

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION
MEETING OF NOVEMBER 9-10, 2016
SOUTH LAKE TAHOE**

ITEM 6

CLIMATE CHANGE WORKING GROUP UPDATE

CHRONOLOGY

Nov. 13, 2014	Water Board staff hosted first Climate Change Adaptation Public Workshop in Barstow, CA. Climate change experts presented the latest research regarding anticipated climate change effects in the Lahontan Region to over 100 attendees. Attendees provided ideas regarding potential Water Board adaptations/responses (regulatory, policy, coordination with stakeholders, education, etc.) to climate change.
Jan. 15, 2015	Water Board staff hosted second Climate Change Adaptation Public Workshop in South Lake Tahoe, CA., which is similar in attendance, content, and format to Nov. 2014 workshop.
May 13-14, 2015	Water Board staff presented summary of public ideas generated from the Nov. 2014 and Jan. 2015 public workshops to the Water Board.
July 8-9, 2015	Water Board staff presents Climate Change Conceptual Model and Adaptation Strategy. Water Board provides direction.
Dec. 2015	Three internal Water Board Climate Change Working Groups are formed and begin meeting: Infrastructure, Storm Water and Low Impact Development, and Wetlands and Floodplains.
Aug. 2016	Water Board staff widely distributes Climate Change Adaptation Survey (Enclosure 1) to Email Subscription Lists and other interested persons. Survey is posted on the Climate Change page of the Lahontan Water Board's web site.
Aug. – Oct. 2016	Water Board staff attends outreach meetings with a variety of stakeholder groups to encourage stakeholder participation with staff's survey, and to solicit input.

BACKGROUND

Climate change is having, and will continue to have, widespread impacts on California's diverse population, natural resources, and economy. Because the Lahontan Water Board region spans nearly 600 miles along the eastern side of the state, the region will

experience differing effects from climate change. The northern part of the region is expected to receive more precipitation as rain and less as snow, while the southern part will be hotter and drier. Flood events will likely become more severe throughout the region. Addressing the impacts brought about or exacerbated by climate change will require a fundamental shift in water resource management and water quality protection as the amount, timing, and form of precipitation changes.

The State and Regional Water Boards have recognized the critical roles and responsibilities they have in California's efforts to adapt to the current and developing impacts of climate change. There is also recognition that there are other local, state, and federal agencies and non-government organizations that are also working on adapting to climate change. The Lahontan Water Board, as part of its developing climate change program, has expressly stated its strong desire to reach out and work collaboratively with others in its efforts to efficiently and effectively develop and implement its Climate Change Adaptation Strategy.

The Climate Change Working Groups agreed to reach out to external partners by developing a web-based survey to find out what people, agencies, and organizations are currently doing to plan for climate change, what challenges or obstacles they face, and their level of support regarding actions the Water Board may consider for adapting to climate change. The information received from the survey will be used along with information gathered during the workshops to draft a Water Board Climate Change Adaptation Strategy. Water Board staff has also been participating in various stakeholder group meetings to discuss the survey and solicit information. Staff is also seeking individuals to work with each of the Water Board's Climate Change Working Groups, to provide an outside perspective as staff develops the draft Water Board's Climate Change Adaptation Strategy.

ISSUES

1. Does the current range of potential actions presented in the survey generally capture the nature and extent of actions/concepts the Water Board wants to evaluate?
2. How should Water Board staff prioritize and implement next steps?

DISCUSSION

Recent Outreach Activities (Survey and Stakeholder Meetings)

In August 2016, Water Board staff released its Climate Change Adaption Survey. Enclosure 2 presents a table of the meetings that staff has attended or plans to attend by the end of 2016. Staff's outreach efforts are paying off. As of early October 2016, over 100 participants had completed the survey. The survey asks:

- Who are you and what are you doing to plan for climate change?
- What challenges do you face?
- What is your opinion about the potential actions the Water Board is considering?

The survey allows respondents to express their opinions regarding the third section, above, by selecting from the following options: strongly support, support, neutral, oppose, or strongly oppose. Also, respondents can submit written comments in multiple sections to provide additional information. Staff has identified 26 potential actions/concepts where the Water Board could take action or assist others. Those 26 actions/concepts have been broken into three survey categories: (1) Protecting Resources and Providing Resiliency, (2) Improving Water Supply and Water Quality, and (3) Communicating, Collaborating, and Streamlining Processes.

