Planning Far into the Future: the Minnesota Water Sustainability Framework

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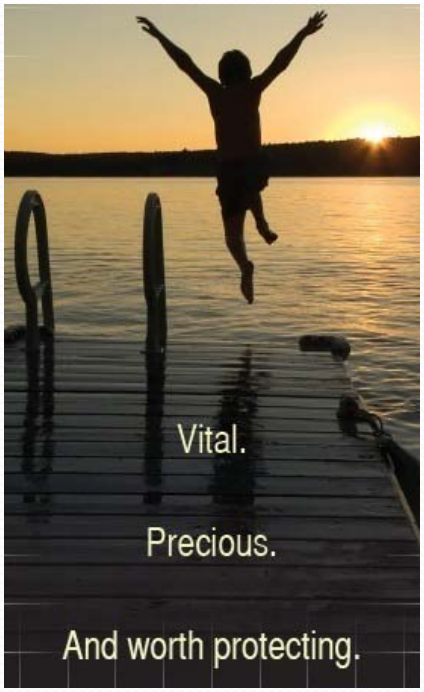
What is the Framework?

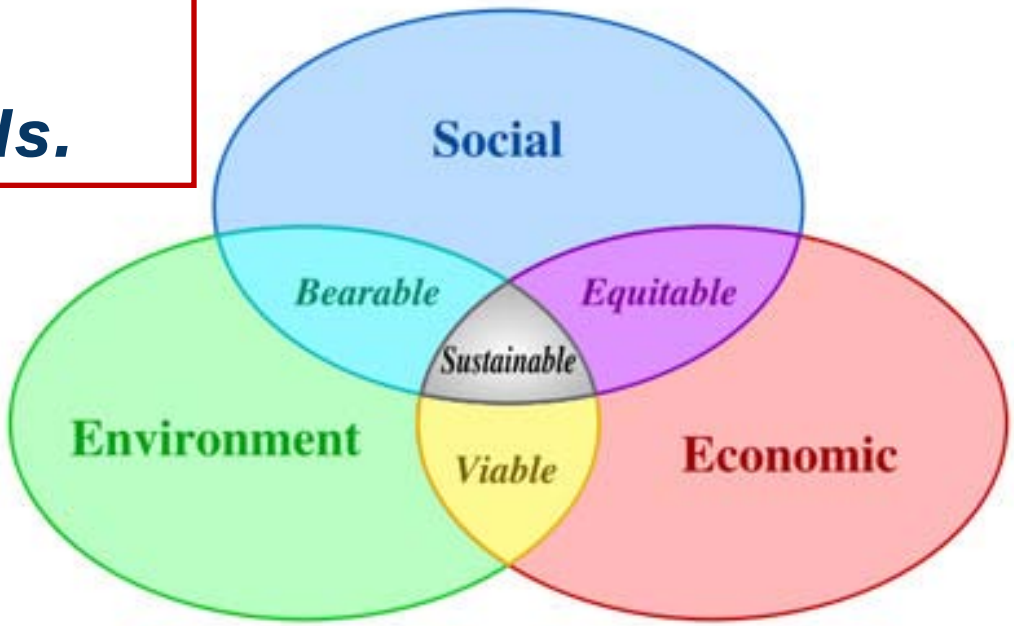
- A 25-year plan to protect, conserve, and enhance the quantity and quality of the state's groundwater and surface water

- An approach to manage the state's water resources that is
  - Sustainable
  - Comprehensive
  - Integrated



Sustainability

Sustainable water use does not harm ecosystems, degrade water quality, or compromise the ability of future generations to meet their own needs.



Mandate – to address needs related to:

- Drinking water
- Stormwater
- Agricultural use
- Industrial use
- Surface and groundwater interactions
- Infrastructure
- Interface of water resources with climate change, land use, development, demographics

