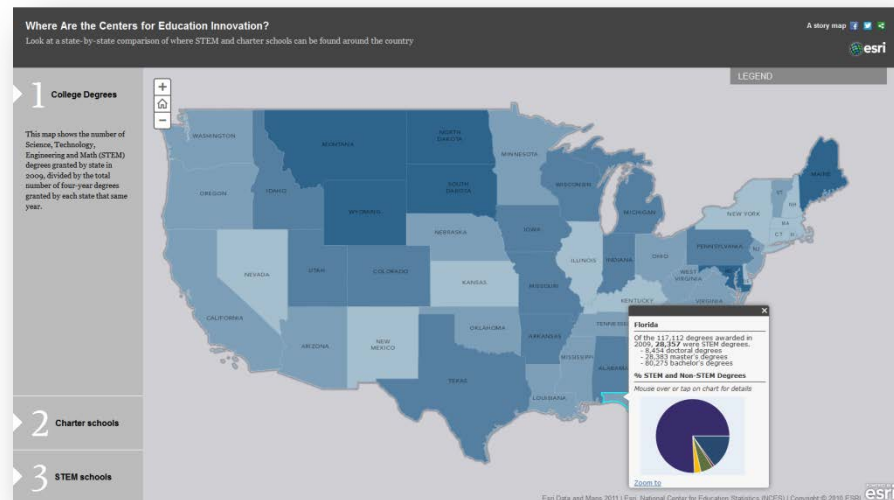
- Methods

  how to ask questions

- People

Infrastructure Requirements

- Computer hardware
- Network connectivity
- Educator knowledge & experience
- Circulum materials available
- Acquired an educational site-wide license
  - +30 license platforms with <u>unlimited use</u>
  - Desktop, server, tablet & smartphone platforms
  - Mobile (IOS, Windows Mobile & Android)
  - Business & community analyst applications
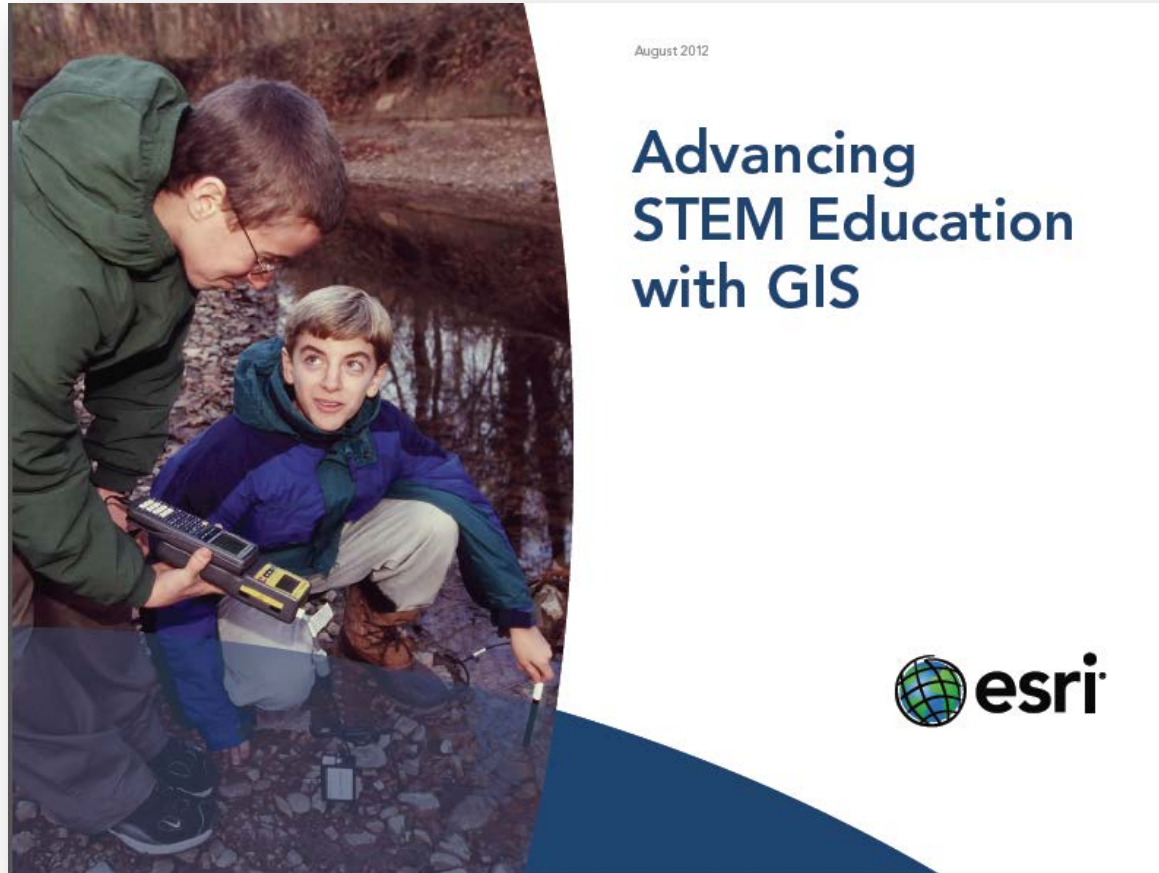 - Cloud-based applications with ArcGIS Online

Infrastructure Requirements

- Circulum & informational materials available
  - National Science Foundation (NSF)
  - U.S. Geological Survey (USGS)
  - National Geographic Society – Geo-Literacy Project
  - Institute for the Application of Geospatial Technology (IAGT)
  - GIS & Science Blog
  - ESRI or GIS.com
  - GIS2GPS Portal
  - Slideshare
  - District's site

<u>Moving the Bar Forward</u>

Question – Part 2:

Why is it important?
(to student learning & success)

