

RECLAMATION

Managing Water in the West

Water 2112

(Future Trends in Water Management)

by

Roger Hansen

Wayne Pullan

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UWUA Workshops



U.S. Department of the Interior
Bureau of Reclamation

Roger D. Hansen

- Group Chief, Planning, Reclamation
- Water Resource Automation, Reclamation
- Board, Engineers w/o Borders
- Member, International Water History Association
- Live Part-time in Uganda

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Caveat

**“It’s tough to make predictions,
especially about the future.”**

-Yogi Berra-

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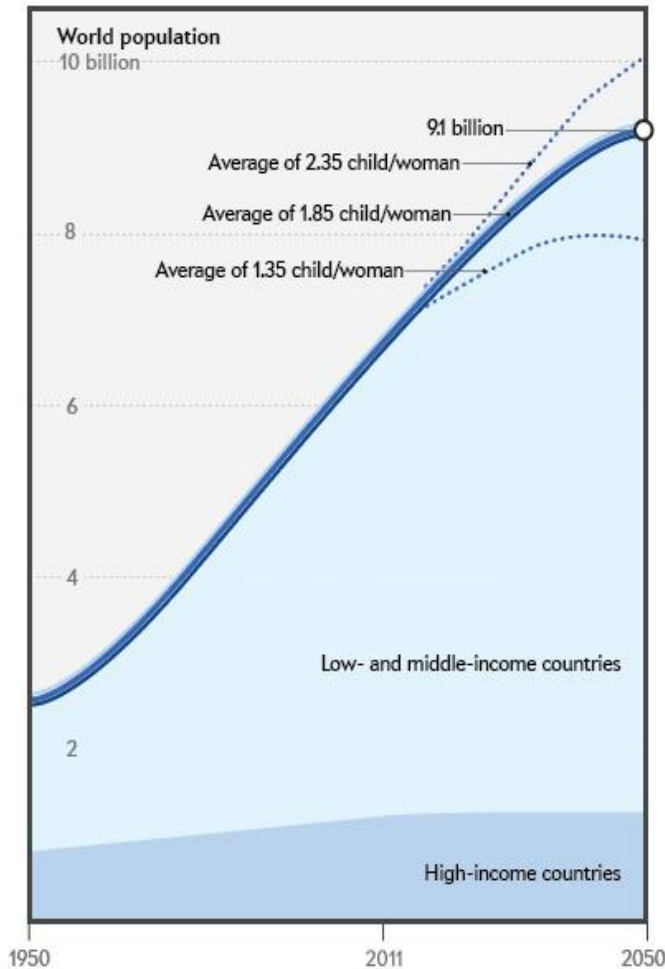
Optimistic About the Future

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Future Trends in Water Management

1. Exploding World Population
2. Holistic Water Management
3. More Responsive Infrastructure
4. Use of Remote Sensing
5. River Basin Brain

1. Exploding World Population



**7.0 billion
today**

**9.1 billion by
2050**

Food a Concern

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Africa



Uganda
30 million

Dire Poverty

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Uganda



Exploding
Population



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Why should we care about Central Africa?

- Uganda: HIV/AIDS and Ebola
- Uganda: Wheat fungus
- Uganda: Tilapia
- USA: Ethanol production



- Uganda: Unique habitat
- Chimps
- Mountain gorillas

The world is getting smaller

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Food Production Critical

- Bio-engineering crops
- Better preservation technologies
- Precision farming
- Expanding food options