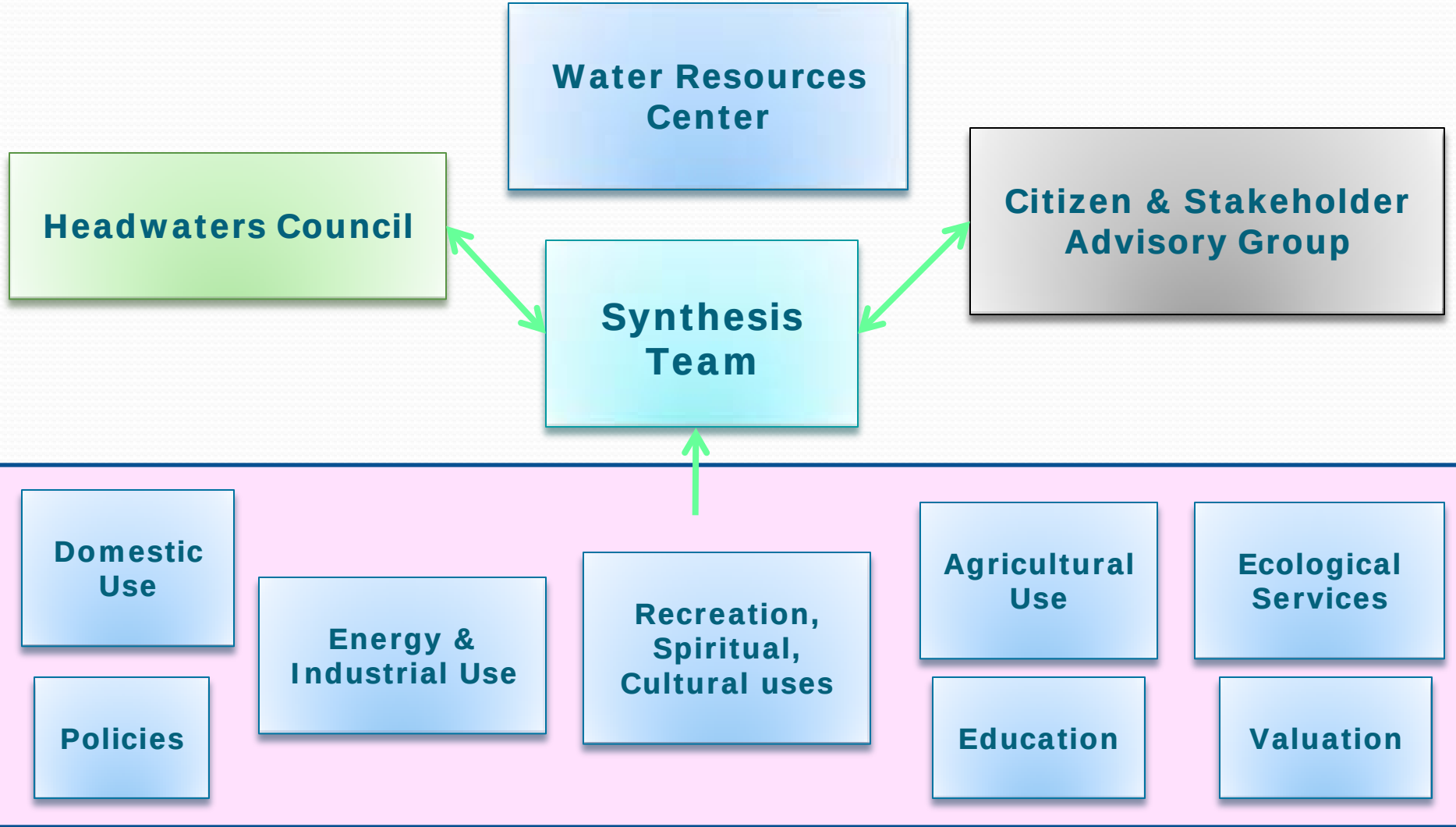
Identify BMPs for WWTP, DW source protection, P2, conservation, and water valuation

A Collaborative Approach

UNIVERSITY OF MINNESOTA

- DNR
- MDA
- MPCA
- MDH
- EQB
- BWSR
- WDs
- WMOs
- SWCDs
- NGOs
- Counties & Cities

Approach


Water Resources Center
Headwaters Council
Citizen & Stakeholder Advisory Group
Synthesis Team
Domestic Use
Energy & Industrial Use
Recreation, Spiritual, Cultural uses
Agricultural Use
Ecological Services
Policies
Education
Valuation

Players

- Academic: 34
- State Agency: 46
- Federal Agency: 10
- City/Cty/LGU: 16
- WD/WMO/SWCD: 8
- NGO: 15
- Private sector: 20
- Agriculture: 14
- Tribal: 7
- Citizen: 7

Foundational Materials

White Papers:

- Water Use in Minnesota
- Water Supply in Minnesota
- Water Quality in Minnesota

Presentations on:

Climate Change, Demographics, Land Use

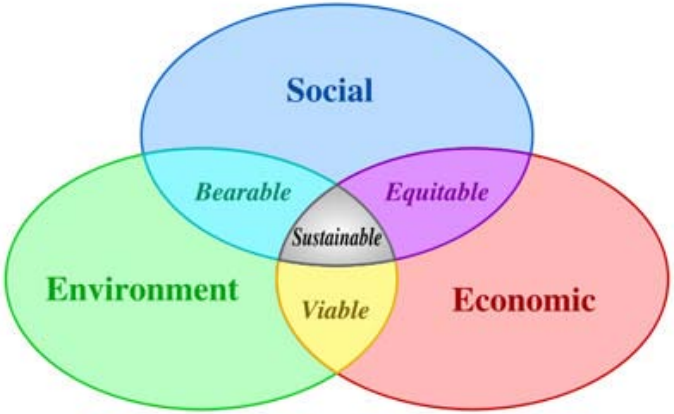
Technical Team White Papers

- Agriculture
- Ecosystem Services
- Domestic
- Energy/Manufacturing
- Rec/Cultural/Spiritual
- Policy
- Education
- Valuation

http://wrc.umn.edu

Framework

- Framed 90 specific needs
- Collected under 10 “Big” Issues
- Contained in 3 categories of sustainability



Issues/needs

Environmental

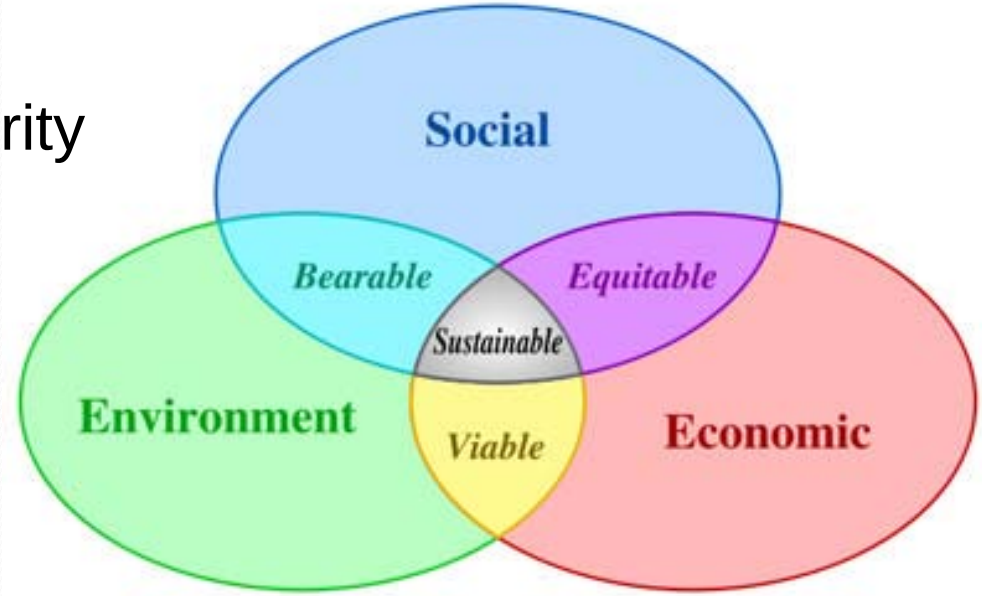
- Sustainable water supply
- Cultural eutrophication & conventional impairments
- Contaminants of emerging concern
- Land-water connection
- Ecological & hydrologic integrity
- Water-energy “nexus”

