

For every complex and difficult problem, there is an answer that is simple, easy, and wrong.
- H. L. Mencken

Plans are worthless. Planning is essential.
- Dwight D. Eisenhower

You got to be careful if you don't know where you're going, because you might not get there.
- Yogi Berra

Materials and Results

WRCC Annual Conference 2010

"Creating New Leadership for Arizona's Water and Environment in a Time of Change"

Workshop 1: Identifying Key Issues in Statewide Water Planning

We live in the present, we dream of the future, but we learn eternal truths from the past.
- Madame Chiang

As for the future, your task is not to foresee it, but to enable it.
- Antoine de Saint Exupery

The government solution to a problem is usually as bad as the problem.
- Milton Friedman

THE REASON THAT EVERYBODY LIKES PLANNING IS THAT NOBODY HAS TO DO ANYTHING.
- JERRY BROWN

Where there is no vision, the people perish.
- The Bible

I have not failed. I've just found 10,000 ways that won't work.
- Thomas Edison

Those who plan do better than those who do not plan even though they rarely stick to their plan.
- Winston Churchill

Plans are only good intentions unless they immediately degenerate into hard work.
- Peter Drucker

When you're dying of thirst it's too late to think about digging a well.
- Japanese Proverb

Everybody's got plans... until they get hit.
- Mike Tyson

A good plan today is better than a perfect plan tomorrow.
- George S. Patton

IN DIFFICULT AND HOPELESS SITUATIONS THE BOLDEST PLANS ARE THE SAFEST.
- TITUS LIVY

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Statewide Water Planning

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Agenda

- 1. Introduction**
- 2. Overview of Water Planning**
 - **Historic**
 - **Current & Future**
 - **International & Ecological**
- 3. Work Individually—Name Your Chapter**
- 4. [Break & Voting]**
- 5. Work at Tables—Plan Press Release**
- 6. Work as a Group—The Way Forward**

Water Planning - Historic

Thinking Big! [video]

Examples of Previous Arizona Water Planning Efforts and Town Hall Recommendations Related to Water Planning

Summaries provided by Valerie Herman, Kelly Mott Lacroix, and Amy Stabler

Planning Efforts

Summarized here are eight large-scale, either regional or statewide, planning efforts that have occurred over the past 35 years. This is not intended to be a comprehensive list or summary of planning efforts in the state. It is merely a sample of what has come before.

Arizona State Water Plan Phases I, II and III (1975, 1977 and 1978)

The Arizona Water Commission, predecessor of the Arizona Department of Water Resources, published Phase I, *Inventory of Resource and Uses*, in 1975 to provide “physical and economic information” for planning and legislative efforts. It outlines the problems faced at the time and condensed current information into a format that was usable by the public. Phase II, *Alternative Futures* (1977), presents scenarios for growth considering water limitations. Phase III-Part I, *Water Conservation* (1978), proposes conservation options available to each water using sector.

Recommendations:

- Monitor statewide groundwater pumping.
- Measure return flows to the Colorado River.
- Educate the public on water issues.
- Clarify water law descriptions of beneficial use, reasonable use, and waste.
- Study feasibility of agricultural subsidies for farms using irrigation management services and tax credits for farmers replacing their irrigation system.
- Legislation to create replenishment districts.
- Low flow requirements on toilets sold, promote retrofitting programs, and city code revision for new buildings.
- Limitations on outdoor watering.

Arizona Water Resources Assessment Volumes I and II (1994)

Both volumes were produced by the Arizona Department of Water Resources in 1994 as a continuation of the efforts from the 1975 State Water Plan. Volume I, *Inventory and Analysis*, presents supply and demand projections for the 1990-2040 time period, as well as water management issues in each planning area relating to legal institutions and governmental frameworks.

Volume II, *Hydrologic Summary*, describes each planning area, the groundwater and the surface water quality. The sections discussing groundwater typically provide storage information, while the surface sections offer stream flow data within each basin.

Arizona Riparian Protection Program Legislative Report (1994)

The Arizona State Legislature passed Senate Bill 1030 in 1992 requiring Arizona Department of Water Resources (ADWR) to study riparian areas affected by groundwater pumping and surface diversions, and to develop programs mitigating effects on riparian systems while considering current and future water rights. The Arizona Game and Fish Department (AGFD) identified, mapped, and classified riparian areas throughout the state. The Arizona Department of Environmental Quality (ADEQ) identified activities on federal, state, and private lands that affect riparian areas. The report is divided into hydrological and ecological findings, case studies from the Upper San Pedro, Upper Santa Cruz, and the Verde Rivers, followed by regulatory strategies.

Recommendations:

- Additional stream flow data is necessary to accurately assess impacts.
- Hydrological data can be used to predict changes to riparian areas using ecological models.
- More vegetation-groundwater studies are needed, especially for systems at higher elevations. Vegetation-groundwater relationships can be used in models to predict limiting conditions.
- Water table requirements for plant establishment need to be determined for many riparian plant species.
- Modify pumping when indicator species begin declining.
- Establish riparian monitoring programs that continuously monitor groundwater, stream flow, and species interactions.
- Additional monitoring wells are needed that determine groundwater and surface water interactions.
- During the growing season and drought years, surface water diversions should be minimized to prevent riparian losses.
- Reference watersheds with various riparian plant communities could be used as an index to determine changes from modifications.
- Expand programs that monitor water quality, including salinity, nutrients, and heavy metals.
- Alter permitting systems to protect riparian areas by limiting groundwater pumping or surface water diversions.

Third Management Plans (2000-2010)

The Groundwater Code of 1980 requires ADWR to produce, implement, and enforce five, ten-year water management plans for Arizona's five Active Management Areas (AMAs) – Pinal, Phoenix, Prescott, Tucson, and Santa Cruz – with the goal of “promoting water conservation and the use of renewable or non-groundwater resources” to achieve safe yield by 2025 or earlier.

Each regional Plan provides an overview of the AMA's water resources and water use data (chapter 1-3), contains the regulatory programs and the decision-making criteria used to formulate them (chapters 4-10), and outlines future budget projections and conservation measures (chapters 11-12).

Regulatory programs, established by previous Management Plans, are continued via Agricultural, Municipal, and Industrial Conservation Programs, a Groundwater Quality Management Program, an Augmentation and Recharge Program, and a Water Management Assistance Program, whose details vary based on the specific resources and requirements of each AMA.

Verde River Watershed Study (2000)

The population in the Verde watershed has doubled in the past twenty years and is expected to continue growing. The increasing demand on their limited water supply will undoubtedly cause further aquifer overdraft. Produced by the Arizona Department of Water Resources, this study identified water resources within the Verde River Watershed and determined the need for further studies of current and future water supply impacts.