The 26 actions/concepts presented in the survey capture the essence of the over 400 ideas that workshop participants provided. These actions/concepts include a variety of short-, mid-, and long-term actions; actions where the Water Board has direct authority/responsibility; ideas that can be implemented with existing resources; and those that will require a shift in resource allocations or require additional resources to implement. Staff anticipates there will be some additional ideas that are brought forth and will be considered for inclusion in the Climate Change Adaptation Strategy.

Prioritizing Potential Actions/Concepts

The 26 action/concepts identified in the survey present a project management challenge given their variety, complexity, resource needs, and reliance upon others to develop and implement. A critical next step in the strategy development process will be to prioritize the 26 actions/concepts, recognizing that some of the concepts will develop into additional actions. Given limited staff resources, prioritization of possible actions is a critical next step in developing a strategy to adapt to climate change. At this time, staff is considering a set of criteria that would be applied to a minimum of two project categories. Specifically, the initial separation of actions into groups would be based upon time required to develop and implement (short-term and long-term actions). The reason for this separation is to avoid a potential bias to select short-term projects over long-term projects. A second potential separation is to identify those projects that can be directly implemented by the Water Board, compared to those that the Water Board has no jurisdiction over or will need to collaborate with and have partial reliance upon others to implement. Other criteria that are being considered for all actions, regardless of subgroup, include:

Multi-benefit to environment/parties	High survey support
Fulfills Water Board priorities*	Geographically broad effect
Ease of development/implementation	Under development/implementation by others

*Protect human health and aquatic life; protect/improve aquatic resources and surface water quality; support disadvantaged communities; (in addition to) respond to and prepare for climate change.

Staff is considering whether or not resource availability should be considered as a criterion, or better addressed as part of the planning/scheduling process. Staff is moving forward by addressing resource availability in the planning/scheduling process to avoid the potential of a very effective action falling down the priority list, largely

because resources are not available. Staff will identify a pathway to pursue adequate resources, recognizing that the development/implementation schedule will be highly dependent upon securing such resources.

Next Steps

With the Water Board's input, staff anticipates developing a Climate Change Adaptation Strategy document for the Water Board's consideration. This Strategy will summarize the current and anticipated effects of climate change on water quality and resources, the Water Board's climate change adaptation goals and objectives, its action/concept prioritization process, and an actions/concepts list with implementation schedule. The Strategy would also identify collaborative efforts to date and plans for collaborating with others to efficiently meet the goals/objectives of the Water Board and its partners throughout the region. Staff plans to circulate the draft Strategy for public review and comment prior to bringing it before the Water Board for its consideration.

PUBLIC OUTREACH/INPUT

The Climate Change Workshops held in 2014 and 2015, and the current survey and public outreach has provided opportunities for the public to provide suggestions regarding the range of alternatives the Water Board should explore as it develops a Climate Change Adaptation Strategy.

RECOMMENDATION

Water Board staff is seeking Board member input and suggestions. Staff will compile final survey results in January 2017 and develop a Climate Change Adaptation Strategy for Board consideration in mid-2017

ENCLOSURE	ITEM	BATES NUMBER
1	Climate Change Adaptation for Water Resources Survey	6-7
2	Table of Public Outreach Meetings	6-17
3	Water Board Staff's Presentation	6-21

ENCLOSURE 1

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Climate Change Adaptation for Water Resources



Thank you for taking about ten minutes of your time to complete this survey. The Lahontan Water Board is interested in partnering with other organizations and agencies to adapt and prepare for climate change.

The survey questions are divided into three main sections:

1. Who are you and what are you doing or planning for climate change?
2. What challenges do you face?
3. What is your opinion about actions and priorities the Water Board is considering?

Highlight of Climate Change Effects

Climate change is having, and will continue to have, widespread impacts on California's diverse population, natural resources and economy. Because the Lahontan Water Board region spans nearly 600 miles along the eastern side of the state, the region will experience differing effects from climate change. The northern part of the region is expected to receive more precipitation as rain and less snow, while the southern part will be hotter and drier. Flood events will likely become more severe throughout the region. Addressing the impacts brought about or exacerbated by climate change will require a fundamental shift in water resource management and water quality protection as the amount, timing and form of precipitation changes.