Geo-literacy
from National Geographic
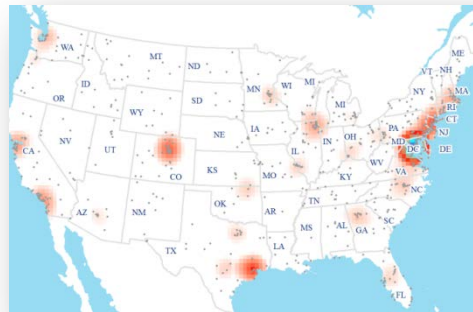### (Preparing for Decision-Making in the 21 Century)

Learning Important Skillsets

- Critical thinking
- Cross-disciplinary problem solving
- Connects STEM's focus discipines
- Real-world concepts
- Pathway to best solutions
- Problem-based learning (PBL)
- Great motivational tool
- Involves latest technology

What is the GIS Job Market?

- Industry grew by double digits in early 2010's
- Is considered a "high growth industry" *(Dept. of Labor)*
- Expected annual growth of 35% each year through 2020
- Florida was 4th of top 10 job postings states in GIS
- Can earn an annual salary of up to $70,000
- GIS Analyst (Information Technology Sector) rank in top 100 of Best Jobs in America *(CNN Money)*
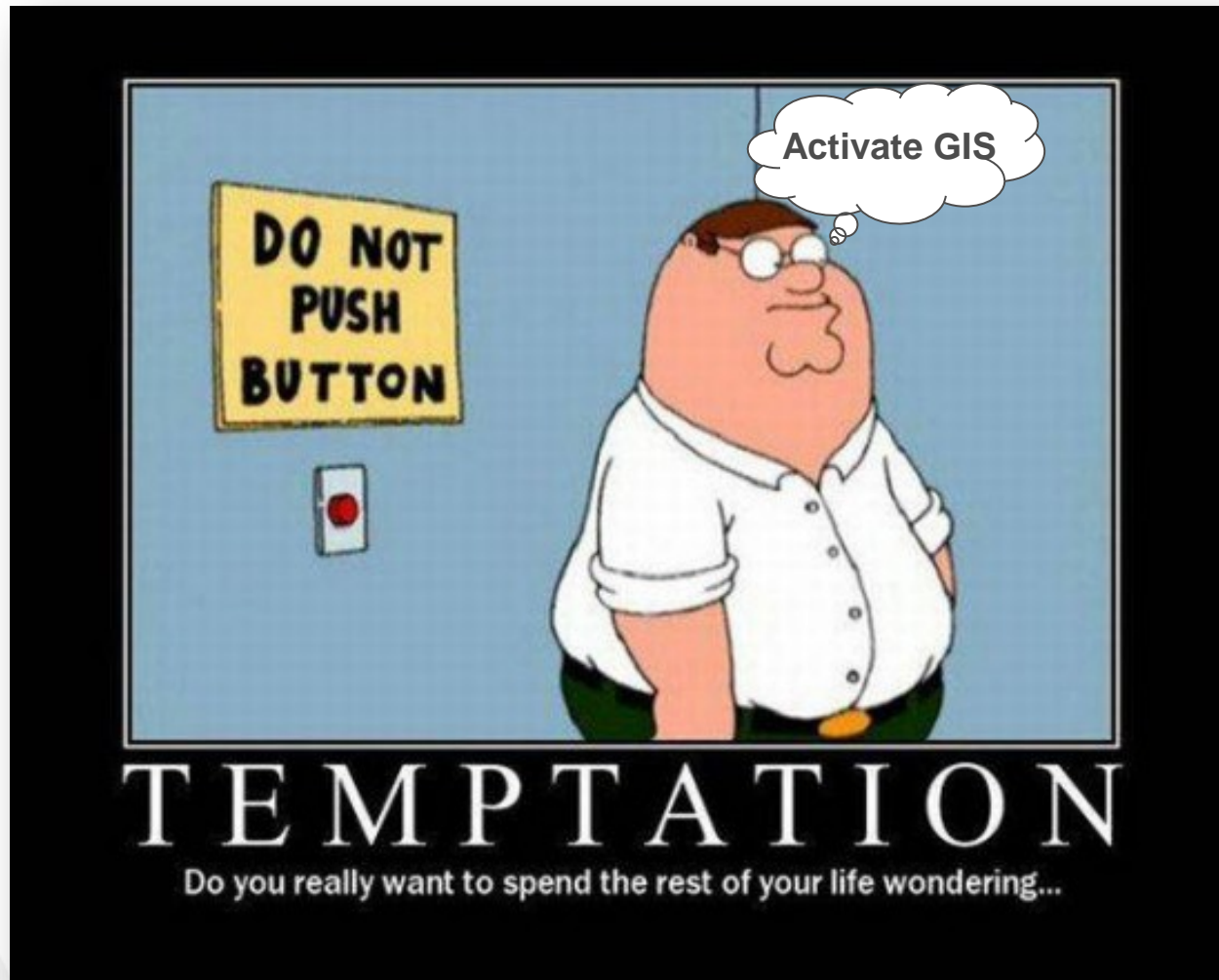- Diversity of available jobs based on all educational levels

Types of jobs that use GIS

- Computer Science
- Electric/Gas Utilities
- Business/Marketing
- Telecommunications
- Transportation Logistics
- Petroleum & Mining
- Engineering
- Water & Wastewater
- Health Care
- Federal Government
- Economics
- Environmental Mgmt.

- Local Government
- School Districts
- Geology
- Military/Intelligence
- Archeology
- Sociology
- Community Planning
- Real Estate & Cadastral
- Agriculture
- Forestry
- Public Safety
- Risk Management
- Aerial Photography

Presentation Takeaway

Questions

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