

2012 Update of the Oklahoma Comprehensive Water Plan

OWRB Meeting: June 14, 2011



Agenda B.

**OVERVIEW OF TECHNICAL & PUBLIC
POLICY COMPONENTS OF UPDATE**

Goals of the 2012 OCWP Update

1. Characterize demands by water use sector.
2. Identify reliable supplies to meet forecasted demands.
3. Perform technical studies in support of the evaluation of emerging water management issues.
4. Engage comprehensive stakeholder involvement to make recommendations regarding the management of Oklahoma's water resources.
5. Ensure water resources management programs that create reliability.
6. Make “implementable” recommendations regarding the future of water management in Oklahoma based upon technical evaluations and stakeholder input.

82 Basins in 13 Regions for Detailed OCWP Analyses



Oklahoma Comprehensive Water Plan

Technical Components

- Executive Report
 - Statewide Water Assessment
 - Demand Forecasts
 - Physical Water Availability
 - Demand Projections by Sector
 - Climate Change Projections and Implications
 - Water Quality Trends Analysis
 - Regional and Statewide Opportunities and Solutions
 - Hot-Spot Evaluation
 - Aquifer Recharge
 - Marginal Quality Water
 - Drinking Water and Wastewater Infrastructure Needs
 - Conservation
- 13 Watershed Planning Region Reports

Oklahoma Comprehensive Water Plan

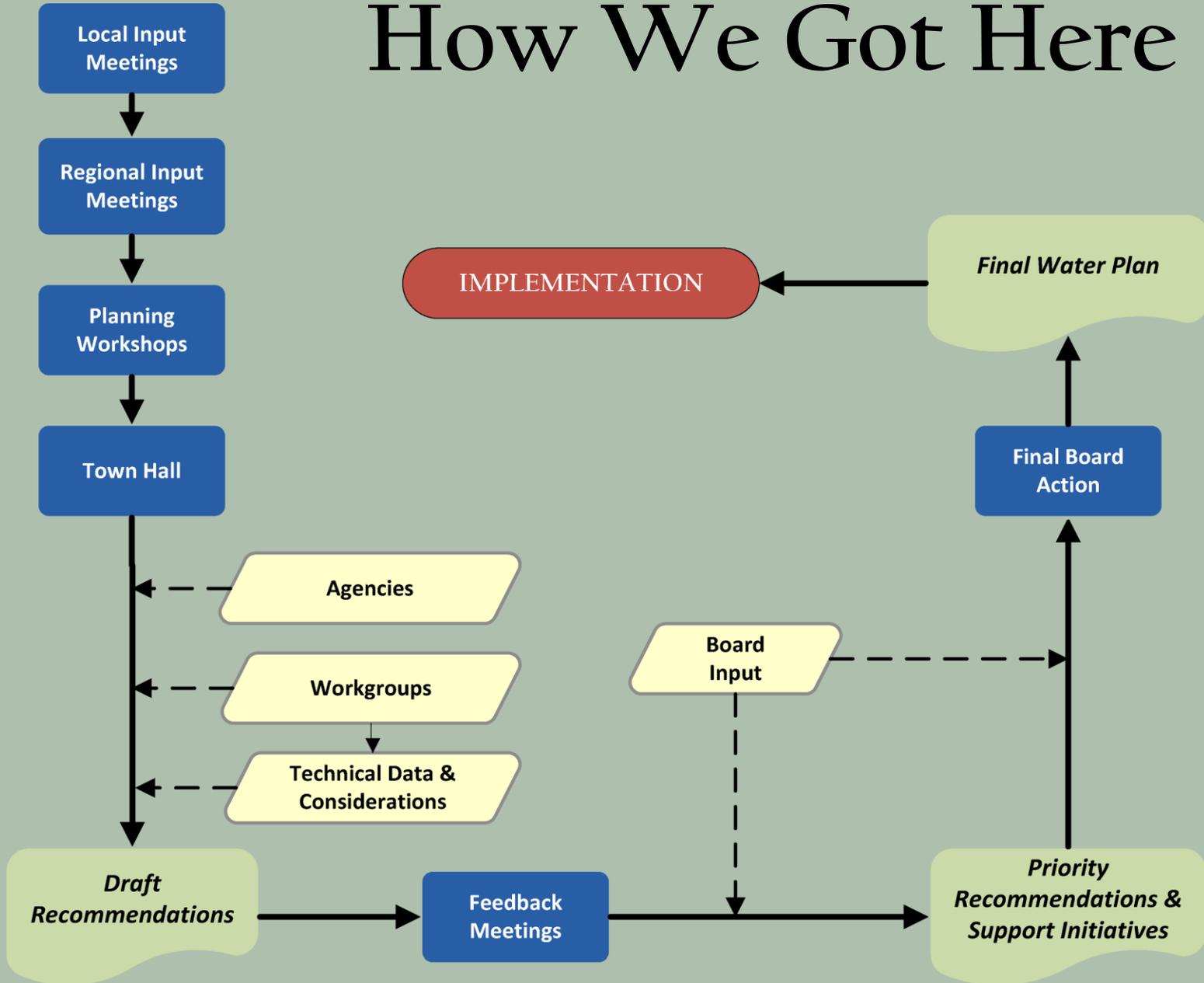
Water Policy Development (Public Input)

- **Through the collaborative Water Plan process, the OWRB is discovering exactly how Oklahoma citizens wish to manage their water resources.**
 - Local Input Meetings (2007; 42 meetings):
 - 2,250 attendees; 2,539 comments received
 - Regional Input Meetings (2008; 11 meetings):
 - 340 discussants; > 1400 recorded comments
 - Planning Workshops (2009; 3 sessions):
 - 10 workgroups draft policy recommendations
 - Town Hall (2010; 3 days):
 - Refined recommendations
 - Feedback & Implementation Meetings:
 - Final round of statewide regional meetings

Agenda C.

