

**Advisory Committee Suggestions
&
DWR Review and Response**

**Work Completed January - May 2001
For
California Water Plan – Update 2003**

**Department of Water Resources
June 20, 2001**

**Advisory Committee Suggestions and DWR Review and Response
Work Completed from January through May 2001
California Water Plan – Update 2003
June 18, 2001**

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I. Introduction

A. Collaborative Process

The Department of Water Resources and the Advisory Committee have been working together since January 2001 to accomplish two related tasks during the winter and spring of 2001, as outlined in the Advisory Committee Charter and Work Plan (presented at the March 8, 2001 Advisory Committee meeting¹).

On the one hand, they have embarked together on a three year “strategic planning” process that will culminate with the release, by December 31, 2003 of the *California Water Plan - Update 2003*. This strategic planning process will take them on a multi-step planning journey from “where we are now,” through “where we want to be,” to “how to get there,” and “how to measure our progress along the way.” Insights shared during this strategic planning process will inform the structure and content of *Update 2003*.

On the other hand, DWR is now required by a statute enacted in 2000 to produce, by January 1, 2002, a preliminary draft report to “daylight” the assumptions and other estimates that will be used in *Update 2003*. The legislation identifies eight broad categories that, at a minimum, the preliminary report must contain. Accordingly, DWR must develop, by the end of 2001, a preliminary but detailed “road map” of what will eventually become *Update 2003*.

With these twin challenges in mind, DWR began the process with a series of overview presentations to the Advisory Committee at its March 8, 2001 meeting. These presentations all followed the same three-step format. First, staff presented what it had done to prepare the 1998 update - *Bulletin 160-98*. Second, staff identified some of the principal comments and criticism they had heard following the release of *160-98*. Finally, staff identified key items for “early Advisory Committee” input. Staff selected the specific items to help them get started on their work and to help prepare the draft *Assumptions and Estimates* report. After each presentation, Advisory Committee members were given substantial opportunity to ask questions for clarification as well as to generate additional suggestions for “early input” items. At the end of the meeting, Advisory Committee members were invited to join one or more of eight initial Work Groups composed of DWR staff and Advisory Committee members, that would meet, during March and April 2001, to develop more focused proposals for these items for early Advisory Committee input.

¹ The Advisory Committee charter and Work Plan, along with meeting agendas, key presentation materials, and detailed notes for all Advisory Committee and Work Group meetings can be found on the *Update 2003* web pages at http://www.waterplan.water.ca.gov/b160/committee/co_index.html.

Between March 19 and March 30, 2001 the eight initial Work Groups each met for roughly three hours. In total, over 40 Advisory Committee members, joined by additional interested members of the public, met with over a total of over 30 DWR staff members. The meetings generally followed a similar format. Work Group members first reviewed the lists of questions for early input, arranged topically, that DWR staff had compiled from the presentations and discussions at the March 8, 2001 Advisory Committee meeting. Members then added and discussed additional questions for early input. Finally, as time permitted, members were asked to help staff prioritize the early input questions.

Following the initial Work Group meetings, DWR staff prepared draft "Discussion Papers" on the prioritized list of early input matters. The draft Discussion Papers identified specific potential strategies for addressing the early input matters, and outlined the advantages and disadvantages of each potential strategy.

At three follow-up Work Group meetings held between April 17 and 20, 2001 DWR staff and Work Group members discussed the draft Discussion Papers. At the April 17 meeting, Work Group members discussed "Framework Assumptions" for *Update 2003*. At the April 17 and 20 meetings, Work Group members discussed detailed elements of alternative approaches for describing *current* water uses and supplies - "where we are now." Finally, at the April 20 meeting, Work Group members discussed some of the initial elements of alternative approaches for describing *future* water supplies and uses - "where we are going."

These three follow-up Work Group meetings all followed the same general format. Following presentation by DWR staff on a particular topic, Work Group members were given the opportunity to ask questions for clarification. After these questions, members were asked to expand the list of potential approaches to the matters for early input. Finally, members were asked to discuss the advantages and disadvantages of the potential approaches. At the end of this discussion, consensus was sought on a specific proposal to be taken to the full Advisory Committee at its April 25 and May 3 meetings. In all cases, the Work Groups were able to reach consensus on a suggested proposal.

Following these three meetings, DWR staff revised the draft Discussion Papers to incorporate the Work Group's insights and proposals. The revised Discussion Papers were specifically keyed to agenda items for the April 25 and May 3 Advisory Committee meetings. At those two meetings, DWR staff made presentations on the Work Group proposals to the Advisory Committee members. Shortly after both meetings, absent members were emailed meeting summaries and suggestions made at the meetings. They were given an opportunity to express their support or concerns. No one raised any fundamental disagreement.

B. Consensus-seeking

During the April 25 and May 3 Advisory Committee meetings, after clarifying questions and full discussion, consensus was sought among the full Advisory Committee members on each proposal prepared by the Work Groups. In some instances, where

the discussion indicated overwhelming Advisory Committee support for a proposal, members were simply asked to speak up if they had any fundamental disagreement with the proposal. In most cases, however, members were asked to indicate formally their level of support for a proposal using a five-point scale.

The five points on the scale were:

- **Level 1: Unqualified Support.** Full agreement with all aspects of proposal.
- **Level 2: Strong Support** for most aspects of proposal. No fundamental disagreements with any aspect of proposal.
- **Level 3: General Support** for all or most aspects of proposal. No fundamental disagreement with key aspects of proposal.
 - Includes having unanswered questions that need additional information or clarification.
- **Level 4: Qualified Support.** Significant disagreement with one or more aspects of proposal; however, can live with proposal as packaged (i.e., overall, suggested proposal is better than leaving things as they are now).
 - In the “not happy, but I’ll live with it” option, parties need to work on generating alternatives that address the concerns of all.
- **Level 5: Fundamental Disagreement** with key aspects of proposal. Not willing to support or live with the proposal as it stands.
 - Parties are still required to suggest alternatives that move proposal to accommodating the interests of all.

C. DWR Review and Response

After the May 3 Advisory Committee meeting, DWR staff and management began their formal review of the Advisory Committee’s suggestions on the following eight topics.

1. Prepare “Water Portfolios” for each hydrologic region and statewide.
2. Describe “Where We Are Now” using actual data for multiple years.
3. Present water balance data for unique areas (Mountain Counties) and counties.
4. Consider Planning Horizons 2010, 2020, 2030, and 2050.
5. Consider a range of hydrologies from wet to dry for “Where We Are Going.”
6. Consider a list of “Key Drivers and Constraints” for planning for the future.
7. Improve Agricultural Water Use data; use existing ETAW data.
8. Improve Urban Landscape Water Use estimates

DWR staff Work Teams met during the weeks of May 7 and 14. On May 21, DWR staff held an all-day Project Team meeting to further discuss the Advisory Committee's suggestions. During these meetings, staff considered the implications on DWR program resources of adoption of the suggestions. Staff also considered the impacts on statutory and other internal deadlines of adoption of the suggestions. On May 30, DWR staff held a final Project Team meeting to review these implications and impacts.

Following the May 30 meeting, DWR staff and the facilitation team prepared this report, with direction from DWR management. The matters set out below represent the initial suggestions arising from the collaboration. Many additional suggestions will be developed in the coming months and years, with the next set likely to be ready for DWR Executive Review in September 2001.

D. Time/Resource Limitations; Commitment to Further Dialogue

There is a substantial chance that limitations on available time and on DWR staffing and resources will pose real challenges to DWR's ability to implement fully the Advisory Committee's suggestions for *Update 2003*. To address this, DWR has described its approach to prioritizing work and allocating available resources in relevant sections of this report. It is also likely that such resource challenges could be heightened by the additional Advisory Committee suggestions that will emerge from the next stages of our collaboration.

To help manage this apparent conflict between desired products in *Update 2003* and available time and resources, and in keeping with its commitment to an open and transparent stakeholder collaboration, DWR will communicate with the Advisory Committee when significant staffing and resources challenges appear and solicit the Committee's input on priorities and level of detail. DWR staff and Advisory Committee members can then explore the specific challenge(s) together and attempt to develop solutions to meet the interests of DWR and the Advisory Committee.