Recommendations:

- Monitor agricultural water use from all irrigation wells.
- Add more precipitation recording stations to improve estimations for the water budget.
- Improve stream data with additional gages and discharge measurements to improve recharge estimates.
- Monitor groundwater regularly through well levels to identify trends and fluctuations in storage.
- Conduct studies to determine evaporation loss totals.
- Improve the understanding of the groundwater system through geohydrological studies.
- Additional hydraulic data to help understand groundwater flow in the watershed.
- Develop a groundwater model to describe the geologic framework of the aquifer.
- Use an evapotranspiration rate analysis from the riparian vegetation in the watershed.
- Monitor baseflow at sites that are sensitive to change.
- Undertake a comprehensive planning effort that includes ADWR, community and county participants, private providers, irrigation providers, and developers to identify future necessary studies about water resources and impacts.

Governor's Water Management Commission Final Report (2001)

Review of the 1980 Groundwater Code and water quantity management in Arizona's Active Management Areas (AMAs). The Commission evaluated: progress toward meeting the goals of the 1980 Groundwater Management Act and the management goals of each of the AMAs; mechanisms to reduce groundwater mining and increase renewable water supply utilization; and if changes are needed in statutes, rules, or policies to increase the efficacy of water management in the Active Management Areas. The commission produced 50

recommendations in the categories of renewable supplies, allowable groundwater pumping, environment & economic issues, conservation, management goals, water resources planning and costs of water management.

Summary of Recommendations:

- Authorize enabling legislation for a multi-jurisdictional infrastructure financing authority to finance multi-jurisdictional water infrastructure projects that benefit a specified geographic area.
- Require that CAGR to establish a replenishment reserve to help secure water supplies for CAGR members and an enrollment fee for new subdivisions.
- Institute a phased-in “Mined Groundwater Tax” for certain municipal and industrial water users within the AMAs who currently have no obligation to use renewable supplies and require certain new municipal and industrial water users to use renewable supplies or replenish all of their mined groundwater over a period of time.
- Eliminate issuance of certain new groundwater permits or rights without a full replenishment obligation after 2025 (2040 in Pinal AMA).
- Change the exempt well statutes in the AMAs.
- Increase funding and responsibilities of the Arizona Water Protection Fund.
- Create a nonprofit cooperative association to coordinate effective water conservation, education and research throughout the State.
- Continue collaboration between local water users and ADWR to develop new programs to achieve the management goals in the AMAs.
- Fund the Rural Watershed Initiative program.
- Develop and fund a planning process for addressing the state’s future water demands.
- Prepare a periodic report on hydrologic conditions and progress towards meeting the goals of each AMA, and a separate biennial summary report of hydrologic conditions in the AMAs to the Legislature.
- Governor and the legislature should consider mechanisms to ensure ADWR has sufficient resources to carry out programs recommended by the Commission, to maintain current programs and to provide timely and quality technical assistance and water management planning for the State of Arizona.

Arizona Drought Preparedness Plan: Operational Drought Plan (2004)

Created in response to Gov. Napolitano’s Executive Order #2003-12 by the Governor’s Drought Task Force – a body of state agencies and elected officials advised by a Monitoring Committee and five Drought Impact Assessment Workgroups composed of key stakeholders and members of the general public – the Arizona Drought Preparedness Plan was the first attempt to develop a statewide drought strategy for Arizona.

Goals:

Identification – Five Impact Assessment workgroups considered drought vulnerabilities and possible impacts in their key government and economic areas: Commerce, Recreation and Tourism; Environmental Health; Watershed Management, Livestock and Wildlife; Irrigated

Agricultural; Municipal and Industrial; and Tribal Affairs. Findings, included in the Plan's appendices, were presented to the Drought Task Force.

Monitoring – The Plan created a permanent Monitoring Technical Committee of climate and water supply experts responsible for:

- Developing a set of “trigger” measurements to provide advance warning for severe drought conditions.
- Collecting technical data from existing State climate division stations and securing funding to develop a more comprehensive monitoring network.
- Creating an annual report for the Interagency Coordination Group describing monitoring activities, drought status, and recommendations for Plan revisions.

Mitigation – Overseen, led, and coordinated by the Arizona Department of Water Resources (ADWR), mitigation and response duties were delegated to the following newly-created bodies:

- The Interagency Coordinating Group – comprised of state, federal, tribal, and non-governmental organizations – directs state agency action pre-drought and drought mitigation and response actions, provides policy guidance to the Governor for plan implementation, and oversees plan review and modification.
- Local Area Impact Assessment Groups - county-level organizations that raise public awareness of drought conditions, provide information on local drought impacts and, upon consultation with ADWR, the implement of local mitigation or response actions as necessary.

Recommendations:

In general, recommendations from all bodies focus on increasing data collection abilities, improving and expanding future drought planning, and increasing public awareness. Some general recommendations include:

- Fund a Drought Coordinator, two staff, and a University partner to improve response and preparedness.
- Continue ADWR facilitation of coordinated water planning between counties, cities, and water providers.
- Legislative authority for ADWR to require potable water systems to file Drought Contingency Plans and all water systems to consistently provide relevant water supply information to ADWR.
- Assess the merits of an Assured Water Supply program in non-AMA areas.
- Establish a public website with drought information.

North Central Arizona Water Supply Study (2006)

In 1998, the Arizona Department of Water Resources (ADWR) organized a study to evaluate future municipal water demands in North Central Arizona. After reporting their initial findings, ADWR and local stakeholders requested technical support from the Bureau of Reclamation to conduct a regional water study to determine:

- Whether water demand would be unmet in the region by or before 2050,

- If at least one regional alternative existed to meet future demands, and
- Whether one or more of those alternatives could be carried forward into a Federal feasibility study.

Findings and Conclusions:

During the five year study examining the region's communities - population projections, demographic information, economic and social conditions, and technical data on current and potential water supply and use in each area – a Technical Advisory Group found that:

- Available surface water sources, including the main stem Colorado River, the LCR, and sources associated with the Three Canyons Project, are small and unreliable, with surface water rights either fully appropriated or under adjudication.
- Ground water from the region's four aquifers is the major source of public water supply in the study area and, over time, the growing demand areas will likely continue to develop these groundwater sources, often at high monetary expense and with adverse effects to surface stream flow and aquifer health.

The proposed regional alternative plans all included continued use and development of the region's groundwater resources, increased reuse and conservation measures, and often the transportation of additional surface water into the study area from outside sources. Because of the nature of the population centers in the North Central region, conflicts between Tribal and Non-Tribal communities on water supply development, use, and conservation measures add a further layer of complication to the formulation of the proposed regional plans.

