IWRS 2010 Public Input Results:
Community Open Houses, Stakeholder Workshops, and Online Survey

The Integrated Water Resources Strategy (IWRS) Project Team conducted 31 workshops with stakeholders and held 11 open house events throughout the state over the past year. These events were largely aimed at gathering local input to inform the development of the strategy. Participants offered their vision for the future of Oregon's water resources and identified the threats and weaknesses that hinder the ability to meeting our water needs. Ideas and suggestions for solving our water resource challenges were also gathered during these events. Participants also had an opportunity to provide their input through a survey, either electronically or by mail.

Open House Events (Spring 2010)

- Bandon
- Burns
- Eugene
- Gresham
- Klamath Falls
- Medford
- Ontario
- Redmond
- Salem
- Tillamook
- Umatilla
- *Online Version*

Stakeholder Workshops (September 2009 – August 2010)

- American Water Works Association (Water Resources Committee)
- Association of Oregon Counties (Planning Directors)
- Environmental / Conservation Partners
- Federal Partners (BLM, USFS, USFWS, USGS, USACE, BPA, NOAA)
- First United Methodist Church of Salem, Oregon
- Groundwater Advisory Committee (Advisory to WRC)
- League of Oregon Cities Water Policy Committee
- Network of Oregon Watershed Councils 2009 Gathering
- Oregon Business Development Department
- Oregon Department of Agriculture (Administrators)
- Oregon Department of Environmental Quality (Regional Managers)
- Oregon Department of Environmental Quality (Water Quality Program)
- Oregon Department of Environmental Quality (Groundwater Program)
- Oregon Department of Fish and Wildlife (Regional Managers)
- Oregon Department of Human Services (Drinking Water Program)
- Oregon Farm Bureau Water Committee
- Oregon Girls' State 2010
- Oregon League of Women Voters Annual Meeting
- Oregon Plan for Salmon and Watersheds (Core Team)
- Oregon Technical Advisory Committee (NRCS/USDA)
- Oregon Tribal Water Forum
- Oregon Water Resources Congress 2009 Law Seminar
- Oregon Water Utilities Council
- Regional Water Providers Consortium (Portland Region)

- Socially Responsible Investment (Portland BaseCamp 2010)
- Special Districts Association of Oregon Water Committee
- Tualatin Riverkeepers and Tualatin River Watershed Council
- Oregon Water Resources Department (Managers' Group)
- Oregon Water Resources Department (Northwest Region Field Staff)
- Oregon Water Resources Department (Regional Managers)
- Oregon Water Resources Department (Water Rights Division)

This document summarizes the input received from the open house events, stakeholder workshops, and online survey responses. Participants were asked to provide comments on four main topics: vision, challenges, solutions, and public education and outreach. This document briefly summarizes responses given for vision and threats, and describes the solutions, including education and outreach, in more detail. The four questions presented in each of these venues and through the online survey are as follows:

> **Question 1 (Vision):** As we embark on a long-term, integrated water resources strategy, what are some broad objectives you have, with regard to water in Oregon? Describe your hopes and goals for the state, in terms of water quantity, water quality, and other water-related issues.
>
> **Question 2 (Challenges/Threats/Weaknesses):** What do you see as some factors that may hinder our ability to meet Oregon's water needs in the future? (This question was aimed at identifying institutional weaknesses or external threats.)
>
> **Question 3 (Solutions/Opportunities/Strengths):** Do you have water resource solutions (policies, programs, projects) that you would like to see as part of this Integrated Strategy? What are some successful models from your organization, community, or elsewhere that we should encourage or develop further?
>
> **Question 4 (Education/Outreach):** Do you feel that you have access to adequate information about water resource issues? Please suggest ideas for better education and outreach about these issues.

These questions were posed using an open format (i.e., no choices to choose from). The group discussion was structured as a "brainstorming" session. That is, staff and participants were not allowed to pass judgment or argue with ideas offered by the participants. The Project Team immediately recorded ideas and suggestions on flipcharts for all participants to see.

Vision

Responses ranged from a vision of the physical resource itself to visions that include management, understanding, and process-oriented goals. Many of the responses mirror the vision statements developed by the Oregon Water Resources Commission and the IWRS Policy Advisory Group. Responses are summarized and organized accordingly:

Vision of the Physical Water Resource
Healthy aquatic ecosystems, free flowing streams, protected aquifers, wetlands, marine reserves, and pristine areas; safe drinking water, clean water for fish, fishable and swimmable water, and enhanced hydrologic connectivity. Water exists in the stream during critical summer months and there is sufficient water and quality to support native fish species in all streams where they historically existed.

Vision for Understanding Our Water Needs
More data is readily available and includes information on population growth and climate change impacts on water resources. There is usable groundwater data. The public understands the importance of wetlands. Everyone understands where their water comes from and goes. We are all thinking in terms of watersheds. There is a shift from mechanical physics to living systems.

Vision for Meeting our Water Needs
Overarching Goals: The public is willing to support infrastructure financing. Protect all beneficial uses, including water rights and the prior appropriation doctrine. There is regional flexibility, cooperation without regulation, and an emphasis on local planning. Integrate water management and use water sustainably. The people of Oregon, not the legislature or governor, are the driving force behind the strategy. Federal control of water does not exist. Water becomes a stronger component in land-use planning. There is a balance among all uses and sufficient water for all needs. Local long-range plans and rules serve as our primary guide, while still meeting the federal and state mandates. Protect waterways and still provide for our economic needs. Prioritize water for individuals, not for corporations. Avoid environmental injustices. Re-evaluate everything! Use a local participatory democracy. Local food systems exist where the consumer is connected to the grower. Low head hydro-electric dams with fully-operational and successful fish ladders.

Instream (Non-Consumptive) Goals: Protect ecological flows. Adopt instream water rights on all streams and designate additional scenic waterways. Increase cooperation among agencies related to water quality management and move beyond the 303d list to determine the water quality reality. Prevent point and non-point sources of pollution. Meet water quality standards in all rivers, lakes, and streams. Prevent barriers to species movement. Source water protection becomes a higher priority. Protect watersheds from toxic chemicals, logging, and human overuse.

Out-of-Stream (Consumptive) Goals: Maintain and increase storage capacity. Protect Oregon's ability to provide food. Focus on water efficiency and provide tax incentives exist for water conservation. Reduce per capita water consumption by 25% during the first five years of implementation. Recycle water, graywater, and rainwater among commercial industries. Reduce pesticide use. All users conserve water and share the cost of conservation. Protect agricultural water users and their needs; ensure that they politically represented.

Challenges / Threats / Weaknesses

The challenges, weaknesses, and threats to meeting our future water needs are many. Many of the responses provided have been outlined in the IWRS Issue Papers and discussed during Policy Advisory Group Meetings. They are summarized under 12 topics, listed alphabetically.

