GEOSPATIAL MAPPING FOR WATER & WASTEWATER ASSET MANAGEMENT

ARWA

ALABAMA

RURAL WATER

ASSOCIATION
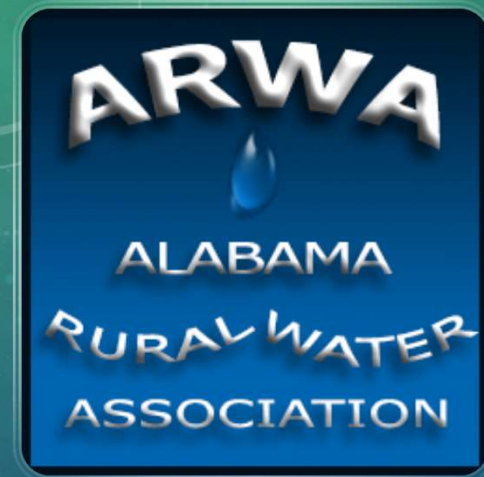
AGENDA

Introduction to Water & Wastewater Asset Management

Overview of Geospatial Mapping Software

- Free Software Options
- Cost-Effective Solutions

Details on Free Geospatial Software
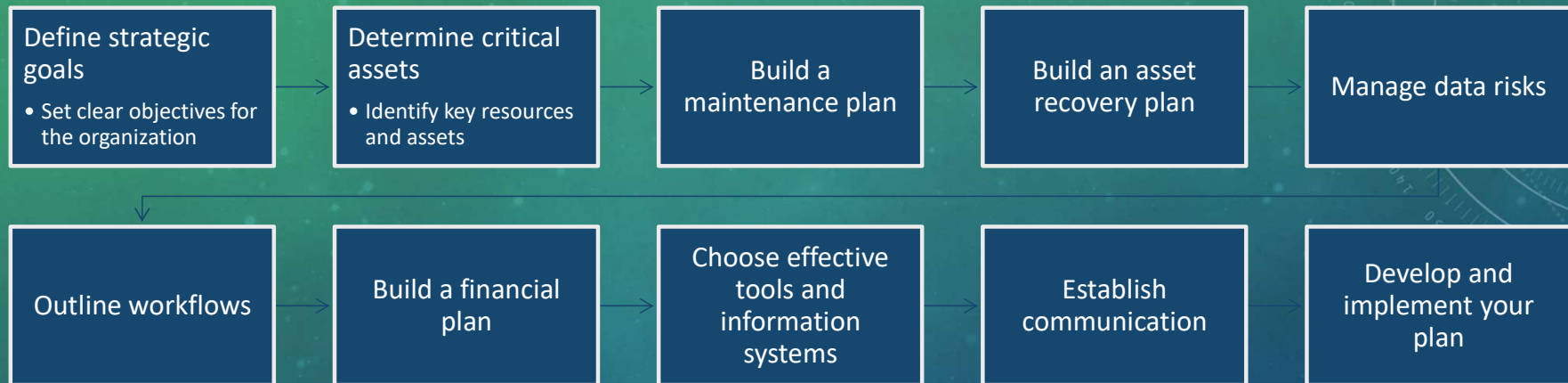
- Google Earth Software
- QGIS 3

Details on Cost-Effective Geospatial Software

- ESRI
- iamGIS and Other Solutions
- Diamond Maps

GPS Hardware/Software for Asset Management

- ARWA's GPS Solutions
- Components of GPS Systems

Upcoming Technology in Asset Management

Define strategic goals • Set clear objectives for the organization	Determine critical assets • Identify key resources and assets	Build a maintenance plan	Build an asset recovery plan	Manage data risks
Outline workflows	Build a financial plan	Choose effective tools and information systems	Establish communication	Develop and implement your plan

INTRODUCTION TO WATER & WASTEWATER ASSET MANAGEMENT

FREE SOFTWARE OPTIONS

Google Earth Software

Free viewing platform for geospatial data

Google Earth Pro allows quick import and viewing of tables with latitude/longitude coordinates