Arizona Town Hall Reports/Recommendations

The Arizona Town Hall has addressed water issues in 1964, 1970, 1977, 1985, 1991, 1996, 1997 and 2004. Relevant recommendations from each town hall, with the exception of 1985, which was not available, are included below.

1. 85th Arizona Town Hall, "Arizona's Water Future: Challenges and Opportunities" (2004)

- Invest in further water literacy for Arizonans, with increased conservation education at the K-12 levels.
- Increase and facilitate interagency, interstate, state-tribal, and public-private communication and cooperation.
- Emphasis on the importance of local planning and flexibility, especially in terms of tools and conservation measures for non-AMAs.
- Develop a statewide water plan by the end of 2006.
- Give ADWR an expanded and more proactive role in water planning.
- Allow market forces to yield pricing that reflects long-term cost when possible. Pricing options that accurately reflects the scarcity of the resource were recognized as the most effective conservation tool.
- Focus on increased water recycling and use of effluent, more extensive water banking, and better watershed management and reclamation efforts, both for human and ecological uses.
- On the interstate and Federal level, Arizona should explore legal issues of water

exchange, examine the possibility of working with California and Mexico on desalination projects, negotiate with the other Colorado River Basin states to establish shortage criteria, and focus on expediting the operation of the Yuma desalination plant to prevent the delivery water to Mexico that cannot be charged to treaty obligation.

- Secure funding for critical water management, planning and infrastructure needs.

2. “Ensuring Arizona’s Water Quantity and Quality into the 21st Century” (1997)

- Arizona should expand water banking to prepare for future Colorado River shortages.
- Develop technologies that make efficient use of effluent, desalination, and cloud seeding to augment current supplies.
- Local communities should partner within hydrologic boundaries to work with the government.
- Water laws that regulate and manage regional challenges would be more efficient if handled by a bottom up approach.
- Legislative action that resolves disputes from the bifurcated system.
- Settle water right adjudications to improve management efforts.
- Improve water resource data, especially on groundwater outside of the AMAs, and compile a database on quality and quantity information.
- Determine if water quality standards are realistic based on risk and compliance costs.
- Conserve water through price structure alterations that discourage waste and allow the market to reflect the true cost of water.
- Increase effluent use through water credits and other incentives.
- Facilitate grey water system use.
- Settle American Indian water claims through congressional leadership.
- Locate treatment plants for cost effective use.
- Safe-yield is only appropriate for some AMAs.
- Monitor subsidence and target recharge where there is an impact.
- Water policy should consider riparian and environmental entities.
- Increase the level of coordination among governmental agencies and merge ADEQ programs into ADWR to improve management efforts.
- Improve coordination between data collections to reduce redundancy.
- Long term goals require public education to raise conservation awareness.

3. “Arizona’s Growth and the Environment - A World of Difficult Choices” (1996)

- Water conservation must be stressed.
- Overreliance on groundwater should be reduced.
- Full utilization of the renewable Colorado River water will help preserve our allocation.
- Modify regulations on reclaimed water use to recognize health standards and technology.

- Use wetlands to treat effluent.
- Use technology to make effluent potable.
- Remediation funds to address water contamination.
- New rural water uses need a water management policy.

4. “Preserving Arizona’s Environmental Heritage” (1991)

- Urban areas must “solve their own problems through, for example, the retirement of agricultural lands.”
- High CAP costs tends to increase groundwater pumping, but the renewable source needs to be substituted.
- Protect stream flow for fish and wildlife.

5. “Arizona Water: The Management of Scarcity” (1977)

- Additional information is necessary to determine the extent of water availability.
- Methods for utilizing water supplies include drainage control, suppressing evaporation, controlling seepage, desalination, weather modification, water recycling, improving irrigation, conservation education, and exploring new sources.
- Encourage conservation with water rate structures.
- Desalination is a potential water source in Arizona.
- Investments for research and development of technologies that reduce water problems should be made.
- Conservation methods through education and economic incentives are preferred over mandates.
- Consolidate responsibilities of the numerous agencies to coordinate water policy for the state.
- Indian claims should be settled by the federal government.
- The federal government should clarify its water policy and reserved rights.
- All sectors of the public should participate in a comprehensive system for water management.
- Inter-basin and interstate transfer projects should be investigated to help alleviate groundwater overdraft.
- Impose penalties for water misuse, limit decorative uses, consider taxation, and improve the “reasonable use” definition.
- Establish either a single water authority for the state or locally controlled hydrological districts. In addition, create a water court and a permit system for pumping groundwater.

6. “Preserving and Enhancing Arizona’s Total Environment” (1970)

- Concerning water pollution, the State Health Department should review sewage disposal regulations.
- Prohibit non-biodegradable detergents and encourage the use of returnable containers through legislation.
- Create a water commission to research and develop a “total water plan thereby coordinating the Federal, State and local agencies.”

- Recycle water when appropriate.

7. “Arizona’s Water Supply” (1964)

- Water supplies within the state were insufficient to meet demand at the time and watershed management was inadequate.
- All sectors should conserve.
- Expedite studies on legal, hydrological, and engineering issues.
- No solution for Mexico’s salinity problem should be proposed that would provide them with water in addition to the treaty allocation.
- Groundwater shortages and depletions existed in “most sections of Arizona.”
- Practically all surface water had been appropriated and there were indications for further control through groundwater code restrictions.
- Conversion from agricultural to municipal use is only a temporary solution to water shortages.
- Even after proposals and projects are completed, including the Central Arizona Project, there will still be a water deficit. Research on “the processing of saline water as a future solution to the regional water problem” should continue.
- Emphasize multiple use watershed management to improve water yield.
- Control salt cedar, water transportation and seepage losses, and control evaporation from surface waters.
- Irrigation conservation practices such as lining ditches, proper timing, water reuse, improved leveling, short-row irrigation, low water use crops, and sprinkler irrigation.
- Create permanent water conservation committees in each community for planning.
- Effluent resources need attention.
- Artificial recharge and storage challenges.
- Water harvesting large scale pilot projects.
- Evaporation suppression techniques.
- Coordinate state water resources through an organization that analyzes efforts done throughout Arizona and other states to centralize water functions.
- The Central Arizona Project was the primary focus for alleviating water problems.

Water Planning - Current



Public Policy Review

By Sharon Megdal

Now's the Time to Fit Together the Pieces of an Arizona Water Plan



Over time, I have become more and more convinced that Arizona needs to do a better job of planning for our water future. We face water challenges within and outside of the Active Management Areas. I suspect no person knowledgeable about our complex water issues would deny we face challenges associated with growth and limited water supplies. Significant uncertainties abound, including

those associated with flows of the Colorado River.

