



National Capital Region Section

American Water Resources Association

AWRA



2017 National Capital Region Water Resources Symposium

**Applications of Remote Sensing and
Space Technologies in Water Resources
Management**

2017 National Capital Region Water Resources Symposium Theme

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Water Resources Historic Perspective

Stage 1: Water Resources Development
(800 B.C.)

Stage 2: Water Resources Management
(1970s)

Stage 3. Sustainable Management of Water Resources
(21st Century)

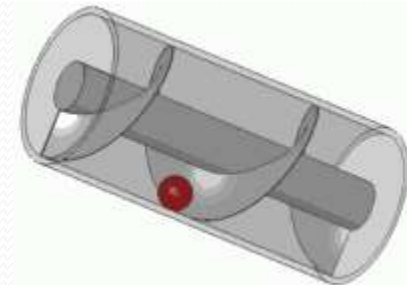
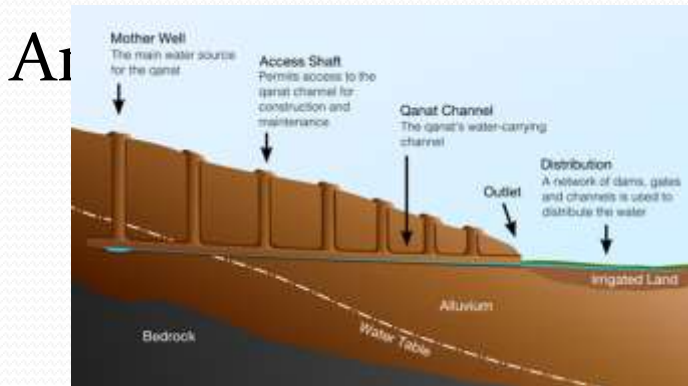
Stage 1: Water Resources Development

One Dimensional Approach

Extraction of Surface and Groundwater

Phase 1. Gravity Flow -dates back to 800 B.C. in Persia

https://en.wikipedia.org/wiki/Traditional_water_sources_of_Persian_antiquity



Phase 2. Water wheels, Archimedes screw (200 B.C.), piston pipe (1500s), steam powered pump (1800s), centrifugal pump (1950s)

https://en.wikipedia.org/wiki/Archimedes%27_screw

Quantitative Measurement of Natural Water – Physical Monitoring



Edme Mariotte (1620-1684)

- Pierre Perrault (1608-1680)
- Edmond Halley (1656-1742)

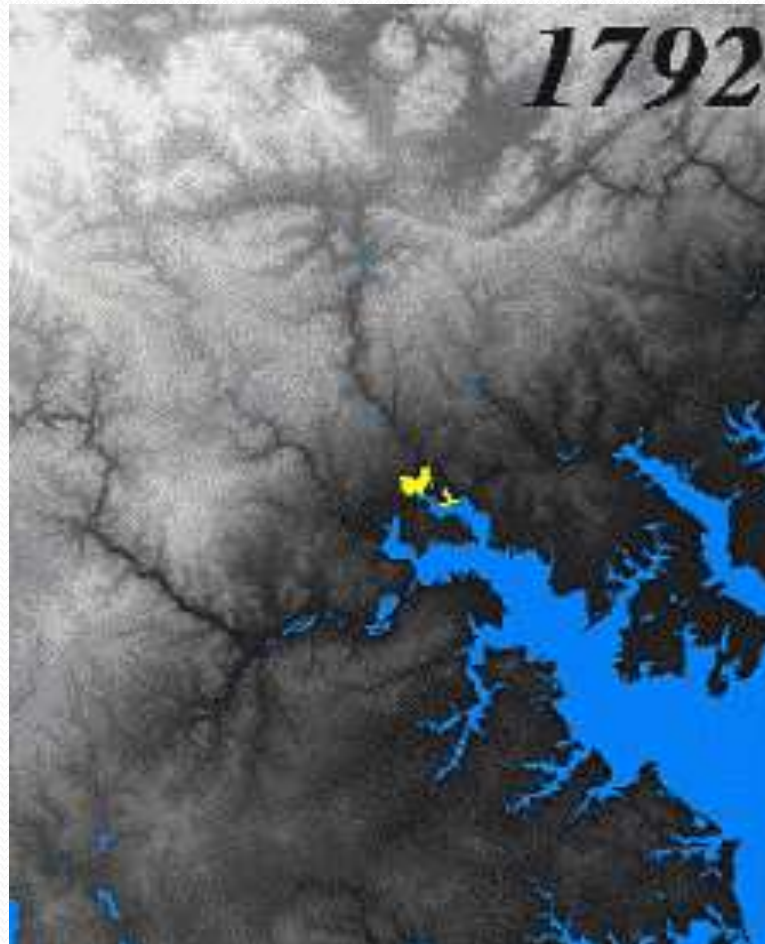
Qualitative Measurement of Water

- The connection between water quality and public health – pioneering works of Joseph Lester and Robert Koch (1870s-1880s) in bacteriology –
Acute diseases
- Detecting chemical contaminants (1960s) –
Chronic diseases
- Biological monitoring (1970s) –
Ecosystem health