1. **Changing or Uncertain Regulatory Environment**: at the local, state, and federal level.
2. **Climate Change Threats:** decreasing snowpack, groundwater recharge, and resiliency and adaptability of natural systems; increasingly flashy systems, storms, floods, fire hazards, invasive species, species risks and habitat effects, general uncertainty.
3. **Conflict, Lack of Cooperation**: interstate, urban-rural, incorporated-unincorporated, big city-small city, big farmer-small farmer, east-west, county-state, among differing uses, goals, and environmental trade-offs.
4. **Data Gaps:** groundwater (construction, levels, yield, quality, cumulative impacts, mapping), water use, streamflow, pollutants, basin yield, inconsistent data gathering efforts, climate change, population growth, peak and ecological flows.
5. **Funding**: for infrastructure, modeling, water supply development, conservation, data collection, testing, reporting, watershed restoration, TMDL reviews, and funding to help entities meet requirements for federal and state regulations (Clean Water Act, etc.).
6. **Maze of Public Institutions:** differing mandates and federal counterparts, conflicting or confusing statutes and rules, complex systems, incomplete information, inadequate capacity to manage and protect natural resources.
7. **Natural Disasters:** drought, flood, seismic events, and storms.
8. **Population Growth Threats:** changing demographics, climate "migrants" arriving from drier climates, rapid development in urban growth boundaries, floodplains, and wetlands. Increased use of exempt wells. Additional pressures to provide water/wastewater services.
9. **Public Unwillingness:** to place a value on water, to use without waste, to protect natural areas, to pay for protections, to be involved, to change habits or cultural norms (green lawns).
10. **Threats to Meeting Water Quality Needs:** inadequate institutional capacity to monitor and address traditional and emerging contaminants. Aging infrastructure, inadequate treatment regimes, and new programs/technologies pose a threat to public health. Hazardous waste disposal and storage. Pesticide and herbicide use.
11. **Threats to Meeting Water Quantity Needs:** scarcity or perceived scarcity, timing issues, debate over "need" versus "demand" for water, privatization, competing uses, declining water levels, unauthorized use, over-appropriation, un-adjudicated areas.
12. **Threats to Meeting Ecological Needs:** unknown instream needs and inadequate protection on all streams, difficulty protecting ecosystems throughout all conditions and times of the year. Invasive species management and endangered species protection. Land-use changes. Development encroaches on the ability of ecosystems to function properly.

Solutions / Opportunities / Strengths

General Observations

Participants made several comments that fall within the IWRS framework: (1) data and information, (2) planning and institutional structures, (3) public policy and programs, (4) statute and rule, (5) funding, (6) public education and outreach. The sixth framework category, education and outreach, was a featured question in the open house events, online survey, and stakeholder workshops. As a result, participants offered specific ideas or suggestions to improve pubic education and outreach. This document organizes those general observations, including education and outreach comments, using the IWRS framework.

Recurring Solutions

Next, the top 16 suggested solutions (by topic) are described using the IWRS framework. These suggestions are listed in order by the number of venues in which the topic emerged. Some categories are quite broad, and so the accompanying description includes the breadth and scope of underlying ideas, as well as examples of "successful" implementation, in the eyes of participants.

It will fall next to the IWRS Policy Advisory Group to help the Project Team decide which suggestions to prioritize and hone as part of the project's formal "Recommended Actions."

Framework Category: Data and Information

Several participants identified better data and information as the "number one" need in the IWRS. General suggestions on this topic included:

- Recognizing the need for constant update and improvement of data.
- Not allowing a lack of data to paralyze decision-making at the local and state levels.
- Doing a better job of prioritizing and communicating water resource efforts, based on available data.

Data Collection Methodology

- Making a concerted effort to establish data collection standards for communities and organizations, so that information can be shared and used at all levels of public and private organizations.
- Coordinating the collection of water quantity and quality data at local, state, federal levels.
- Increasing shared monitoring sites (upgrading monitoring sites to capture multiple types of information). Share maintenance and data collection costs.
- Using higher education institutions for technological, applied research.
- Continuing to partner with the U.S. Geological Survey on surface water and groundwater technical studies.
- Investing in better technologies for monitoring water use (satellite, etc.).
- Increasing and enforcing statutory requirements (and incentives / funding) for water-use reporting among municipal, agricultural, industrial, and domestic users of water.

Models and Data

- Relying more heavily on "modeling" tools, where data is not available. Especially helpful as an early warning device…provides clues about where to "look" for water quality and quantity problems.

Measurement Devices

- Establishing a more robust system of stream gages and monitoring wells to provide water quantity and water quality data (some basins have almost no monitoring in place). Include funding to monitor and maintain these devices. Install monitoring devices now where there might be development in the future (create baselines).
- Requiring measuring devices on all surface water and groundwater diversions.

Access to Data and Information

- Coordinating or combining agency databases and GIS layers.
- Making more tax lot information accessible on publicly available maps and GIS layers.
- Providing better access to water-related data in all public agencies.

- Publishing “how much water is in each product,” will help Oregonians understand and appreciate the value of water to the state’s economy—similar to *National Geographic’s* 2010 Water Poster. Help people understand where their food comes from.
- Improving updates on major water and wastewater efforts at the state level.

Paying for data and information

- Finding dedicated funds for data, instead of relying on turbulent general funds.
- Increase volunteerism to help with data collection and processing

Framework Category: Planning and Institutional Structures

General suggestions on this topic included:

Institutional Models

- Use the Northwest Power Planning Council as a potential model for an Oregon Water Planning Council.

Transboundary Issues

- Recognizing that neighboring states manage their water differently, which creates difficulty for federal agencies or other partners.
- Developing a Columbia River Plan among all the Columbia River states (and Canada).
- Noting the Columbia River Treaty with Canada expires in 2014 (currently the Treaty focuses on flood control and hydropower issues).
- Recognizing interstate competition for water; protect Oregon's water from commoditization by or sale or export to external parties.
- Considering whether interstate compacts are possible in today's Congress, or whether striking bilateral agreements are more realistic.
- Improving the state's capacity to handle interstate or international conflict.
- Recognizing that while inter-basin transfers of water require legislative approval, private companies can skirt the requirement by bottling and selling water.

Regionalization / Basin Approaches

- Engaging in broader regional systems than today (multi city, urban and rural, etc.).
- Preparing redundancy and back-up systems by creating interties, mutual aid agreements, water supply partnerships, etc.
- Overcoming the tendency to want to run one's own system, instead of sharing.
- Providing leadership, guidance, and technical assistance from the state to communities, in terms of "how" to plan to meet water needs and at what level of detail.
- Making a business case for regional systems (economies of scale, greater access to grant monies, other incentives).
- Providing an inventory of successful regional solutions.
- Developing basin-wide "visions" of water management.
- Preparing regions / basins for planning by providing tools (data, models, examples), grant monies, policies (standards), incentives.
- Updating basin plans to make them more forward looking, planning friendly, and integrated (addressing water quantity and water quality).
- Finding a better way to integrate demand forecasts from multiple municipal water providers in one region.
- Re-writing basin plans to incorporate water quality, water quantity, and recommendations for local projects to receive state funding.
- Giving basins or regions more control may involve the state providing more flexibility.
- Considering greater basin authorities (shared authorities).

- Involving all partners at the local level, not just a handful of organizations. (Several participants noted that their "regional" water alliances, consortiums, or partnerships are missing key community groups.)
- Increasing local capacity for data, planning, implementation.
- Demonstrating regional approach and partnership helps to leverage state and federal funds.