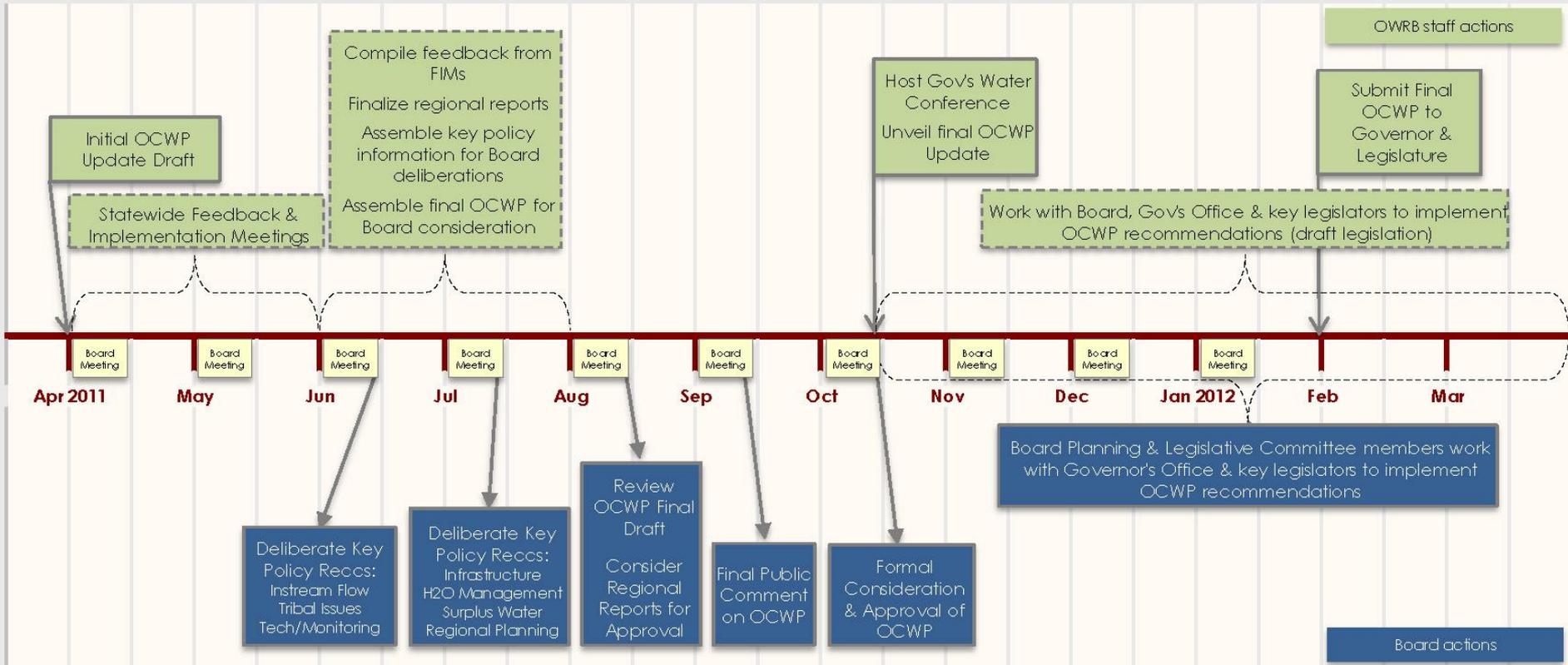
**UPCOMING SCHEDULE TO FINALIZE
PLAN UPDATE AND POSSIBLE ACTION
TO ACCEPT OR REVISE SCHEDULE**

How We Got Here



OCWP Timeline

OCWP Timeline (2011-12)



Oklahoma Comprehensive Water Plan

2011 OWRB Schedule

June 2011:

- Finalize Schedule
- Discussion on Priorities for Implementation

July 2011:

- Further Discussion on Priorities for Implementation

August 2011:

- Finalize Implementation Priorities
- Presentation of Draft Final Executive Report
- Presentation and Consideration of Regional Reports

September 2011:

- Final Water Board review and public comment on draft OCWP
- Discussion and Possible Action by Board to Request Any Changes

October 2011:

- Formal Water Board consideration and adoption of OCWP
- OCWP unveiled at Water Conference

Agenda D.

**REVIEW AND DISCUSSION OF WATER POLICY
RECOMMENDATIONS & IMPLEMENTATION
AND POSSIBLE ACTION TO ACCEPT, REVISE
OR ADD RECOMMENDATIONS**

Oklahoma Comprehensive Water Plan

Draft Priority Recommendations for Implementation

How did we arrive at the list?

- Priorities for Implementation
- Imminent Need
- Limited Funding Available
- Focused Tactical Plan
- Input from Board Members/Planning Committee
- Input from Public
- Input from OWRB Staff and Other Agencies
- Input from Policy Makers
- Technical Considerations

Draft Priority Water Policy Recommendations for Implementation

Monitoring & Studies

Instream/Environmental Flows

State/Tribal Water Consultation & Resolution

Water Project & Infrastructure Financing

Water Management & Supply Reliability:
Conjunctive Management & Seasonal Allocation

Excess & Surplus Water

Local & Statewide Water Planning:
Regional Planning Groups

Draft OCWP Priority Water Policy Recommendations & Implementation Monitoring & Studies

SUGGESTED CONSOLIDATED RECOMMENDATION:

The State Legislature should provide a dedicated source of funding to enable the OWRB to accurately assess the quality and quantity of the state's water resources thereby ensuring improved water quality protection, accurate appropriation and allocation, and long-term collection of data to inform water management decisions. Such funding should be directed towards conducting and updating hydrologic studies of Oklahoma's surface and groundwater resources and development and maintenance of permanent statewide water quality and quantity monitoring programs.

Draft OCWP Priority Water Policy Recommendations & Implementation Instream/Environmental Flows

SUGGESTED CONSOLIDATED RECOMMENDATION:

The establishment of an instream flow program should be investigated and evaluated to preserve water quality, protect ecological diversity and sustain and promote economic development, including benefits associated with recreation, hunting and fishing. The process developed by the OCWP Instream Flow Workgroup should be implemented and followed to ascertain the suitability of such a program for Oklahoma. The OWRB should seek express authority from the State Legislature prior to promulgating rules to accommodate and protect instream flows.

Draft OCWP Priority Water Policy Recommendations & Implementation State/Tribal Water Consultation & Resolution

SUGGESTED CONSOLIDATED RECOMMENDATION:

To address uncertainties relating to the possible validity of water rights claims by the Tribal Nations of Oklahoma and to effectively apply the prior appropriation doctrine in the fair apportionment of state waters, the Oklahoma Governor and State Legislature should establish a formal consultation process as outlined in the OCWP Report on Tribal Issues and Concerns.

Draft OCWP Priority Water Policy Recommendations & Implementation Water Project & Infrastructure Financing

SUGGESTED CONSOLIDATED RECOMMENDATION:

To address Oklahoma's considerable drinking water and wastewater infrastructure need and the inability of current programs to meet that need, a team of financial and water/wastewater infrastructure professionals, led by the OWRB, should investigate the development of a separate state funding program to meet the state's projected \$87 billion drinking water infrastructure need – as well as the substantial wastewater infrastructure requirement – by 2060. Any potential program should include a specific mechanism to address the significant financing requirement of small communities in the state, as well as the encouragement of regionalization of water/wastewater systems, where appropriate.

Draft OCWP Priority Water Policy Recommendations & Implementation Water Management & Supply Reliability

SUGGESTED CONSOLIDATED RECOMMENDATION:

To address projected statewide and regional increases in consumptive demands for water and effectively administer a water management program that ensures reliable supply for all users, the OWRB should implement the following recommendations, considering regional variations when appropriate:

The OWRB should conduct a prioritized comprehensive hydrologic evaluation of groundwater basins across the state to characterize valid groundwater/surface water interactions as well as the suitability of a potential conjunctive management program in Oklahoma.

The OWRB should organize a statewide workgroup of water users, researchers and other experienced professionals to investigate the utility, impacts and appropriateness of transitioning from an average annual to a seasonal stream water allocation program.

Draft OCWP Priority Water Policy Recommendations & Implementation Excess & Surplus Water I

The OWRB shall adopt the following definition and procedure for determining excess and surplus water:

Definition: "For implementation of the 2012 Update to the Oklahoma Comprehensive Water Plan, 'excess and surplus water' shall mean the volume [or a percentage of the volume] of stream water measured in acre-feet per year within each of the 13 OCWP watershed planning regions (i.e., areas-of-origin) in the state that is estimated to be available for water permits (for use of water inside or outside the watershed of origin) at the watershed outlet at the conclusion of the year 2060, provided that nothing herein shall affect ownership rights to groundwater."