Social

- Citizen engagement & education
- Governance

Economic

- Water pricing
- Infrastructure needs



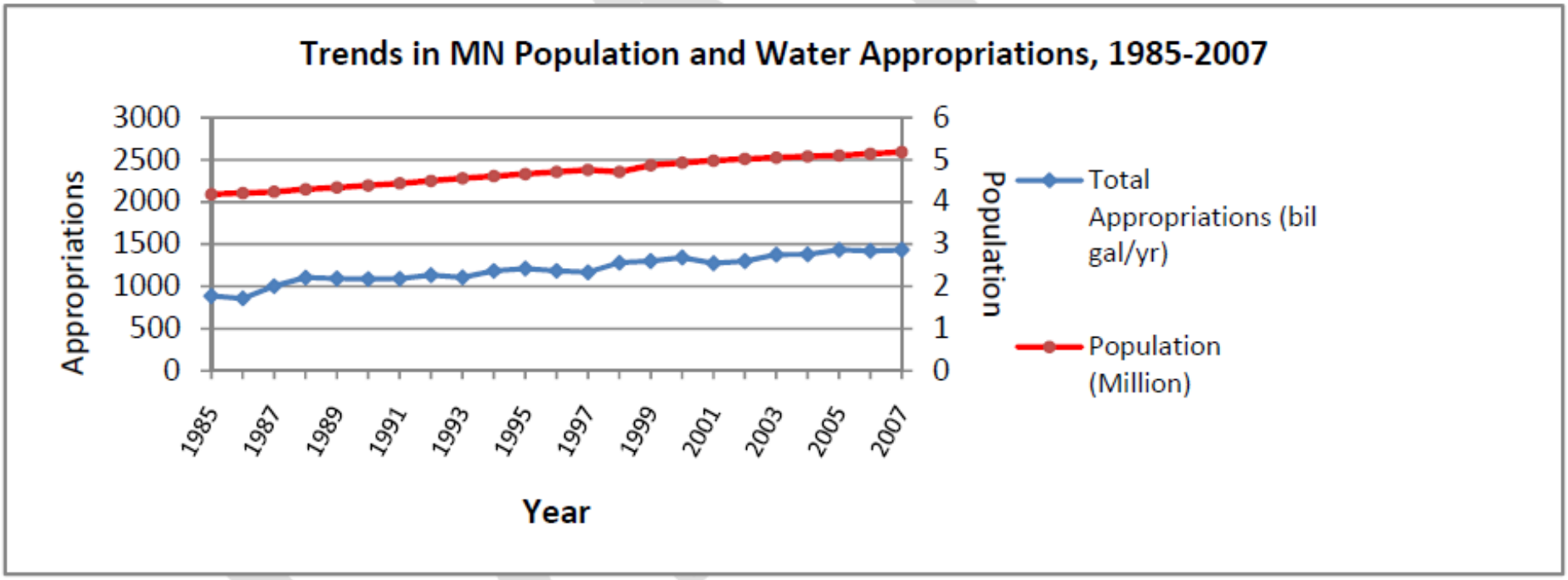
For each Issue:

- Problem statement
- Desired future Minnesota condition
  - Strategies (“what outcome we want”)
    - Actionable tasks (“how to get there”)
  - Benchmarks of measuring progress
- Implementation schedule

Issue: Sustainable Water Supply

Problem:

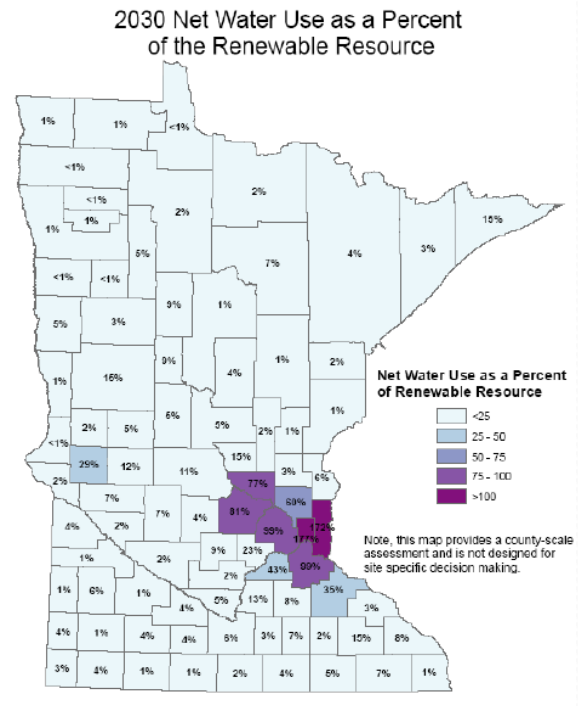
- Population growth means more water demand