Name and Title (optional)

Agency/Organization (optional)

Email address (optional)

Contact number (optional)

*** What type of agency/organization is your employer?**

- ☐ Federal
- ☐ State
- ☐ County
- ☐ Local
- ☐ NGO/Non-Profit
- ☐ Other:

*** In what county is your agency/organization? Note: counties are listed from north to south.**

- ☐ Modoc
- ☐ Lassen
- ☐ Plumas
- ☐ Sierra
- ☐ Nevada
- ☐ Placer
- ☐ El Dorado
- ☐ Alpine
- ☐ Mono
- ☐ Inyo
- ☐ Kern
- ☐ San Bernardino
- ☐ Los Angeles
- ☐ Other:

*** In what city is your agency/organization?**

*

Please indicate strategies/programs/plans that your agency/organization is currently implementing to adapt to climate change. Check all that apply.

- ☐ **Updating floodplain maps**
- ☐ **Monitoring groundwater elevations**
- ☐ **Low Impact Development plans or requirements for construction projects**
- ☐ **Ordinances for climate change adaptation**
- ☐ **Education and Outreach**
- ☐ **Water conservation**
- ☐ **Rate changes**
- ☐ **Incentives/Disincentives**
- ☐ **Policies/plans/ordinances/strategies toward an aquatic habitat protection program**
- ☐ **Risk assessment conducted for infrastructure**
- ☐ **Implementation/Approval of multiple benefit projects such as flood control, drought and climate change**
- ☐ **Participation in a Local Hazard Mitigation Plan**
- ☐ **Inventory and Assessment of facilities vulnerable to potential hazards**
- ☐ **Identification of the level of useful life for facilities**
- ☐ **Plans to retrofit facilities to protect against hazards**
- ☐ **Increased enforcement**
- ☐ **Other strategies/programs/plans**

Please provide additional explanation here:

*

What impediments or barriers to climate change adaptation (e.g., improvements to storm water collection and use, infrastructure, and/or wetlands and floodplain management) does your agency face? Check all that apply.

- ☐ Water rights
- ☐ Groundwater basin adjudication
- ☐ Land uses and zoning
- ☐ Regulatory permits
- ☐ Economic/cost
- ☐ Lack of governance and/or community support
- ☐ Federal regulations or laws
- ☐ State regulations or laws
- ☐ Regional regulations or laws
- ☐ Local regulations or laws
- ☐ Other barriers

Please provide additional explanation here:

Which were or are the most relevant climate-related events that have affected or are affecting your agency/organization in the last decade? If none, what are anticipated future climate-related events that may affect your agency/organization? Please explain.

*

PROTECTING RESOURCES AND PROVIDING RESILIENCY - RANGE OF OPTIONS

The Lahontan Water Board is considering the following options to protect water resources from the impacts of climate change. Please indicate your level of support for each option listed below.

	Strongly Support	Support	Neutral	Oppose	Strongly Oppose
1. Adopt policies to protect critical groundwater recharge areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Expand monitoring and evaluation activities to continuously assess the effectiveness of water quality programs in building resiliency to extreme events and changing temperature and precipitation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

PROTECTING RESOURCES AND PROVIDING RESILIENCY - RANGE OF OPTIONS

The Lahontan Water Board is considering taking actions to increase protection and restoration of floodplains and wetlands. Having well-functioning wetlands, wet meadows, and floodplains will increase resiliency against severe flood events, improve water storage, increase water infiltration, and improve water quality. Please indicate your level of support for each option listed below.

	Strongly Support	Support	Neutral	Oppose	Strongly Oppose
1. Increase protection and restoration of floodplains and wetlands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Evaluate expanding wetland and floodplain protection programs, such as those in the Lake Tahoe and Truckee River basins that restrict many types of development within floodplains and wetlands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Increase the required impact mitigation ratios (1.5:1) for wetland disturbance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Enhance protection and restoration of floodplains and wetlands by increasing enforcement of existing regulations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Increase protection of headwaters and adjacent areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Update regulation and protection for Waters of the State that are not subject to Federal Clean Water Act regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

PROTECTING RESOURCES AND PROVIDING RESILIENCY - RANGE OF OPTIONS

The Lahontan Water Board is considering actions to identify, assess, and prevent water quality impacts from infrastructure failure due to climate related events. Please indicate your level of support for each option listed below.