A recent survey suggests that Arizonans recognize water as a major issue needing investment. The Center for the Future of Arizona's Gallup Web survey of 831 Arizonans asked that they prioritize six options for the best use of their tax dollars. The greatest number of respondents (28 percent) chose: "Adopt a water management plan that protects water supplies for the entire state." Rural areas and small cities registered greater support for water management planning than other sectors, at 28.7 and 29.6 percent respectively. Otherwise, little difference existed in the opinions by geography, attachment level, or age when it comes to water.

The next most popular policy option (21.5 percent) was "balancing population growth with preserving open space and recreational opportunities." Other options included mass transit systems, new highways and roads, improved interstate transportation and high speed Internet. Admittedly, survey results merely suggest what policies or investments citizens are likely to support

in the future. Results clearly depend on the structure of the survey instrument itself. Nevertheless, they suggest that citizens recognize the need for investment in water infrastructure.

What do I mean by water planning? I recently responded to this question by stating that I would begin simply by identifying (1) what water needs have been identified by jurisdiction/water provider; (2) which entities may be looking at the same water sources (such as the Colorado River); and (3) where economies of scale could be realized for infrastructure investments. It was suggested that I call the exercise a "Needs Assessment" rather than a "State Water Plan." I have no problem with that; that is exactly what I am suggesting we do. One has to know the needs before one can identify the solutions.

So, by all means, let's get people together to talk about their needs and see where solutions overlap. Let's engage in a sustained discussion — in other words, we don't go home after collecting data — about water sustainability in Arizona. Let's discuss the water needs of current and future residents, agriculture and industry (including energy), as well as water needed to support the environment. Let's also talk about issues that may not be on the horizon for many of us. For example, the May issue of *Southwest Hydrology* iden-

tified carbon sequestration as an issue. What if efforts to sequester carbon in deep aquifers limit our future ability to use aquifers? Very few experts are discussing the treatment of poor quality groundwater as well as efforts to sequester carbon.

The Arizona Department of Water Resources has worked long and hard to collect the data presented in its water atlas. We need to take a collective look at that data and see what additional information we need to gather. We need communities throughout Arizona participating, much as they do with transportation planning.

Resources necessary to support a needs assessment, however, are limited since Arizona is cutting agency budgets. This makes it difficult to carry out existing tasks, let alone take on an assignment as significant as a statewide needs assessment/planning exercise. But all the work does not have to be done by ADWR. If we put our heads together, we can perhaps come up with a strategy involving the universities, and loaned executives from local governments, water agencies, industry and non-governmental organizations.

Arizona Cooperative Extension will be visiting some of Ari-

zonia's communities to conduct water listening sessions. County Extension and campus personnel will listen to communities' questions and concerns about water. This winter, we will host a visit by the director of the Oklahoma Water

Megdal on Blue Ribbon Panel

WRRC Director Sharon Megdal has been invited to join the Blue Ribbon Panel on Water Sustainability, established to provide advice to the Arizona Department of Water Resources, Arizona Department of Environmental Quality and the Arizona Corporation Commission. A prime task of the multi-agency collaboration will be to focus on increased water conservation and water recycling.

Resources Research Institute to hear about their participation in Oklahoma's water planning. At the WRRC, we recently received a grant from the Nina Mason Pulliam Charitable Trust (see page 3) to assess methods used to quantify the water needs of the environment, which will enable us to work more closely with stakeholders currently involved in this important work. Numerous stakeholders, including those outside the three-county Central Arizona Project service area, are participating in the ADD water process. Future needs of water providers and Central Arizona Groundwater Replenishment District are being considered. The Arizona Investment Council funded a study of water-related infrastructure needs that is posted on its web site.

The point is that many pieces of the puzzle are already being assembled. What we need is an overlay to bring the parts together for a comprehensive look at water and water-related infrastructure needs.

I continue to use the half-full, half-empty glass to summarize our water management situation. Some may say we cannot afford to undertake a needs assessment/planning exercise with the economy in a slump. Knowing that growth and prosperity will return to Arizona, I can only ask the question: Can we afford not to?

International Water Overview
Madeline Kiser
State Water Planning Session
Water Resources Research Conference
“Creating New Leadership for Arizona’s Water and Environment in a Time of Change”
June 10, 2010

I. I’d like to start by sharing poems from my students, teens and adults in jail and detention who were asked to write about water these past weeks. They mirror a global shift underway -- away from a central focus on engineered water solutions and a public expectation of “Somebody Bring Me Water from Somewhere”--towards holistic or integrated water management, and a new global water ethic and citizenry.

Water Poems by Men Incarcerated in the Pima County Jail

1.

The Colorado River
Doesn’t reach
The ocean
Because of our
Demands on it.

So we pump
The Mississippi
West.
What happens
When the Mississippi
No longer
Reaches
The ocean?

2. I would like to start off by saying that this [learning about water in a changing world] is an eye-opener for me. I live in an apartment complex that has eight pools and four Jacuzzis. We also water the grass like three times a day. I even sometimes take two showers a day and wash my truck just to get it dirty to wash it again. I feel that with more information on the waste of water we could all make a little change and make a big difference. So if you are like me and you waste as much as I do then we can make a change and give our future generations a better life *with* water!

3. *Many generations have lived with water, not only of people, but of animals and plants. Let’s think for a second what we’d do if we didn’t have water. Without water you wouldn’t see the river run, you wouldn’t be able to see the trees grow with this life they need, water wouldn’t run with so much pride by way of the rocks and gullies, with incandescent sounds. Water gives life and pride to whichever beings it runs through, in lakes, oceans and houses where water descends and rests so you can enjoy it, not only you or I, also the soul of grasslands, the plants and trees that need*

water. Take care of water, also a kind of being, that with the generations grows as if it were a life we don't know when it began.

II. Googling Integrated Water Resource Management brings up uncountable listings pointing to decades of work involving grassroots movements, and government, institutional and legal changes. But at center of all this, there is this characteristic, as these students said, of living WITH water.

So at the risk of simplifying too much, the areas of the world that are getting traction on creating sound water policy in a time of change, whether through state plans or other tools, share these traits:

1. Together, the public, policy makers and the press articulate with NEW CLARITY that this is a NEW MOMENT in human history, brought about by the convergence of climate change, stressed ecosystems, population growth and other factors. In a recent blog posting about Australia, water expert Peter Gleick states:

“It wasn’t until the drought had cost the Australian economy more than A\$20 billion ...caused electricity blackouts because power stations were forced to shut down production for lack of cooling water, before –finally – there was sufficient will on the part of the government and public to act. Where political will is strong, action can be swift.”