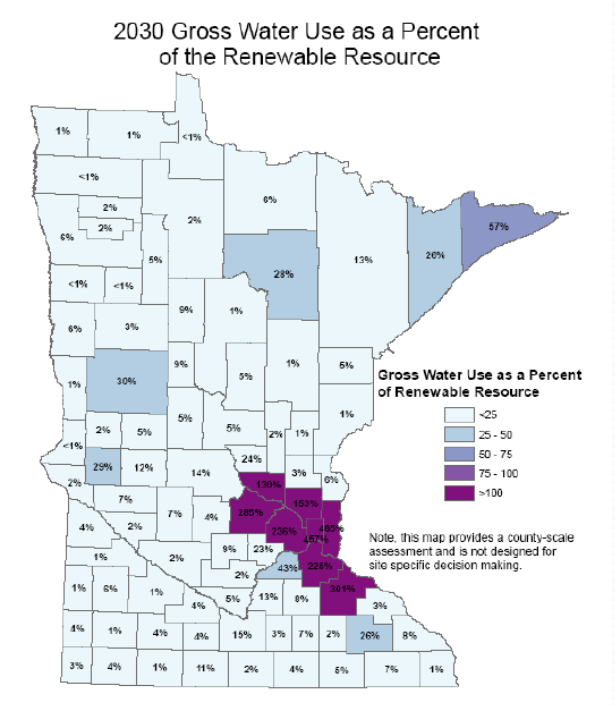


Issue: Sustainable Water Supply

Problem:

- Studies indicate we may be using more groundwater than is being replaced in Metro





Issue: Sustainable Water Supply

Desired Minnesota Future:

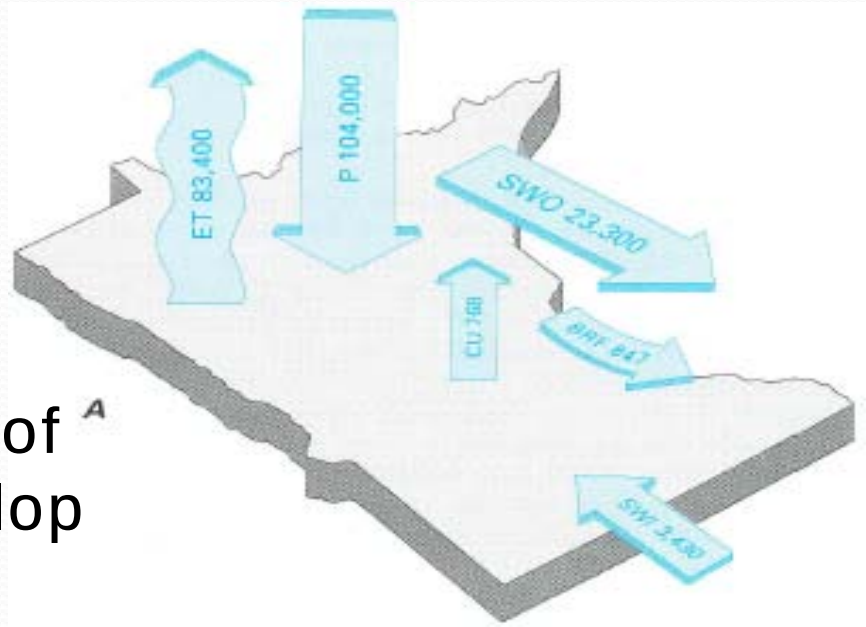
- *Enough water of sufficient quality that is protected for use by all future generations*

Issue: Sustainable Water Supply

Strategy 1:

Full knowledge of water balance

- **Task:** determine flows, storage, recharge rates of major aquifers and develop model of water balance



- **Task:** complete, and update as needed, county geologic atlases

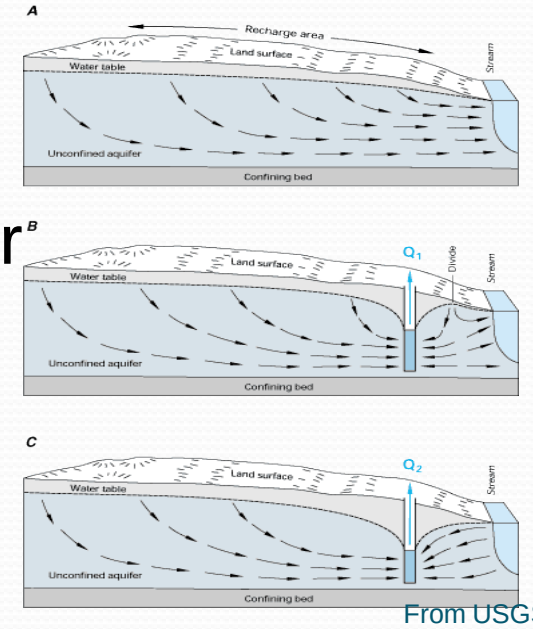
Benchmark: rate of data collection; atlases complete