Useful for geocoding addresses against street datasets

QGIS 3

Free and open-source GIS software

Developed over many years with continuous improvements

ESRI's main competition for robust geospatial work in an open-source environment

Other Free Options

Many more free geospatial mapping software options available

COST-EFFECTIVE SOLUTIONS

- ESRI
  - World leader in Geospatial Technology
  - Significant software discount for Rural Water and Wastewater Utilities with a population under 3,000
  - Used by numerous consulting firms in Alabama for managing GIS data and assets
- Diamond Maps
  - 51 installations in Alabama
  - Low Learning Curve
  - Extremely Affordable
- iamGIS
  - Numerous deployments in Alabama
- COTS Asset Management Solutions

GOOGLE EARTH SOFTWARE

- Free Viewing Platform
  - Access to geospatial data
  - Available at
    https://www.google.com/earth/about/versions/
- Google Earth Pro Features
  - Import and view tables with latitude/longitude
    coordinates
  - Supports numerous geospatial data types
- Use Case Example
  - Water systems: Importing a table of correct
    addresses
  - Geocoding against street addressed road dataset

QGIS 3

Free and Open-Source

- Available at http://qgis.org
- Accessible to everyone

Continuous Improvements

- Developed over many years
- Ongoing enhancements by developers

Robust Geospatial Work

- Competitor to ESRI
- Suitable for advanced geospatial tasks

ESRI

ESRI: World Leader in Geospatial Technology

Offers significant software discounts

Targets Rural Water and Wastewater Utilities

Applicable for populations under 3,000

Consulting Firms in Alabama

Utilize ESRI's ArcGIS Cloud-based Platform

Manage client's water and wastewater utility GIS data

Handle assets efficiently

IAMGIS AND OTHER SOLUTIONS

iamGIS
- Website: https://iamgis.com/

Other Software Solutions in AL
- Numerous deployments exist

COTS Asset Management Solutions
- Too many to list
- Too much to sort through

DIAMOND MAPS

Diamond Maps Software

Website: https://diamondmaps.com/

Installations in Alabama

Total installations: 51

DIAMOND MAPS

COMPONENTS OF GPS SYSTEMS

- Satellites
  - Provide signals for positioning
  - Orbit the Earth
- Ground Stations
  - Monitor satellite signals
  - Ensure accuracy
- Receivers
  - Receive signals from satellites
  - Calculate position

ARWA'S GPS SOLUTIONS
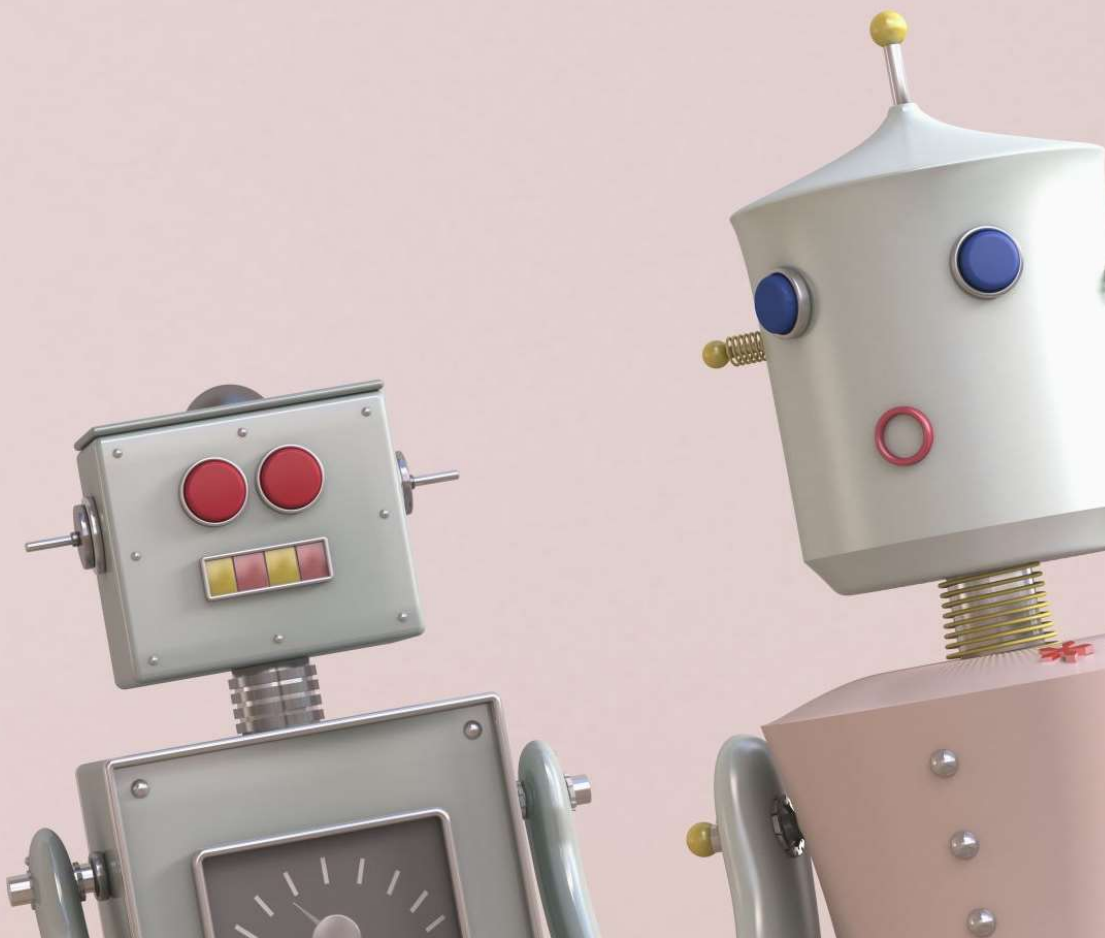
Trimble Hardware/Software

