WATER SUPPLY PLANNING AND MANAGEMENT: SUSTAINABILITY

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ILLINOIS DEPARTMENT OF NATURAL RESOURCES

ISWS

ILLINOIS

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HOW TO MANAGE REGIONAL WATER SUPPLIES?

- **Business as usual? Reasonable use.**
- **Change?**
- **Many pieces to the jigsaw puzzle (supply; demand; impacts of withdrawals; conservation; reuse; surface water; groundwater; conjunctive use; climate change; droughts; time horizons;)**

HOW TO MANAGE REGIOANL WATER SUPPLIES? (contd.)

- **Previously not had a process and structure for regional planning and management (other than LM diversion)**
- **Governor established an administrative process and structure for regional planning and management**
- **RWSPG needs develop a framework for making management recommendations**
- **The concept of sustainability offers an opportunity for developing such a framework**
- **If not sustainability, what other framework?**

GOAL OF WATER SUPPLY PLANNING:

TO PROVIDE

ADEQUATE SUPPLIES

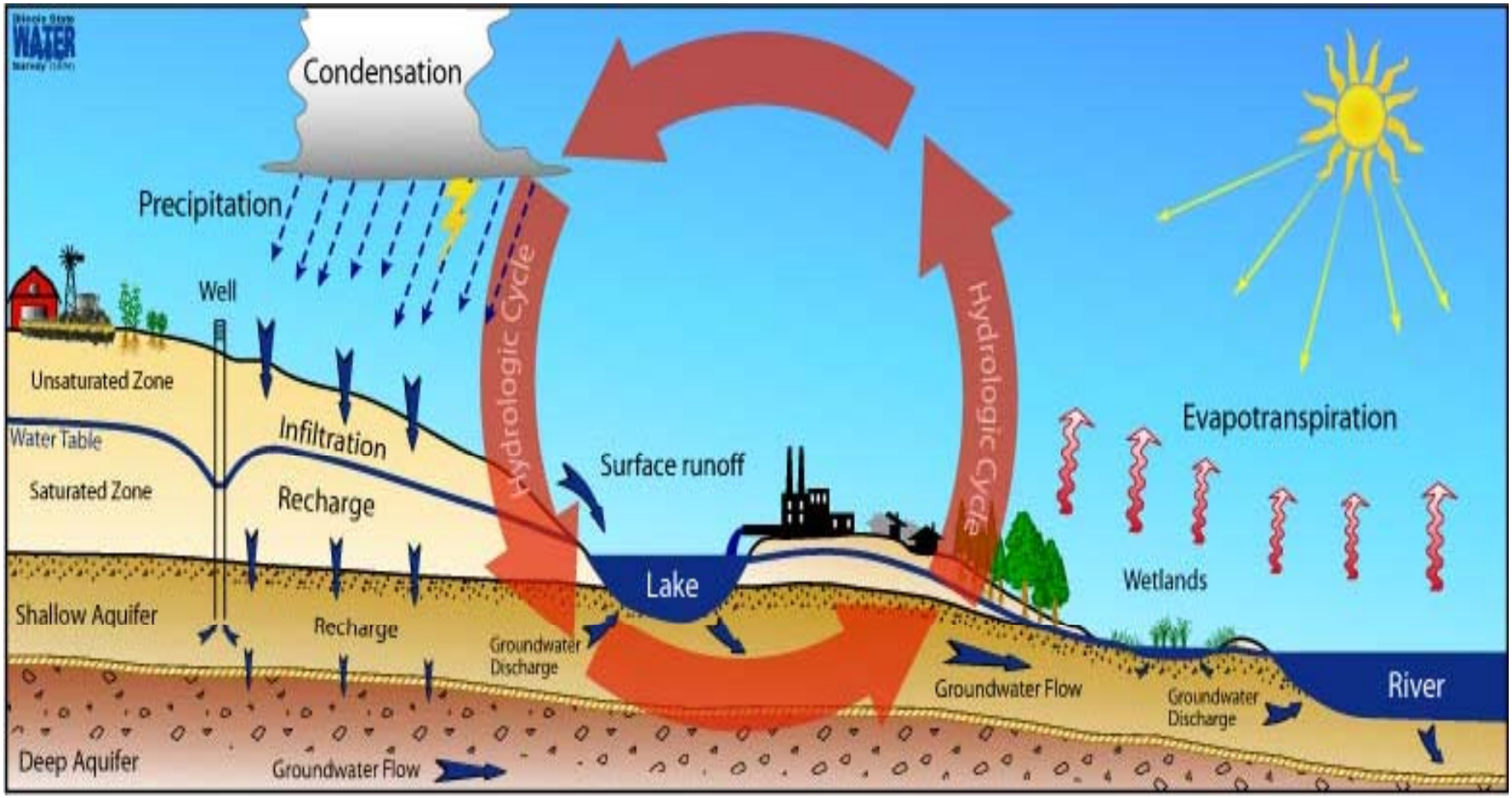
OF

CLEAN WATER

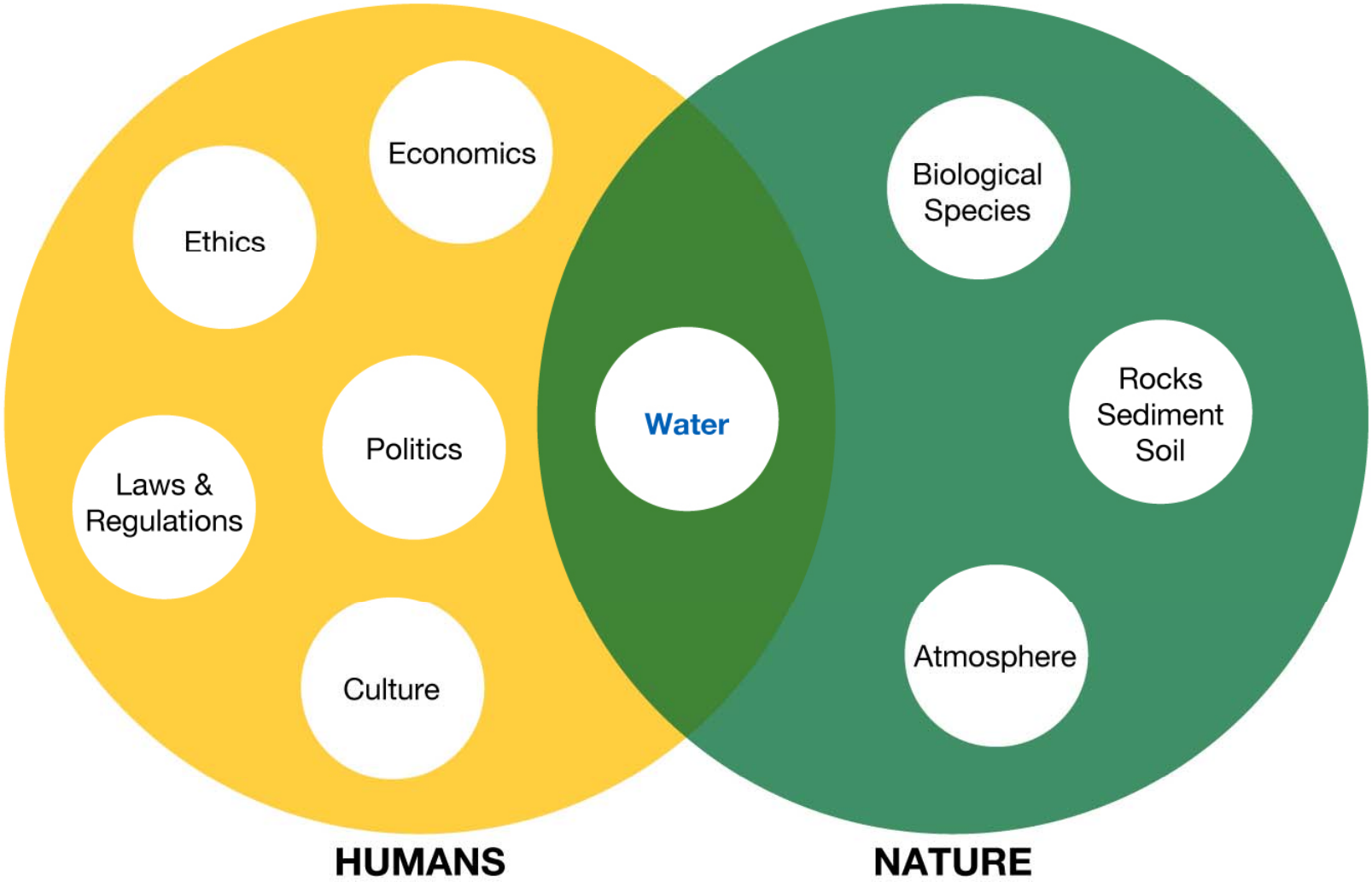
FOR ALL USERS

AT REASONABLE COST

THE WATER CYCLE:
A PHYSICAL AND BIOLOGICAL FRAMEWORK FOR REGIONAL WATER SUPPLY PLANNING AND MANAGEMENT



Water Supply Planning and Management



SUSTAINABILITY

“meeting current needs without compromising the opportunities of future generations to meet their needs”

World Commission, 1987

GROUNDWATER SUSTAINABILITY

“ .. development and use of groundwater in a manner that can be maintained for an indefinite time without causing unacceptable environmental, economic, or social consequences.”

USGS Circular 1186, 1999

SUSTAINABILITY RECOGNIZES:

- **Present and future generations**
- **The value of water supply**
- **Shared responsibilities**
- **Renewable but not limitless water supply**
- **Stewardship**
- **Reasonable use and acceptable impacts**
- **Maintenance of integrity of societal and ecological systems**
- **Adaptability and flexibility to deal with uncertainties and risks**

NON-SUSTAINABLE MANAGEMENT INCLUDES:

- **Inadequate consideration of future generations**
- **Undue recognition of the value and limits of water**
- **Singular decision making**
- **Unreasonable use, unacceptable impacts, and high costs**
- **Imbalance between meeting societal and ecosystem needs**
- **Inability to deal with droughts, climate change etc.**

Does A Reservoir In Illinois Offer A Sustainable Water Supply?