Issue: Sustainable Water Supply

Strategy 2:

Water appropriation process that accounts for surface – groundwater interactions and ecological needs

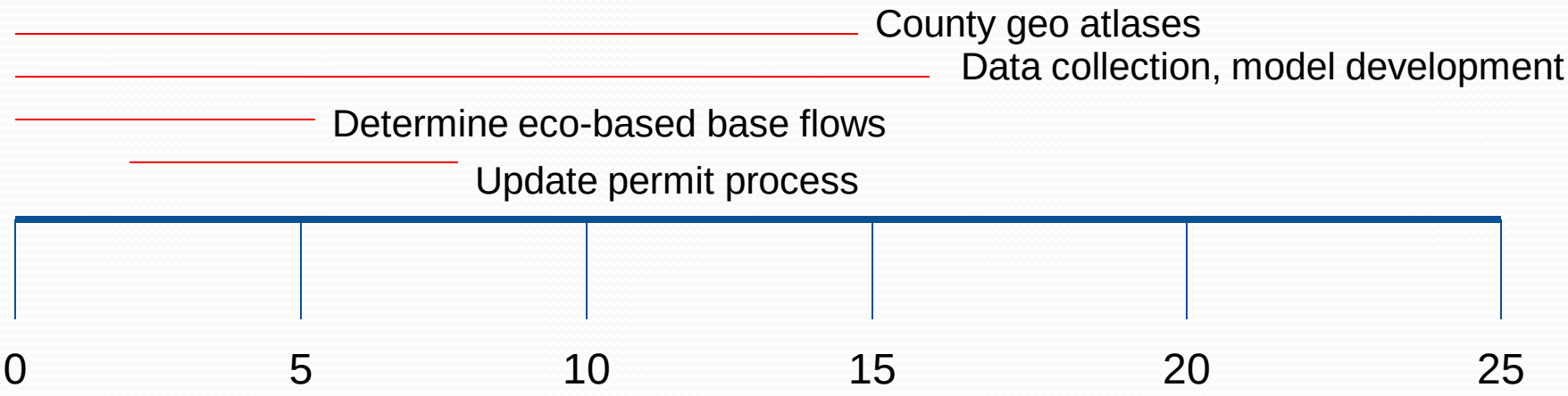
- **Task:** base permits on minimum base flow that is protective of ecological needs for given hydrologic regime



From USGS Ci

Benchmark: development of minimum base flows; monitoring of ecosystem health indicators to assess their effectiveness

Issue: Sustainable Water Supply



Implementation Schedule

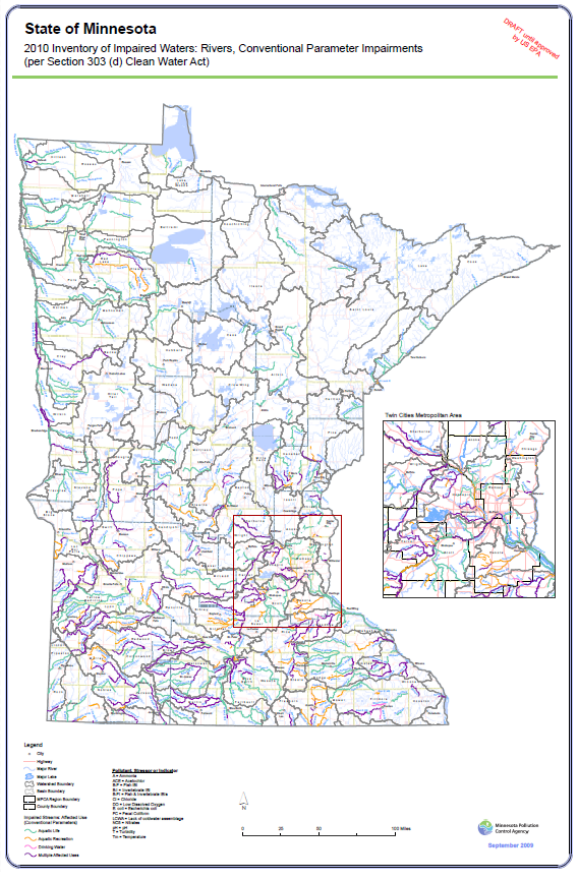
Issue: Cultural Eutrophication & other Conventional Impairments