E. Report Organization

The remainder of this report is organized in two sections, Section II – Advisory Committee Suggestions, and Section III – Additional Matters. The eight Advisory Committee suggestions are presented in Section II and the customer survey and draft Assumptions and Estimates Report are discussed in Section III.

Each of the Advisory Committee suggestions is described separately in subsections A through H of Section I. Each suggestion includes the "Advisory Committee's Consideration" (topics: specific suggestion, rationale, background, range of perspectives, and follow-up), followed by "DWR Review and Response."

II. Advisory Committee Suggestions

A. Water Portfolio - Concept

1. Advisory Committee Consideration

a) Specific Suggestion

If water balances are to be calculated, create a “water portfolio” that would show the State’s actual and potential supplies as akin to “assets” and its actual and potential uses as akin to “liabilities.” Allow the Advisory Committee to review and express its perspective on both the categories and the regions that are developed for the portfolio.

b) Rationale

A water portfolio can import into the water planning process some of the insights offered by traditional business accounting tools. In particular, it can: 1) help better separate consumptive and non-consumptive uses of water; 2) show underutilized assets; and 3) show unmet liabilities.

c) Background

Traditionally, the updates to the *California Water Plan* have quantified current conditions and future forecasts through “water balances.” (In the strategic planning terminology being used in the *Update 2003* planning process, these conditions and forecasts are described as “where we are now” and “where we are going,” respectively.) For “where we are now,” these balances compare current supplies and uses. For “where we are going,” these balances compare potential supplies and uses. For each of the balances, DWR staff calculates applied water, net water, and depletions.

At the March 8, 2001 Advisory Committee meeting, DWR staff presented a brief overview of how the water balances were developed for *Bulletin 160-98* and summarized some of the responses heard at workshops in 1999 and 2000. DWR staff sought input on how to begin the water balance process for *Update 2003*. Committee members gave some general comments and the topic was referred to the appropriate work groups that were set up at the meeting.

In March and April, several of the initial Advisory Committee work groups reviewed the general approach to the water balances developed for *Bulletin 160-98*. During these discussions, work group members raised two principal concerns. First, some members found the “applied water” concept difficult to use to describe non-consumptive uses, such as some of the environmental water uses quantified in *160-98*. Second, some members found the water balances missed two key categories - underutilized sources of water and unmet demands (i.e., the entire water “pie,” not just developed water supplies and uses.)

From these general observations, the discussions progressed to a suggestion that the “balances” use more traditional business accounting principles. Eventually, the “water portfolio” concept emerged. This concept imports some of these traditional accounting

principles into the water planning process. In addition, it uses a simple “assets and liabilities”² format to report “balances” that is more accessible to the users of the *Update* who are not trained hydrologists, and considers many more categories of water supplies and uses.

d) Range of Advisory Committee perspectives

At the April 25 meeting, the initial discussion centered on whether to use a water balance at all. The members who raised this question believed the concept outmoded or unnecessary. After some discussion, members agreed to postpone further discussion of whether to use balances at all. The question presented to the committee for consensus-seeking was “if water balances are used, should a water portfolio be developed to display them?”

Members were asked to indicate their degree of support on the 5-point scale outlined in the Introduction.

In the initial round of perspective sharing, members expressed near-unanimous support (all but two placed their support at levels 1, 2 or 3) on the proposal. In particular, there were 5 members who indicated level 1 support; 24 who indicated level 2 support, 1 who indicated level 2.5 support, and 10 who indicated level 3 support. There was no particular pattern of support among the various interests groups represented on the committee.

The two members (one level 4, one level 5) who initially had some fundamental opposition to the concept later indicated basic support provided that there were additional opportunities to examine the details about the categories and the regions to be reported in the portfolio.

e) Follow-Up

At the May 3 Advisory Committee meeting, members discussed in greater detail the possible categories for the portfolio. Members were asked to review the expanded list of water flow categories used in *B160-83* as well as additions suggested by the initial work groups. Members were asked to suggest potential additions, deletions, or modifications to the categories or their definitions. Members were also asked to consider division of the categories into “assets” and “liabilities.” Finally, members were asked to consider how to display some of the suggested categories, such as water quality, water rights, and environmental water.

The suggestions and other comments were captured, compiled and presented to DWR on May 14. At this stage in the development of the “portfolio,” there was no formal attempt to reach consensus or record the range of perspectives on these suggestions.

² Some Advisory Committee members have expressed concern that their water uses be labeled “liabilities.” These members have not agreed on an alternative term. Some DWR staff members have expressed concern with the “portfolio” label. The latter group would prefer something more akin to a corporate “balance sheet” than an investor’s “portfolio.”

Indeed, many of these suggestions and comments require substantial additional work before an attempt at consensus-seeking can be made. Others will pose substantial implementation challenges to DWR staff. They should be seen as simply the next step in the conversation. The next step in the conversation will be DWR's response to the suggestions.

2. DWR Review and Response

DWR supports the concept of using a "water portfolio," as an expanded and enhanced water balance, to describe both current and future water supplies, uses, constraints, and key water management decisions or drivers. The "water portfolio" would significantly enhance the water balance prepared and presented in Bulletin 160-98, and preparing them would require more time and resources. DWR will need to work with the Advisory Committee as work progresses to assist in identifying priorities and level of detail.

DWR appreciates the need and rationale expressed by Advisory Committee members for a "water portfolio," namely to: (1) consider the "entire water pie" (all water supply sources), (2) provide better appreciation of the disposition of our source waters statewide by including additional categories of water supply and use, (3) present water balances using accepted accounting principles, (4) provide insight where there may be underutilized "assets" (supply) and unmet "liabilities" (uses), (5) provide insight in natural, physical (infrastructure), and institutional constraints, and water management decisions, by annotating water balances with narrative, and (6) include key supplemental information, for instance, on water quality, water rights, and water contracts.

Staff played an active role during the March/April Work Group meetings on this topic, including introducing and describing to Advisory Committee members the detailed statewide water balance DWR presented in *Bulletin 160-83* which has 40 categories of water supply and use. Based on Advisory Committee input from the May 3 meeting (namely, additional categories, category definitions, and supplemental information), staff is currently preparing a proposed "water portfolio" (categories and structure) for the June 20 Advisory Committee meeting. For the proposal, staff is working with the 40 categories in *B160-83* and with additional categories suggested by the Advisory Committee.

DWR currently considers the "water portfolio" to include the following elements:

1. Water balance categories from *B160-98*.
2. Additional categories from *B160-83*, as expanded and modified with input from the Advisory Committee suggestions.
3. Narrative to annotate the "water portfolio" categories.
4. Supplemental information and/or data tables.

The total number of "water portfolios" that could be prepared depends on the following decisions: (1) the number of regions (discussed in Section II.C.), the number of actual years used to describe "where we are now" (discussed in Section II.B.), the number of

planning horizons (discussed in Section II.D.), and the approach and number of forecast scenarios (not determined at this time). A “water portfolio” could be prepared for each region and statewide, each actual year used to describe “where we are now,” and each planning horizon and forecast scenario used to describe “where we are going” and “where we want to go,” cumulatively. DWR will determine the actual number of “portfolios” (i.e., quantitative representation of water supplies and uses) that will be included in *Update 2003* with input from the Advisory Committee (see Section I.D.2).

Additionally, DWR will decide at a later time with Advisory Committee input, how best to present categories of the “water portfolio” that are relevant to a “net” water balance, “applied” water balance, and “depletion” water balance.

DWR recommends the following approach and work sequence for preparing each set of “water portfolios” for the ten hydrologic regions and statewide. Staff will use this process to begin its work on describing “where we are now.”