	Strongly Support	Support	Neutral	Oppose	Strongly Oppose
1. Improve and protect water and waste water infrastructure from failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Provide incentives to improve protections for aging or vulnerable water and waste water infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Require owners of infrastructure to map areas that are vulnerable to failure from floods and erosion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Require sewage collection systems to have backup systems to prevent spills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Work with utility districts to assess the vulnerability of infrastructure within the 500-year floodplain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

IMPROVING WATER SUPPLY & WATER QUALITY - RANGE OF OPTIONS

The Lahontan Water Board is considering the following options to protect water resources from the impacts of climate change. Please indicate your level of support for each option listed below.

	Strongly Support	Support	Neutral	Oppose	Strongly Oppose
1. Increase requirements to collect and infiltrate storm water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Increase water recycling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Provide incentives to conserve water and capture/use storm water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Prioritize recharge over groundwater extraction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Require implementation of Low-Impact Development (LID) principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Encourage using BMPs to collect and infiltrate storm water, such as pervious pavement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Allow dual plumbing that uses grey water for irrigation and infiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

*

COMMUNICATING, COLLABORATING, AND STREAMLINING PROCESSES - RANGE OF OPTIONS

The Lahontan Water Board is considering the following options to protect water resources from the impacts of climate change. Please indicate your level of support for each option listed below.

Strongly
Support

Support

Neutral

Oppose

Strongly
Oppose

1. Present more public workshops to reach out and inform stakeholders about actions that private citizens and public agencies can implement for climate change adaptation



2. Ensure disadvantaged communities are invited and represented in discussions



3. Coordinate with all responsible agencies and foster collaboration, including maximizing efficiencies in using monitoring budgets



4. Promote and prioritize grant funding for projects adapting to climate change



5. Reduce permit requirements to essential information and streamline processing



6. Work with the Division of Drinking Water to evaluate water quality in public water supplies, including investigating sources of pollution



Comments:

* The Water Board is planning to engage stakeholders in a process to develop collaborative strategies, plans, and policies to further climate change adaptation in our region and purview.

Would your agency/organization be interested in participating in this process?



Yes



No

If yes, please provide your contact information:

* Would you like us to add you to our climate adaptation email distribution list (aka LYRIS list)



Yes



No

If yes, please provide your full name and email address

ENCLOSURE 2

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**Climate Change Adaptation
Outreach Meetings**

External Meeting	Date	Location	RB6 Staff
Upper Truckee River Watershed Advisory Group	Aug. 10, 2016	UTR Filed Tour; South Lake Tahoe	Brian Judge
Mojave River Watershed Group (Members consist of representatives from High Desert Small MS4 permittees including: City of VVL, City of Hesperia, Town of Apple Valley, County of San Bernardino)	Sept. 21, 2016	Apple Valley City Hall	Tom Browne
Tahoe Sierra IRWM (STPUD)	Sept. 22, 2016	South Tahoe PUD Board Room; South Lake Tahoe	Scott Ferguson
Mojave Water Agency Technical Advisory Committee (MWA is the watermaster for the adjudicated Mojave groundwater basin and the lead agency for the Mojave IRWM Group; the TAC consists of stakeholders including water purveyors, pumpers, and other interested parties located within MWA's boundary)	Oct. 6, 2016	MWA Board Room, Apple Valley	Patrice Copeland
Dredging and Aquatic Invasive Species Interagency Meeting	Oct. 6, 2016	TRPA	Mary Fiore-Wagner
Aquatic Invasive Species Coordinating Committee (interagency folks, LTSLT, TRCD, ACOE, CA State Lands)	Oct. 24, 2016	TRPA	Mary Fiore-Wagner
Hinkley CAC	Oct. 27, 2016	Hinkley	Lisa Dernbach
Bridgeport Ranchers Organization Meeting	Nov. 30, 2016	Gardnerville - CoopExtension Office	Bruce Warden
Inyo Mono IRWM Group	TBD	TBD	TBD

External Meetings not yet planned but staff are trying to contact these groups so they may attend next meeting. If the IRWM does not have a meeting scheduled by the end of the year, staff has requested these groups distribute the survey to their email membership.