The crisis and a sense of urgency led to: “regulatory reform, steep increase in the price of the resource to correspond with its value, investment in new infrastructure and (critically) a powerful and highly visible public awareness campaign. The response was unprecedented and would have been unimaginable just a few years earlier.”

The main point is that it is proving hard globally to get traction on water issues – to create needed political will and shared purpose, i.e., to carve out a few clear ways forward, vs. 100 -- without clarity about this new moment, and a sense of urgency. And it’s better to act sooner than wait until a crisis forms.

2. Second, matching this new clarity about this moment, sound water management in a time of change reflects a NEW ETHICS about how we need to live with land and water. It puts forth a Bill of Rights, of sorts, for nature, people, and future generations. A growing number of countries are changing their laws to grant the right to water FIRST to the environment and people. This isn’t to say that the rights of other sectors aren’t hugely important, rather, to affirm something out of children’s storybook: If you want the golden eggs, first, you have to take care of the goose. In the long run, a degraded environment can’t provide for our grandchildren – or for the houses they’ll live in and jobs they’ll hold. This NEW ETHICS reflects a 180 degree shift away from “wedging needs for environment into water budgets,” to stewardship as the cornerstone of water planning.

Without it, it’s proving difficult to consolidate multiple projects and visions: like running a country without a Bill of Rights.

3. And finally, with new urgency in mind, and new ethics to match, NEW WATER ACCOUNTING – evaluating the triple bottom line costs/benefits of altering any ecosystem – takes center stage of sound water planning in this new age. Eliminating a wetland won't just reduce fish species and the jobs of fisherman. It will cost millions of dollars for business, industry and cities to pay for a water filtration system that does what nature did for free.

The result of NEW CLARITY, NEW ETHICS, and NEW ACCOUNTING, are the following:

NEW COMMON GROUND is slowly being carved out by groups that have sometimes found themselves to be adversaries – business, agriculture, cities, environmentalists – who come to embrace that simple child's story: Want Eggs, Care for Goose. And the haves and the have nots, especially the environment, are brought to the table on more equitable terms. It creates the perfect lose/lose situation. Everyone has to give up something. Every river can't be returned to its pristine state. But the quiet side of the ledger – the full costs of that altered wetland – begin to be measured fully, articulated, and understood. One important side effect is that collaborating about water can spill over into other civic debates. Trust creates trust

And NEW PUBLIC ENGAGEMENT is becoming possible, and NEW POLITICAL WILL. Having a new sense of urgency, a new ethic to follow, a new way to measure the tradeoffs between leaving in tact and altering aquatic systems, is helping streamline and prioritize multiplicities of water debates and projects, in effect creating an on-ramp for the public – ways to meaningfully support creating and implementing sound water policy.

I wanted to raise all this before the exercises which will follow, in order to ask:

- Do we have clarity about the urgency and singularity of this new moment?
- Do we have an ethical north to guide our efforts, and allow us to prioritize and streamline our actions?
- Do we have an effective way of measuring the triple-bottom-line costs of what we're choosing, and communicating them to the public?

Exercise 1: “Name Your Chapter”

You have been given a chance to write a chapter in “The Plan”
What is your chapter title & description?

Be creative!

Complete List of Proposed Chapters:

Conservation

A desert ethic: Water planning that accounts for individual action; household reductions in water use; a changing water ethic-a desert ethic-that prioritizes/values less consumption. Socially-acceptable water conservation practices; socially-unacceptable water waste. Reframing access to excess. (Individual, municipal, commercial)

Ad valorem tax finance solutions for water conservation: The trajectory of voluntary water conservation is inadequate to the challenge of meeting the water needs of an Arizona with ten million people. Mandatory plumbing retrofit programs, mandatory graywater reuse (for both new construction and existing construction), instantaneous water heaters, water harvesting measures, and the like, will benefit everyone and should be paid for by everyone.

Wasteful water practices awareness and SMART water education: Volunteer programs and organizations to teach the general public about ways to reduce their water “footprint” and community outreach.

Water conservation – why do it: A discussion on why water conservation should be a major priority in statewide water planning. Enhancing capacity for drought and the environment by using water smarter. Discusses implementable solutions to save water now.

Economics/Funding

Crisis management: The steps that will be taken to address limited water supply and pricing strategies that will rear proactive strategies which will meet the needs of our state.

Developing market pricing for AZ water: Water prices that accurately reflect the true scarcity of the resource is a very powerful tool to create “conservation ethic” that historical planning efforts have stressed. This chapter focuses on the extent to which such a system is possible and how it would impact allocation equity between “have and have-nots” stakeholders.

Economic values of water in the natural environment: An economic analysis of the state decision-making process, looking at the value of water in Arizona. Water managers agree to adopt key actions to ensure the economic and aesthetic values of water will be given equal values of water will be given equal consideration in statewide water plan implementation.

Project approval: No water or wastewater project/program can be approved until the economic, social, and environmental issues have been addressed/identified. Done within context of the

applicable watershed and groundwater basin(s). Must consider the TBL of at least 2 alternatives. Funding provided through rates.

Secure water management and regulatory funding: Promote autonomous funding for appropriate agency/organization to remove long term regulation planning and water management from short term budget issues. Example: gas (water) tax; small sales tax (capped), agency (ADWR, CAP, SRP, user association).

What happens when we stop building: An exploration of Arizona's economic dependence upon an economy of growing water consumption and what happens when the limit is reached.

What is the value of water for energy: With what mechanisms and forums do decision-makers account for and allocate and businesses obtain water (ground and surface) for generating various sources of energy?

Who gets credit: An examination of potential and existing strategies to apportion costs and benefits of water reuse, groundwater recharge, and other water infrastructure among different municipal and/or private utilities.

Environment and Water Needs

Environmental water needs – isn't it about time we consider them: A long overdue investigation and assessment of the water demand and use of environmental systems, with a particular focus on riparian systems.

Percent for wildlife and habitat: Provide a percentage of all un-appropriated watersheds for wildlife purposes. This includes allowing a beneficial use for habitat conservation, restoration and enhancement. Re-appropriate forfeited/abandoned rights to wildlife management agencies or conservation entities in partnership w/ water management industry.

Talking care of the goose so we still get the eggs: 1) Analyzing the ecological health of the rivers and aquifers nature itself, our children, industry, agriculture depend on 2) Measuring the environmental, social, and economic costs and benefits of continuing to use them the way we do.

Tools to fund protection and enhancement of riparian, watersheds, and natural sources of water: Identify which tools like water banking, creation of water funds, caps on groundwater withdraw using market-based exchange of existing uses, leaving water for in-stream flows, cooperative land management incentives, can be used in which areas to protect and enhance riparian.