- Step 1. Begin with the categories of water balance used in *Bulletin 160-98*. The data would be compiled at the DAU level and aggregated to their respective hydrologic regions as well as statewide.
- Step 2. Add the other categories of the “water portfolio” at the hydrologic region level and statewide. Some of these categories would be presented as part of an expanded water balance, while others such as total runoff would be presented to show the disposition of water from source to sink (an example of this is the statewide water diagram [Figure 27] presented in B160-83).
- Step 3. Prepare narrative to annotate the “water portfolio” categories to capture the key constraints and management decisions implicit in the “portfolios” describing “where we are now,” as well as the key drivers and assumptions for “portfolios” describing “where we are going” or “where we want to go.” Working with the Advisory Committee, we have identified 15 drivers and constraints presented alphabetically in Table 1 to consider for the narratives.
- Step 4. Prepare data tables and/or citations to other sources to provide supplemental information suggested by the Advisory Committee, such as water contracts, water rights, and water quality. An expanded list is presented alphabetically in Table 2. We will need the most dialogue with the Advisory Committee in completing this step (level of detail and prioritization), in light of time and resource constraints.

Table 1. Water Portfolio Factors and Constraints (in alphabetical order)

a.	Area of origin
b.	Court decisions
c.	Endangered species listings
d.	Energy crisis (hydroelectric generation), deregulation, divestiture
e.	Environmental Water Account, Delta standards and operations
f.	FERC relicensing
g.	Government crop programs
h.	Legislation
i.	Market activities (crop prices, surpluses, etc.)
j.	New facilities
k.	Ordinances
l.	Super fund cleanup activities
m.	SWCRB decisions
n.	Water contract provisions
o.	Water transfers

**Table 2. Water Portfolio Data Tables and Sources of Supplemental Information
(in alphabetical order)**

a.	Efficiency (in place estimates - irrigation methods, urban)	1998 estimates from CUWCC, DWR, others
b.	Environmental (by refuge and river)	DWR existing procedure
c.	Groundwater safe yield by basin and overdraft (long term data)	Basin only (<i>Bulletin 118</i> , where data are available)
d.	Groundwater storage	Basin only (<i>Bulletin 118</i> , where data are available)
e.	Hydropower generation	Data from USBR, DWR, PG&E, Energy Commission
f.	Land use (DAU by county by 20 crops)	DWR existing procedure
g.	Population (DAU by county)	DWR existing procedure
h.	Reservoir carryover storage	Data from Sept. 30 storage data from CDEC, purveyors, others
i.	Reservoir yields (long term data)	CALSIM and reservoir owners
j.	Unmet entitlements (urban, agricultural, environmental)	Data from contractor, purveyors, others
k.	Urban discharges	DWR staff retrieves information if not available from DOHS Reports, SWRCB and RWQCB
l.	Water contracts	List SWP, CVP, Colorado River, and other amounts by contractor
m.	Water quality (surface, groundwater well shut down, and urban deliveries and discharges)	Data from DOHS, USGS, SWRCB, USBR, DWR, other
n.	Water rights (including tribal)	Data from SWRCB, DWR, others

B. Describing “Where we are now”

1. Advisory Committee Review

a) Specific Suggestion

1. Prepare a Water Portfolio (a comprehensive water balance) for:
 - Each Hydrologic Region and Statewide;
 - Actual 1999 (Wet) or 1998 (Wet); and

- Actual 2000 (Average).
2. Identify Water Portfolio categories relevant for each region and year.
 3. Assign best values for each Water Portfolio category using measured data if available or estimates if not.
 4. Prepare a detailed narrative for each Water Portfolio (regions and years) to capture real-time constraints and management decisions.
 5. In addition, prepare a qualitative/narrative Water Portfolio for actual 2001 (Below Normal) to capture categories, constraints, and management decisions characteristic of drier conditions.³

b) Rationale

Using data from recent actual years (along with a detailed narrative) to help describe current conditions acknowledges the unique constellation of water management decisions that are made by water planners and users each year as they respond to an ever-changing set of hydrological, economic, and regulatory conditions. These decisions will help *Update 2003* identify the inventory of current management challenges and responses. In addition, a report of recent actual years meets the needs of some *Water Plan Update* users and their customers for data on actual year water supplies and uses. Finally, data from recent actual years are less likely to cause confusion or controversy than “normalized” data, i.e., data comprised of an adjusted average of a series of relevant recent years.

c) Background

The background leading to this proposal demonstrates neatly both the collaboration of Advisory Committee members and DWR staff, as well as the evolution of a proposal as the result of spirited and wide-ranging discussion. The following background section is longer than most, as the topic occupied substantial meeting time at both the April 25 and May 3 Advisory Committee meetings, and led to four different requests for formal indication of Advisory Committee perspectives.

Traditionally, the updates to the *California Water Plan* have described current conditions by constructing and reporting a typical “base year,” i.e., the starting point of the planning period. In developing this “base year,” for a given hydrology (e.g., an “average water year,”) DWR first developed data on actual water supplies and uses over a range of relevant recent years. For example, for describing base year water supplies, DWR would use actual water deliveries during the three to five most recent years that were neither overly dry nor wet.⁴ DWR then used a two-step process to “normalize” these

³ The 2001 data are not likely to be available in time to prepare a quantitative Water Portfolio for each region and statewide.

⁴ Other supply data came from reservoir and aqueduct operational studies rather than actual deliveries.

data, by first averaging the data and then using professional judgment to adjust the averages to take into account any perceived trends or anomalous events and conditions. DWR reported these normalized data to represent a “typical average year” for the base year.

For example, in *B160-98*, as its average water year scenario for the chosen base year of 1995, DWR reported what a “typical” average year of water supplies and uses might have looked like in 1995 given the facilities available and the regulatory constraints applicable in 1995. As explained in *B160-98*, DWR believed that normalization allowed a better comparison of present with future needs and provided an evaluation of a baseline level of development under a range of hydrologic conditions.

In recent years, the normalization process, however, has received substantial criticism from some *Water Plan Update* customers and others. Controversies have occasionally erupted over the types, methods, and extent of the adjustments made. Some users of the *Water Plan* updates have struggled to understand the process and its rationale, or have attempted to discover how the adjustments were made for a particular set of data. Finally, several *Water Plan Update* users reported that they or their own customers often wanted data for a specific year’s actual water supplies, deliveries and uses, not the normalized data. While such data, when available, were readily provided by DWR, these users wanted the *Water Plan* updates themselves to display it.

At the March 8, 2001 Advisory Committee meeting, DWR staff presented an overview of the normalization process used in *B160-98*. Staff sought input on how to begin describing the “base year” for *Update 2003*. After general Advisory Committee discussion, the matter was referred to the initial work groups for a more detailed review of the issues and options.

While issues relevant to describing current water supplies and uses arose in most of the initial work groups, the Framework and Assumptions work group addressed the broadest implications of the question. In a draft discussion paper presented to the work group at its April 17, 2001 meeting, staff presented four general strategies for describing current water supplies and uses. These ranged from strategy one - the report of a single actual year’s data - to strategy four - the report of a “typical” year constructed from an average of recent years adjusted for perceived trends and anomalies.⁵ In essence, although the details of the process remained for further discussion, strategy four represented the general normalization process used in *B160-98*.

Discussion at the Work Group level focused on the perceived strengths and limitations of strategies one and four. Each had their proponents and opponents. Among other matters, proponents of strategy one found it more intelligible and useful to their customers. Proponents also expressed some skepticism over the normalization process, suggesting that any one year’s data was likely to paint a misleading picture without a detailed explanation of what made the year both typical and atypical. In the end, the Work Group developed and reached consensus on a fifth strategy. Strategy

⁵ Strategies two and three were intermediate steps on the one through four continuum. Strategy two proposed adjusting a single actual year’s data. Strategy three proposed simply reporting an unadjusted average of data from relevant recent years.

five proposed that the full Advisory Committee and DWR defer a decision until after they had compared the results of strategies one and four. Informing this new strategy was the understanding that whichever choice DWR ultimately made, it would have to justify why that choice was a better description of current water supplies, uses, constraints and management decisions than the other. And in order to make that case, DWR staff would likely have to compare actual and “typical” data anyway to see which better described “where we are” today.