Framework Category: Public Policy and Programs

General suggestions on this topic included:

- Remembering that water is a public resource.
- Paying more attention to environmental justice issues.
- Decreasing and inconsistent funding create discontinuity in policies and programs.

Many comments made concerning public policy and programs are specific to an issue, such as conservation, restoration or re-use. For example, comments related to WRD's Allocation of Conserved Water Program can be found under "Water Conservation / Water Efficiency" (see page 20).

Framework Category: Statute and Rule

General suggestions on this topic included:

- Acknowledging that local, state, and federal agencies have different underlying missions.
- Clearing administrative backlogs before taking on new projects.
- Form partnerships with Oregon Innovation Council, higher education institutions, Tribes, private sector, non-governmental organizations and agencies to accomplish tasks more efficiently.
- Tracking national legislation closely at the state level; acknowledge that federal action on biological opinions, navigability, etc. may trump state-level plans and policies.
- Using / maximizing already-existing authorities and management tools.
- Enforcing state and federal statutes and rules that are already in place.
- Making more resources available to be more pro-active in water management; currently WRD is reactive in water management; has little capacity to deal with abandoned or unused water rights.
- Recognizing that increased regulations translate into increased costs for all parties.

Regulatory Streamlining

- Coordinating software, databases, and data entry within and between agencies who are working on the same permit applications or files.
- Establishing formal protocols with ODFW, DEQ, DHS, and WRD, when field staff find potential water quality or public health problems in the field.
- Partnering with private sector and public agencies up front to move projects along.
- Cutting the length of time and amount of uncertainty involved in applying for permits.
- Addressing roadblocks to regional projects, such as the WISE Project in Medford.
- Instituting frequent meetings, one-stop shopping, or other ways to speed up permits that must be processed by multiple agencies.
- Reconcile differing definitions at different agencies (e.g., “beneficial use”).
- Providing better information up front about application processes, particularly criteria and requirements. State and federal agencies have basis for denial of permit applications but rarely share the details; this information could decrease inefficiencies, wasted time, and court contests.

Framework Category: Funding

General suggestions on this topic included:

Funding at the State Level

- Reversing the declining trend of funding in Oregon for natural resource management (today, natural resource agencies comprise < 2% of the state's budget, but the resource provides > 37% of the state's economic output).
- Recognizing that seasonal tourism poses water quantity and quality challenges, without having anyone to pay for it.
- Adequately funding the data and information required to make water resource decisions.
- Dedicating funding to ongoing data collection and processing, IT development, and GIS capability. Some agencies only develop data as funding becomes available for a "snapshot" in time.
- Weaning natural resources agencies off the general fund and onto dedicated monies for water resource management.
- Taking advantage of cost-share opportunities with the federal government.
- Working with federal agencies to establish a Water Trust Fund for the State of Oregon (develop a joint water resource plan).
- Encouraging local fundraisers to support water education efforts.
- Creating a "Dry Day" investment fund for the state.
- Partnering with private funders, federal agencies, education foundations, and non-profits.
- Preventing water-related fees and funds from getting "swept" by the Legislature for other uses.
- Supporting scientific and field work through administration, or maintenance, fees on existing water rights. Stop disproportionate spending on "permits," and increase spending on enforcement, verification, and data. Develop a "rate-base."
- Considering a "cap" so that fees are not too high for any one water right holder or applicant.
- Improving access to bonds for water and wastewater infrastructure and projects.
- Supporting the state's revolving loan programs and the newly created Infrastructure Finance Authority.
- Supporting a national water and wastewater infrastructure bank.
- Utilizing a whole suite of fees (a penny on bottled water, transactions fees, other).

Funding at the Local Level

- Funding integrated water planning efforts at local and state levels.
- Funding existing and future water and wastewater infrastructure (municipal, industrial, and agricultural).
- Coordinating state and federal grant and loan programs. Communities are spending too much time chasing dollars with slightly different criteria and requirements.
- Speeding up federal consultations (NMFS and NOAA), which can cost communities grant opportunities.

- Taking advantage of federal Farm Bill funds for pivots and irrigation systems. Expanding and continuing to seek Federal funds to improve irrigation efficiency.
- Developing funding and capacity for communities to participate in long-term water planning at the "basin" or watershed level.
- Creating a strategy for funding basin or watershed work: Where would funding come from? Who would distribute and who would be eligible? Projects would be evaluated according to what criteria? How would priorities be developed and addressed?
- Using Bonneville Power Administration and Energy Trust as a model for funding water needs.

Framework Category: Education and Outreach

Suggestions for public education and outreach were provided in response to Question 4, they include:

Issues or Topics to Focus On

- Stream/Wetland development (accessible information).
- The value of wetlands, and water in general.
- Emerging contaminants.
- The value of peak flows for storage, particularly in eastern Oregon.
- Focus on child education, from kindergarten and beyond.
- Educate on all of the uses of water.
- Groundwater recharge, groundwater availability.
- Pesticide use.
- Needed inputs to grow food.
- The need for conservation.
- Water efficiency and conservation options.
- Instilling values for nature, forests, natural systems, and the great outdoors.
- The benefit of dams (increased flow for fish).
- The effect human activities (development, transportation, trash, etc.) have on water quantity and quality.

Ideas or Suggestions to Promote Public Education and Outreach

- Continuing to improve websites and electronic public access to information; make databases searchable and extractable. Scan and post public documents.
- Partnering with OSU extension, universities, tribes, watershed councils, soil and water conservation districts, local governments, non-governmental organizations, industry associations to collect and disseminate information.
- Establishing a "Water Information Center" clearinghouse for water resource information: local, state, and federal data, restricted areas, best management practices, how to find grants, relevant legal documents, etc. Assign professional staff to this task.
- Developing long-term public understanding through K-20 curriculum (look at Tillamook Estuaries Partnership as an example). Teach the water cycle; develop water projects and a list of research needs to share with students. "Awareness bracelets" are a good way of reaching tweens and teens.
- Building a corps of experts in hydrology, hydrogeology, water law, sanitation, farming and irrigation techniques, and other scientific specialties to help.
- Preparing Oregonians for the coming hydrologic changes and the policies and programs to adapt to these changes require patience and assistance from skilled educators and effective communicators.
- Reaching wide-spread audience through OBP's "Oregon Field Guide" and other programs, newspapers, advertisements, mailing, community meetings, and other media. Try to overcome citizen apathy or lack of awareness. Start with a baseline

survey of public knowledge. Use simple terminology. Encourage local journalists to write water articles. Conduct a "Celebrate Oregon's Waters!" campaign.

- Using electronic media, such as on-line video games, Facebook, Twitter, You Tube, and other social media to reach Oregonians.
- Creating a water mascot (see the success of Smokey the Bear, or Woodsie the "Give a Hoot. Don't Pollute" Owl, or McGruff the Crime Fighting Dog).
- Reaching public officials and policy-makers through their staff members and networks.
- Translating raw "data" to useful "information" for the public and for decision-makers.