Outreach

Engaging the public – Getting your neighborhood and grandparents to adopt water conservation practices: A step-by-step guide for communities to reach every constituent, inform them about the need to conserve water, offer solutions and incentives for conservation practices, and a system to track water savings. Oh, and maybe some conservation mandates.

Get the word out: A plan to educate the population, change attitudes, and create the political will

necessary to implement the changes needed to protect and conserve our future water supply.

Persuasive planning through persuasion, education, and outreach: Need an effective education and outreach effort that persuades people to actually change their behavior. Must be strategic with that goal in mind not enough to do an “information dump” on the public that does not result in changed behavior (conservation, supporting water-wise policy, etc.)

Sell it as a public health issue: Community members to understand the health risks they face as they become ever more dependent on a limited water supply. There needs to be community development and improvement areas where water quality and quantity is the most threatened. Through the lens of social justice and distributive equity the community, scientists, and decision makers may have an easier time selling the idea of conservation and working together.

Stakeholder input: Communities; public; and other stakeholders input related to water issues of concern for their county and state will be collected, considered, and incorporated in the planning process.

Who’s at the planning table? An exploration of the stakeholders necessary to engage for successful development and implementation of an integrated, long-term water management plan, including those who can and cannot come to the table themselves.

You do not know the value of your water until your well runs dry: As a policy maker, I am fact driven. The data is there but action is slow to come. Meeting after meeting more ideas come up but the agencies are slow to act. Money is not there. We must come together, leave our egos at the door, and create solutions, not just ideas. How are we going to get there? We can not conserve our way to safe yield.

Water Re-use

Study of re-use of municipal water in urban areas in AZ: Evaluation/feasibility of available water resources for groundwater recharge, reuse or development of wetlands water purification in all urbanized area in all Arizona towns with populations above 50,000 residents. Identify areas where water resource efficiencies can contribute to conservation and water quality. Prioritize new programs based on the potential for conservation and feasibility of implementation.

Water reuse: Need to look at how to reuse the water we have, the psychological impediments (you factor), biological impediments (ampicillin resistant bacteria) and biochemical and chemical issues (PCPs and endocrine disrupters) as well as legal issues (a 3rd type of water?). How will it be fed into existing water systems (natural and human)?

Water Supply and Demand

Achieving sustainability: No more studying the issue. This chapter identifies the top fifteen steps that must be taken in the state to achieve a sustainable water supply for the environment, urban, and rural communities, agriculture, and industry. Importantly, this chapter also sets forth how these steps will be accomplished.

Appropriate water demand for a desert society? Water supply in Arizona is unpredictable at best. This chapter discusses whether Arizona's water demand truly reflects the state's water uncertainty; can we get away from the mentality of the oasis in the desert by comparing and contrasting water use as a whole and per capita water use to similar and differing regions (climate wise). How must we change?

Baseline streamflow data: Preserve and enhance Arizona streamflow monitoring network. As a fundamental priority, the state of Arizona must maintain its cooperative funding arrangements with the USGS.

Basic water budget planning: Formulate (sustainable) standardized equation that must be met; considering: 1) population, 2) business, industrial, and energy, 3) agriculture [our food – how much do we outsource], 4) environment [riparian and species survival].

Balancing river water among agriculture, human development, and ecosystem: At present we are not able to find the balance of water use among the agriculture, human development and ecosystem. We need to find the limit and manage our water sources so that we can divert river for agriculture and human development but it should also support river ecosystem. With climate change these in going to be less water available but demand in going to increase. So, we need to find this balance.

Critical basin assessment: Statewide assessment of groundwater basins based on available data – looks at long term and short term declines and rises, inflow and outflow, natural and artificial recharge, total demands, both current and future projected. Also considers current infrastructure and how this does or does not fit with future demands. Based on these criteria, a value is assigned and a status is given. Critical groundwater basins would then be priority in planning and efforts.

Current water supply and demand quantifications: A compilation of the most recent data available on supply and demand in a standardized format. Additionally, use of models will fill the information gaps as assumptions.

“Fuzzy Math:” A description of the ways in which we account for the physical and legal character of water. Includes an explanation of water budgets, water rights, and “paper water.”

Please note-results may vary, or when the average of function is not the function of the average: Water availability may vary in space and time over many scales by even orders of magnitude. Moving beyond planning for a world of averages, how does the variability itself shape water needs and responses of people and of our environment.

Protecting our values and securing our future: Quantify current and future (50 years) needs and opportunities, both surface, subsurface, and its interface, by HUC where populations exist, including the impacts and needs of the greater basin(s) it shares, including environmental needs, quality of life, and climate changes.

Right water for the right use: Arizona has many water supplies – surface water, groundwater, and impaired waters such as effluent, brackish groundwater, and remediation waters. Each source has uses that are more appropriate and sustainable. Think it out.

The status of Arizona's Aquifers: 2010- This chapter includes information in hand about aquifers throughout AZ and identifies gaps. It includes projections for what is expected to happen to water in storage over the next 100 years plus. The information provided should help us gauge what will be there for the future-or the rate at which we are depleting groundwater.

Other

Many small steps: A summary chapter that describes in order the measurable, achievable, actionable pieces that will lead to complete plan implementation.

Problems and opportunities: Illustrating the opportunities that will exist to solve “other” problems in the process of identifying water problems and developing solutions. (Typically thought of as an unrelated to water.

Water defines humanity: Lets us jump into the pool. The water is wet and will if justly management satisfy the basic human senses and needs. History, economic, law, tradition, and technology effect the splash...

Water justice: As society plans for its water needs, it has to keep in mind that anything that it plans to must be something that is the “right thing to do.”

Break & Vote

Participants were asked to place a “shape” sticker on the four chapters they would most like to read and to use their “banana” or “monkey” stickers to vote for the most clever

Winning Ideas:

First Place for both most clever and like to read

Achieving Sustainability

No more studying the issue. This chapter identifies the top fifteen steps that must be taken in the state to achieve a sustainable water supply for the environment, urban, and rural communities, agriculture, and industry. Importantly, this chapter also sets forth how these steps will be accomplished.

Other Popular Ideas:

- Stakeholder Input
- Secure water management and regulatory funding
- Developing market pricing for AZ water
- Project approval
- Value of water for energy
- Tools to fund watersheds and protection
- Engaging the public
- Conservation
- Water reuse

Water Buffalo [video]

Exercise 2: Plan Press Release

It is 2015, and “The Plan” is complete. Working as a table, write a press release announcing this major accomplishment

- What is in your Plan?
- How is it different from previous efforts?
- What would change as a result?

Press Releases

Mad Lib Press Release

This Plan is the culmination of 4 years of fabulous, but sometimes expletive deleted work, including 300000 hours of meetings held in good conference rooms. In the process, the participants consumed a staggering amount of wine and chocolate. The key breakthrough came at our Grand Canyon meeting, and would not have been possible without the assistance of Einstein, Cher, and particularly, Bruce Babbitt.