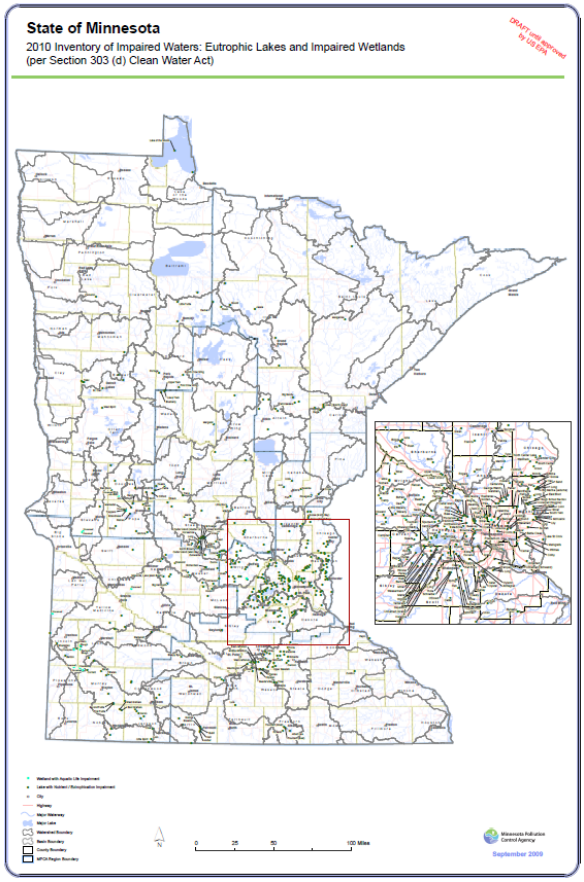
Problem:

- approx 40% of Minnesota's waters do not meet water quality standards

Desired MN Future:

- *"Land of Unimpaired Waters"*





Issue: Cultural Eutrophication & other Conventional Impairments

Strategy 1:

- Develop statewide nutrient enrichment management plan, implemented at watershed level, that is adaptive, and addresses all aspects of excess nutrients from all sources (include TSS and pesticides)

Issue: Cultural Eutrophication & other Conventional Impairments

Tasks:

- Strengthen TMDL assessment and implementation by accelerating the schedule and make implementation plans mandatory for all sources/sectors
- Encourage green infrastructure for stormwater using incentives, tax credits, grants
- Strengthen shoreland rules to specifically protect water quality and address sustainability
- Improve regulation and management of SSTS
- Inventory and improve testing of private wells

Issue: Cultural Eutrophication & other Conventional Impairments

Benchmarks:

- Declining trends in nutrients, TSS, pesticides
- Improved compliance rates of TMDL implementation plans
- Improved compliance rates of SSTS performance