1. Addressing Groundwater Issues

This topic emerged in the survey responses, all 11 Open Houses, and 24 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Continuing to manage Oregon's surface water and groundwater in a "conjunctive" manner, both in terms of the water quantity and quality that passes between surface and ground.
- Halting the depletion of groundwater aquifers, at rates faster than they can recharge.
- Protecting Oregon's groundwater from diversion or contamination by other states.
- Considering development "water markets" focused on groundwater (leasing groundwater, like unitization in the oil industry).
- Limiting the development of exempt-use wells based on water availability or discontinuing the concept of exempt-use wells altogether. Follow the State of Utah's example and require all wells to get permits before construction begins.
- Declaring new groundwater limited areas.
- Helping Oregon communities "fix" groundwater limited areas, critical groundwater areas, and withdrawn areas, so they can have the designation removed.
- Making it cheaper and easier to abandon old wells correctly.

B. Data / Information

- Developing better water models and data to understand and manage "conjunctively" (accounting for flows between surface water and groundwater).
- Better understanding the collective impact of exempt use wells in aquifers; identify the wells and measure their effects.
- Better understanding the impact of groundwater pumping in other states.
- Increasing the number of dedicated observation wells throughout Oregon (measuring quantity, quality, rate and source of recharge, etc.).
- Ensuring that water level data is collected and made available in all areas of the state.
- Tying well log and water right information together in one database would save everyone time.
- Putting all groundwater restrictions into one database (water quality and quantity, state and local).
- Requiring the collection of borehole samples during drilling would provide much better information about water and soil quality.
- Measuring and monitoring well use, particularly in new developments.
- Monitoring areas with known nitrate and other problems
- Better understanding groundwater-dependent ecosystems.
- Continuing to coordinate with the State of California on groundwater data collection and sharing in the Klamath Basin.

C. Planning and Structuring for Groundwater Use

- Identifying and addressing failing septic systems, particularly on the coast and in areas using groundwater supplies.

D. Statutory / Regulatory Considerations, Institutional Structure

- Taking water availability into account when developing well construction standards.
- Shifting the burden of proof to water right applicants, to demonstrate water availability in the face of surface water and groundwater connection.
- Developing better regulations to protect and restore groundwater quality.
- Lowering the maximum daily volume water allowed from exempt-use wells.
- Limiting the development of exempt-use wells before they are constructed, instead of afterwards. Requiring permits would result in better overall groundwater data.
- Preventing new exempt-use wells in critical groundwater areas.
- Ensuring that rules for groundwater limited areas and critical groundwater areas have teeth.
- Enforcing standards and rules for well drillers.
- Halting the loss of groundwater through poorly constructed wells that co-mingle waters from different aquifers (Mosier area and elsewhere).
- Making it less difficult and complicated to obtain groundwater rights.

E. Need for Public Education and Outreach

- Making resources available to owners of wells, with water quality questions (how to test for pollutants, what to do if pollutants are found, what are the risks, etc.).
- Providing informational resources to well owners with questions about how to prevent or address arsenic, nitrates, and other pollutants in their wells.
- Providing better information to the public in terms of well construction standards.
- Making more groundwater information available to the public (well logs, water levels, water quality, etc.)
- Making more information available to the media, water professionals, and the public about the High Cascades Aquifer.
- Documenting and communicating how irrigated agriculture recharge groundwater.

F. Funding Groundwater Efforts

- Committing to funding Oregon's groundwater studies. Consider partnering with public and private entities (see Portland State University and Columbia Soil and Water Conservation District groundwater study as a model).
- Partnering with the US Geological Survey to increase and improve groundwater studies.
- Providing financial assistance to public and private entities who are trying to maintain wells (including deepening wells and lowering pumps).

2. Water Conservation / Water Efficiency

This topic arose in the survey responses, all 11 Open Houses, and 23 Workshops. The concept includes a broad range of suggestions, including:

A. Public Policy and Programmatic Considerations

- Determining the "true cost" and "true value" of water. Pricing water to encourage conservation.
- Creating a comprehensive, state-wide water efficiency / conservation policy. Make water conservation a state priority.
- Setting standards (either across-the-board, or specific to types of water users) (either voluntary or mandatory standards, triggered by certain events). Recognize that each water system has a different mix of users (e.g., more "industrial" or more "residential"). Giving agricultural, municipal, other users "credit" for conservation investments they have already made. Requires some sort of metric.
- Accounting for the unintended effects of water conservation: decreased return flow, groundwater recharge, wetlands; potentially increased energy costs (pumping costs).
- Changing building codes and plumbing codes to further promote water conservation.
- Composting, instead of flushing, waste.
- Encouraging installation of insta-hot water dispensers.
- Harvesting rainwater. See "Rainwater Harvesting," from the Oregon Dept. of Consumer Business and Services' Building Codes Division.
- Managing juniper (a water-intensive invasive plant).

B. Data / Information

- Documenting already-existing water conservation and efficiency policies in other Western States.
- Establishing an EPA "Energy Star"-like rating to help consumers choose efficient water appliances. Call it "Water Star."
- Using the energy efficiency "O Energy" project as another model.
- Calculating how much water everyone uses now, how much conservation savings has already occurred, and how much potential there is in the future.

C. Planning and Structuring for Conservation

- Creating conservation positions at WRD (like circuit riders who can provide technical assistance).
- Using Water Management and Conservation Plans to get more municipal and agricultural conservation programs in place.

D. Statutory / Regulatory Considerations, Institutional Structures

- Determining whether there are regulatory, public perception, or funding barriers to conservation.

- Better communicating the "Allocation of Conserved Water" Program at WRD (and making it easier to understand and access). Ensuring that conserved water is protected instream.

E. Funding Conservation

- Sharing responsibility (and costs) for conservation, among different types of water users. For example, helping the sector with most water use (agriculture) secure capital investments necessary to make systems more efficient.
- Establishing water and sewer rates that encourage users to conserve water.
- Recognizing that the "financial cost" of implementing a water conservation program may outweigh the "financial savings," because of current pricing structures.
- Working closely with partners who can help: Soil and Water Conservation Districts, OSU Extension, Homeowner Associations, corporate campuses, etc…
- Providing low-interest loans, rebates, tax breaks (a "WETC"?) or other incentives to install water efficient systems.
- Providing technical assistance to chase EQIP and other conservation-related Federal grant monies.

F. Need for Public Education and Outreach

- Involving the public in water conservation
- Using the term "water efficiency" will resonate better than "savings" or "conservation."
- Developing state and community conservation campaigns (avoiding waste, not watering lawns, install Xeriscaping, etc.).
- Developing education and training materials for agricultural users (making the "business case" by capturing "before" and "after" data, "how to" guides for evapotranspiration, soil moisture monitoring, updating irrigation rates—amount of water it takes to grow specific crops, tilth practices, crop conversion, infrastructure upgrades, pumping, piping, water application techniques such as drip irrigation, etc.). See the WISE project in Medford as a potential model.
- Developing education and training materials for municipal users (customer rebates for water efficient appliance, leak detection, metering, conservation rate structures, covering reservoirs, public outreach, etc.).
- Developing similar programs for residential water users who are not on public water systems.
- Addressing "bad habits" through public outreach: long showers, running water in the sink, watering the sidewalk, overwatering lawns. Addressing cultural "must haves" too: golf courses, swimming pools, hot tubs, water features.
- Developing education curriculum for K-12. Partner with the already existing "Green School" program.
- Developing a rating system for municipal water providers to place on customer bills, to show them "how their household is doing" in terms of water efficiency.
- Helping communities understand how and why municipalities structure water rates to achieve conservation.