At the Advisory Committee meeting on April 25, the agenda called for the Committee to report its range of perspectives on “Strategy Five.” Several of the members reiterated portions of the Work Group discussion regarding the relative merits of using “actual” versus “typical” data. The discussion, however, ranged more broadly than the Work Group discussion. Several members asked staff to explain the purpose of having any description of current supplies and uses in *Update 2003*. Others said that their answer to how to best describe current supplies and uses depended upon the purpose to which that information would be put. In particular, several said that if the description of current supplies and uses is the “baseline” upon which future projections would be extrapolated, then the method used to describe the “baseline” was vitally important to the Update’s validity and reliability. If, however, the description of current supplies and uses is simply a real-time snapshot of “where we are now,” they were less concerned with how that information was developed. In response to these latter points, DWR staff replied several times that the choice of how best to describe “where we are” could be made independently of the choice of how best to describe the starting point for “where we are going.”

During the discussion, several Advisory Committee members who were planners for water agencies explained how their agencies describe current conditions relative to future projections. Several agencies did include one or more recent years’ data in their plans. These agencies, however, included detailed narratives to put that actual year or those actual years in context.

Based on these descriptions, members then agreed to a modification of the “Actual Year” (“strategy one”) approach. The final version of strategy one proposed to describe “where we are now” by reporting on an actual recent year’s water supplies and uses, and included a detailed narrative to put that actual year’s data in its broader hydrological, economic and regulatory context.

After strategy one was modified, members were asked to give their perspectives first, on strategy five and then on the modified strategy one. Members were asked to consider strategy five, “if we (*Update 2003*) were to decide how to describe ‘where we are now’ after first comparing an actual year’s data with data from a series of years that had been averaged and adjusted, what would be your group’s degree of support?” Members were asked to use the same five-point scale that had been used to record the degrees of support for the Water Portfolio concept. Members were further directed to consider their response to this question independently of what was going to be their subsequent response to strategy one. In other words, a high degree of support for strategy five did not preclude a high degree of support for strategy one as well.

When all the perspectives on strategy five were recorded, only two registered fundamental disagreement (level 5 support) with the proposal.⁶ Five members indicated unqualified support (level 1). Thirteen indicated strong support (level 2). Twelve indicated general support (level 3). Eight reported qualified support (level 4), indicating some fundamental concerns that the members could nevertheless “live with.” A review of the relative degrees of support among the different interests represented revealed no strong patterns.

Members were then asked, “if we (*Update 2003*) were to describe current conditions using an actual year’s data, including a detailed narrative to put that year in proper context, what would be your group’s degree of support?” Members were again reminded that they should answer this question independently of their answer to the prior question regarding strategy five. When compared with strategy five, there was both more fundamental opposition and more unqualified support for this approach. Six members reported fundamental disagreement (level 5), indicating that they could not live with the approach. The same number, however, registered unqualified support (level 1). Only eight members, however, indicated strong support (level 2) and only nine gave it general support (level 3). Ten members reported qualified support (level 4), indicating some fundamental concerns but reported that they could “live with” the proposal. Again, a review of the relative degrees of support among the different interests represented revealed no strong patterns.

In summary, after a long and far-ranging discussion, members were not actually all that far apart on the two approaches, although there was a preference for strategy five. Twenty-three members had indicated support at levels one through three for modified strategy one, with 16 having only levels four or five support. In contrast, 30 members gave strategy five their support at levels 1 through 3, and only 10 were at levels 4 or 5.⁷

Given the differences of perspective during the wide-ranging discussion, DWR promised to come back with some additional material to help focus the decision at the May 3 meeting.

Following the meeting, work on the “where we are now” description proceeded along two paths. On the first path, the facilitation team prepared a draft of a short summary of the discussions regarding the perceived benefits of the different approaches to describing “where we are now.” This was circulated to DWR staff and some of the Advisory Committee members who had been very active in the topics raised in the April 25 discussion. That summary prompted an exchange of ideas about the topic, leading to some new insights among the participants. These insights were then captured and presented to the full Advisory Committee for discussion at the May 3 meeting.

The critical point was the shared perception that, given inter-annual hydrological and economic variability and regulatory changes, each water year presents a unique set of management challenges and responses. Consequently, to these Advisory Committee members, the “typical” (i.e., normalized) year approach is less useful a tool for

⁶ See the summary table that follows this section.

⁷ For unknown reasons, one member only reported a perspective on strategy five.

describing “where we are now” than a detailed description of how the system actually responded to particular real-time challenges in given recent years.

Meanwhile, based in large part on suggestions made during the May 3 meeting by a couple of Advisory Committee members, DWR staff developed the proposal - detailed at the beginning of this section - to describe “where we are now” by reporting multiple recent actual years. This approach dovetailed with the parallel discussions regarding inter-annual variability of water management challenges and responses. And coincidentally, recent hydrology seemed to support the approach as well, as there were examples of above normal, normal, and below normal precipitation to be found among water years 1998-2001.

At the May 3 Advisory Committee meeting, DWR staff reopened the “where are we now” discussion by presenting briefly a description of several different approaches to forecasting. The presentation was meant to reinforce staff’s April 25 assertions that the decisions on describing “where we are now” and “where we are going” were generally independent of each other. Following additional presentations and discussion, the “multiple actual years” proposal was presented to the Advisory Committee for a formal indication of members’ degrees of support.

As had been done during the April 25 meeting, Advisory Committee members were asked to consider the “multiple actual years” proposal independently of their previous consideration of “strategies one” and “five.” That is, they were told that their support for this proposal did not mean that they could not also support strategies one, or five, or the “typical year” approach. They were asked, “if we (*Update 2003*) were to adopt the multiple actual year approach, what would be your organization’s degree of support?” The same five-point scale used in the April 25 meeting was used.

All of the members present indicated support at levels three or above. Nine indicated unqualified support (level 1). Twenty-two indicated strong support (level 2). Seven indicated general support (level 3). No one indicated level 4 or 5 support.

Immediately following the registration of levels of support for the multiple actual years approach, after time for further discussion, Advisory Committee members in attendance at the May 3 meeting were asked to complete the “where we are now” discussion by recording their perspectives on the “typical” year approach. This was the approach that had been labeled “strategy four” by the Work Group and discussed in some detail at the April 25 meeting. It involves the averaging and adjusting of relevant recent data to come up with a “normalized” or “typical” year. (Staff clarified that under this proposal, there would be a typical “average” year, a typical “wet” year and a typical “dry” year.) Again, Advisory Committee members were asked to consider the “typical years” proposal independently of their previous consideration of strategies one, five, or the “multiple actual year” approach. That is, they were told that their support for this proposal did not mean that they could not also support strategies one, or five, or the

“multiple actual years” approach.⁸ They were asked, “if we (*Update 2003*) were to adopt the “typical year” approach, what would be your organization’s degree of support?”

Of the four different approaches considered during the two meetings, this strategy (“normalized” or “typical” years) received the weakest support. Four members indicated unqualified support (level 1). One indicated level 1.5 support (i.e., very strong, but not completely unqualified.) Five indicated strong support (level 2). Eight indicated general support (level 3). Eleven indicated qualified support (level 4). And eleven more indicated fundamental disagreement (level 5).⁹

⁸ Discussion after the registration of perspectives on this approach indicated some lingering confusion among a few of the Advisory Committee members on the independence of their perspectives on the respective approaches. Following this discussion, all members were given the opportunity to change their recorded perspective on either the multiple actual years or the typical years approach. The range of perspectives reported here are the final perspectives indicated by Committee members.

⁹ For unknown reasons, two members recorded perspectives on this approach but not on the multiple actual years approach.

Summary of Range of Advisory Committee Perspectives on Approaches to Describing “Where We Are Now” for Update 2003

Approach	Work Group Strategy #	#/AC Members Indicating Level of Support				
		Unqualified	Strong ¹⁰	General	Qualified	Fundamental Disagreement
Single Actual Year (w/narrative)	1	6	8	9	10	6
Multiple Typical Years ¹¹	4	4	6	8	11	11
Compare 1 and 4 and then decide	5	5	13	12	8	2
Multiple Actual Years (w/narrative)	N/a	9	22	7	0	0

2. DWR Review and Response

The Advisory Committee has clearly indicated a preference for using actual year information over using “typical” or “normalized” information, in the “water portfolios” for describing current conditions, i.e., “where we are now.” Members of the Advisory Committee have also expressed that we not use “typical” or “normalized” data as the starting point for future forecasts.