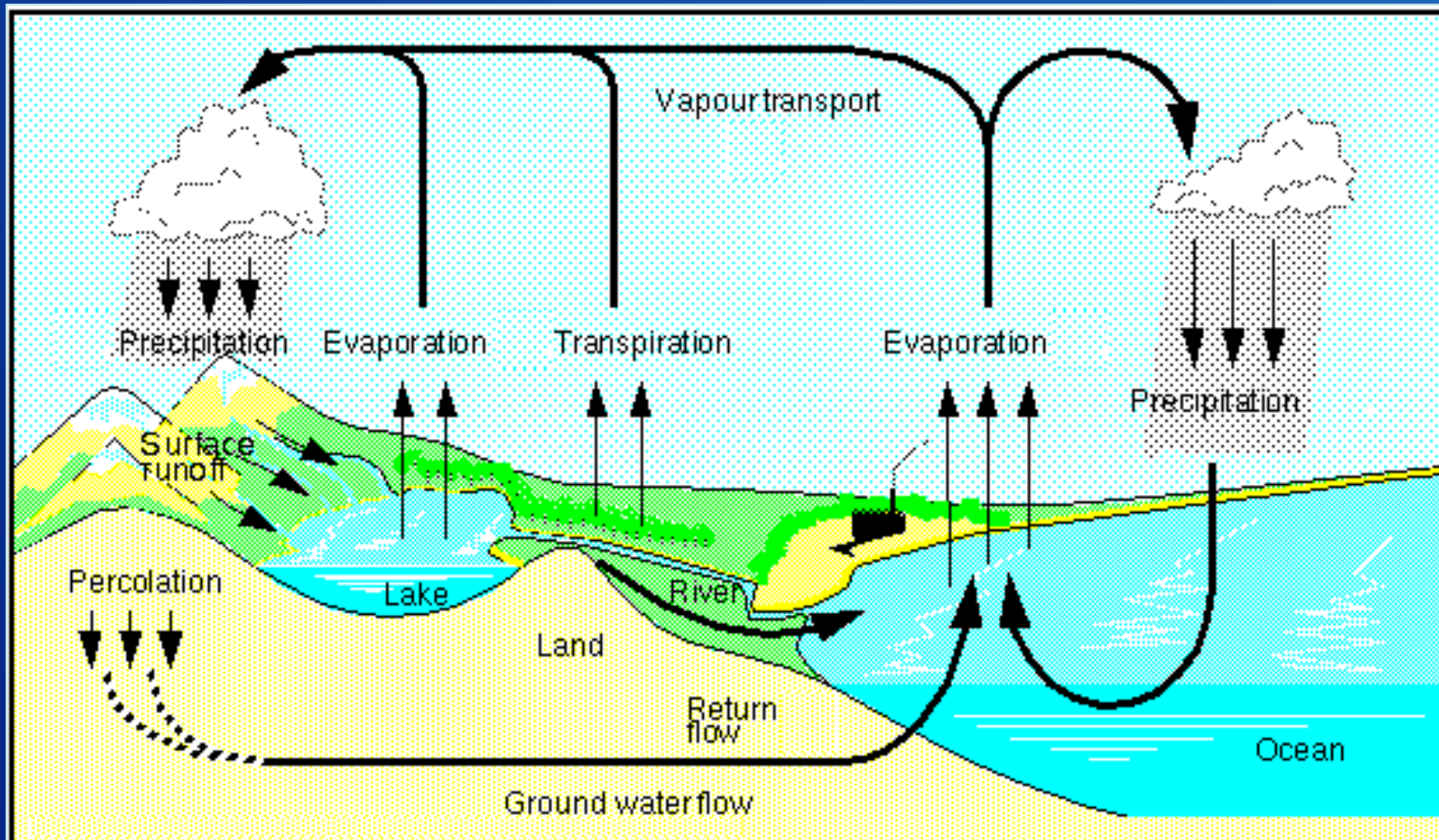
New Food Choices



UN Encouraging
Alternative Diets

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2. Holistic Water Management