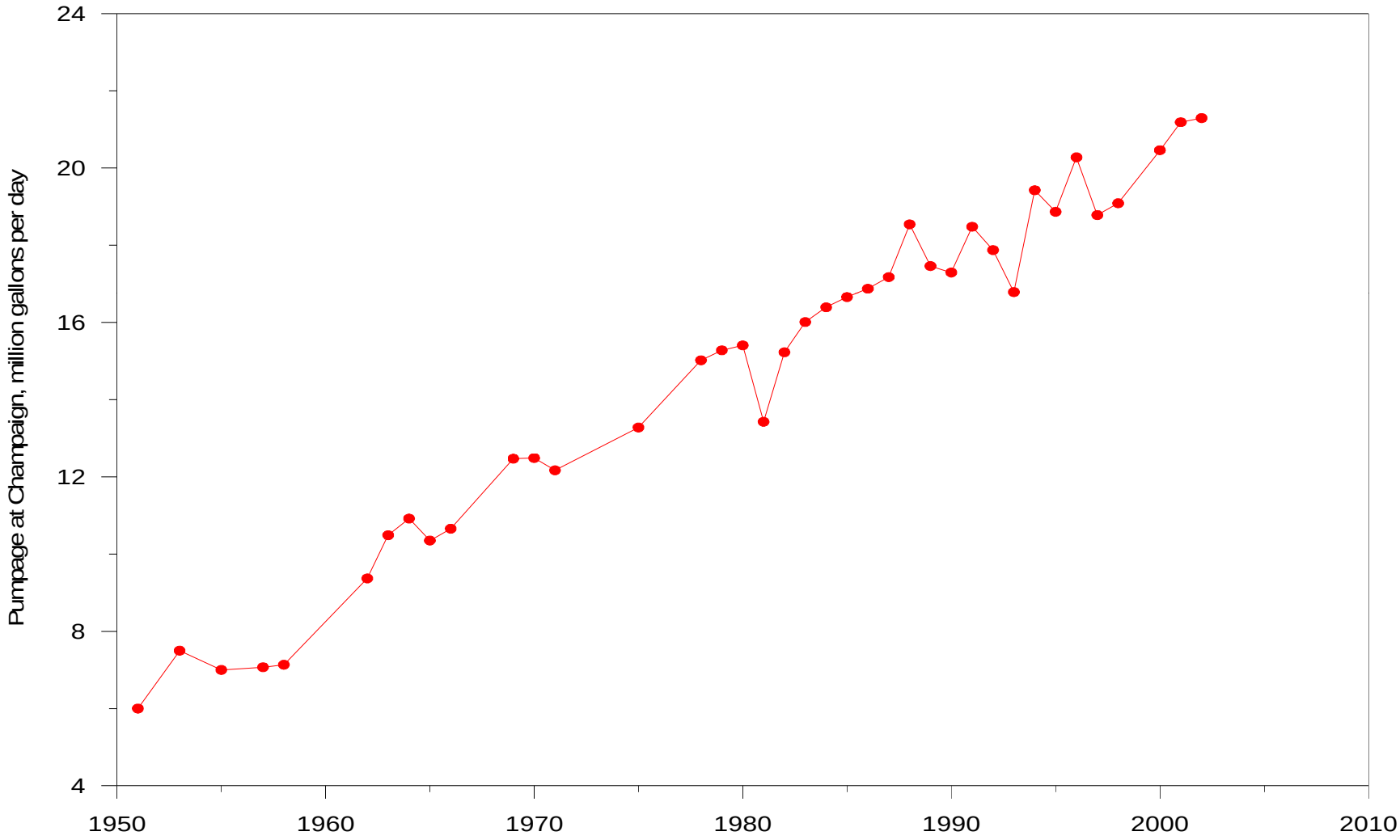
Does A Reservoir In Illinois Offer A Sustainable Water Supply?

- **May be, may be not!**
- **Depends on definition of sustainability**
- **Critical considerations: time, costs and acceptable impacts**
- **Sustainable until water storage capacity is no longer adequate to meet needs – reduced supply (e.g., droughts; sedimentation)**
- **Sustainable until costs of dredging, enlarging the reservoir, or preventing sedimentation become too high**

IS WITHDRAWING LARGE AMOUNTS OF WATER FROM AQUIFERS SUSTAINABLE?