**SUGGESTED CONSOLIDATED
RECOMMENDATION:**

Draft OCWP Priority Water Policy Recommendations & Implementation Excess & Surplus Water II

SUGGESTED CONSOLIDATED RECOMMENDATION:

Procedure: To determine “excess and surplus water,” the total projected demand for water within each of the watershed areas-of-origin as estimated in the 2012 OCWP Water Demand Forecast Report shall be subtracted from the cumulative total of the estimated amount of stream water that physically originates within each watershed planning region (i.e., area-of-origin); provided that any estimated amount of groundwater underlying each watershed area-of-origin shall be disregarded as being physically available; and provided further, that the flow at the watershed outlet estimated to be available less than 10% of the time, and the quantity of water adjudicated or agreed to be available for federal or Tribal rights, instream or environmental needs shall never be considered excess and surplus water. Cumulative total flow for the watershed area-of-origin shall be based on the period of record for the gage at or near the watershed outlet or estimated from data from the closest gage in the watershed area-of-origin having similar hydrologic conditions.

Draft OCWP Priority Water Policy Recommendations & Implementation Regional Planning Groups

SUGGESTED CONSOLIDATED RECOMMENDATION:

The OWRB should form a workgroup to investigate and make appropriate recommendations to the State Legislature related to the creation of thirteen Regional Advisory Groups to assist in implementing local OCWP initiatives. These groups would be comprised of local stakeholder representatives charged with identifying local water resource issues, prioritizing planning initiatives, collaborating on matters of mutual interest, promoting conservation activities/green projects, implementing educational initiatives, developing action plans and making recommendations, when appropriate, for implementation by the OWRB. The State Legislature should establish regular appropriations to the OWRB to fund the activities of these groups.

Agenda E.

**REVIEW & DISCUSSION OF INITIAL SET
OF DRAFT WATER POLICY
RECOMMENDATIONS**

Draft OCWP Priority Water Policy Recommendations & Implementation Monitoring & Studies

SUGGESTED CONSOLIDATED RECOMMENDATION:

The State Legislature should provide a dedicated source of funding to enable the OWRB to accurately assess the quality and quantity of the state's water resources thereby ensuring improved water quality protection, accurate appropriation and allocation, and long-term collection of data to inform water management decisions. Such funding should be directed towards conducting and updating hydrologic studies of Oklahoma's surface and groundwater resources and development and maintenance of permanent statewide water quality and quantity monitoring programs.

Monitoring & Studies

Sound water

management is predicated on the consistent, long-term collection of “good” data, its availability and interpretation:

- **Water Use/Permitting**
- **Public Health**
- **Pollution Remediation**
- **Flood Forecasting**
- **Drought Preparedness**
- **Planning**

Monitoring & Studies

Existing Programs:

- Numerous federal, state, local and private entities are involved in state water quality and quantity monitoring:
 - Conservation Commission
 - Dept. of Environmental Quality
 - Dept. of Agriculture, Food and Forestry
 - Corporation Commission
 - Corps of Engineers
 - US Geological Survey
 - Others

Monitoring & Studies

Cooperative Stream Gaging Program:

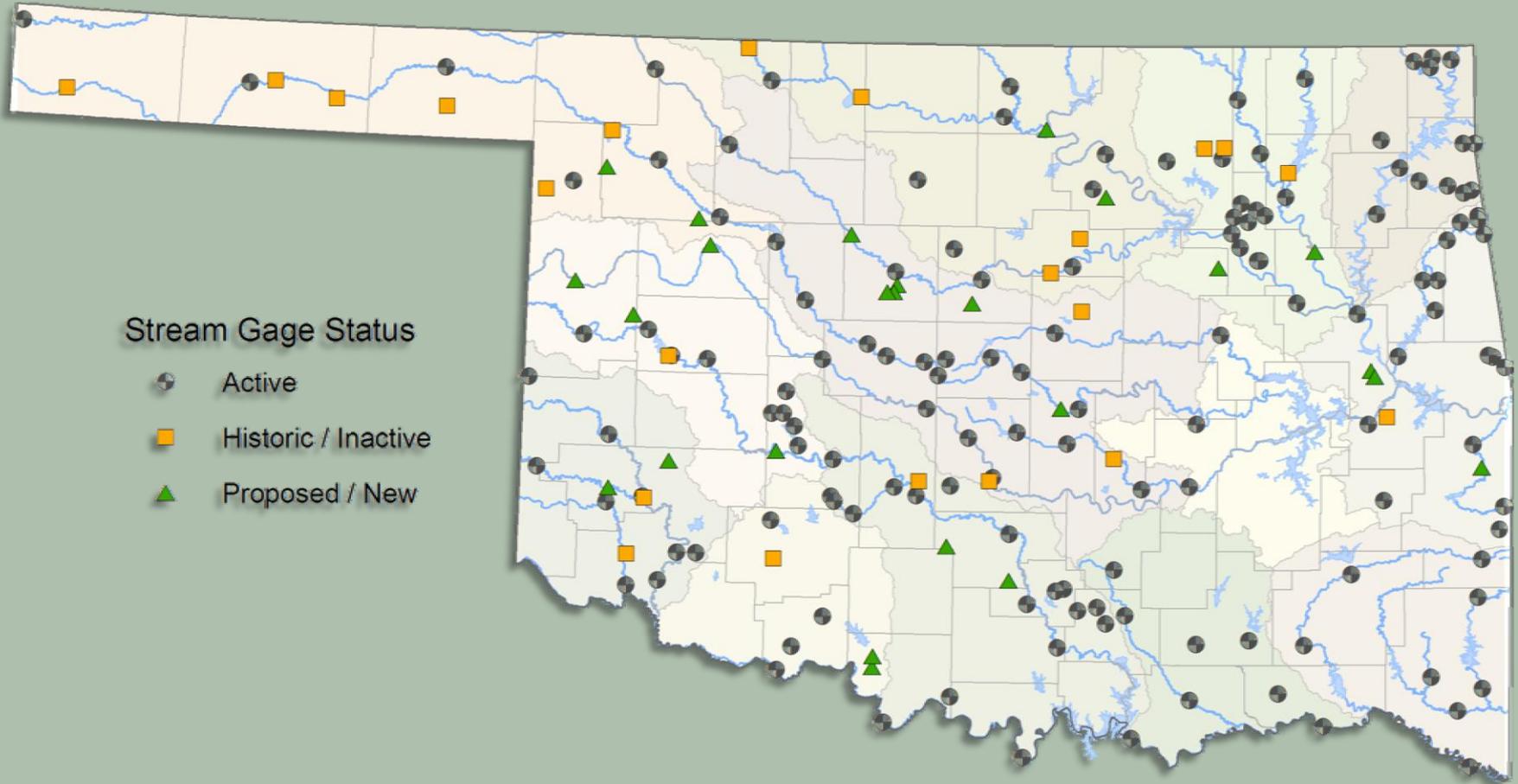
- Established 1939
- Joint effort between the USGS, OWRB and numerous other governmental, private and tribal entities
- Vital for water quality/quantity management, flood forecasting, drought monitoring, etc.
- Critical data component of the OCWP
- OWRB and Federal program funds have decreased considerably; costs continue to increase (5-8% per year)

Monitoring & Studies

Cooperative Stream Gaging Program Needs:

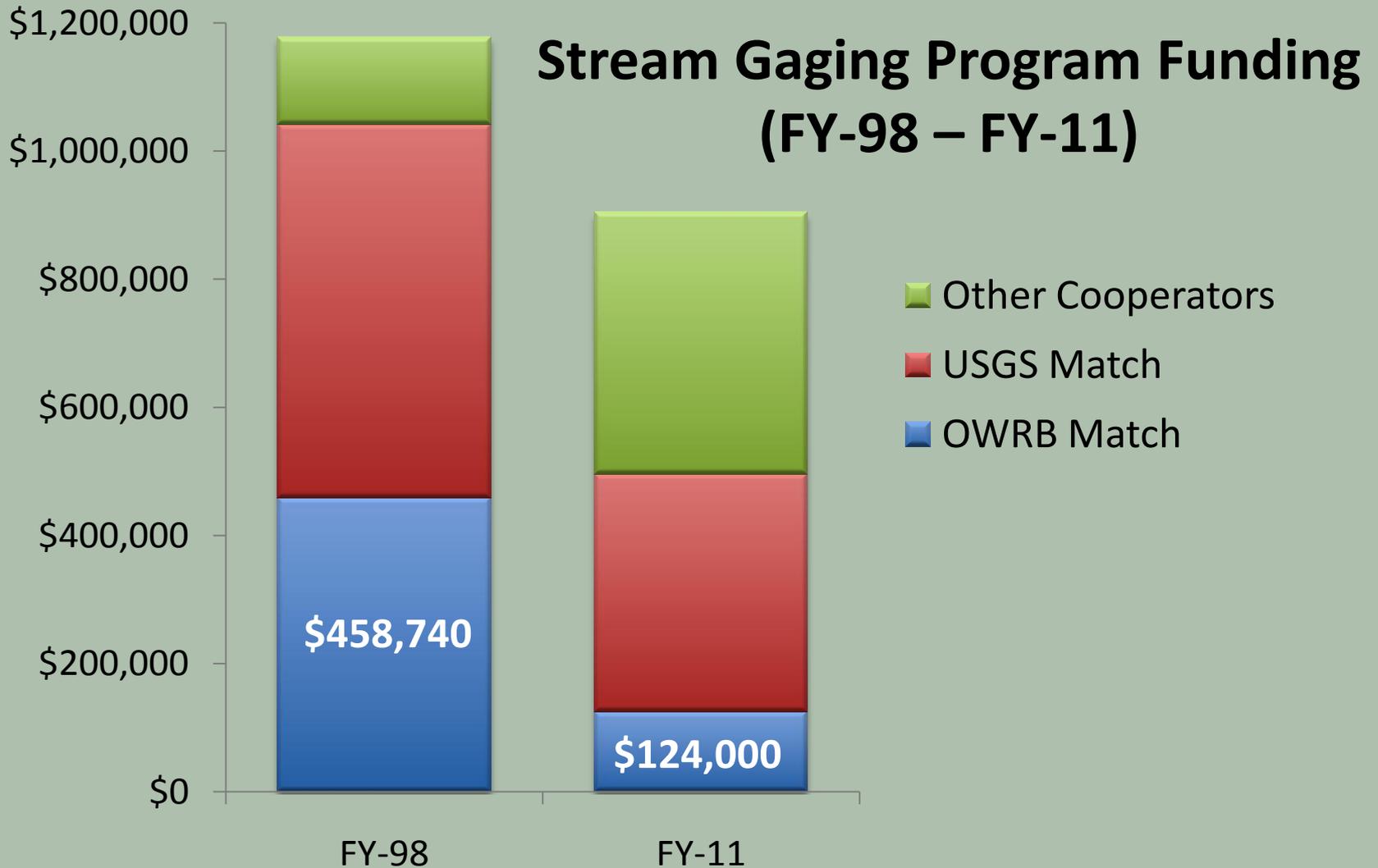
- Dedicated source of state monies to support the program in an acceptable and scientifically defensible manner and its use in implementing OCWP initiatives (accurate data)
- Establish at least one stream gage in each OCWP planning basin to strengthen water allocation and related management decisions (comprehensive, long-term data)
- Total funding of approximately \$565,000 to meet state's immediate needs and address uncertain cooperator funding

Monitoring & Studies



Cooperative Stream Gaging Network
Existing & Proposed Gages

Monitoring & Studies



Monitoring & Studies

Surface Water Quality Monitoring Program (BUMP, Probabilistic Sampling, Other Ongoing Programs):

- Statewide, long-term water quality data is crucial to making water management and planning decisions.
- Since 1998, BUMP costs have increased approximately 35% for laboratory analysis, 31% for travel, and 23% for personnel;
 - funding has decreased 34%.

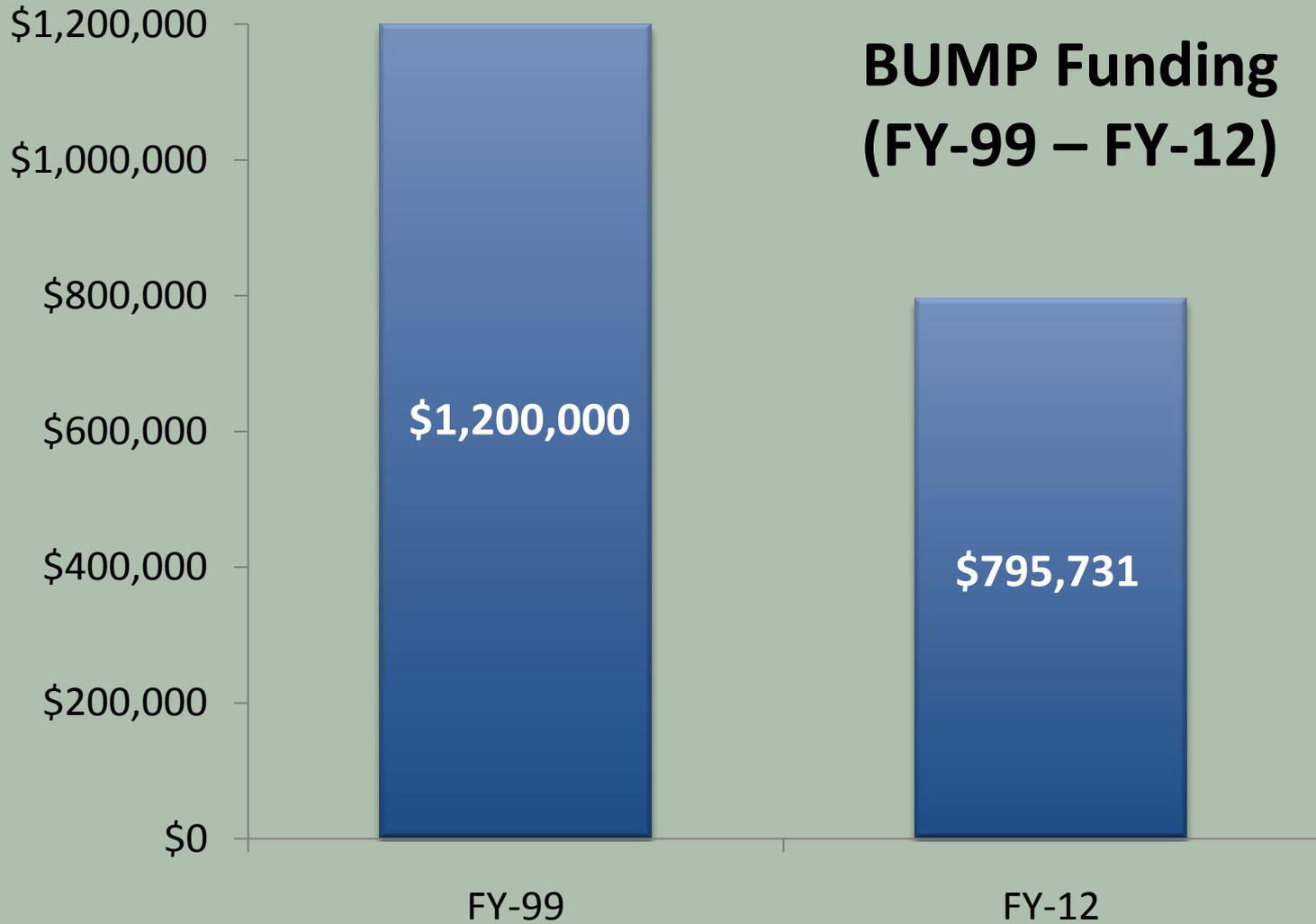
Monitoring & Studies

Surface Water Quality Program Needs:

- A more robust biological collection program:
 - Targeted monitoring
 - Full implementation of probabilistic sampling principles
 - Integrate all state water quality monitoring programs into a holistic, coordinated effort (“Oklahoma Water Quality Monitoring Strategy Document, 2010”)

**BUMP alone requires approximately \$1,775,000 per year (including up-front capital costs).*

Monitoring & Studies



Monitoring & Studies

Groundwater Monitoring and Assessment

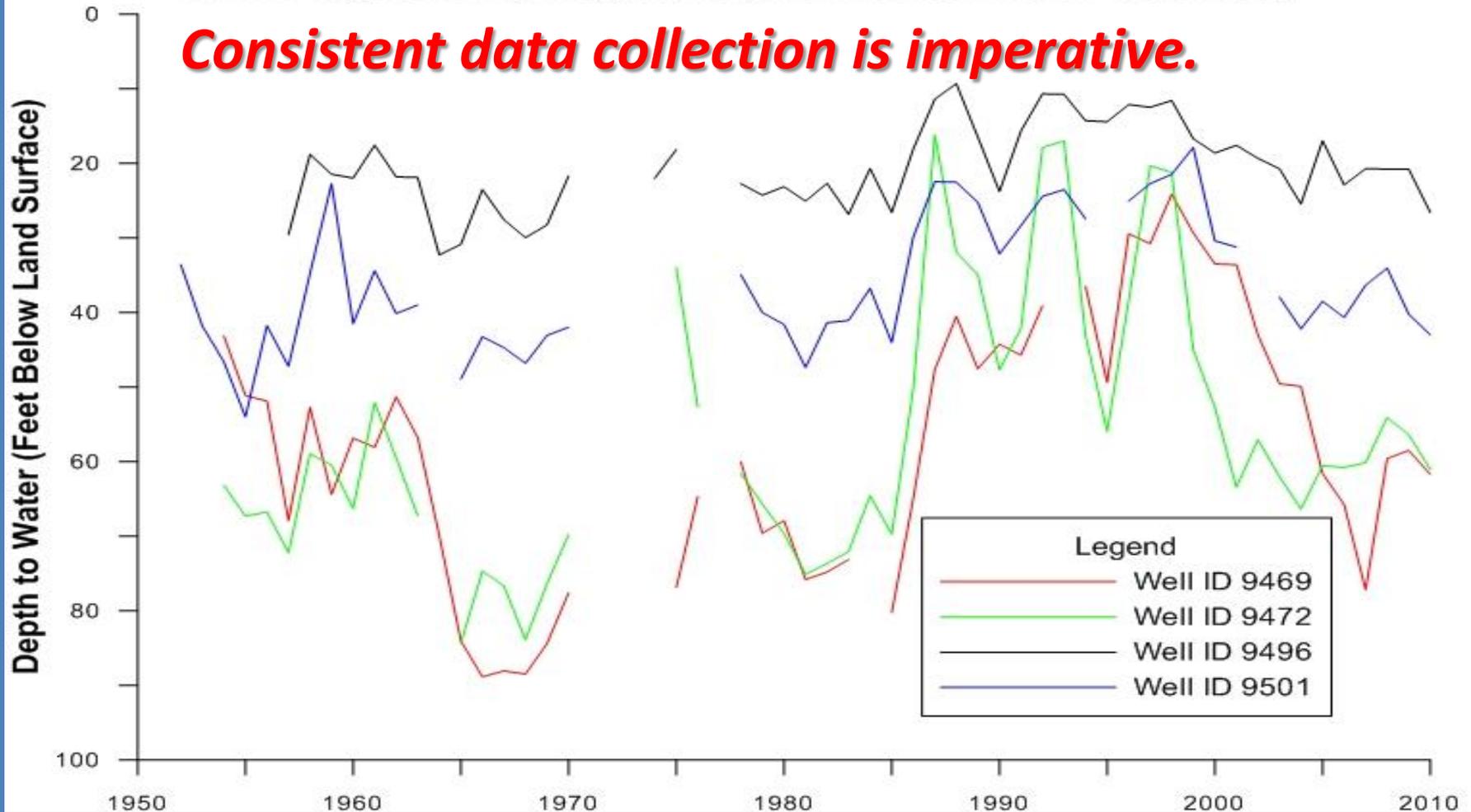
(Quantity/Quality):

- OWRB annual groundwater level (Mass Measurement) program in existence since the 1950s; no dedicated funding
- Oklahoma currently has no ambient groundwater quality monitoring program:
 - Historical OWRB program (initiated 1986) discontinued in 1992

Monitoring & Studies

Blaine Gypsum Hydrographs (Harmon/Jackson Counties)

Consistent data collection is imperative.