This is a fundamental departure from the way DWR calculated and presented current conditions in the last and prior *Water Plan* updates, which used the “typical” or “normalized” year approach to prepare water balances describing the “baseline” or current conditions. Another fundamental difference is that the actual year “water portfolio” would likely *not* serve as the starting point for future forecasts, recognized by DWR and the Advisory Committee. In *Bulletin 160-98*, the “baseline” (typical/normalized) water balances were also used as the starting point (or initial condition) for all forecasts.

¹⁰ Includes “level 1.5” support.

¹¹ The “multiple” refers to multiple hydrologies, e.g., “average,” dry,” and “wet.”

What has complicated DWR's review of this topic is not knowing at this time what approach(es) we will use to forecast future water supply and use conditions, including how to initialize the forecasts. We have only begun discussing these topics with the Advisory Committee and the bulk of this work will begin at the end of June and continue through this summer. For *Bulletin 160-98*, the time and resources DWR spent in describing current conditions also served in describing the starting point of future forecasts. This would likely not be the case using the actual year approach.

At the same time, DWR understands and appreciates the value of using actual data to help capture and explain the complex nature of California water management decisions. In fact, DWR has prepared annual reports using actual data for the categories in *Bulletin 160-98* for years 1988-1996. This information, however, has been primarily used internally and was provided to others only upon request.

For *Update 2003*, DWR will work to expand the water balance, as suggested by the Advisory Committee, to describe current water supplies, uses, and management, in the form of regional and statewide "water portfolios" using the procedure described in Section I.A.2 above with actual data. Based on input from some Advisory Committee members at the May 3 meeting, DWR recommends using 1998 to as a recent wet water year, 2000 as a recent average water year, and 2001 as a recent below normal water year. The year 1999 was suggested as a recent wet year in the initial proposal for a multi-year approach using actual data for describing current conditions; however, at the May 3 meeting it was noted that conditions were not wet statewide in 1999, but were so in 1998.

DWR recommends the following process and prioritization, in light of when data will be available for water years 1998 (wet), 2000 (average), and 2001 (below normal), as well as possible limitations in time and resources. Staff would, however, request and compile the data and information for all three years concurrently.

- A. Prepare the "water portfolio" for 1998 because most of the data are currently available (not so for 2000 or 2001) using the procedure recommended in Section I.A.2 above. Being the first "water portfolio" assembled for *Update 2003*, DWR recommends the involvement of an Advisory Committee Work Group to give input on work prioritization and level of detail. Staff would concentrate first on completing Steps 1 – 3 of the "water portfolio" for 1998 before proceeding to Step 4 (supplemental information/data).
- B. Prepare the "water portfolio" for 2000 after DWR and the Advisory Committee have refined the categories and presentation for 1998, and as 2000 data become available. Staff would first concentrate on completing Steps 1 – 3 of the "water portfolio" for 2000 (procedure recommended in Section I.A.2 above) before proceeding to Step 4 (supplemental information/data).
- C. Prepare only the *narrative* portion of the "water portfolio" for 2001 (Step 3). At this time, DWR anticipates that 2001 data will not be available in time to prepare the numerical components of a "water portfolio" for *Update 2003*. The intent of the 2001 narrative "portfolio" is to capture the constraints and management decisions that may be indicative of (or unique to) drier conditions.

- D. Complete Step 4 for 1998 and 2000, that is, prepare supplemental information and/or data tables for items listed in Table 2.

While completing this work, DWR will also need to allocate significant staff resources to work with Advisory Committee on determining the approach(es) for planning future forecasts, as well as compiling information and data on the key drivers and constraints needed to develop forecasting tools.

C. Additional Geographic Areas For Reporting

1. Advisory Committee Consideration

a) Specific Suggestions

The Advisory Committee made near-consensus suggestions on three separate but related proposals on data availability and reporting for geographic areas not addressed in comparable detail in previous updates.

- All but two Advisory Committee members gave at least qualified support to a proposal that, in addition to the information presented in Bulletin 160-98, *Update 2003* present water balances for additional regions with unique characteristics (e.g., Mountain Counties).
- All but three Advisory Committee members gave at least qualified support to make available county level data easily accessible, e.g., through web pages.
- All but nine Advisory Committee members gave at least qualified support to a proposal to, where possible, include reports in *Update 2003* on at least some water portfolio categories at the county level.

b) Rationale

- **New Regions:** Those Advisory Committee members who supported inclusion of additional regions of the State believed that the relevant regions are not necessarily limited to the ten hydrologic regions reported in *Bulletin 160-98*. If a compelling case can be made for inclusion of additional information on a regional scale, resources permitting, the *Water Plan* updates should include that information.
- **County Information:** Those Advisory Committee members who supported easier access to county-level data, or inclusion of some water portfolio categories at the county level, believed that counties need easy access to these kinds of information to help with their own planning processes.

c) Background—Other Regions

Historically, the *Water Plan* updates have reported water balances both statewide and regionally. As summarized by DWR staff during the March 8, 2001 Advisory Committee

meeting, *Bulletin 160-98* included 10 different regions whose boundaries generally follow watershed boundaries. DWR staff sought input regarding the geographic areas for which water balances and other data should be collected, analyzed and displayed for *Update 2003*. Following general discussion, consideration of these matters was referred to the Framework Work Group.

At the Work Group meeting on April 17, 2001 members discussed the inclusion of other regions in the State. The member representing the Mountain Counties described his area's unique characteristics. These included relative position in the watershed vis-a-vis locations of source and locations of some major users, as well as recent demographic trends, including high rates of population growth. The Work Group agreed to propose to the full Advisory Committee that *Update 2003* include water balances for other regions, like the Mountain Counties, that can demonstrate similar unique characteristics from a water supply planning perspective.

At the April 25 meeting, this Work Group recommendation was presented to the Advisory Committee. After discussion, members were asked to indicate their level of support for the proposal. The same 5-point scale used to review the Water Portfolio and "where are we now" proposals was used. All but two Advisory Committee members gave at least qualified support to the proposal. Nine members gave the proposal unqualified support (level 1). Nine more gave it strong support (level 2). Eleven gave it general support (level 3). Five gave it qualified support (level 4). The two members who fundamentally disagreed indicated that, from their perspective, statewide planning simply should not be done at the county level.

d) Background - County Data and Portfolio Information

Historically, the *Water Plan* updates have reported water balances both statewide and regionally. DWR, however, collects and analyzes data at much smaller geographic levels. Indeed, historically, water balances have been computed even for its smallest data collection and analysis area - the Detailed Analysis Units ("DAUs").

When the Framework Work Group considered the topic of geographic regions that should be included within *Update 2003*, several members suggested that *Update 2003* would be more useful if it included additional information at the county level. DWR staff indicated that much of the basic county-level water balance information could be rather readily assembled from the information normally collected at the DAU level. Indeed, staff indicated that this county-level water balance information, while not presented in prior updates, was normally provided in response to individual requests by planners or researchers. Staff also indicated, however, that they did not have information at the county level for many of the new water balance categories that were being proposed for the water portfolio. Accordingly, recognizing the limitations on available information at the county level, the work group agreed to propose to the full Advisory Committee that, "in addition to the information presented in *Bulletin 160-98*, *Update 2003* should also present water portfolio information, where available, at the County Level."

At the April 25 meeting, this Work Group proposal was presented to the full Advisory Committee for discussion. The proposal elicited some strong support by those who

agreed with the Work Group that such water portfolio information would be useful. Several Advisory Committee members, however, stated that it was inappropriate in general for *Water Plan* updates to report on the county level. These members either believed that the *Update*'s focus should be at the State and regional level, or that local water planning was best left to individual cities and water districts, not counties.