External Meeting	Date	Location	RB6 Staff
Antelope Valley IRWM Group	TBD	No meeting scheduled, Group has been asked to distribute survey to IRWM mail list	TBD
Mojave IRWM Group	TBD	No meeting scheduled, Group has been asked to distribute survey to IRWM mail list	TBD
Lahontan Basins IRWM Group (Honey Lake Valley Resource Conservation District)	TBD	No meeting scheduled, Group has been asked to distribute survey to IRWM mail list	TBD
Fremont Basin IRWM Group	TBD	No meeting scheduled, Group has been asked to distribute survey to IRWM mail list	TBD
Fort Irwin National Training Center, U.S. Army (Fort Irwin National Training Center)	TBD	No meeting scheduled, Group has been asked to distribute survey to IRWM mail list	TBD

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ENCLOSURE 3

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Lahontan Water Board Climate Change Adaptation

Climate Change Working Group Update

November 9-10, 2016 Board Meeting



Presentation

- Water Board Climate Change Background
- Recent Water Board Climate Change Activity
- Climate Change Adaptation Survey and Results



Presentation

- Potential Concepts/Actions
- Prioritizing System for Concepts/Actions
- Next Steps



Need for Adaptation

- Drought
- Flood
- Heat
- Fire
- Water Quality
- Water Supply



Water Board Climate Change History

- Public Workshops – Nov. 2014/
Jan. 2015
- Public Ideas Summary – May 2015
- Climate Change Conceptual
Model/Strategy Discussion – July 2015

Water Board Climate Change History

- Climate Change Working Groups Established - Dec. 2015
- Climate Change Survey- Aug. 2016
- Stakeholder Outreach- Sept. 2016+



Other Climate Change Happenings

- Other Regional Water Boards
- State Water Board's Climate Change Policy Development
- Recent Legislation