Issue: Cultural Eutrophication & other Conventional Impairments

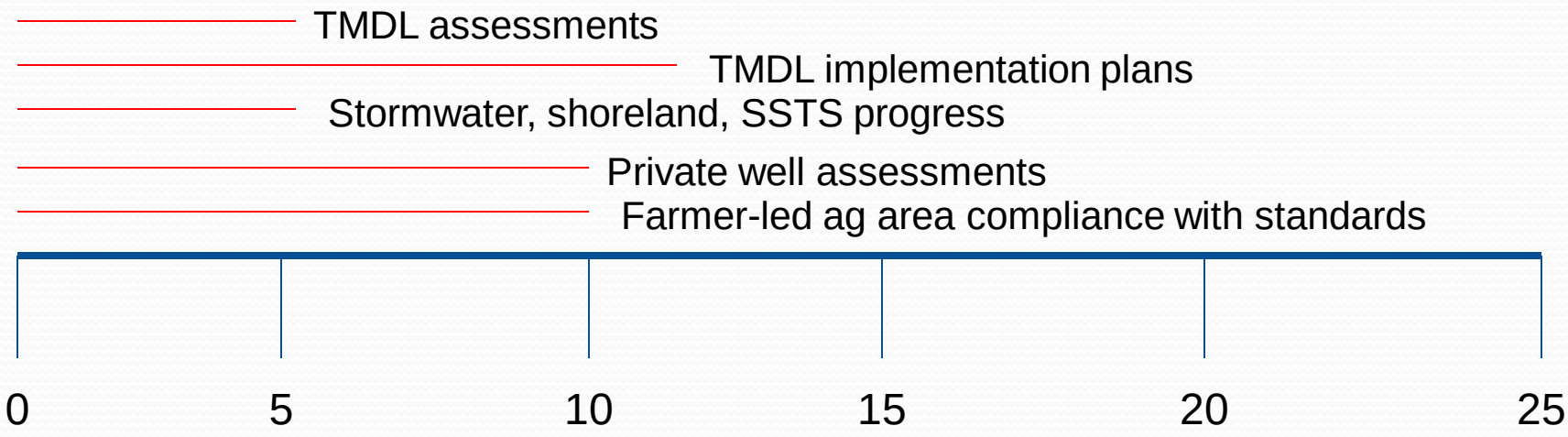
Strategy 2:

- Accelerate improvements in water quality and provide equity in solutions to cultural eutrophication
  - **Task:** establish farmer-led, performance-based approach to meeting water quality standards in agricultural areas

Benchmarks:

- adoption rates of BMPs
- Reduction in loadings and increase in compliance of loading allocations

Issue: Cultural Eutrophication & other Conventional Impairments



Implementation Schedule

Issue: Contaminants of Emerging Concern

- How do we get upstream of hundreds of potentially harmful, trace level contaminants entering from different sources?
  - Promote green chemistry and manufacturing
- How do we manage the CECs already in water?
  - Multi-pollutant approach

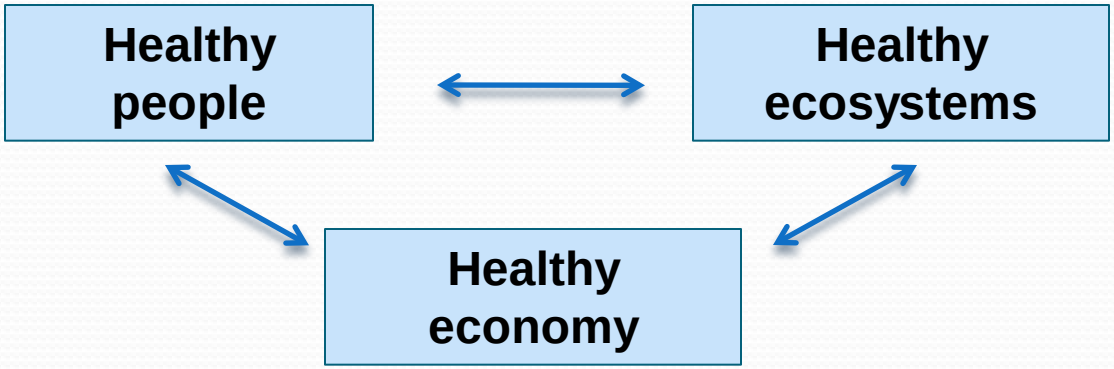
Issue: Land-water connection

- Integrated water and land sustainability planning
- Increased compliance capacity
- Determine effectiveness of land use BMPs

Issue: Water-energy “nexus”

- Quantify all water - energy relationships evaluate energy policy for water sustainability

Issue: Ecological and Hydrologic Integrity



- Protect habitat and manage & prevent AIS, develop climate adaptation strategies
- Account for costs of degraded ecological benefits in environmental reviews
- keep more water on the land – conservation drainage

Economic Issues:

- **Water pricing**

  Determine economic value of diminished ecological benefits and incorporate into new pricing structures; use funds to further protect source of water supply

- **Public Water Infrastructure**

  Develop long-term strategy for funding new, expanded, and updated infrastructure and its maintenance to go beyond the revolving funds available

Social Issues:

- **Citizen Engagement and Education**

  Stable and long term funding for aggressive programs in “water literacy” and conservation for citizens, children, and adults

- **Governance**

  Review of water laws and statutes and revise as needed to incorporate sustainability as a guiding principle; align land, energy, and transportation policies with water sustainability

Minnesota Water Sustainability Framework