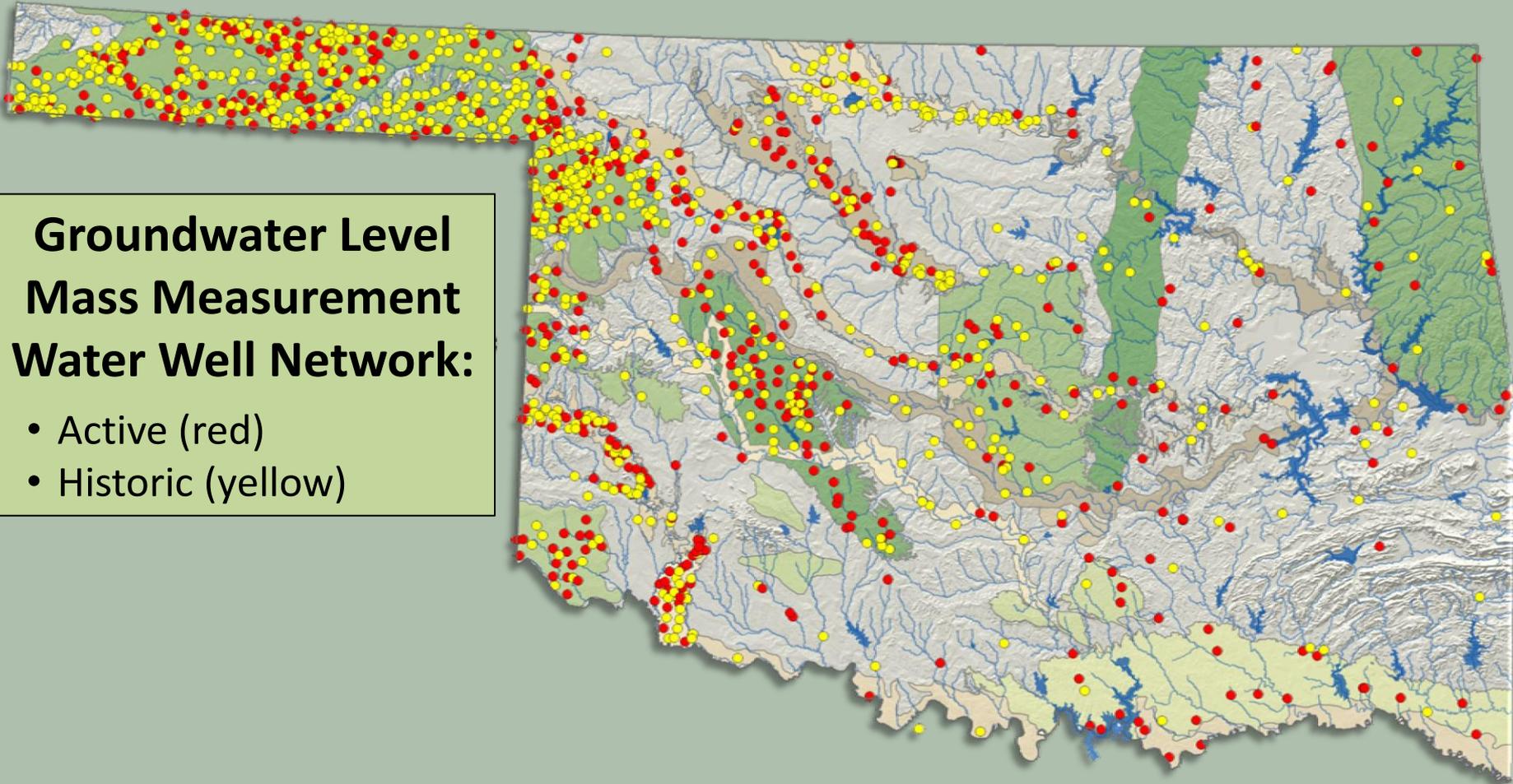
Monitoring & Studies

Groundwater Monitoring and Assessment

(Current):

- ODEQ conducts limited groundwater quality monitoring
- Sampling of monitoring wells at swine licensed managed feeding operations (OWRB/ODAFF)
- Mapping and data mining of trace metals in Garber-Wellington aquifer
- Required aquifer technical studies conducted only as funding allows (e.g., Arbuckle-Simpson and Garber-Wellington)

Monitoring & Studies



Groundwater Level Mass Measurement Water Well Network:

- Active (red)
- Historic (yellow)

Monitoring & Studies

Groundwater Monitoring Program Needs:

- Unification of existing and new programs into one holistic groundwater quantity/quality monitoring program for Oklahoma (similar to the BUMP):
 - Groundwater sampling program requires \$815,000 per year (not including start-up costs)

Monitoring & Studies

Hydrologic Studies:

- Groundwater Basin Studies
- Stream Water Allocation Modeling

OCWP Recommendation:

- “...*appropriate significant funds... to conduct and regularly update hydrologic studies...*”

Monitoring & Studies

Hydrologic Studies/OCWP Recommendations:

- **Public:**
 - Funding priority on outdated and unstudied aquifer studies; SW/GW interactions
 - Fairness in water rights administration; interstate water issues (Ogallala)
- **Agriculture Water Needs Workgroup (ODAFF):**
 - Robust modeling to predict supply/demand impacts; “exurban development” impacts on alluvial GW use; reservoir and in-stream flow optimization to minimize use conflicts
- **OWRB Staff:**
 - Scientifically defensible water rights administration; improved protection; prediction of seasonal shortages/water availability; and informed management decisions

Monitoring & Studies

Hydrologic Studies:

- Answer the fundamental question...*How much water is available?*
- Fundamental to State Water Management and Planning
- Offer robust characterization, opportunity for availability forecasting and “what-if” assessment for policy decisions
- Minimal/inconsistent funding available for studies or contributing water rights admin. (e.g. use reporting)

Monitoring & Studies

Hydrologic Studies – Groundwater:

- *OWRB statutorily mandated to...*
 - Allocate water based on hydrologic yield studies to determine Maximum Annual Yield (equal proportionate share)
 - Update hydrologic studies “at least every 20 years”
 - Utilize specific criteria for determination – land area, water in storage, recharge/discharge, transmissivity, possibility of contamination by natural pollutants, use projection, etc.
 - Facilitate water use reporting, which informs studies

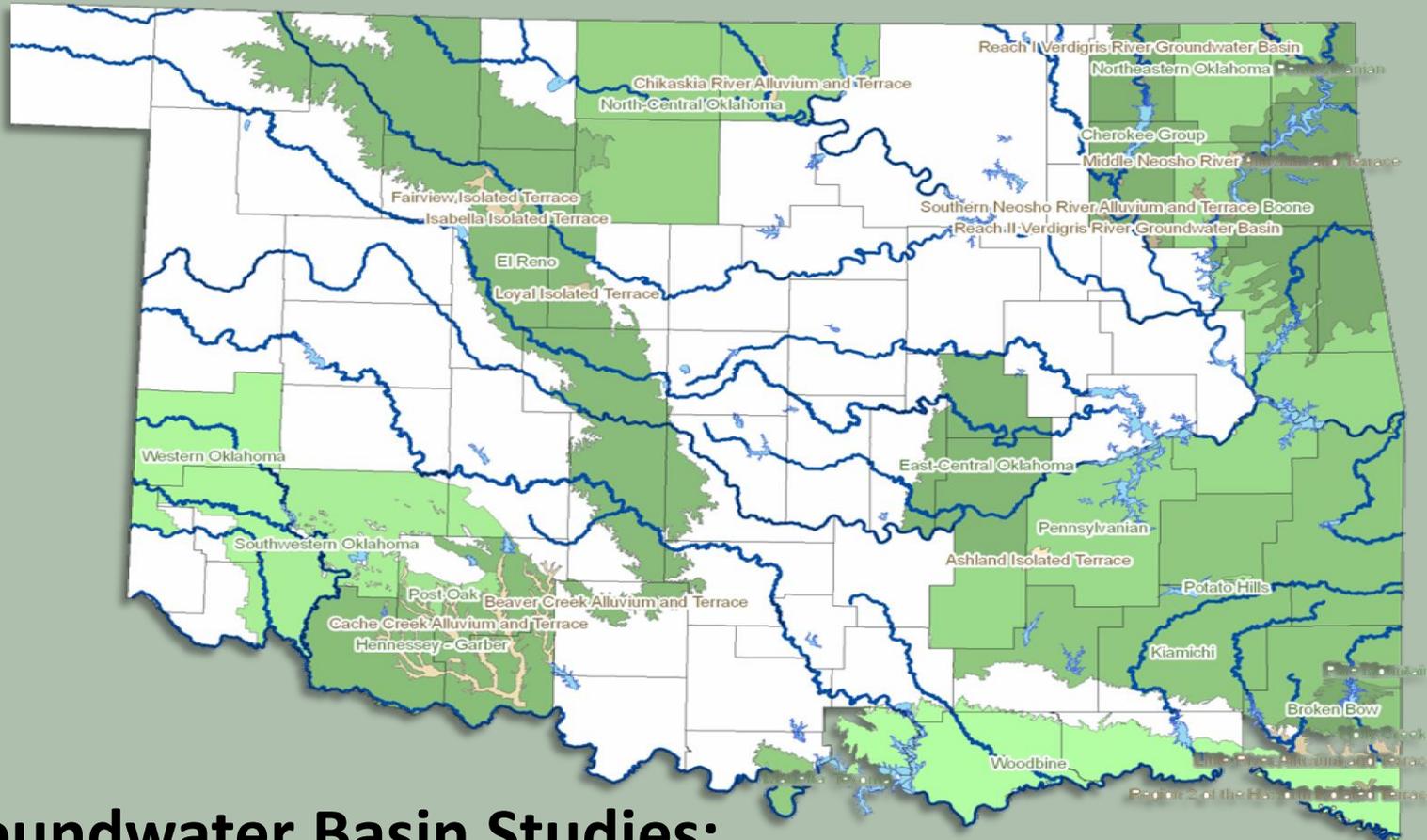
Monitoring & Studies



Major Groundwater Basin Studies:

- 10 major basins unstudied
- 9 updates overdue

Monitoring & Studies



Minor Groundwater Basin Studies:

- 17 minor basins unstudied
- 0 updates overdue (next due 2020)

Monitoring & Studies

Hydrologic Studies (Stream Water Allocation):

- OWRB Statutory Mandate – determine if unappropriated water is available prior to permit issuance
- Modern analysis – simulates SW management using a priority-based water allocation system:
 - Requires data on streamflow, permitted water, water use, reservoir demands, compact/environmental flow requirements
- Existing Water Rights and New Applications:
 - Anticipated water shortages at current permitted diversions
 - Accurate evaluation of potential supply interference
 - Resource availability/reliability to potential applicants

Monitoring & Studies

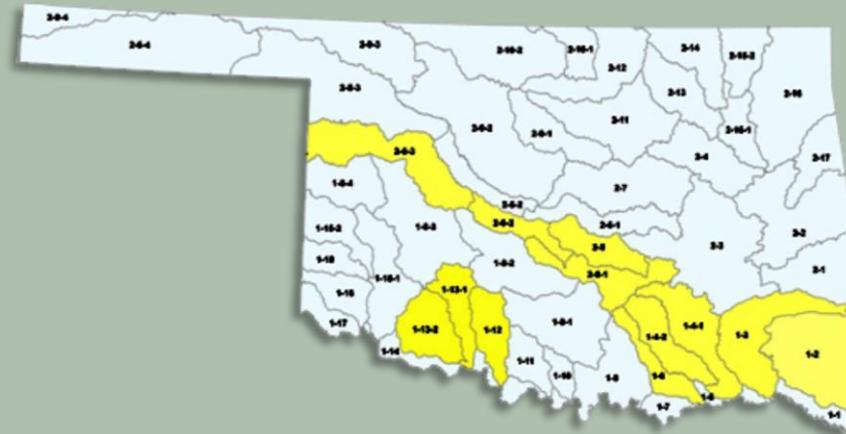
Stream Water Allocation Studies:

- Manage resource during drought events:
 - Pre-drought warning for permittees
 - Cut off triggers for junior permittees
- Analyze location-specific “what-if” scenarios:
 - Characterize surface water availability at any location
 - Domestic use impacts
- Assess potential implications of various water policy scenarios:
 - Legal flows, environmental, compact, industry-specific
 - SW/GW interactions
- Make permit-specific and “adaptive” management decisions:
 - e.g., new permit oversight for mining industry

Monitoring & Studies

Stream Water Allocation Models:

- 9 stream systems completed; 42 unstudied
- Future Priorities:
 - Full or mostly allocated systems (e.g., Washita, North Canadian, North Fork/Red)
 - OCWP hot spots, demand growth areas, etc.
 - Public, policymaker, sector need



Modeled Basins



OCWP Hot Spot Basins

Monitoring & Studies

Implementation (Hydrologic Studies):

- Seek funding and complete unstudied GW Basins (including permit modernization) and overdue 20-year updates by 2022:
 - \$1.6 million/year
- Seek funding and complete SW hydrologic investigations/allocation models by 2017:
 - \$196,000/year
- Work with stakeholders, academia, local, state, federal agencies to prioritize studies

Monitoring & Studies

Monitoring/Studies Implementation Costs:

- Surface Water:
 - Quantity Monitoring = \$ 564,575
 - Quality Monitoring = \$1,775,320
 - Hydrologic Studies = \$ 196,000
 - Groundwater:
 - Quantity Monitoring = \$ 65,000
 - Quality Monitoring = \$ 750,000
 - Hydrologic Studies = \$1,644,000
- = \$4,994,895**

Draft OCWP Priority Water Policy Recommendations & Implementation Monitoring & Studies

SUGGESTED CONSOLIDATED RECOMMENDATION:

The State Legislature should provide a dedicated source of funding to enable the OWRB to accurately assess the quality and quantity of the state's water resources thereby ensuring improved water quality protection, accurate appropriation and allocation, and long-term collection of data to inform water management decisions. Such funding should be directed towards conducting and updating hydrologic studies of Oklahoma's surface and groundwater resources and development and maintenance of permanent statewide water quality and quantity monitoring programs.

Draft OCWP Priority Water Policy Recommendations & Implementation Instream/Environmental Flows

SUGGESTED CONSOLIDATED RECOMMENDATION:

The establishment of an instream flow program should be investigated and evaluated to preserve water quality, protect ecological diversity and sustain and promote economic development, including benefits associated with recreation, hunting and fishing. The process developed by the OCWP Instream Flow Workgroup should be implemented and followed to ascertain the suitability of such a program for Oklahoma. The OWRB should seek express authority from the State Legislature prior to promulgating rules to accommodate and protect instream flows.

Instream/Environmental Flows

Why Address

Instream Flows?

- Significant interest in value of non-consumptive water uses of water, especially related to recreation/tourism (including lake level management)
- Associated factors related to ecological integrity, endangered species, interstate compact compliance, etc.
- Consistent with holistic water planning principles and in calculating excess/surplus water

Instream/Environmental Flows

“Instream Flow” Definitions:

- The amount of water set aside in a stream or river to ensure downstream environmental, social and economic benefits are met [OCWP/Workgroup]
- Flow conditions necessary for supporting a sound ecological environment in the river basin [Texas Senate Bill 2]
- Many others...

Instream/Environmental Flows

Existing Policy:

- Current OWRB rule seeks to protect domestic uses through a set-aside of 6 acre-feet of water/year per 160 acres of land
- OWRB has established a 50 cfs minimum flow requirement in a portion of Barren Fork (established through OSU study)

Instream/Environmental Flows

Key Considerations of State Instream Flow Methodology:

- Legal/policy factors (statutory authority)
- Costs/Benefits
- Ease of implementation
- Role of stakeholders
- Impact to existing/future water rights holders
- Coordination with state water planning process
- Adaptive management
- Selection of desired method:
 - hundreds available (minimum flow - natural flow regime that reflects seasonality - habitat considerations - models)

Instream/Environmental Flows

OCWP Instream Flow Advisory Group:

- Coordinated by Barney Austin (INTERA)
- 5 meetings between February-December 2010
- Members from a variety of interests
- Technical analysis of various instream flow methods
- Analysis of regulation and potential implementation
- Review of successful and unsuccessful programs in other states/countries

Instream/Environmental Flows

Workgroup Final Report/Recommendations::

Recommendation 1 – Address the legal and policy questions

1. Factors that can legally be considered in developing a flow recommendation
2. Effect on current and future water right holders
3. Process for implementing flow recommendations
4. Statutory changes [OWRB would seek express authority from State Legislature]
5. Is an instream flow program necessary in Oklahoma?