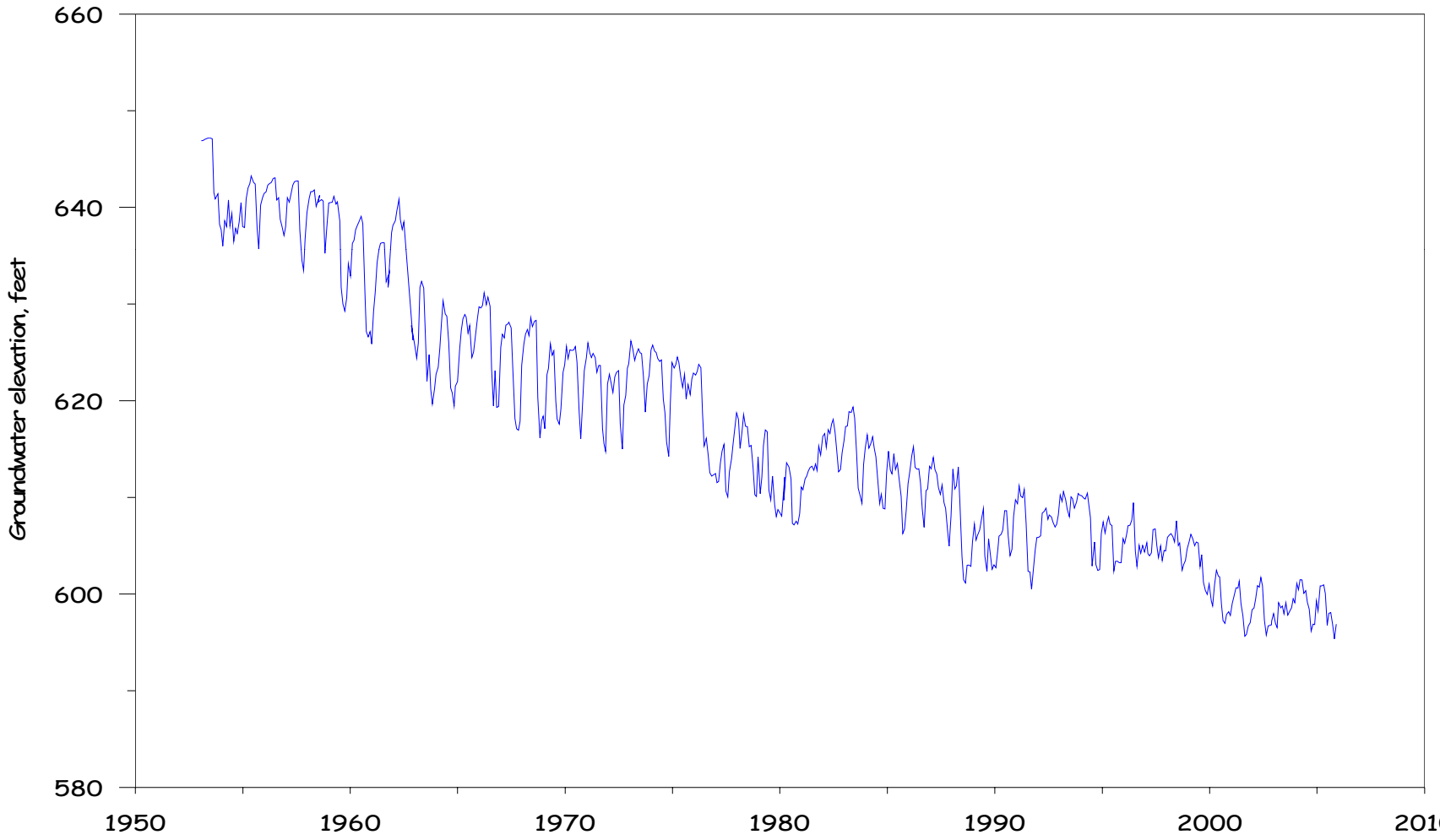
- **Safe yield: withdrawals = recharge**
- **BUT withdrawals can e.g., reduce streamflow; dewater aquifers; cause existing wells to go dry; cause deterioration in water quality**
- **Often decades to centuries for groundwater flow system to come to new equilibrium**
- **Safe yield is not necessary sustainable**
- **Critical considerations: acceptable impacts and costs**