- Utilized with Source Water Program
- Used for Asset Mapping

SparkFun GPS Solution

- Cost-effective
- Currently in development at ARWA
- Adopted by other State Rural Water Associations

ESRI and EOS GPS Integration

- ESRI is closely integrated with EOS GPS

NEW TECHNOLOGY IN ASSET MANAGEMENT

- Machine learning and AI can now help predict asset failures

- Connected sensors and the Internet of Things (IoT) enable real-time monitoring of assets

- 3D printing can be used to create replacement parts on-site

- Drones and aerial imaging can quickly survey and inspect assets

- Blockchain technology can improve supply chain transparency and asset tracking

WATER LEAK DETECTION WITH THERMAL CAMERAS AND AI
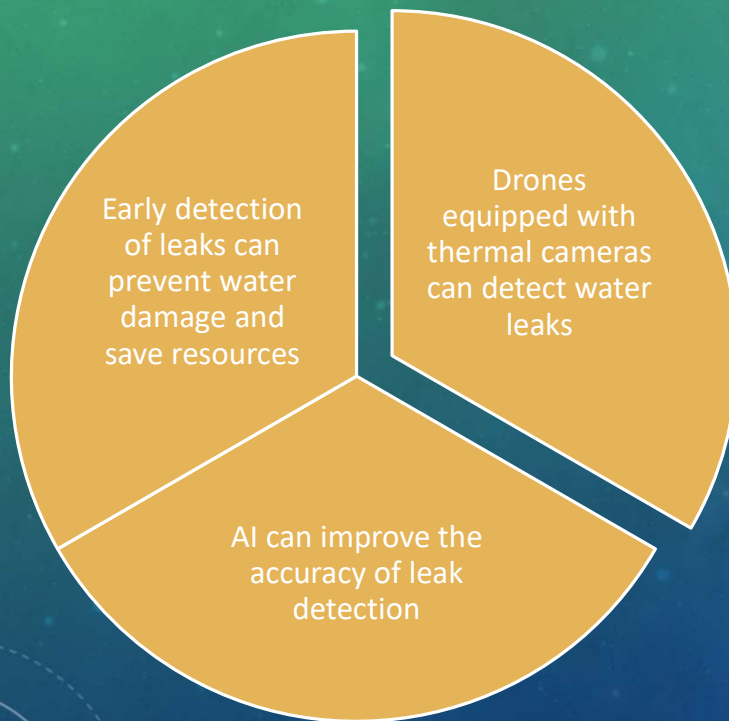
Thermal cameras are used to detect water leaks

AI can improve the detection accuracy

Leak detection helps prevent water damage and save resources

DRONES FOR LEAK DETECTION WITH AI

Early detection of leaks can prevent water damage and save resources

Drones equipped with thermal cameras can detect water leaks

AI can improve the accuracy of leak detection

THANK YOU!

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