- Publishing water consumption records, community-by-community, or user group-by-user group (friendly competition) – carrot.
- Publishing an annual “Water Hog” list for the state – stick.

3. Water Quality / Public Health

This topic emerged in the survey responses, all 11 Open Houses, and 23 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Ensuring that pollutants (including high temperatures, turbidity, pH, conductivity, bacteria, dissolved oxygen, emerging contaminants, and other water quality impairments) are removed at the source of the pollution and do not enter the environment – either surface water or groundwater Take a look at green chemistry, product stewardship, pharmaceutical take-back and other models.
- Better understanding the human and ecological health impacts of chronic, low doses of chemicals in surface and groundwater supplies.
- Restricting the cosmetic use of synthetic lawn pesticides (see announcements from the governments of Quebec, Ontario, and New Brunswick, Canada as examples).
- Banning the use of mixing zones by industries, municipalities, and other dischargers.
- Finding alternatives to forestry and agricultural practices that put chemicals, animal waste, and pollutants into the water.
- Ensuring that municipal wastewater treatment plants have adequate technology in place to remove all pollutants before discharging to the stream.
- Doing more to address non-point source pollution (run-off from impervious surfaces, construction areas, instream mining, shorelines, agricultural fields, roads, etc.).
- Encouraging the use of phytotechnology (plants) to treat water (e.g., bio-swales, rain gardens, wetlands, etc.).
- Understanding that increased pollutants decrease usable supplies, particularly for exempt-use wells.
- Addressing the water quality problems that stem from deteriorating infrastructure and facilities. Retrofit equipment and revisit permits.
- Protecting downstream communities from upstream wastewater that still contains pollutants.
- Protecting the shellfish industry and other coastal industries from surface water pollutants.
- Curbing outbreaks of toxic blue-green algae.
- Addressing cumulative effects of National Pollutant Discharge Elimination System (NPDES) discharges in a watershed.
- Protecting and restoring the water quality in Oregon's creeks, rivers, lakes, estuaries, wetlands, and aquifers.
- Limiting in-channel mining of gold and gravel.
- Ensuring that water quality rules protect public health, particularly when estimating fish consumption rates.
- Preventing sanitary sewer overflows and combined sewer overflows.
- Taking seriously the public health concerns related to graywater use and other decentralized water systems (in homes, businesses, etc.).

- Cleaning up and mitigating for water quality concerns from the Willamette Harbor and Hanford Nuclear sites.

B. Data / Information

- Developing high level common indicators on water quality.
- Developing better information about the quality of water at the source of diversion can be used to adjust protection measures.
- Establishing "reference sites," areas that are still of high quality. Helps to better define expectations for other areas; creates long-term sites that are well-protected and serve as baselines.
- Having better data about the kind and volume of pollutants in the water, beyond the 143 pollutants regulated by DEQ.
- Increasing local capacity to conduct water quality monitoring.
- Sampling for suspected pollutants. Even stream reaches without a "303(d)" listing have been compromised.
- Reporting pesticide use, particularly near water.
- Determining the extent to which other states and countries affect Oregon's water quality (e.g., mercury from China).

C. Planning and Structuring for Water Quality

- Providing safe and legal disposal options for pharmaceuticals, household hazardous waste, and other toxics.
- Making sure LNG and other pipelines do not pose problems to the quality of groundwater supplies.
- Providing a continuous supply of good, clean water to support currently and future home and businesses in Oregon.

D. Statutory / Regulatory Considerations, Institutional Structure

- Developing regulations that are flexible enough to keep up with new pollutants and detection technologies.
- Developing set-back rules for the use of herbicides and pesticides in forests, near wetland, near streams, etc.
- Building upon SB 1010 water quality efforts in the agricultural sector, particularly related to TMDLs. Include enforceable flow targets in TMDLs.
- Finding better ways to communicate "risk" (parts per trillion) to the public.
- Addressing more sources of heavy metal contamination (use of lead sinkers, railroad bridges, vehicle components, industrial fertilizer, atmospheric deposits, etc.)
- Centralizing water quality testing (see State of Minnesota for example).
- Providing flexibility to reach water quality compliance (see Clean Water Services as an example).
- Incorporating more comments from ODFW and ODF into water quality permits.

E. Need for Public Education and Outreach

- Providing guidance for homeowners to test for, prevent, or mitigate contamination in drinking water wells, lead pipes, and other components.
- Understanding that water is not “pristine” in nature, not even in the headwaters.
- Providing better information to the public on water quality, sanitary sewer overflows, water treatment technologies, effluent discharge points, and emerging contaminants (the risks, what to do about it, long-term plans, etc.).
- Providing easy access to nitrate and arsenic results as part of the Real Estate Transaction Database (analyze the data and share with new owners).

F. Funding Water Quality

- Funding the Pesticide Use Reporting System.
- Funding reviews of Total Maximum Daily Load (TMDLs)
- Funding better programs to address nonpoint source pollution.
- Adding water quality testing for “emerging contaminants” to water utility bills.
- Putting a price on wastewater discharges; increase the price as water quality decreases.
- Taxing LNG and other pipelines, to generate adequate funding to manage groundwater quality and quantity.
- Funding compliance with and enforcement of increasingly stringent regulations (related to point-source and nonpoint source discharges).
- Funding water treatment facilities / technologies that allow more water to meet DEQ / DHS standards for Aquifer Storage and Recovery.

4. Water Storage

This topic arose in the survey responses, all 11 Open Houses, and 19 Workshops. This category encompasses a broad suite of options, including:

A. Public Policy and Programmatic Considerations

- Increasing storage opportunities for both population and agricultural centers.
- Needing a way to capture water when it arrives and hold it until it is needed (for beneficial uses including drinking, agriculture, power, cooling, flow augmentation).
- Accessing existing Federal reservoirs that still have "unspoken for" water (unallocated or not contracted). Focus on U.S. Army Corps of Engineers reservoirs and Bureau of Reclamation contracts in the Willamette River Basin.
- Respecting resistance to additional above-ground, in-channel storage, particularly in more pristine watersheds, and particularly on federal forest lands. Entering an era of increasing dam removal.
- Continuing to use reservoirs for flood control, power generation, and other beneficial uses.
- Removing silt and sediment behind existing dams to re-gain storage capacity.
- Developing smaller storage projects than traditionally.
- Continuing to use underground storage (Aquifer Storage and Recovery and Artificial Recharge) to store water, cool water and provide return flows.
- Protecting and restoring natural storage systems (wetlands, floodplains, forest lands, etc.)
- Acknowledging that loss of snow pack (from climate change) means alternate storage options will become more important.
- Evaluating whether man-made uplands storage (replacing snowpack) would be feasible.
- Using pump-to-storage to avoid building more dams.
- Favoring "off channel" storage instead of "on channel" storage.
- Capturing "winter" flows to store and use later.
- Allowing access to Columbia River water in May for diversions to storage.
- Removing dams limits hydropower generation opportunities, as well as an ability to release additional water during low streamflow.