Water Use - *Long-term trend at Champaign*

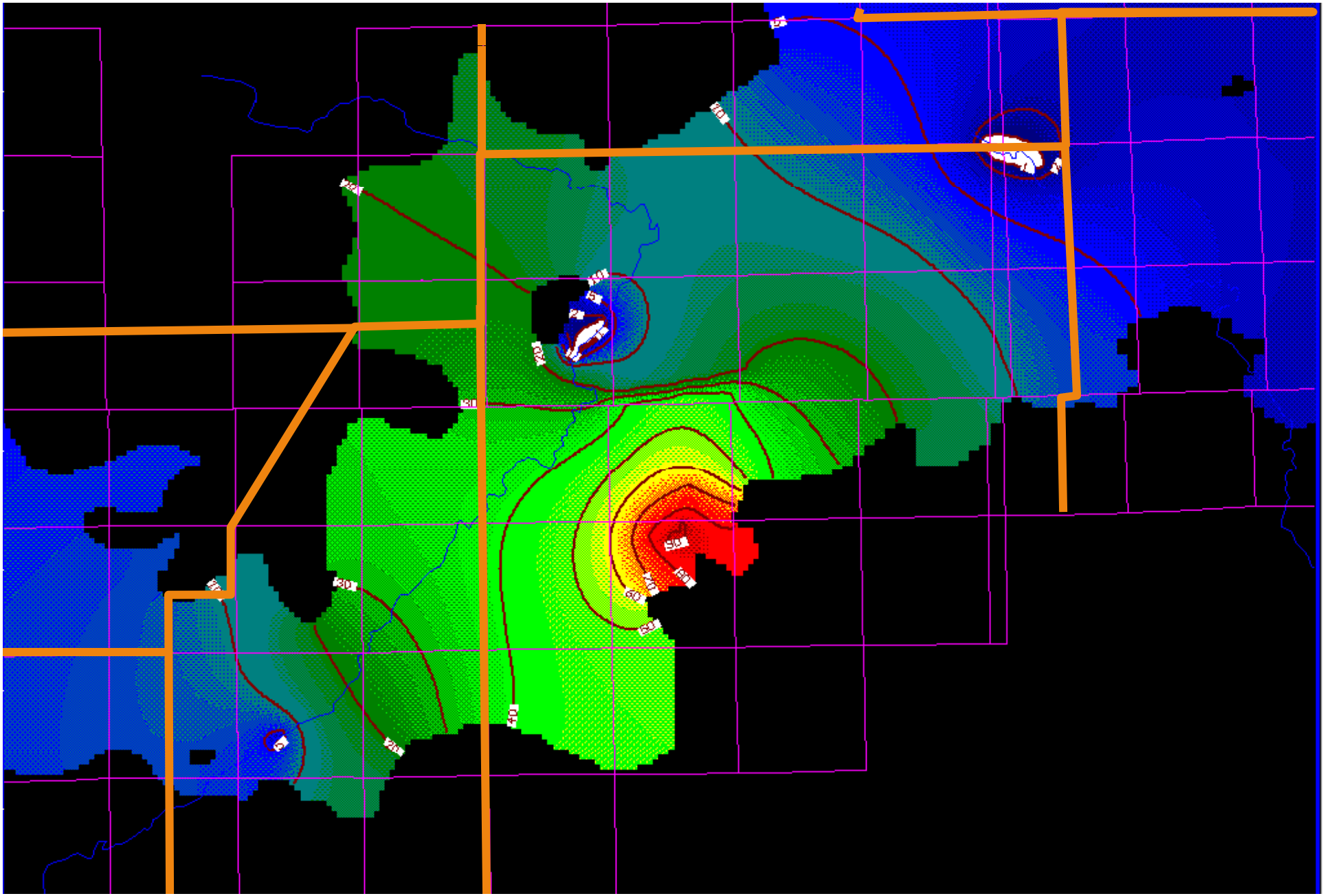


Mahomet Aquifer Water Level [Head]

at Rising, near Champaign



Simulated Drawdown from IAWC Wellfield, draft 2005



SUSTAINABILITY THRESHOLDS?

- Critical levels for managing water supply operations, e.g, Q7/10
- Sustainable operations above thresholds
- Non-sustainable operations below thresholds
- Thresholds can be set by society based on acceptable/unacceptable impacts, costs, etc
- Strategies can be implemented to ensure compliance with thresholds
- Do you wish to identify and recommend thresholds?
- Can you implement additional thresholds within existing laws, regulations and property rights?
- Can you achieve “sustainability” without changing laws, regulations and/or property rights?

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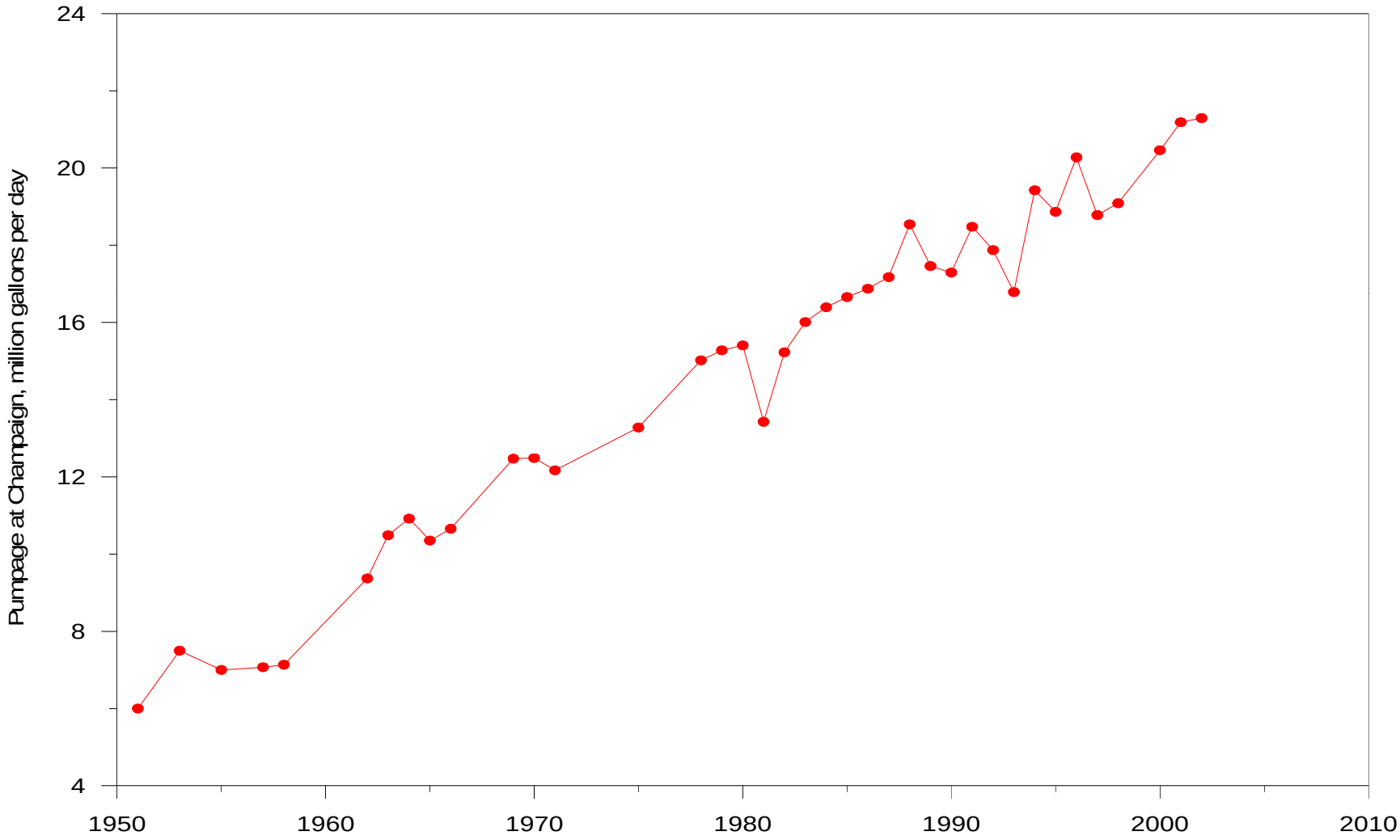