Recommendation 2 – Study other mechanisms for protecting instream flows

Recommendation 3 – Develop a draft methodology for instream flow studies in Oklahoma

Recommendation 4 – Conduct a study on the economics of instream flows in Oklahoma, including an analysis of the following:

1. Cost of studies
2. Cost of managing an instream flow program
3. Economic impact of implementation

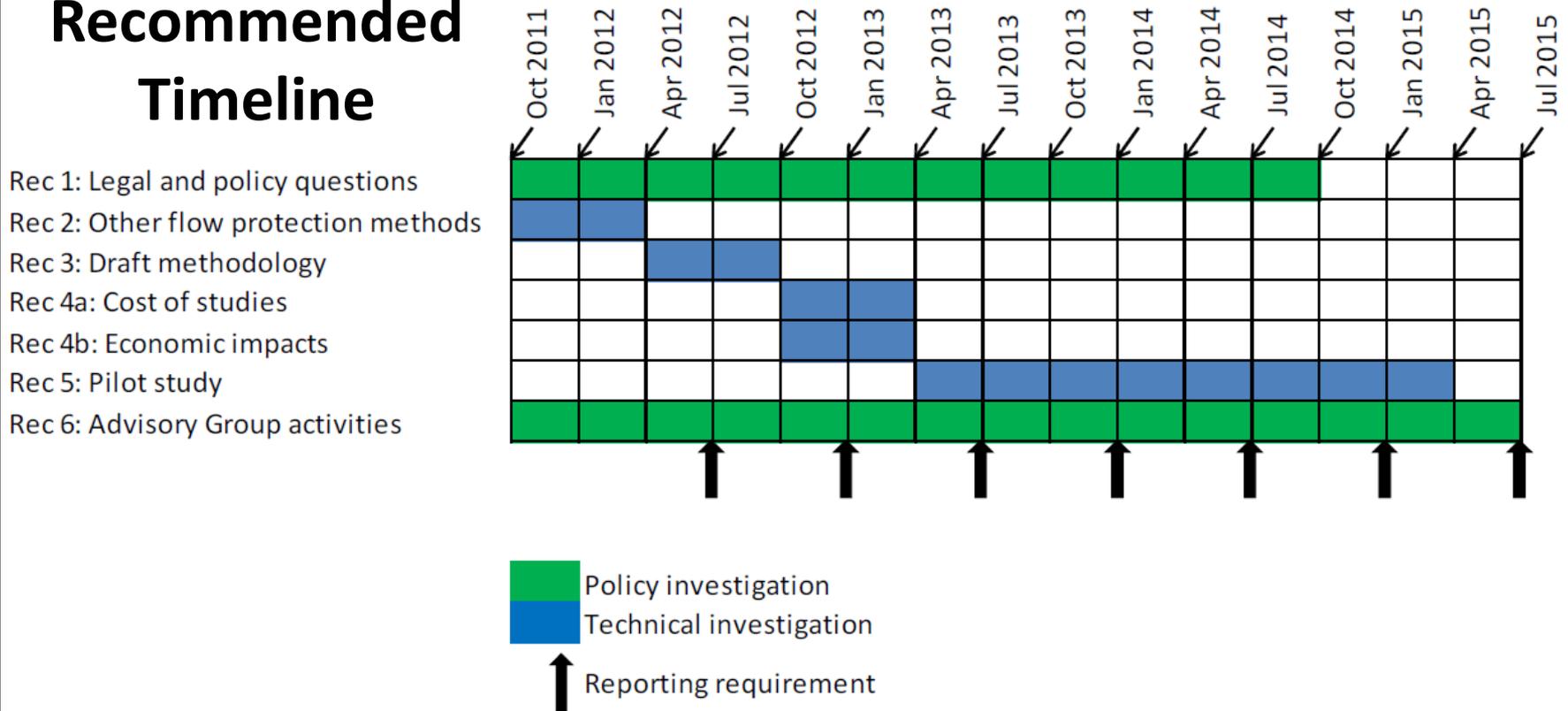
Recommendation 5 – An instream flow pilot study in a scenic river

Recommendation 6 – Preserve the instream flow Advisory Group

Instream/Environmental Flows

Implementation Costs = \$ 1.5 million over 4 years

Recommended Timeline



Draft OCWP Priority Water Policy Recommendations & Implementation Instream/Environmental Flows

SUGGESTED CONSOLIDATED RECOMMENDATION:

The establishment of an instream flow program should be investigated and evaluated to preserve water quality, protect ecological diversity and sustain and promote economic development, including benefits associated with recreation, hunting and fishing. The process developed by the OCWP Instream Flow Workgroup should be implemented and followed to ascertain the suitability of such a program for Oklahoma. The OWRB should seek express authority from the State Legislature prior to promulgating rules to accommodate and protect instream flows.

Draft OCWP Priority Water Policy Recommendations & Implementation State/Tribal Water Consultation & Resolution

SUGGESTED CONSOLIDATED RECOMMENDATION:

To address uncertainties relating to the possible validity of water rights claims by the Tribal Nations of Oklahoma and to effectively apply the prior appropriation doctrine in the fair apportionment of state waters, the Oklahoma Governor and State Legislature should establish a formal consultation process as outlined in the OCWP Report on Tribal Issues and Concerns.

State/Tribal Water Consultation & Resolution

Why negotiate resolutions?

- Longstanding uncertainty of tribal claims
- Weakens planning efforts
- Need to effectively apply appropriation doctrine
- Need to fairly apportion water
- Avoid costly, protracted litigation
- Amicable resolution, opportunity to recognize State and Tribal sovereignty

State/Tribal Water Consultation & Resolution

1980 OCWP:

- Recognized Winters, but stated no reservations in Okla. and Indian population demand considered

1995 Update:

- Claims, resultant uncertainty:
 - Study forming of permanent committee with inclusive membership to address issues
 - Develop mutually acceptable negotiation system
 - Identify projects warranting cooperative action

State/Tribal Water Consultation & Resolution

Public recommends resolution:

- Professor Robertson:
 - Oct. 2008 independent contract
 - 20 meetings with tribal representatives
 - Issues and concerns discussed
- Tribes recommend negotiation
- Town Hall recommends negotiation
- February 2011 Report recommendations

State/Tribal Water Consultation & Resolution

OCWP Report on Tribal Issues/Concerns:

- Oklahoma Governor and State Legislature should establish a formal consultation process in accord with [this report]:
 - Decide authority to approve process of negotiations
 - Decide authority to conduct negotiations
 - Decide authority to approve negotiated agreement
 - Assemble team to meet with tribal reps on process
 - Appoint team to conduct negotiations
 - Submit negotiated results to State for approval
 - Consider implementation of regular consultation protocols

State/Tribal Water Consultation & Resolution

Implementation Timeline:

- To be established by Oklahoma Governor and State Legislature
- Cost to be determined by Oklahoma Governor and State Legislature

Draft OCWP Priority Water Policy Recommendations & Implementation State/Tribal Water Consultation & Resolution

SUGGESTED CONSOLIDATED RECOMMENDATION:

To address uncertainties relating to the possible validity of water rights claims by the Tribal Nations of Oklahoma and to effectively apply the prior appropriation doctrine in the fair apportionment of state waters, the Oklahoma Governor and State Legislature should establish a formal consultation process as outlined in the OCWP Report on Tribal Issues and Concerns.

2012