B. Data / Information

- Utilizing previous "potential storage" studies from Dept. of Agriculture, Water Resources Department.

C. Planning and Structuring for Storage

- Helping the South Coast find additional storage, given poor geologic capacity and inability to secure above-ground storage permits.
- Critical groundwater areas in Oregon having problems developing plans and funding for additional storage.
- Encouraging local government to take a regional approach, to build support and funding for storage projects. Look to Tualatin Basin Water Supply Project as a model.

- Locating and removing invasive species (plants and animals) upstream from storage structures to improve their performance.

D. Statutory / Regulatory Considerations, Institutional Structure

- Improving the regulatory environment, data, and case studies around Artificial Recharge (AR) and Aquifer Storage and Recovery (ASR).
- Defining and protecting peak and ecological flows while capturing water for storage.
- Maneuvering through State permitting requirements is difficult and expensive (even true for the streamlined, alternate reservoirs process). ODFW conditions on permits are arduous.
- Maneuvering through Federal ESA and other requirements is very difficult.
- Ongoing concerns — dam safety and seismic retrofits.
- Needing more flexibility in reservoir management in the face of climate change.

E. Need for Public Education and Outreach

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F. Funding Storage

- Working with Federal and other partners to get storage projects into the budget cycle.
- Exploring grants and other funding to help with storage projects.

5. Allocation and Adjudication

This topic arose in the survey responses, all 11 Open Houses, and 19 Workshops. The concept includes a range of suggestions, including:

A. Public Policy and Programmatic Considerations

- Taking a "watershed approach" is very difficult when forced to seek water right and project permits agency-by-agency.
- Ensuring that water is allocated in a fair and transparent way.
- Conducting public interest reviews on all water right transfers to ensure they meet today's standards.
- Applying stronger protections for "the public right" when water is allocated.
- Coming to agreement with neighboring states, about the use and protection of water quantity in each state.
- Completing adjudications that remain throughout the state would allow the Water Resources Department to regulate and distribute water on behalf of senior water right holders. Klamath Basin is in progress. Several, including the Willamette, remain.
- Settling all Tribal water right claims.
- Protecting already-existing water rights (this stands in stark contrast to the opposite view – to review or sunset all existing water rights and re-allocate using to different criteria). Treat all beneficial uses as equal, differentiated by seniority of water right.
- Treating water as a right and not a commodity (this stands in contrast to the opposing view – to place a monetary price tag on water and let the market re-allocate the use).
- Insisting on adequate demand analyses before issuing water right permits or extensions.

B. Data / Information

- Assembling adequate inventories of water needs (actual "needs," not "demands"), water availability, basin capacity (a water "budget"), septic systems, well fields, land-use types, etc.
- Generating better population projections (numbers, distribution, timing). University of Oregon's "carrying capacity" studies may serve as a good model, including the one done for the Portland Metro region.
- Revisiting whether the water availability model is detailed enough in the Willamette and other basins. (Water right decisions have been based on the mainstem, instead of the tributaries).
- Analyzing the potential effects of the gradual loss of agricultural users – inability to send water down a ditch, gentrification of irrigation districts, domino effect down the food chain.
- Determining and serving actual needs.
- Confirming which water rights are still in use.
- Tracking which water rights are "turned off" each as water becomes scarce. This could help identify potential partners for conservation, storage, or other approaches.
- Displaying the water rights <u>at and above</u> each point of diversion would be very helpful for developing water resource projects and making water availability decisions.

C. Planning and Structuring for Allocation and Adjudication

- Getting a better handle on the water needs of new and arriving industries in Oregon.
- Helping new industries and developments partner with already existing water rights holders.
- Anticipating the arrival of "climate migrants" from hotter, drier areas. This will increase overall demand for water.

D. Statutory / Regulatory Considerations, Institutional Structure

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E. Need for Public Education and Outreach

- Helping water users find sources of water for new uses or new developments.
- Helping water users better understand extent of Oregon water supplies, especially groundwater and Oregon's system of water rights with its responsibilities and permit conditions.

F. Funding Allocation and Adjudication

- Dedicating funds to complete adjudications throughout the state.

6. Water Re-Use

This topic arose in 11 Open Houses and 18 Workshops. The concept includes a range of suggestions, including:

A. Public Policy and Programmatic Considerations

- Setting additional state-wide water re-use policies where needed; make re-use a state priority.
- Recognizing re-use of water as a potential water supply (particularly for non-edible crops and non-potable purposes)
- Requiring water reuse systems in new developments / communities.
- Improving opportunities for graywater (in-home systems, particularly toilets)
- Improving opportunities for recycled water (in municipal-wide systems, particularly for irrigating turf and lawns). Look at the Durham Treatment Plant in Tigard supplying recycled water to irrigated ball fields as a model.
- Improving opportunities for water reuse in industrial / factory settings, particularly cooling towers, irrigation of corporate campuses, and industrial processes.
- Increasing incentives to re-use water.
- Offering LEED certification for water re-use.
- Addressing public health and water quality concerns associated with re-use of water.
- Accounting for unintended effects of water reuse: less discharge decreases return flow for downstream users.

B. Data / Information

- Documenting already-existing water conservation and efficiency policies in other Western States; include best practices.
- Closely coordinating with DEQ and DHS-Drinking Water Program in any re-use initiative.
- Quantifying the amount of wastewater in Oregon; determining the extent to which it has been treated.
- Determining the concentration of pollutants remaining in wastewater (beyond the 143 regulated pollutants).
- Understanding public acceptance of water re-use for different tasks (flushing, irrigating, drinking, etc.)

C. Planning and Structuring for Re-use

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D. Statutory and Regulatory Considerations, Institutional Structures

- Addressing regulatory barriers at DEQ and DHS to re-use (municipal and industrial recycling and residential graywater).
- Addressing regulatory barriers to using recycled water to recharge aquifers.
- Developing water re-use friendly building codes.

E. Funding Re-Use

- Paying for new or upgraded infrastructure (i.e., purple pipe). Creates a double piping structure.
- Improving partnerships to support wastewater utilities who are interested in producing recycled water. The Metropolitan Wastewater Management Commission (Eugene / Springfield), Clean Water Services (Durham Plant in Tigard), and City of Newberg may serve as good examples.

F. Need for Public Education and Outreach

- Getting over the "yuck" factor.

7. Addressing Instream Needs

This topic emerged in the survey responses, all 11 Open Houses, and 18 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Accounting for the "ecosystem services" provided by the environment, whenever adequate water is available instream.
- Strengthening instream protections and incentives (creating ecosystem services markets).
- Encouraging the three state agencies with authority to apply for instream rights (ODFW, DEQ, Parks) to apply for more rights on streams that need additional protections.
- Allowing additional organizations to apply for instream water rights.
- Revising Forest Practices Act to address temperature impacts, especially riparian buffer regulations on non-fish bearing streams.
- Revising DEQ's TMDL process to integrate flow, water quantity, and water quality.
- Determining and protecting flows necessary for channel maintenance, fish and wildlife needs, Scenic Waterway Act needs, groundwater recharge, and water quality. Protect groundwater supplies that contribute to surface water.
- Recognizing that both instream needs and hydrology will change in face of climate change.
- Placing a quantitative value or comparative value on "instream" uses, so they are given the weight they deserve, compared to other uses.
- Protecting sensitive, threatened, and endangered species (these include anadromous species, non-anadromous species, lamprey).
- Protecting and restoring beavers to their native habitat.
- Protecting water placed instream in Oregon, throughout Washington State's jurisdiction.