Courtesy Erich Roeckner, Max Planck Institute for Meteorology

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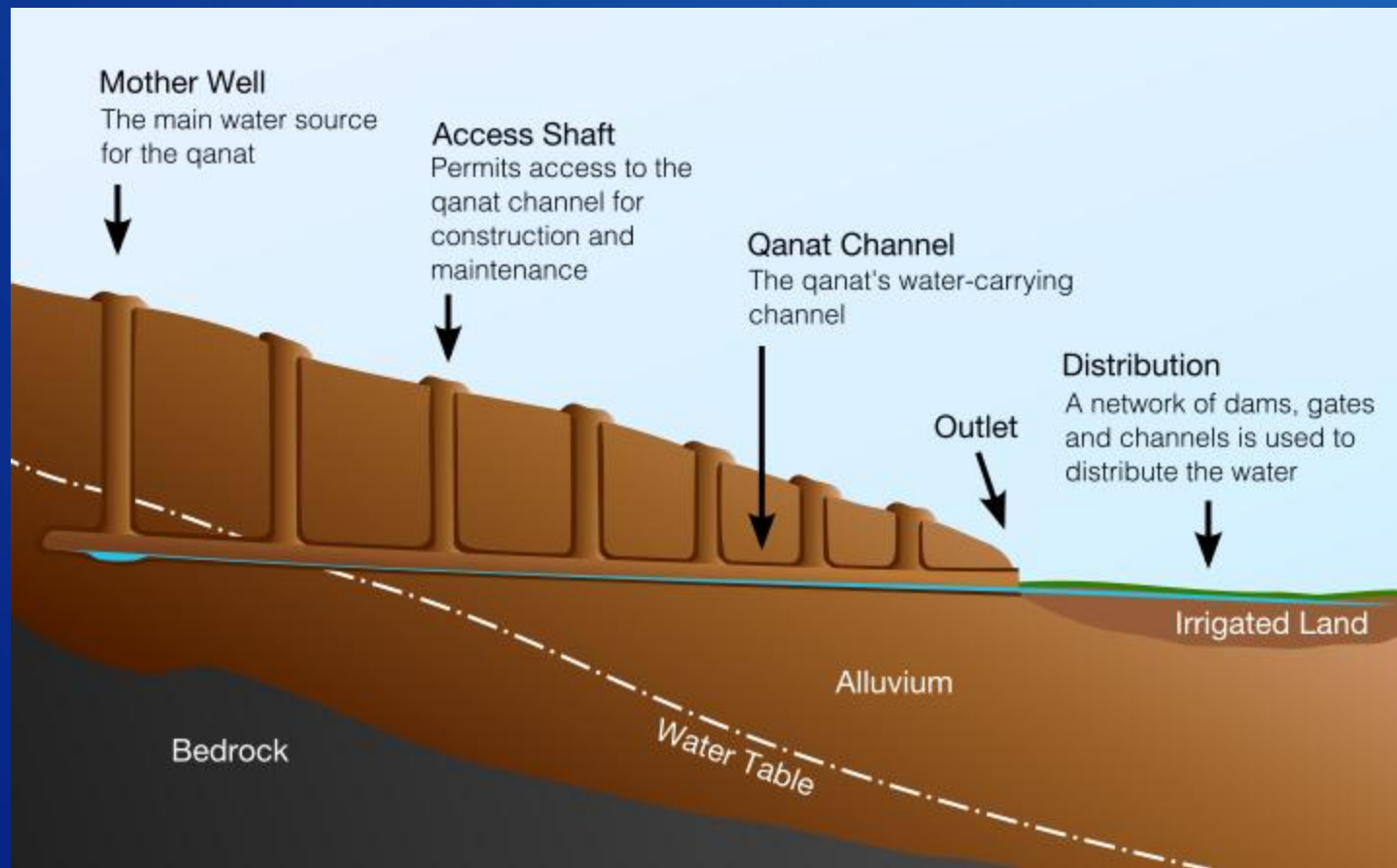
Serious Issues Internationally:

- Flooding (deforestation)
- Earth warming (ice melting)
- Desertification
- Mining groundwater/land subsidence

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Qanats

- 3,000 year old technology



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Qanats

- Very sustainable technology
- No pumping required
- Negatively impacted by over-pumping of groundwater

3. More Responsive Infrastructure

- **Big Urban Water Project - SCADA Systems**
- **Rural Projects - Low-cost monitoring and control**
- **Additionally, conversion from open canal to pipe**

Rural Projects



Over 100 control sites installed in 6 states

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Types of Gate Actuators

- Mechanical Do-It-Yourself - Slide Gates
- Hydraulic Do-It-Yourself - Slide Gates
- Commercial Unit - Slide Gates
- Commercial Unit - Radial Gates