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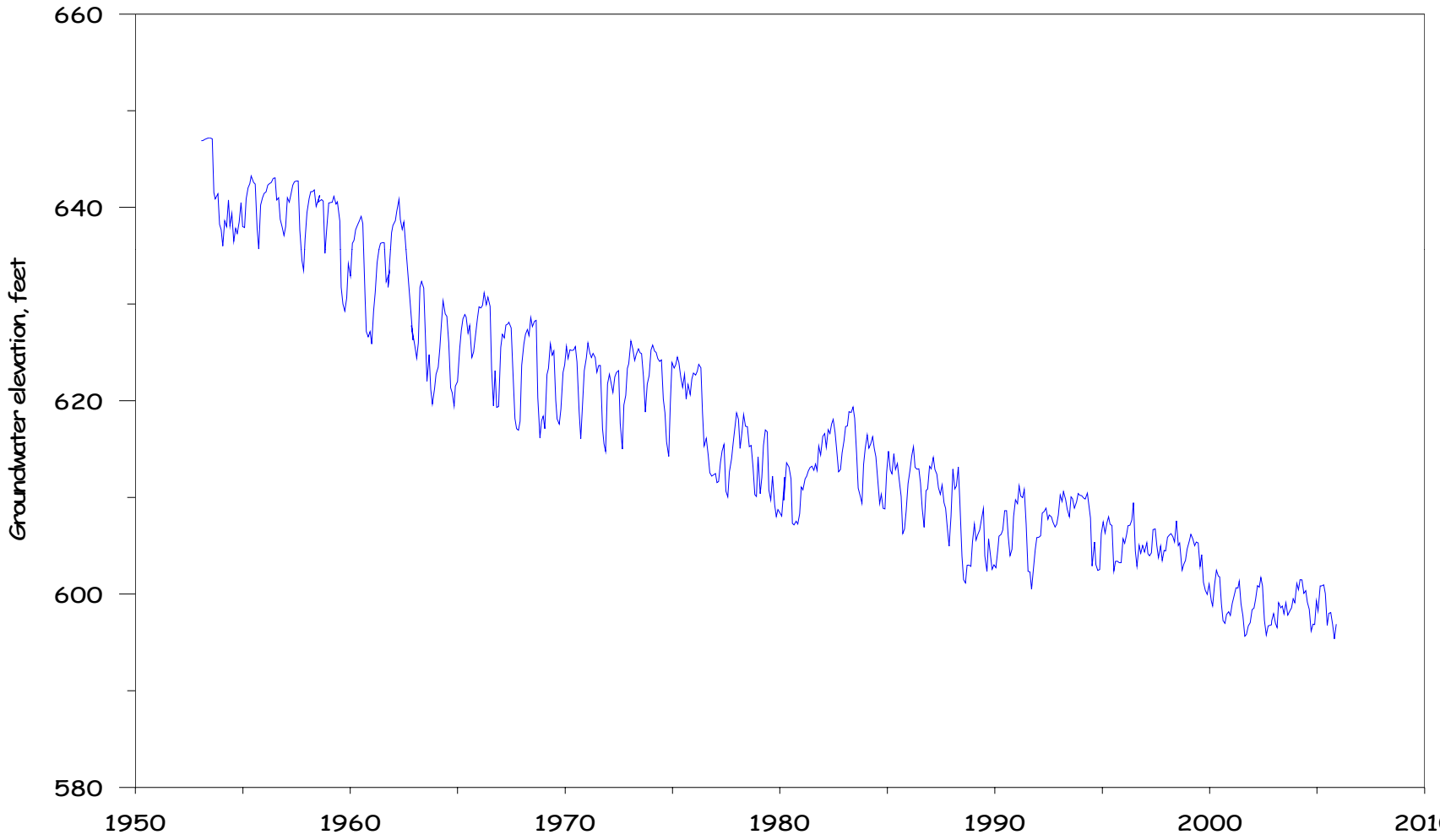

