Water Resources Challenges and Geospatial Technology

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In this Presentation

- Water Resources Management - Challenges
- Key National Programs
- Advancements in GIS
- Let us try to do simple things!
Water Resources Management
Challenges
Water Resources Management is a complex subject!!

- Flood management
- Drought management
- Groundwater management
- Conjunctive use of surface and groundwater
- Water conservation
- Watershed management
- Rainwater harvesting
- Water quality conservation and environment restoration
- Recycle and reuse of water
- Inter basin water transfer
- Vulnerability to climate change and adaptation strategies
- Water demand reduction and management measures
- Land use planning and cropping pattern
- Demand management for urban areas and industries
- Environmental flow requirement
- Water pricing
- Desalination of water
- Data monitoring and information system
- Applications of decision support system in water resources
- Eco-hydrological approach to water resources management
- Virtual water transfer
- People participation and capacity building
Challenges…

• Water resources of a country constitute one of its vital assets. India receives annual precipitation of about 4000 km$^3$

• The rainfall in India, due to spatial and temporal variability in precipitation, the country faces the problem of flood and drought syndrome

• With rapid growing population and improving living standards the pressure on our water resources is increasing and per capita availability of water resources is reducing

• Overexploitation of groundwater is leading to reduction of low flows in the rivers, declining of the groundwater resources, and salt water intrusion in aquifers of the coastal areas

• Over canal-irrigation in some of the command areas has resulted in waterlogging and salinity.

• The quality of surface and groundwater resources is also deteriorating because of increasing pollutant loads from point and non-point sources
Key National Programs
Key National Programs

- Integrated Watershed Programme (IWMP)
- Neeranchal Project
- Water Resource Information System (WRIS)
- Hydrology Project II (HP-II)
- National Water Mission (NWM)
- Dam Rehabilitation & Improvement Project (DRIP)
- National Mission Clean Ganga (NMCG)
Role of Geospatial Technology in Water Resource Management
With GIS Platform, you can protect water supplies and their integrity

Understanding how today’s actions affect tomorrow’s water system

- Understanding how human behaviors impact the natural system
- Document water sources and quantify their capacity based on current and historic data
- Share the story of the water system through engaging maps
Web GIS Integrates All Data Types
With Web Maps and Web Services

Web Maps

- Imagery
- Services
- Enterprise Data
- Social Media
- Maps
- Sensor Networks
- Big Data

Providing a New Medium for GIS
Receiving Real-Time Data

Easily integrate real-time streaming data into ArcGIS using an Input Connector

**Inputs**
- Poll an ArcGIS Server for Features
- Poll an external website for GeoJSON, JSON, or XML
- Receive Features, GeoJSON, JSON, or XML on a REST endpoint
- Receive GeoJSON or JSON on a WebSocket
- Receive RSS
- Receive Text from a TCP or UDP Socket
- Subscribe to an external WebSocket for GeoJSON or JSON
- Watch a Folder for New CSV or JSON Files

**GeoEvent Services**

**Outputs**
- You can create your own connectors

**ArcGIS Platform**

**GeoMessage**
- ActiveMQ
- CAP
- CoT
- Cursor-on-Target
- Exploitation Support Data
- FAA (ASDI)
- NMEA 0183
- Kafka
- NDIS
- OSIsoft
- Sierra Wireless (RAP)
- Trimble (TAIP)
- Twitter

**Partner Gallery**
- CompassLDE
- enviroCar
- exactEarth AIS
- GNIP
- Networkfleet
- OSIsoft
- Valarm
- Zonar
- Zonar
Sending Real-Time Data
Easily disseminate notifications, alerts, and updates using an Output Connector

ArcGIS Platform

GeoEvent Services

You can create your own connectors.

Out of the Box
- Add or Update a feature
- Publish Text to a UDP Socket
- Push GeoJSON or JSON to an external Website
- Push GeoJSON or JSON to an external WebSocket
- Push Text to an external TCP Socket
- Send a Text Message
- Send an Email
- Send an Instant Message
- Send Features to a Stream Service
- Write to a CSV, GeoJSON, or JSON File

Esri Gallery
- ActiveMQ
- Cursor-on-Target
- Hadoop
- Kafka
- MongoDB
- MQTT
- RabbitMQ
- Twitter

Partner
- CESIUM
Let us try to do simple things also!
Story Maps

Story Map Tour

Story Map Shortlist

Story Map Countdown

Story Map Playlist

Story Map Tabbed

Story Map Swipe

Story Map Spyglass

Story Map Side Accordion

Story Map Journal

Great Story Maps and How to Emulate Them
Flood Management Story Map
Let’s create India story map for water resources

- https://storymaps.arcgis.com

No Coding Required.
Incredibly Powerful.
Open Source.
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