B. Data / Information

- Continue to develop scientific basis for putting water instream (back up policy with data).
- Quantifying return flows and their benefits.
- Better documenting and protecting hydraulic connection between groundwater and surface water.
- Determining the effects that hatcheries have on water quality.
- Determining how much water can be removed from a reach without detrimental effects.
- Partnering with the Sustainable Rivers Program, which is looking at environmental flows. This would provide an opportunity to get additional data to support instream flow efforts.

C. Planning and Structuring for Instream Efforts

- Creating more general guidance to use during permit reviews at ODFW, based on types of streams and types of projects, so that review of each water right permit does not take as long.
- Strengthening temporary instream water leasing program, permanent instream water transfer programs, partnerships, and incentives to increase participation.

D. Statutory / Regulatory Considerations, Institutional Structure

- Basing flow restrictions on actual peak and ecological flows, instead of calendar months.

E. Need for Public Education and Outreach

- Encouraging Washington State to adopt Oregon's Columbia Basin Rules.
- Better communicating and advertising the instream leasing and instream transfer programs to water right holders.
- Creating a "master watershed steward" program (like master gardener, master recycler, etc.). Define success: what "should" a watershed look like?

F. Funding Instream Efforts

- Ongoing need for funding for fish screens, fish passage, and other protections.
- Partnering with the Oregon Watershed Enhancement Board (OWEB), watershed councils (e.g., the Partnership for Umpqua Rivers was mentioned), non-governmental organizations, public and private entities, and Tribes.

8. Climate Change Adaptation

This topic emerged in the survey responses, 9 Open Houses, and 19 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Understanding that climate change effects could render useless existing infrastructure, permitting, and regulatory systems.

B. Data / Information

- Supporting additional climate change studies (early indicators of the change in natural resources, including water).
- Strategically placing monitoring and measuring devices to detect early climate change effects.
- Down-scaling and fine-tuning climate change modeling.

C. Planning and Structuring for Climate Change

- Constructing scenarios to help the state get ready to "adapt," despite the high degree of uncertainty. Scenarios include loss of snowpack / natural storage, loss of farmland / certain crops, variability of stream flow, groundwater recharge, water temperature / quality, and flooding / flashy streams each season.
- Preparing each basin for climate change immediately – reacting afterwards will be too late.
- Preparing for "climate migrants" (people coming from hotter, drier climates).
- Flexibility managing federal reservoirs in response to changes in climate.

D. Statutory / Regulatory Considerations, Institutional Structure

- Really committing to the coming changes in climate (by modifying permits and institutional structures).
- Establishing landscape conservation co-ops and regional climate centers (there are three now in Oregon).

E. Need for Public Education and Outreach

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F. Funding Climate Change Adaptation

- Take advantage of federal monies available for climate change research and adaptation.

9. The Water – Land-Use Nexus

This topic emerged in the survey responses, 6 Open Houses, and 18 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Deliberately considering water when establishing local land-use plans, and limiting development when water is unavailable.
- Recognizing the effect of changing land-use from agriculture to urbanization.
- Incorporating management differences among federal, state, and private lands into a broader strategy.
- Taking care not to work at cross purposes in corporate recruiting (do not recruit water-intensive industries to areas that cannot sustain them).
- Fully integrating water and land-use plans; update state agency coordination plans.

B. Data / Information

- Measuring and communicating how land-use changes affect water quality and quantity.
- Providing more data on water availability to county planners for use in their decision-making (particularly groundwater availability).

C. "Planning"

- Adequately reflecting water issues in County Comprehensive Plans.
- Continuing the use of "Urban Growth Boundaries" to steer growth.
- Addressing the conundrum "Duty to Serve" (municipal water providers must serve all new growth within their service territories and cannot say 'no').

D. Statutory / Regulatory Considerations, Institutional Structures

- Broadening the regulatory powers of counties and their planners, so they are more broadly authorized to make decisions on water availability, in addition to land-use.
- Enlisting help from the Department of Land Conservation and Development to provide incentives to counties, to make a stronger link between land and water planning.
- Integrating private and federal land management into state resource management plans.
- Following the lead of Lane, Benton, Marion, Multnomah, Tillamook and other counties in adoption of ordinances or assessments to deal with water in land-use planning (must demonstrate water availability before securing land-use or building permit).
- Ensuring that development does not interfere with already existing uses of water
- Amending SB 100, making a stronger link between land-use and water quality.

E. Need for Education and Outreach

- Educating county commissioners, city councilors, and land-use and planning departments on water needs and water availability.

F. Funding the Water – Land-use Nexus

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10. Restoration

This topic emerged in the survey responses, 8 Open Houses, and 13 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Maintaining pristine areas before they degrade.
- Restoring riparian, habitat, and floodplain areas provides an alternative to having only "streamflow" solutions. Putting "meanders" back into streams. Creating more shade.
- Reconsidering and limiting development in floodplains.
- Prioritizing restoration areas.
- Restoring wetlands to improve water storage and water quality; preventing further development in wetlands.
- Restoring natural functions of uplands, forest lands, and rangelands (remove juniper!) to improve groundwater recharge / storage and water quality.
- Restoring native plants and removing invasive species.
- Addressing sources of degradation: development / channelization, erosion, wild horses, cattle, etc.
- Asking whether wetland mitigation programs are enough (do they restore what needs to be restored)?
- Acknowledging that flood irrigation provides benefits to wildlife.
- Re-introducing anadromous fish species and fish runs.
- Creating marine reserves.

B. Data / Information

- Evaluating and monitoring wetlands, forests, and other places that are the focus of restoration.
- Understanding and documenting the data sources and methodology behind federal biological opinions and other instream requests.

C. Planning and Structuring for Restoration

- Oregon Plan for Salmon and Watersheds, Recovery Plans, Oregon Conservation Strategy, Oregon Board of Forestry Strategic Plan, Bureau of Land Management "Healthy Lands" all focus on restoration.
- Asking why local governments have zoned their industrial lands in wetlands.

D. Statutory / Regulatory Considerations, Institutional Structure

- Develop clearer restrictions regarding pesticide use in floodplains.

E. Need for Public Education and Outreach

- Increasing riparian habitat/areas and communicating their importance. Look at work in the Tualatin Basin as a model.
- Protecting floodplains and communicating their importance. Look at Tillamook's historic floodplain for a case study.

- Providing educational signage in watersheds.
- Partnering with the real estate industry to provide information on natural resource laws to distribute to homeowners.
- Oregon has a wide range of agencies, organizations, and individuals with experience in restoration; take advantage of that expertise. Look to Estuary Partnerships, Watershed Councils, Soil and Water Conservation Districts, Tribes, local, state, and federal agencies as partners.