Solar-Powered Gate Actuator



DC Hydraulic Controls



Commercial Slide Gate



Commercial Radial Gate



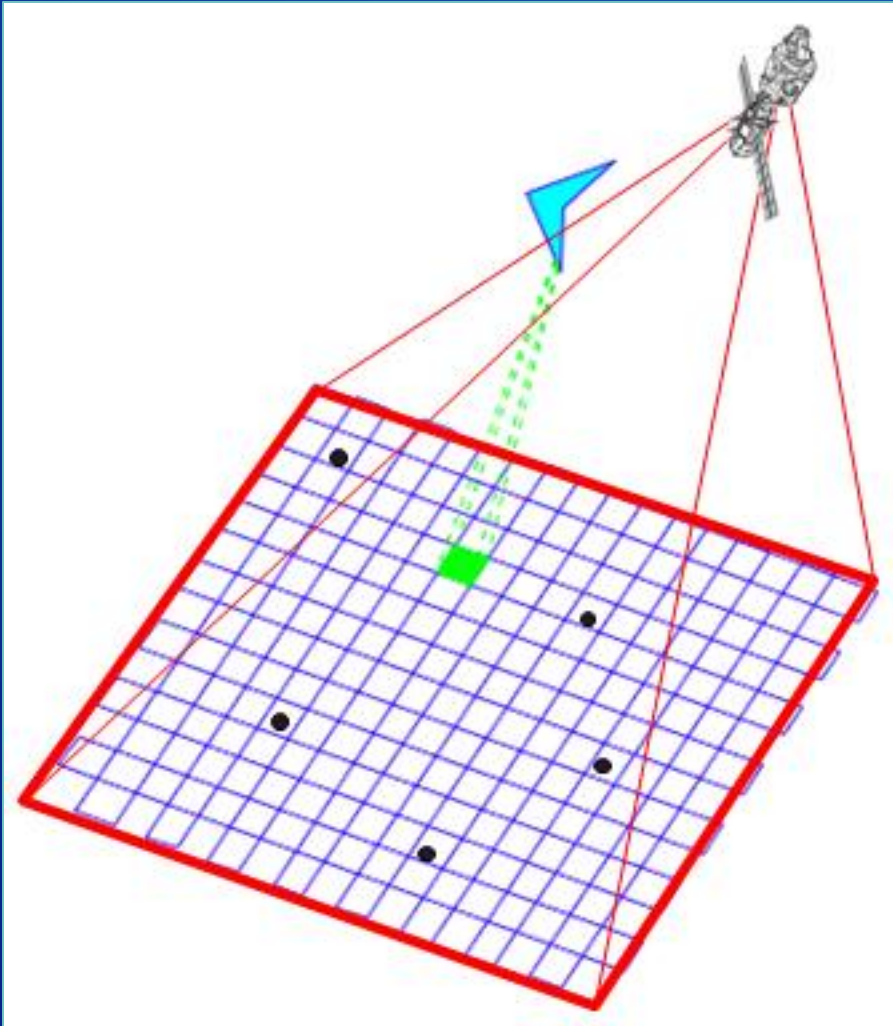
4. Use of Remote Sensing



Utah State University's Aggie Air

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Aggie Air

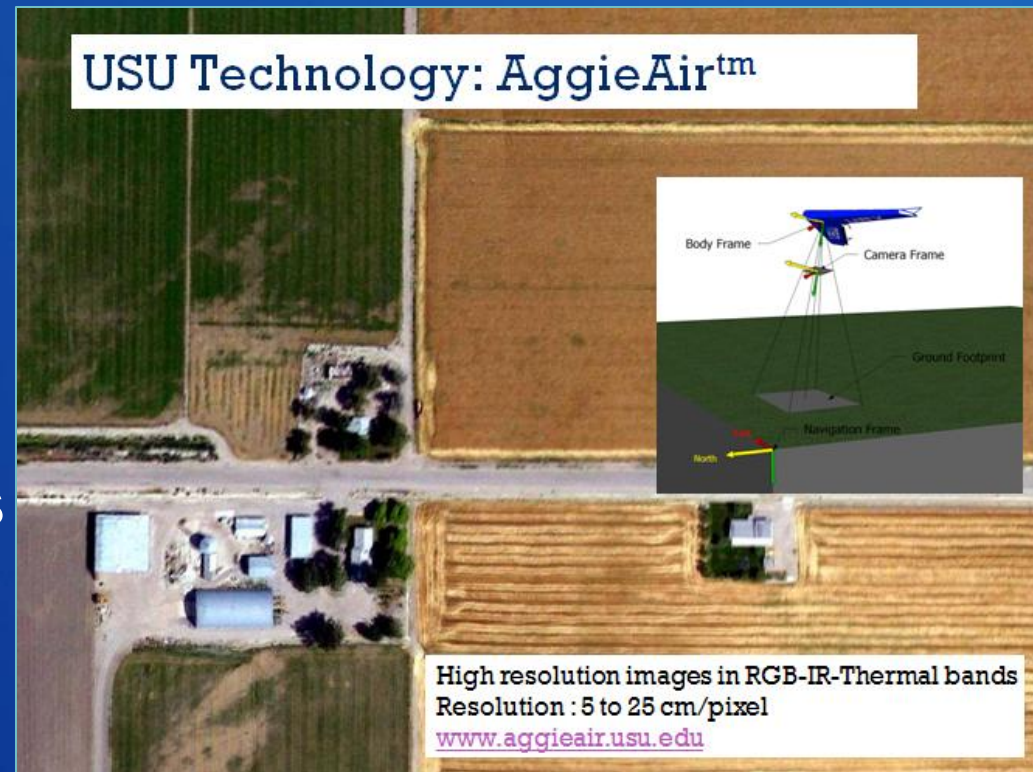