The Clean Water Act Amendments (1972)

Stage 2. Land Use and Water Interaction

Two dimensional Approach: Watershed Concept (1970s)

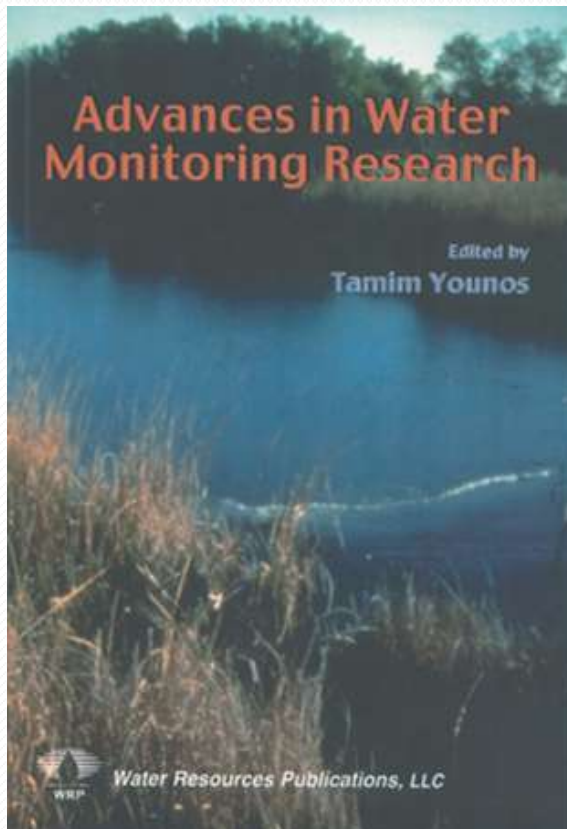


Stage 3. Sustainable Management of Water Resources: Multi-Dimensional Approach (21st Century)

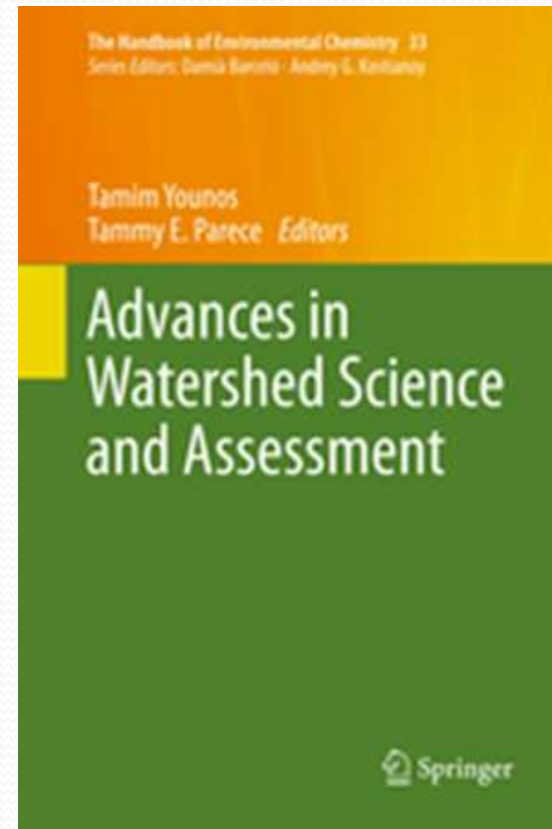
- Interaction between Water, Land and Air
- Climate Change
- Water Scarcity and Sustainability (including quality)
- Water and Energy Nexus
- Water, Energy and Food Nexus

Applications of Remote Sensing and Space Technologies in Water Resources Management

- **Symposium Theme** -



Published in 2003



Published in 2015

Advances in Water Monitoring Research (2003)

Typical Chapters:

- In Search of Technologies for Monitoring River Discharge (R. T. Cheng et al., USGS Water Resources Division, Menlo Park, CA)
- Lake Water Clarity Assessment of Minnesota's Ten Thousand Lakes: A Comprehensive View from Space (L. G. Olmanson et al., Water Resources Center, University of Minnesota, St. Paul)

Advances in Watershed Science and Assessment (2015)

Typical Chapters:

- Using Remote Sensing to Map and Monitor Water Resources in Arid and Semi-Arid Regions (V. Klemas and A. Pieterse, University of Delaware)
- Imaging Spectrometry of Inland Water Quality (C. Giardino et al., National Research Council of Italy)
- Advances in Water Sensor Technologies and Real-Time Water Monitoring (T. Younos, GWI Academy and C. J. Heyer, Aquatic Informatics, Inc.)

2017 NCR Water Resources Symposium Agenda

Morning Agenda

- Keynote
- Expert Panel
- Coffee Break & Poster Presentations
- Lunch & Luncheon Speaker

Afternoon Agenda

USGS Special Session
Con-current sessions
Poster presentations