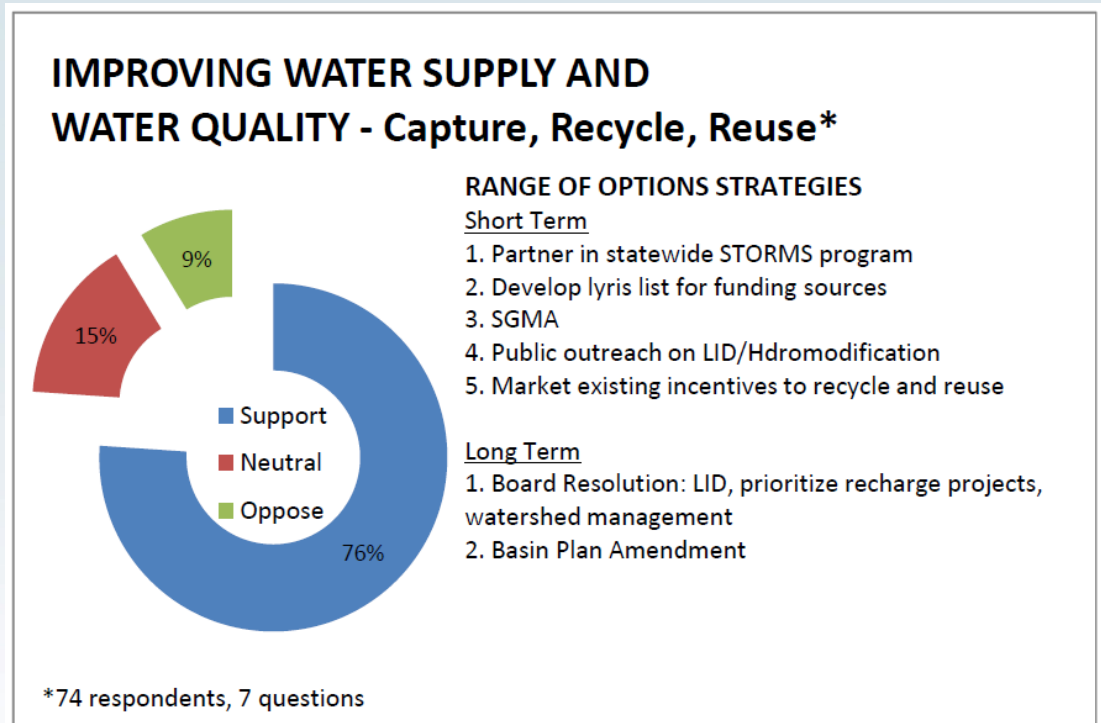


The Survey

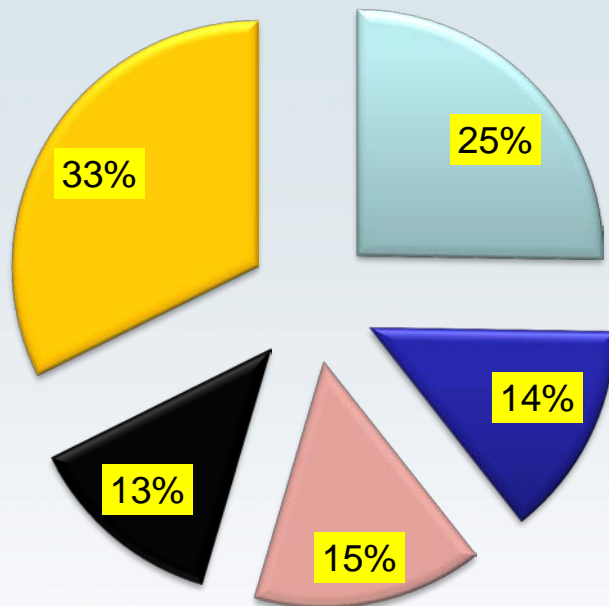
- Respondent Background and Climate Change Adaptation Activity
- Respondent Adaptation Challenges
- Respondent Opinions on 26 Proposed Adaptation Actions/Concepts

Survey Results

- Trends
- Highlights



Survey Results – Respondents



Categories

- Federal or State Govt.
- County Govt.
- Local Govt.
- Non-Profit/Non-Govt.
- Other

Survey Results – Ongoing Activities

- 50+ Percent - Water Conservation, Education, and Outreach
- Groundwater Elevation Monitoring
- Low Impact Development
- Aquatic Habitat Protection
- Infrastructure Vulnerability Assessments

Survey Results – Challenges

- Costs/Economics
- Water Rights Issues
- State Regulations



Survey Results - Opinions

- 26 Potential Actions/Concepts
 - Protecting resources and providing resiliency
 - Improving Water Supply and Water Quality
 - Communicating, Collaborating, and Streamlining Processes



Survey Results - Top Five

- Adopt Policies to Protect Critical Groundwater Recharge Areas
- Improve and Protect Water/Wastewater Infrastructure from Failure
- Provide Incentives to Improve Protections for Aging or Vulnerable Water/Wastewater Infrastructure

Survey Results - Top Five

- Increase Water Recycling
- Provide Incentives to Conserve Water and Capture/Use Storm Water



Survey Results – Interesting Paradox

- Resource and Infrastructure Protection
Concept: Well-Supported
- Proposed Actions to Implement
Concept: Significantly Less Support
- Possible Approach – Explore Other
Options to Implement Concept



Prioritizing Actions/Concepts

- 26 Potential Actions/Concepts are Adequate for Developing Strategy
 - Wetlands/Floodplains/Recharge Areas
 - Infrastructure
 - Storm Water
 - Process



Prioritizing Actions/Concepts

- Proposal
 - Break 26 actions/concepts into subcategories (e.g., short- and long-term)
 - Apply criteria to all actions/concepts in all subcategories
 - Issue
 - Resource availability:
- Criteria or Planning/Scheduling Process

Next Steps

- Continue Outreach - Nov. 2016
- Finish Survey - Dec. 2016
- Evaluate Survey Results - Jan. 2017
- Draft Strategy - Feb. 2017
- Release Draft Strategy - May 2017
- Board Consider Strategy - Summer 2017

Discussion

- Are Current Set of Potential Actions/Concepts Adequate for Strategy Development?
- Prioritization Criteria
- Next Steps

Thank You