In recognition of the range of opinions expressed, the facilitation team proposed splitting the Work Group proposal into two separate questions. The Advisory Committee members agreed. Accordingly, members were first asked whether anyone had fundamental disagreement with simply making already available county-level data more readily accessible, e.g., by posting on web pages. Because there seemed to be widespread general support for this portion of the Work Group recommendation, members were not asked to formally record their level of support. All but three members verbally indicated at least qualified support for the proposal. The three members who had fundamental disagreement later reiterated the twin concerns previously expressed with provision of any county-level information.

Following the solicitation of perspectives on the accessibility of existing county-level data, Advisory Committee members were formally asked to record their level of support on the remainder of the Work Group's proposal. Members were asked whether, where available, water portfolio information should be reported at the county-level in *Update 2003*.

This portion of the Work Group proposal produced a broader range of support. Five members gave it unqualified support (level 1). Seven gave it strong support (level 2). Nine gave it general support (level 3). Nine gave it qualified support (level 4). And nine expressed fundamental disagreement (level 5). Although the members were nearly equally divided in their range of support, one pattern appeared. Eleven of the members expressing only level 4 or 5 support were associated with water suppliers, i.e., water districts, cities, and companies.

2. DWR Review & Response

With respect to county level information, DWR supports the suggestion to make this information available as part of *Update 2003*. DWR has and will be collecting data at the county level for some, but not all of the categories of the "water portfolio", which can be made available to customers and stakeholders of *Update 2003*. This corresponds to providing Step 4 of preparing the "water portfolio" (Section I.A.2). As part of the update process, and with input from the Advisory Committee, we will address how best to make these and other data and information available. DWR does not have the information or resources to prepare the complete, 4-step "water portfolio" as described in Section I.A.2 above for each of the 58 counties.

With respect to additional regions, DWR will maintain the existing ten hydrologic regions which are based on watershed, not political boundaries. However, for providing information on other sub-regions of interest, DWR will consider and handle them as "overlays" on the existing ten regions. The information and data that could be presented for an "overlay" area would depend on the specific boundaries of that region.

The Advisory Committee representative for Mountain Counties has requested that we present information for this region separately. Using this as an example of an “overlay” area, DWR is prepared to:

1. Aggregate and present those categories of the “water portfolio” that are currently handled at the “DAU by county” level for the Mountain Counties area (Step 1 in Section I.A.2, namely the *B160-98* water balance categories).
2. Prepare a narrative annotating those categories (Step 3).
3. Present supplemental information and data of the “water portfolio” (Table 2) corresponding to this area (Step 4).

However, data for the other categories of the “water portfolio” will be prepared at the hydrologic region level (Step 2) and are not readily available (or translatable) at the county level. Reallocating the hydrologic region level information to the Mountain Counties area would require “mapping” watershed and groundwater basin data to an area defined by institutional boundaries. In addition, DWR believes that resources are not available at this time for this reallocation for the Mountain Counties area, or other special areas of interest that may be requested.

D. Planning Horizons

1. Advisory Committee Consideration

a) Specific Suggestion

Use four planning horizons in Update 2003: 2010, 2020, 2030, and 2050. If staff resources are limited, prioritize them after considering the advantages of each particular horizon and the recorded Advisory Committee member preferences.

b) Rationale

Each of the planning horizons offers particular insights and will be useful to different *Water Plan Update* users. If DWR’s resources do not permit inclusion of all four horizons in *Update 2003*, prioritization should be made after consideration of the relative tradeoffs and expressed interests of members.

c) Background

Historically, the *Water Plan* updates have generally included a single planning horizon. The length of that horizon has varied from 20 to 50 years. For each horizon, and each chosen hydrology, DWR has prepared statewide and regional water balances.

At the March 8 Advisory Committee meeting, DWR staff presented the planning horizon used in *Bulletin 160-98*. That update, which used 1995 as its “base year,” presented a single 25-year planning horizon - 2020. Water balances were computed for average and drought hydrologies for 2020. In addition, DWR prepared balances for two scenarios - 2020 with “existing facilities and programs” and 2020 with “options likely to

be implemented.” DWR staff then solicited input on the planning horizons for *Update 2003*. After general discussion, the matter was referred to the initial work groups for more detailed review.

At its April 17 meeting, the Framework Work Group considered the issues. DWR staff outlined the benefits of using various years as one or more planning horizons. Members added to the list of benefits, and expressed a strong preference for multiple planning horizons. Members also recognized that each additional planning horizon created additional work for staff. In the end, Work Group members agreed to propose to the full Advisory Committee that, DWR resources permitting, *Update 2003* include four planning horizons: 2010, 2020, 2030, and 2050.

At the Advisory Committee meeting on April 25, the Work Group proposal was discussed. Committee members were first asked to add to the list of benefits of the four proposed horizons. After discussion, members were asked to indicate formally their degree of support for the Work Group proposal. All members gave at least qualified support to the proposal. Eighteen members gave unqualified support (level 1). Thirteen members gave strong support (level 2). Six members gave general support (level 3). And two members gave qualified support (level 4).

Following the solicitation of perspectives on the Work Group proposal, members were then asked to rank the four planning horizons in the event that DWR resources did not permit use of all four. Members were given a form that listed the four horizons and asked to rank them from 1 to 4, with 1 being their strongest preference, and 4 being the least strong preference. The following table summarizes those preferences.

Horizon	1st Choice	2nd Choice	3rd Choice	4th Choice
2010	26	8	3	2
2020	11	19	3	6
2030	2	9	18	10
2050	0	3	15	21

A simple review of the tabulation produces several observations. From a strictly numerical standpoint, Advisory Committee preferences track the chronological sequence of proposed horizons. (Indeed, 11 of 39 members specifically ranked their preferences in order from 2010 to 2050.) The strongest overall preference was for 2010 - 34 out of 39 members listed that as either their top or second choice. The lowest preference was for 2050 - 36 out of 39 members listed it as their third or fourth choice. In between these two endpoints fall 2020 (30 members indicating it as either their top or second choice) and 2030 (11 members indicating it as either their top or second choice) respectively. Thus, if DWR were to have to choose between 2020 and 2030, 2020 would have the strongest quantitative support - 30 members listed 2020 as one of their top two choices, while only 11 listed 2030 as one of their top two choices.

Similar results can be found by using a weighted average. If members' first preference is assigned 4 points, their second 3 points, and so on, then 2010 received 136 points, 2020 received 113 points, 2030 received 81 points, and 2050 received 60 points.

Beyond the simple numerical review, review of the perspectives of the various interest groups represented in the list of preferences reveals several additional points:

- Members associated with environmental and fisheries interests tended to rank both 2020 and 2050 higher than 2030. (Seven out of a rough grouping of eleven ranked 2030 last.)
- Members associated with environmental and fisheries interests strongly favored 2020 over 2030. Using a weighted system, where 4 points were assigned to their first choice and 1 to their last choice, 2020 received 25 points and 2030 received 18 points.
- Members associated with agricultural water supply interests tended to rank 2050 last. (Five out of a rough grouping of seven ranked 2050 last.)
- Members associated with agricultural water supply interests showed no preference between 2020 and 2030. Using a weighted system, where 4 points were assigned to their first choice and 1 to their last choice, 2020 and 2030 each received 18 points.
- Members associated with urban water supply interests had a slight tendency to rank 2050 last (4 out of a rough grouping of 7).
- Members associated with urban water supply interests had a slight preference for 2020 over 2030. Using a weighted system, where 4 points were assigned to their first choice and 1 to their last choice, 2020 received 19 points and 2030 received 15 points.
- Members associated with local, regional, State or federal government tended to rank 2050 last. (Eight out of a rough grouping of twelve ranked it fourth.)
- Members associated with local, regional, State or federal government strongly favored 2020 over 2030. Using a weighted system, where 4 points were assigned to their first choice and 1 to their last choice, 2020 received 36 points and 2030 received 24 points.

2. DWR Review & Response

DWR thinks it would be most productive to address the topic of multiple planning horizons on two levels: (1) for considering and planning for future scenarios, and (2) for quantifying estimates for future water supplies and uses, both of which are important for *Update 2003*.