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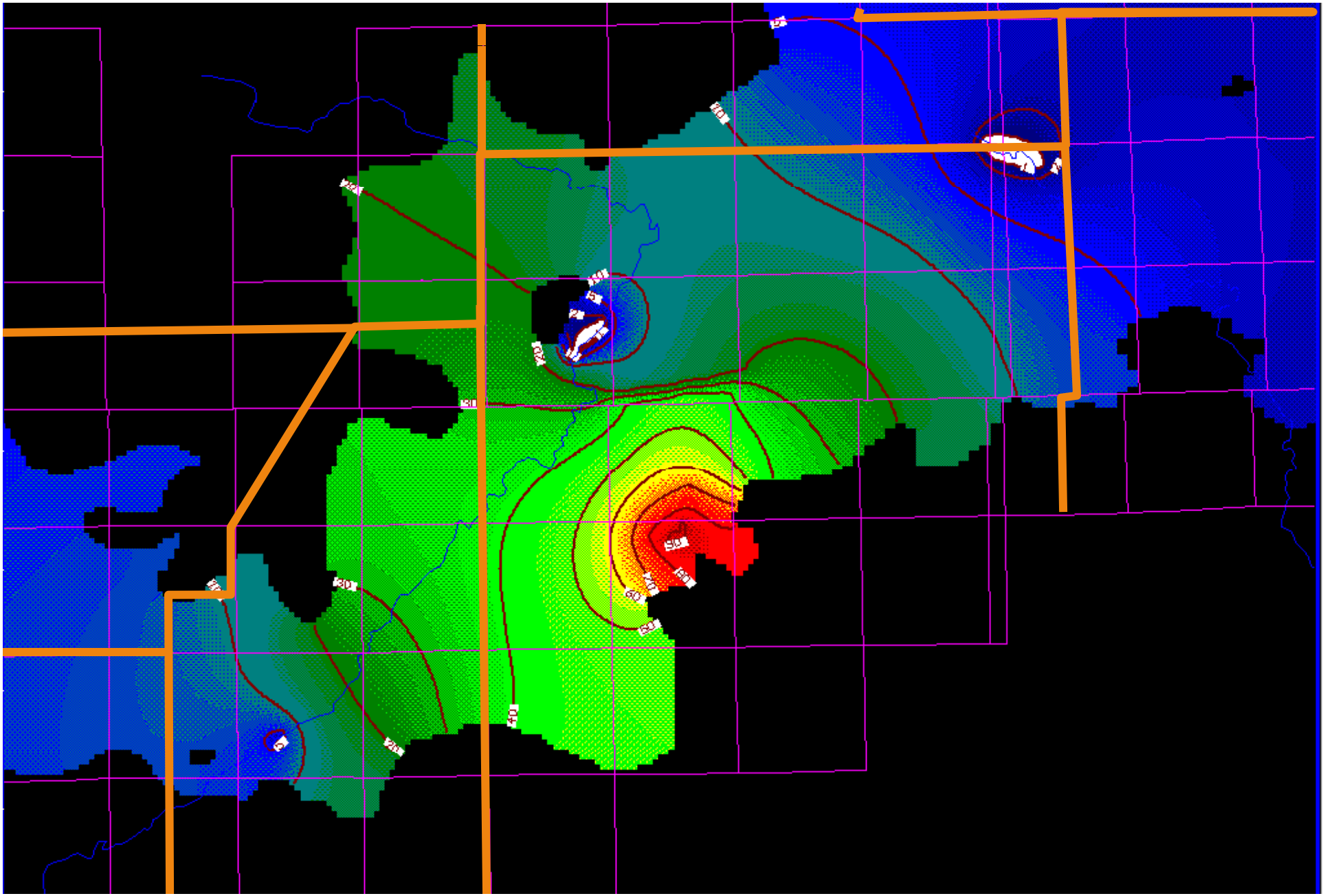
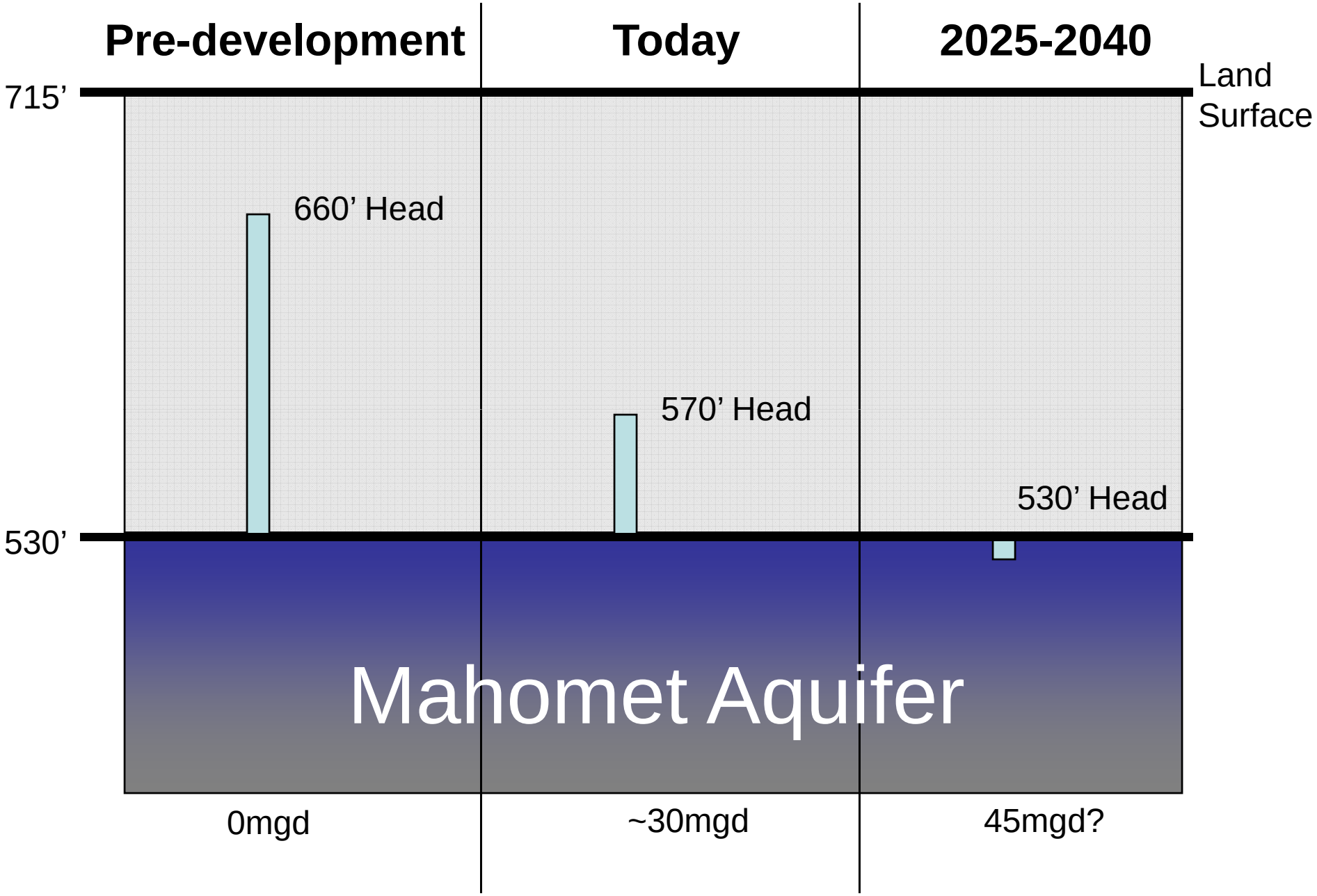
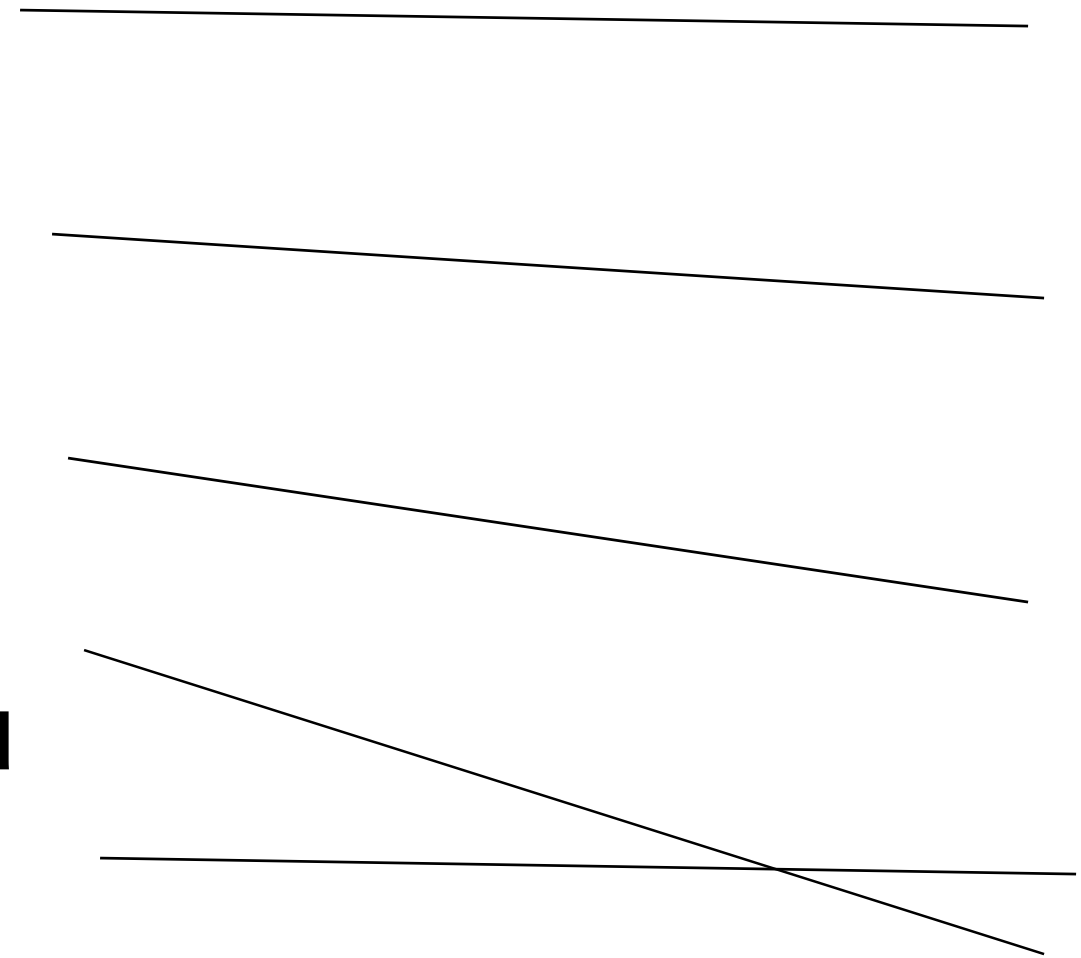




Decline in “head” west of Champaign preliminary)

CUMULATIVE IMPACTS WITH +10 MGD THRESHOLD

- **+2 mgd**
- **+4 mgd**
- **+6 mgd**
- **TOTAL +12 mgd**



CONSERVATION

- **Reduce water demand and withdrawals**
- **Reduce impacts of withdrawals**
- **To what extent does conservation simply delay meeting critical thresholds and support further development?**

Regional
Water Supply Planning Committee

- **Identify a framework within which you can pull all the pieces together and set goals, strategies etc.**
- **Do you wish to use sustainability as a framework for making management recommendations?**
- **If yes, you probably need to clearly define sustainability in an operational mode, otherwise perhaps not different from reasonable use.**
- **If not sustainability, will you adopt another framework?**
- **Identify the resources you wish to protect, preserve and enhance – water storage and flows, society, economy, ecosystems etc.**
- **Identify the impacts and costs that will be acceptable to you.**

THE BALL
IS IN YOUR COURT!