F. Funding Restoration

- Provide incentives to public and private landowners to host restoration projects on their property. Look at the USDA model.
- Putting incentives in place to put real riparian barriers into place.
- Participating in grant programs for restoration.
- Partnering with The Freshwater Trust, Willamette Partnership, Deschutes River Conservancy, watershed councils, soil and water conservation districts, Oregon Watershed Enhancement Board, and others focused on watershed restoration.

11. Water Marketing / Water Banking

This topic emerged in the survey responses, 8 Open Houses and 9 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Determining how water markets and water banks can help meet Oregon's water needs.
- Creating a robust ecosystem services marketplace that rewards and pays for water quantity and quality.
- Avoiding unintended consequences of water marketing – goring high-priced commodities ill suited to the region; pricing agriculture out the market altogether.
- Supporting and replicating the work of the Willamette Partnership to ensure strong markets for water quality improvements.
- Protecting Oregon's water from privatization (referring to ownership of the physical water, not the construction or contracted management of a water system).

B. Data / Information

- Determining how other western states have used water marketing and water banking to accomplish their goals.
- Cleaning up water right databases / information, to increase the speed and efficiency of water banks.

C. Planning and Structuring for the Development Water Markets

- Promoting permanent water transfers and longer term leases.
- Modeling a range of "water market" options and tools from which policymakers can choose.
- Developing the institutional capacity at the Basin or local level to manage water banks.

D. Statutory / Regulatory Considerations, Institutional Structure

- Examining the barriers to well functioning and well-regulated water markets.
- Ensuring that agriculture, small businesses, and small towns do not get priced out of any water market.
- Ensuring that water remains publicly owned.

E. Need for Education and Outreach

- Encouraging additional use of instream leasing (placing water instream on a temporary basis, in exchange for payment).

F. Funding the Development of Water Markets

- Capitalizing water banks, and keep them capitalized, in order to facilitate transactions.

12. Infrastructure for Water and Wastewater

This topic emerged in survey responses, 3 Open Houses and 12 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Maintaining and updating water and wastewater-related infrastructure, particularly if it will increase capacity for reuse, storage, and efficiency.
- Noting competing infrastructure needs (expanding to new technologies and geographies versus upgrading aging infrastructure) and determining priorities.
- Upgrading wastewater treatment facilities or policies to address emerging contaminants.

B. Data / Information

- Getting a better accounting of water and wastewater infrastructure (condition, coverage, future needs) with local government "Asset Management Programs."

C. Planning and Structuring for Infrastructure

- Helping planners get "non-traditional" infrastructure in place (e.g., reuse, etc.)
- Encouraging communities to maintain and replace water and wastewater infrastructure on a schedule.

D. Statutory / Regulatory Considerations, Institutional Structure

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E. Need for Education and Outreach

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F. Funding Infrastructure

- Planning and saving for infrastructure overhaul in the event of natural disaster (seismic events, etc.).
- Participate in the development of a national infrastructure bank.
- Strengthen the capacity and use of revolving loan funds for water and wastewater infrastructure.
- Publicly funding water and wastewater infrastructure that protects public health.

13. Natural Disaster Preparation

This topic emerged in the survey responses, 5 Open Houses and 7 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Ensuring dam safety in seismic events.
- Preserving water and wastewater infrastructure during natural disaster.
- Encouraging the use of natural systems to prevent and mitigate natural disaster.

B. Data / Information

- Obtaining stream gage readings and other measurements during storm events.

C. Planning and Structuring for Natural Disaster

- Developing flexibility, reserves, and contingency plans for long-term drought.
- Developing contingency plans to prevent and respond to flooding.
- Planning for back-up water supplies affected by seismic events.
- Planning for shorter more intense storms.
- Understanding that storm events and other disasters may remove restoration efforts.
- Decreasing the methods by which invasive species travel (boats, vehicles, and gear that have not been properly cleaned).

D. Statutory / Regulatory Considerations, Institutional Structure

- Improving and enforcing seismic standards.
- Improving and enforcing floodplain ordinances.

E. Need for Public Education and Outreach

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F. Funding for Natural Disaster-Related Efforts

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14. Stormwater / Low Impact Development Solutions (LID)

This topic emerged in the survey responses, 5 Open Houses and 6 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Developing state stormwater policies, including Urban Stormwater Low Impact Development measures.
- Regarding stormwater as an asset, instead of a liability to be discarded.
- Using Low Impact Development (LID) techniques to protect water quality and streamflows in urban areas. For example, require new structures and surfaces to be "pervious," allowing water to seep through instead of run off. Replace curbs with water passage, plants, or greenscapes / bioswales to clean and filter water (see OMSI as an example).
- Reconsidering concrete drainage channels.

B. Data / Information

- Improving understanding of localized geology and how this related to state-wide policy on stormwater management (e.g., threat of activating old landslides).

C. Planning and Structuring for Stormwater and Low Impact Development Solutions

- Helping Local governments develop better stormwater treatment and master plans.
- Mitigating development in floodplains with improved construction methods.

D. Statutory / Regulatory Considerations, Institutional Structure

- Developing Low Impact Development ordinances.
- Linking MS4 permits (municipal permits for separated stormwater and sewer systems) and general stormwater permits (developer permits for construction or industrial purposes). There should be more flexibility for MS4 permittees (cities) to deal with general permits in their jurisdiction, providing stormwater treatment or permits to developers for a fee.

E. Need for Education and Outreach

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F. Funding Stormwater and LID

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15. The Water– Energy Nexus

This topic emerged in survey responses, 3 Open Houses and 5 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Removal of dams results in less hydropower generation.
- Moving to more "efficient" water systems often results in greater energy use and costs, as water is pumped, pipes are pressurized, and systems are automated.
- Utilizing additional technologies that use water in to produce energy: in-conduit hydropower (installing turbines into already-existing water pipes), low-head hydro, adding hydroelectric capability to already-existing dams, etc.
- Moving to a hydrogen-run economy will require additional water resources. (Look at Prof. Roger Ely's work at OSU).

B. Data / Information

- Tracking energy prices and the effect on water delivery systems.

C. Planning and Structuring for the Water - Energy Nexus

- Ensuring the integration of water and energy planning. Water is a necessary component in energy generation (cooling water), and energy is necessary component in water pumping and delivery systems.
- Accounting for water needs when planning renewable energy projects: off channel storage, wind, photovoltaic, solar thermal, wave / tidal**.**
- Participating in negotiations around the Columbia River Treaty with Canada (potentially sunsets in 2014; current focus is on flood control and hydropower).

D. Statutory / Regulatory Considerations, Institutional Structure

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E. Need for Education and Outreach

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F. Funding the Water – Energy Nexus

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16. Desalination

This topic emerged in the survey responses, 2 Open Houses and 5 Workshops. Suggestions on this topic included:

A. Public Policy and Programmatic Considerations

- Look into the potential for using desalination as a reliable and affordable water supply, particularly at the coast.
- Anticipate the consequences of desalination: capital costs of construction, high energy use and costs, and salt by-product.

B. Data / Information

- Document successes, costs, and unintended consequences of desalination elsewhere.

C. Planning and Structuring for Desalination

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D. Statutory / Regulatory Considerations, Institutional Structure

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E. Need for Education and Outreach

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F. Funding Desalination

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