- Low Cost
- High Quality Images
- Fast turn around

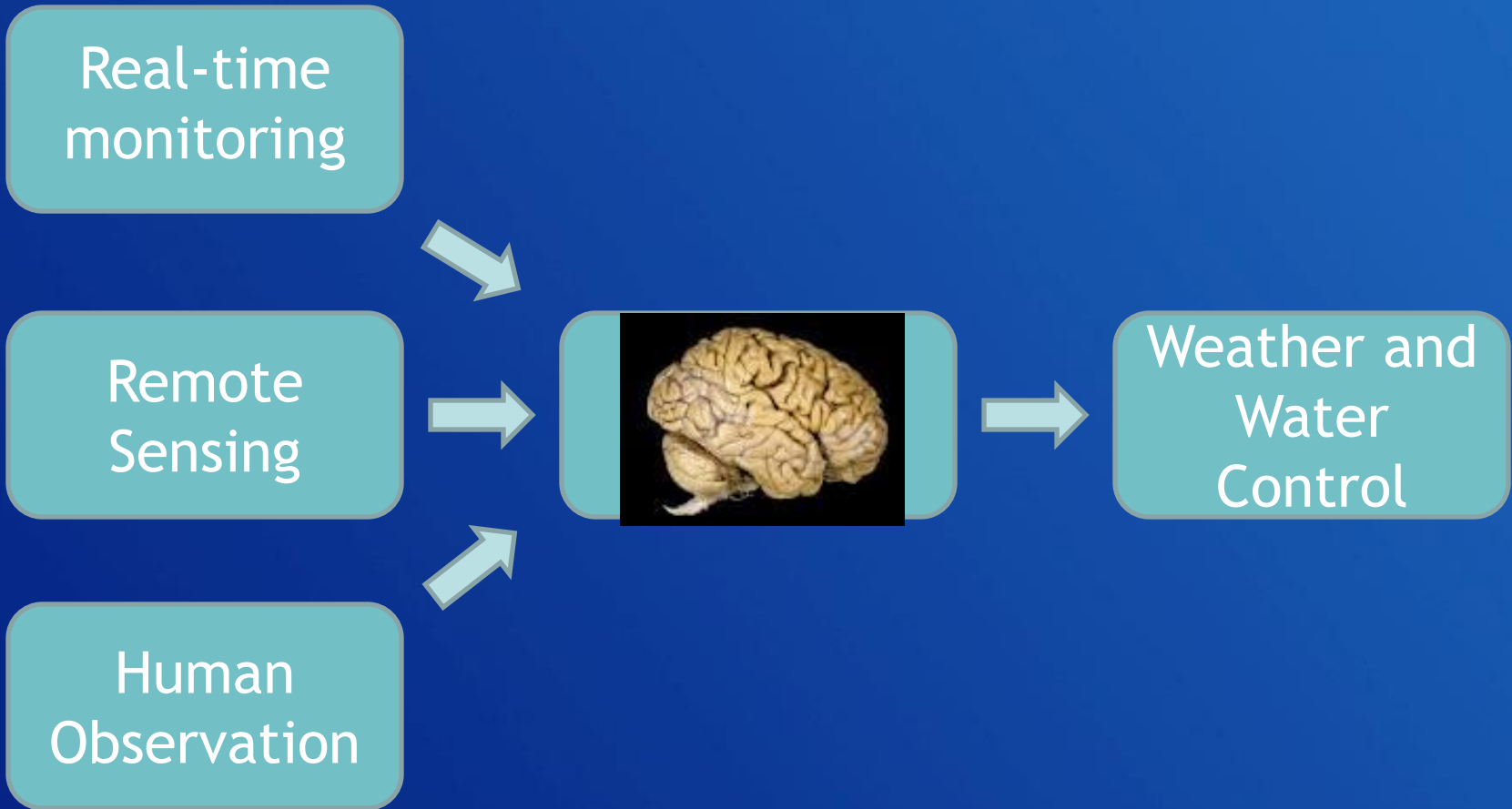
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Uses for Remote Sensing

- Hi-tech farming
- Improve reservoir release estimates
- Habitat investigations
- Canal safety investigations