On the first level, DWR believes it is essential to discuss multiple planning horizons in *Update 2003* for the purpose of working with the Advisory Committee and other stakeholders to: (1) consider future scenarios, (2) examine the validity of key assumptions under future scenarios, (3) select which key drivers, constraints, and water

management strategies/options are relevant to the various planning horizons, (4) make assumptions about the range of values to assign key drivers and constraints, (5) etc. For example, the 2050 horizon would be valuable for long-term scenario planning for uncertain future(s). DWR concurs with the Advisory Committee that global climate change is one of the key drivers for future water planning (Section II.F below) and believes 2050 would be the most appropriate horizon to consider the implications of global climate change on State water supplies, use, and management.

On the second level, DWR believes more work is needed. For instance, most would agree that 2050 would not be instructive (or appropriate) for preparing quantitative “water portfolios” as described in Section I.A.2 above. In this context, (i.e., determining the purpose and utility of quantifying estimates for future water supplies and uses for various management scenarios and different planning horizons), DWR believes the scenario planning process discussed above should help guide which planning horizons are quantified, and of those, which are presented in the form of “water portfolios.”

Two other factors make it difficult for DWR to commit at this time to preparing quantitative estimates of future supplies and uses for the three planning horizons 2010, 2020, and 2030 (assuming that 2050 would be described qualitatively). First, DWR is just beginning the dialogue with the Advisory Committee on what approach(es) to use for estimating future water supplies, uses, and management options. Consequently, staff is unable to estimate the time and resources needed for including 2010, 2020, and 2030 in *Update 2003*, if their “inclusion” is thought to be the same as preparing quantitative “water portfolios” for each planning horizon. Second, DWR is uncertain that it has sufficient resources to complete quantitative “water portfolios” for all possible combinations of planning horizons, water year types, and future scenarios horizon. (The factors affecting the potential number of “water portfolios” are described in Section I.A.2).

Therefore, with respect to the quantification of the various planning horizons, and in light of the factors discussed above, DWR thinks the best approach at this time is to prioritize the order in which DWR would quantify (prepare “water portfolios”) for the different planning horizons. One approach for setting the priority would be to use the ranking results from the Advisory Committee (see Section I.D.1.c above), namely 2010, 2020, and 2030. Another prioritization is: 2030, 2010, and 2020, which DWR recommends in the eventuality that we only have sufficient time and resources to complete a detailed (quantified) “water portfolio” for future scenarios for one planning horizon. DWR thinks it would be best to first begin quantifying planning horizon 2030, because it would serve as the best long-term forecast of the three horizons for *Update 2003*. Some management strategies/options appropriate for the 2030 horizon may not be considered for the shorter 2010 and 2020 horizons.

Time permitting, DWR would quantify scenarios for the other planning horizons, guided by the higher-lever scenario planning process that will be done for all of the four suggested planning horizons.

E. Range of Hydrologies for “Where we are going”

1. Advisory Committee Consideration

a) Specific Suggestion

In *Update 2003*, include a range of hydrologies from “wet” to “dry.”

b) Rationale

The addition of a wet hydrology may help identify additional “underutilized assets” in the water portfolios.

c) Background

Traditionally, the *Water Plan* updates have included one or two different hydrologies. For example, as explained by DWR staff during the March 8, 2001 Advisory Committee meeting, *Bulletin 160-98* included both an “average” and a “drought” hydrology for both the base year and the planning horizon. At that meeting, DWR staff sought input on the hydrologies to use in *Update 2003*. After general discussion on these hydrologies, the matter was referred to the initial work groups for more focused review.

At its April 17 meeting, the Framework Work Group discussed the advantages and challenges of including additional “wet year” hydrologies. The principal advantage raised was an ability to identify potentially underutilized assets in the State’s water portfolio. The principal challenge raised was the additional staff work necessary to generate the additional water balances. After discussion, the Work Group agreed to present to the full Advisory Committee a proposal to compute current level water balances for average, drought, and wet hydrologies, using CALSIM model data to show probability/exceedence information where available.

During the April 25 Advisory Committee meeting, after consultation with DWR staff and management, the facilitation team proposed changing the question to “in its future forecasts, should *Update 2003* include a range of hydrologies from wet to dry?” The Advisory Committee agreed to the change.

d) Range of Advisory Committee Perspectives

After time for discussion, it appeared that the rephrased proposal had overwhelming support among the Advisory Committee members. Accordingly, members were simply asked whether any had any fundamental disagreement with the proposal. No fundamental disagreement was noted.

2. DWR Review and Response

DWR would like to make the distinction between “hydrologies” and “water year types.” The question as posed to the Advisory Committee was intended to determine if we

should examine a “range of water year types, from wet to dry” from our historic (observed) hydrologic record. It was not intended to decide if we should examine a “range of different hydrologies” (i.e., multiple hydrologic series). The exception would be for future scenarios with climate change that would consider a future hydrology different than the historic record.

DWR and the Advisory Committee have completed little or no pre-work on the question as posed on April 25. As explained above, the original question and strategies developed by the Work Group for handling multiple water year types for each planning horizon was modified at the April 25 Advisory Committee meeting. The modified question posed to the Advisory Committee for consensus is more general than the original question and suggests no specific strategy for including a range of water year types in future forecasts.

In the prior section, it is noted that DWR is just beginning the dialogue with the Advisory Committee on what approach(es) to use for estimating future water supplies and uses, including how best to consider a range of water year types (wet to critically dry) in the forecasts.

For these reasons, DWR is unable at this time to estimate the time and resources necessary to address this suggestion by the Advisory Committee. DWR thinks it would be better to defer this decision until after we have worked with the committee on the approach(es) for futures planning for *Update 2003*.

Further discussions with the Advisory Committee would allow us to follow up on some of the strategies considered during the Work Group meetings. At those meetings, we discussed approaches that may be able to consider a series of water year types for at least parts of California. One of the strategies that staff included in the Discussion Paper was using DWR’s CALSIM2 model to consider a series of water year types for the Central Valley and South Coast region (CALSIM2 model boundary). For areas of the State that are not included in the CALSIM2 model, DWR could use historic hydrologic data to represent three water year types, namely wet, below normal, and critically dry, for preparing a quantitative “water portfolio” for a planning horizon. In addition, results from the CALSIM2 approach could be compared with the three-water year type approach for areas of the State included in CALSIM2.

F. List of Key Drivers and Constraints for Forecasts

1. Advisory Committee Consideration

a) Specific suggestion

At its May 3, 2001 meeting, the Advisory Committee generated the following list of key drivers and constraints for *Update 2003* to consider in planning for the future, shown below in alphabetical order.

- | |
|--|
| <ol style="list-style-type: none">1. Climate & Climate Change (e.g., average/maximum-daily temperature, rainfall, global warming/climate change trends; effects on supplies and uses) |
|--|

2. Commercial, Industrial and Institutional Use (including energy generation)
3. Economics (e.g., real price of water [including impacts of energy costs], price elasticity, subsidies and price supports, rate structure, national and world crop market trends, international trade agreements, cost of water management options; diversification of local economies)
4. Environmental Factors (e.g., land restoration, soil salinity and subsoil drainage, reallocation of environmental water to/from urban/ag for drought relief, and hydropower generation)
5. Infrastructure Constraints (statewide storage, extraction and conveyance capabilities for both surface and groundwater)
6. Land Use (e.g., urbanization, crop mix, crop land retirement, conservation easements, other land ownership trends, conversion to habitat, watershed management, drainage)
7. Long Term Groundwater Quantity and Quality
8. Other Planning Processes (CALFED, other State & federal efforts, increased role of local planning processes)
9. Population (e.g., rate of growth, location, density, demographics [including major shifts in age structure & ethnicity] and median income)
10. Public Education and Acceptance (e.g., acceptance of reclaimed/recycled water; acceptance of tax and other policies)
11. Public Policies (tax policies and infrastructure investments, political shifts and bond issues; local regulations, especially groundwater; bi-national opportunities [U.S. and Mexico.]
12. Regulatory Factors (e.g., adjudications, water rights, Endangered Species Act listings, flood control impacts, recreational requirements, other federal and State laws and agreements [e.g., COA])
13. Technology (new industries have new water needs; genetically modified crops may have impact water uses)
14. Water Quality (including Delta standards and drinking water standards)
15. Water Use Efficiency (e.g., quantification, technologies, economics, irrigation techniques, State and federal standards/requirements)

b) Rationale

In planning for the future, the focus must be on those key drivers and constraints that will likely have a material impact on future water supplies and uses.

c) Background

Traditionally, the *Water Plan* updates have tracked or described a variety of factors to assist in the forecasts of future water supplies and uses. At the March 8, 2001 Advisory Committee meeting, DWR staff generally described the processes used in *Bulletin 160-98* to forecast future water supplies and uses. After substantial discussion, these matters were referred to the initial work groups for more focused review.