We are committed to making this a living document, even if it requires an appendectomy, \$99 million in cash, and the personal intervention of Nixon and the Dali Lama. The ongoing financial support from BP and Water for People is a great assistance, as is the unexpected endowment from the state of Alabama.

The Plan authors wish to acknowledge the helpful role that water resource planners from Benson and Jerome played, but without question, this Plan benefitted the most from the practical and highly relevant policy suggestions from the sweeet researchers at the University of Arizona!

New Water Plan ROCKS Grand Canyon State

Associated Press. June 9, 2015.

In an unprecedented historic bipartisan vote, the Arizona State Legislature unanimously approved a new statewide water management plan that will protect Arizona's precious water resources. This historic agreement is a result of the persistent drought conditions which has resulted in a drastic reduction of Arizona's water supply including total curtailment of CAP flows into the state and extreme reservoir depletion. Economic impact from recent water shortages has caused the housing market to crash below 2007 levels, mining industry has outsourced to china, and agricultural production has ceased with fallowing of fields to divert water to thirsty urban areas. Beyond impacts to local water supplies, environmental impacts also have resulted in the extirpation and listing of all of Arizona's native fishes and other aquatic species.

President Ted Nugent declared a state of emergency requiring that all future uses of water be approved by the new state water board. The unanimous decision by the State of AZ is a desperate attempt to revive flowing rivers, recharge aquifers and restore Arizona's economy. It required events of this magnitude to finally bring Arizona's legislators to this position of consensus.

The plan will mandate the daily domestic use to 50 gallons per capita per day for Arizona's 10 million residents. The plan will also lay out a strategy for funding mechanisms where the state will prioritize the importance of water, including beneficial uses that balances water uses between the environment and domestic, agricultural, municipal, and industrial uses.

Arizona Water Management Act of 2015

The Office of the Governor announces the completion, acceptance and first stages of implementation of the 2015 Arizona Water Management Act.'

ADWR is tasked with implementation of this plan.

Governor Megdal took time out of her busy schedule of restocking Gila trout along Raspberry Creek to commend the marathon efforts leading to this moment.

This plan incorporates every significant issue of water management, quality, sustainability and regulation throughout the State.

This watershed-based plan incorporates the needs of both urban and rural areas of the state and every community is required to implement 20% water conservation measures. Unlike previous plans, this plan promotes and priorities sustainability, accessibility, conservation for societal and environmental waster needs. IN particular, the Plan restores perennial streamflows to pre-statehood levels.

Funding of this plan will be staged through a market-based pricing mechanism founded on the sales tax of bottled water sales. This funding mechanism is bolstered by the constitutional amendment requiring perpetual funding of ADWR at 2005 funding/staffing levels.

Last, the plan incorporates water concerns of Arizona's neighbors in New Mexico, Californian Nevada, as well as Mexico.

Benevolent Water Dictator Was the Answer We Were Looking For

By: Shaun McKinnon

The implementation of a statewide water plan 7 years ago has been declared successful by the State Legislature. Proponents of the plan have attributed it to strong community buy-in, transparent communication, the elimination of over 75 independent water planning entities, and the appointment of a water Czar. Outcomes of the plan have included the establishment of a water justice system that resulted in fair water pricing that is affordable and predicable long into the future.

Governor Hendricks declared, "Arizona is open for business. I'm proud to have been involved in helping Herb Guenther get appointed as Water Czar under former Governor Megdal's administration. His unlimited power and authority to implement the plan has yielded a sustainable water future that allows for economic development, enjoyment and protection of our wonderful and unique wilderness, and the continuance of agriculture that is important to Arizona and the entire U.S.

The impetus for the plan was the devastating earthquake 5 years ago that forced the Colorado River to go subterranean, evaporating all previous plans, water rights, and

contracts for water in Arizona. Borrowing from the lessons learned by the Australians when their main source of water, the Muray Darling River all but disappeared as a result of a sustained drought in the early 2000's, this plan was unanimously approved by the State Legislature four weeks after the earthquake.

Arizona has now become the world leader in the production of medical marijuana and geothermal energy. "We definitely turned lemons into lemonade," said Governor Hendricks at a recent West Valley Democratic Women's Tea. Governor Hendrick's comments reflect how the water plan now requires for high dollar crops like medical marijuana instead of low dollar crops like cotton and alfalfa, and the fact that the subterranean Colorado River is superheated by the earth's core. Many scientists are now attributing the recent global cooling to the mass production of the marijuana from Arizona.

The plan has resulted in the availability of vast amounts of water through implementing and applying the triple bottom line approach. Czar Guenther has on numerous occasions stated that we now have enough water for 12 million people and \$3B worth of new industry and commerce, all without the deployment of the Arizona Navy.

Any questions? www.waterczar.az.gov.

Press Release: Arizona Water Plan

PHOENIX, ARIZONA—The Arizona Water Plan, an innovative, ground-breaking report is now available. A collaboration among water planners, conservation organizations, urban developers, agriculture, industry, and many citizen stakeholders from all around the state, the Arizona Water Plan charts a path to achieve sustainable water use for the entire state of Arizona. Unique in its newfound collaboration between state and local level stakeholders who developed a vision for water sustainability, the input ensures this report is nothing like has been produced before. The blend between state-level guidance and locally driven ideas ensures that this document is not a "one-size-fits-all" approach. To secure Arizona's water future, this guide outlines a process for state-wide funding source(s) that ensures an equitable contribution from all water users in the state. The funding ensures that long-term planning is not tied to the ephemeral budget issues of the state legislature. This plan outlines our "ethical north," recognizing the inherent connection between humans and the environment on which we rely, and the fundamental need for access to safe water. We recognize the value that ecosystem services provide, and the needs of the traditional water users. By recognizing the economic, environmental, and social components of Arizona water issues, the Arizona Water Plan ensures that the water users of Arizona are no longer fighting, but working together for a brighter, secure future in Arizona.

Arizona's water future secured

After 5 years, and thousands of hours of effort by people across Arizona, the definitive plan for Arizona's water future is complete. The process brought together water users, government agencies, and the development community, giving the plan broad and unprecedented support.

This broad support has helped bring funding sources to the table to begin the implementation of the plan in 2016. The plan includes aggressive conservation and reuse efforts, a balance of regulatory and voluntary actions, a recognition of all water user needs including the environment, and for the first time, a recognition of the connection between water and energy.

Implementation of the plan will eliminate overdraft and replenish groundwater aquifers, restore riparian habitat, maximize reuse and conservation and it will eliminate the need for water importation projects in the foreseeable future.