5. River Basin Brain



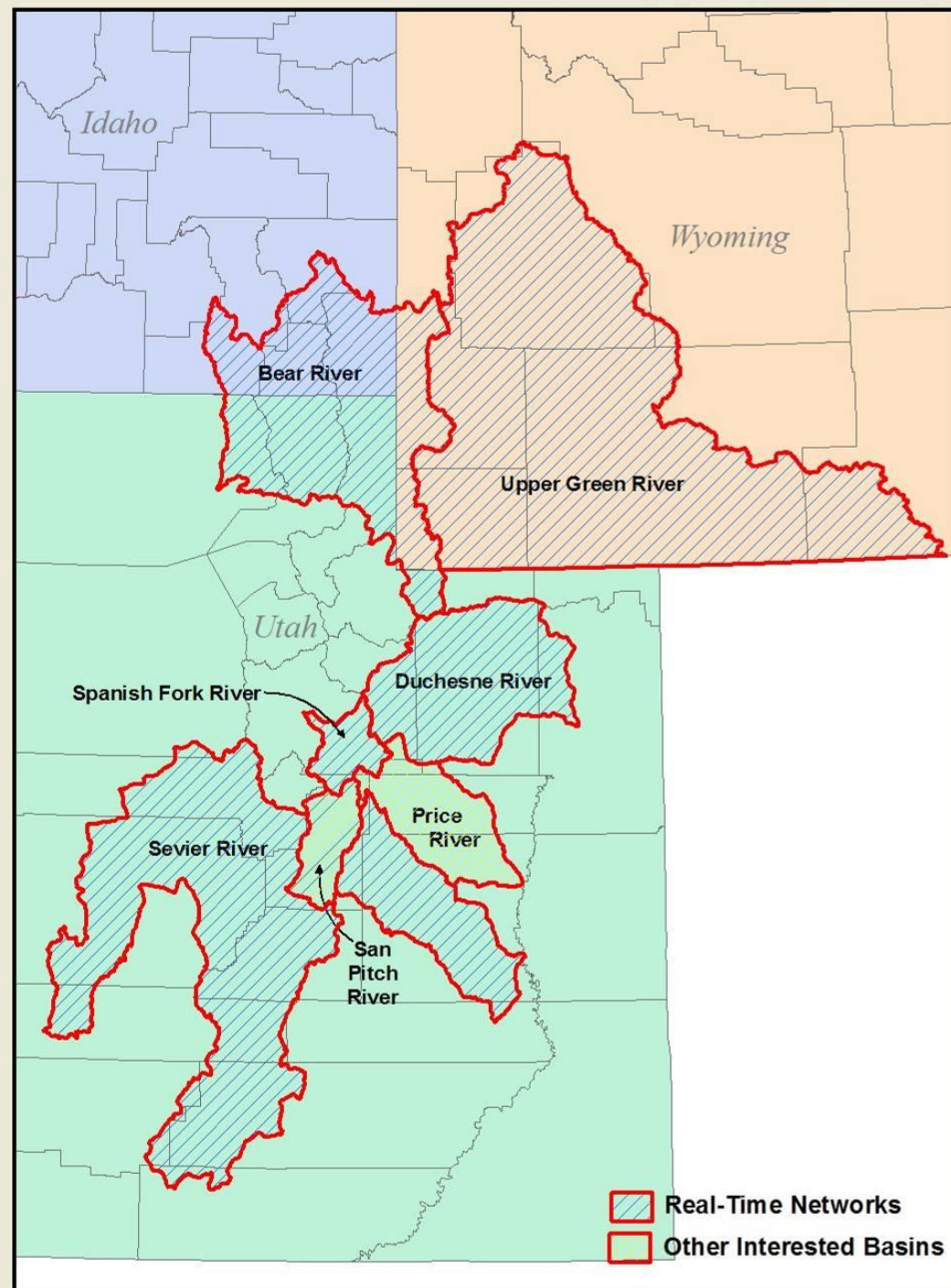
Examples of a Developing Brain

- USU researchers, learning algorithms
- In the small basin at Scipio, automate the entire basin

Scipio

- Automating the entire system
 - Dam
 - Diversion dam
 - Canal
 - Pressure ponds
 - Center pivots
- Like the whole system to run automatically

River Basin Real-Time Monitoring and Control Systems



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Solutions for Uganda

- HIV/AIDS success
- Irrigation
- Very efficient farming
- Aquaculture
- Education

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How can you help?

- **Religious organizations**
 - Catholic Relief Services
 - LDS Humanitarian Services
 - World Vision
- **Others**
 - Oxfam
 - Partners in Health
 - Doctors without Borders

Locally, I'm associated with:

- **Engineers without Borders**
- **Interethnic Health Alliance**
- **See Me Institute**

Encourage All:

- Travel with children and/or grandchildren
- Volunteer when you retire
- Contribute dollars

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The End

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