The participants hammered out a method to provide for environmental needs and to share shortages fairly within the existing water rights structure and considering climate change and the effects that might have on existing water sources. The plan will also provide for orderly growth, urban and rural residential and business uses, recreation uses, and tribal development.

The sustainability of Arizona's future will be assured by implementing the carefully crafted principles embodied in the plan.

Arizona Water Plan

Components:

1. Broad stakeholder and political support
 - a. Energy/industrial
 - b. Tribal
 - c. County municipal
2. Water Budget
 - a. Conservation
 - i. Industrial
 - ii. Wastewater
 - iii. Reuse
 - iv. Commercial
 - b. Groundwater
 - c. Surface water
 - i. CAP
3. Legislation necessary for the Plan

- a. Funding (long-term)
- b. Tax resources
4. Sustainability
 - a. Agreement with room for modification
 - b. Demand (how is it allocated?)
 - c. Defined and accepted
5. Technology Research
 - a. Continuing studies
 - b. Funding

Final Comments and Thoughts...

- Place Arizona in a context with other states, before hitting the wall. Refine our own thinking.
- Maybe we only make drastic choices when drastic things happen.
- Watershed structure, groups need to come together for efficiency.
- We are missing water providers here at the conference. What isn't happening is an interest bubbling up, why don't water providers want water planning?
- In terms of leadership, requires individual efforts and connections to get more people going.
- Sense of fierce independence by providers, they would feel that they would lose something with planning. (Referring to Prescott-area issues.)
- Feeling from larger water providers-they have an assured water supply. The small water providers don't feel protected and need advocates and guidance.
- Devote more time to population issues.
- Tremendous work done by the water oversight committee. Work put into the compilation of data and reports. All meetings were recorded and are available online. Climate change and the Colorado River information are available. We will never have all the data, but you have to come up with something.
- Social, ethical, and moral issue-what is the carrying capacity?
- Data and capacity for putting things together-the AZ water atlas. As a collective group, we may be able to do more. Open letter to the governor/legislature about the loss to the state and the potential loss of continuity regarding ADWR. A grass roots effort.
- It takes all the different sectors to come together.
- Psychologists, communications specialists, and PR people are absent from these conference planning efforts.

Roundtable recommendations for state water planning

Roundtable recommendations for state water planning fell into five categories:

Economics

- Water price must reflect the true cost of water production in both the short and long term. Market price versus regulated price.

Collaboration

- Community involvement.
- Develop collaborative skills and stakeholder understanding.
- Institutional channels for meaningful participation, by a public that has benefited from prior educational efforts and seeks involvement.
- Encourage collaboration between individuals and agencies with diverse perspectives.
- Statewide planning should be a multidisciplinary effort. For example, scientists should focus on communicating with policy makers and communities and vice versa.
- Creation of a venue to allow grassroots organizations access to resources and decision makers.
- Instead of continuing in the litigation cycle, explore a new institutional culture of mediation.

Legislation

- Need for measures to preserve agriculture systems in rapidly developing areas. Defining agriculture's future in Arizona may help with this goal.
- Recognize and act upon the need to educate politicians and policy makers about community water needs and values.

Resource Allocation Dichotomies

- Significant conflicts exist between CAP water receivers and those without access, urban and rural resources, AMAs and non AMAs, and human versus environmental needs in Arizona. Without addressing these gaps, no comprehensive state water plan can be viable.

Implementation Tips

- "Agencies must have vision-good if vision is mandated and consistent."
- Agency should seek consistent funding from diverse sources.
- Technical function of agency must be credible with results that are trusted (increased transparency).

Planning Quotes

Most plans are just inaccurate predictions.

- Ben Bayol

An evil plan does mischief to the planner.

- Hesiod

Where there is no vision, the people perish.

- The Bible

Always have a plan, and believe in it.

Nothing happens by accident.

- Chuck Knox

You can never plan for the future by the past.

- Edmund Burke

Planning is bringing the future into the present so that you can do something about it now.

- Alan Lakein

Always plan ahead. It wasn't raining when Noah built the ark.

- Richard Cushing

Life is what happens to you while you're busy making other plans.

- John Lennon

If you can dream it, you can do it.

- Walt Disney

For every complex and difficult problem, there is an answer that is simple, easy, and wrong.

- H. L. Mencken

Plans are only good intentions unless they immediately degenerate into hard work.

- Peter Drucker

No plan survives contact with the enemy.

- Field Marshal Helmuth von Moltke

I have not failed. I've just found 10,000 ways that won't work.

- Thomas Edison

A good plan today is better than a perfect plan tomorrow.

- George S. Patton

Mix a little foolishness with your serious plans; it's lovely to be silly at the right moment.

- Quintus Horatius Flaccus

It takes as much energy to wish as it does to plan.

- Eleanor Roosevelt

The government solution to a problem is usually as bad as the problem.

- Milton Friedman

Reduce your plan to writing. The moment you complete this, you will have definitely given concrete form to the intangible desire.

- Napoleon Hill

The best way to predict the future is to invent it.

- Immanuel Kant

It's not the plan that's important, it's the planning.

- Dr. Gramme Edwards

In the long run we are all dead.

- John Maynard Keynes

Plans are worthless. Planning is essential.
- Dwight D. Eisenhower

Long-range planning works best in the short term.
- Euripides

As for the future, your task is not to foresee it, but to enable it.
- Antoine de Saint Exupery

A plan which succeeds is bold, one which fails is reckless.
- General Karl von Clausewitz

Those who plan do better than those who do not plan even though they rarely stick to their plan.
- Winston Churchill

The reason that everybody likes planning is that nobody has to do anything.
- Jerry Brown

Think ahead. Don't let day-to-day operations drive out planning.
- Donald Rumsfeld

We always plan too much and always think too little.
- Joseph A. Schumpeter

When you're dying of thirst it's too late to think about digging a well.
- Japanese Proverb

Just do it.
- Nike

If it's planned, it's boring.
- Freddie Mercury

We live in the present, we dream of the future, but we learn eternal truths from the past.
- Madame Chiang

Good plans shape good decisions. That's why good planning helps to make elusive dreams come true.
- Lester Robert Bittel

You got to be careful if you don't know where you're going, because you might not get there.
- Yogi Berra

It's a bad plan that admits of no modification.
- Publilius Syrus

Let our advance worrying become advance thinking and planning.
- Winston Churchill

According to my calculations the problem doesn't exist.
- Anonymous

In difficult and hopeless situations the boldest plans are the safest.
- Titus Livy

Just because something doesn't do what you planned it to do doesn't mean it's useless.
- Thomas Edison

Everybody's got plans... until they get hit.
- Mike Tyson