During at least five of the eight initial work group meetings, work group participants raised key future drivers and constraints. DWR staff then compiled these into a master list and presented them to members who participated in the follow-up work group meeting on April 20. Work group members reviewed the list and agreed to forward it to the full Advisory Committee for its consideration.

At the May 3, 2001 Advisory Committee meeting, members reviewed the list. In making suggestions for additions or modifications to the list, members were encouraged to distinguish “elephants” from “ants,” proposing only new elephants to the list. Members were also encouraged to propose only those key drivers or constraints whose addition might “significantly affect the error bars” in future forecasts. The facilitation team recorded the suggested additions and modifications and compiled the revised list set out at the beginning of this section.

d) Range of Advisory Committee Perspectives

The Advisory Committee has not formally reviewed the list it has generated.

e) Follow-up

Agreement on the revised list will be sought at the June 20 Advisory Committee meeting. After reaching agreement on the list, DWR and members will need to begin the process of identifying the ways in which *Update 2003* will consider the factors and constraints (e.g., quantitatively or narratively).

2. DWR Review and Response

Staff worked with Advisory Committee members in the Work Groups to develop the list of 15 key drivers and constraints presented above. Many of the drivers and constraints were suggested by DWR based on the data needed for developing and applying water use forecasting tools used in preparing *Bulletin 160-98*.

During the remainder of 2001, DWR will need to allocate significant time and resources to compiling data and information on these drivers and constraints. The resulting “data base” will determine in large part the most appropriate/accurate forecasting tools that can be developed for estimating future water use for the ten hydrologic regions.

G. Improve Agricultural Water Use Data - Use Existing ETAW Data

1. Advisory Committee Consideration

a) Specific Suggestion

The Advisory Committee reached consensus on the following proposals for describing “where we are now” for agricultural water usage:

- Conduct an irrigation methods distribution survey.
- Add information from available Agricultural Water Management plans.
- Add Mobile Lab information.
- Supplement with a Delphi approach that includes talks with farm advisors, irrigation district staff, and at least one outside expert.
- Let DWR decide whether additional consultations (i.e., beyond the group identified above) with outside experts are needed.

Consensus should soon be reached on the following additional language:

- Use existing ETAW figures to display total current ETAW.

Additional work needs to be done on the following proposals:

- Where possible, clearly define non-productive evaporative losses as a factor in evaluating the potential for improving agricultural water-use efficiency.
- Where possible separate out "E" and "T" to identify potential water savings from reduced evaporative losses.
- Where such estimates are not possible, note it.
- Assist UC and CALFED to study the issue.

b) Rationale

The additional studies, data sources and Delphi method will supplement the extensive information used by DWR in previous updates to determine current agricultural water use.

The separation of evaporation from transpiration and productive and non-productive evaporation, where possible, may help identify any additional potential for improving agricultural water use efficiency.

c) Background

At the March 8, 2001, Advisory Committee meeting, DWR staff described how agricultural water use had been determined for *Bulletin 160-98*. Staff sought input regarding the description of current agricultural water use for *Update 2003*. After general discussion, the matter was referred to the initial Work Groups.

The matter was first discussed at the Agricultural Water Use Work Group meeting on March 21, 2001. Following that meeting, DWR staff put together a series of options for addressing current agricultural water use in *Update 2003*. These were presented at the follow-up work group meeting held on April 20, 2001. After extensive discussion during that meeting, the work group reached consensus on a proposal to:

- Use existing ETAW data.
- Conduct an irrigation methods distribution survey.
- Add information from available Agricultural Water Management plans.
- Add Mobile Lab information.
- Supplement with a Delphi approach that includes talks with farm advisors, irrigation district staff, and at least one outside expert.
- Let DWR decide whether additional consultations (i.e., beyond the group identified above) with outside experts are needed.

d) Range of Advisory Committee Perspectives

At the May 3 Advisory Committee meeting, this Work Group proposal was presented. After time for discussion, members were asked to communicate any fundamental disagreement to designated staff by the week after the meeting. Otherwise, the Work Group proposal would be sent to DWR as a consensus-based suggestion.

At the meeting, one member raised a fundamental concern regarding the proposal to use existing ETAW data. Staff promised to work with the member following the meeting.

After the meeting, the facilitation team contacted the member and clarified her concerns. That conversation, in turn, led to an exchange of correspondence with an additional Advisory Committee member who had raised similar concerns in the context of the Water Portfolio categories. The second member clarified the concerns. Working with the facilitation team, the second member developed the proposed additional language.

The only concerns raised were with the portion of the proposal to “use existing ETAW” data. Consensus was reached on all other aspects of the proposal.

e) Follow-up

The proposed additional language needs to be presented to the Advisory Committee members for their review. This will be done prior to the June 20 Advisory Committee meeting.

2. DWR Review and Response

DWR agrees with the Advisory Committee's suggestion to improve to the extent possible (time and resources) agricultural water use data. During the Work Group meetings, staff presented a number of DWR's on-going activities addressing this topic, which were incorporated in the committee's suggestion. DWR plans to address the committee's suggestion as follows.

- For *Update 2003*, DWR will use estimates of crop evapotranspiration, effective precipitation, and ET of applied water for the years selected to reflect current conditions. Crop water use estimates would be based on evaporative demand and precipitation that occurred during those years.
- In addition to the suggested measures for augmenting information on agricultural irrigation practices, DWR will submit assumptions regarding on-farm irrigation efficiency for peer review by a select panel including researchers at the Center for Irrigation Technology (CSU Fresno), the Irrigation Training and Research Center (Cal Poly, San Luis Obispo), and the University of California Cooperative Extension.
- DWR will include in *Update 2003* an in-depth discussion on the state of the science regarding quantification of non-productive evaporative losses in agriculture, the results of three on-going studies (two by U.C. Davis and one by Cal Poly, San Luis Obispo), and an overview of the potential implications of reduced evaporation in terms of agricultural water use, productivity and costs. DWR understands the rationale of the proposal from Advisory Committee members, namely that reducing the evaporation component of evapotranspiration would save a significant amount of water while maintaining agricultural productivity. DWR staff believes, however, that the potential for reducing evaporation is uncertain at this time because most data and analyses have treated evapotranspiration as an integrated whole rather than as two separate but integrative processes. The three current studies noted above promise to shed light on this issue.

H. Improve Urban Landscape Water Use Estimates

1. Advisory Committee Consideration

a) Specific Suggestion

The Advisory Committee reached agreement on the following proposal for describing “where we are now” for urban landscape water use:

- Use a combination of remote sensing, disaggregate approach and minimum monthly approach.
- More specifically, use remote sensing data where it already exists (e.g., through Urban Water Management Plans, Urban Water Conservation Council data, NASA data, AWAR data).
- Where remote sensing data does not now exist, use a combination of a disaggregate approach and a minimum monthly approach.
- In the disaggregate approach, separately identify single family residential, multi-family residential, commercial, industrial, and institutional uses; and reflect significant regional differences.
- Where possible, separate out large turf (e.g., parks and golf courses) and small turf (e.g., residences) watering uses.

b) Rationale

The combination of methods will best describe urban landscape use. Remote sensing data, where it currently exists, is quite accurate. The other two methods can combine to provide reliable and useful estimates where remote sensing data is not currently available.

Separation of large and small turf uses will help identify the potential scope of the different management options applicable to the two types of uses.

c) Background

At the March 8, 2001 Advisory Committee meeting, DWR staff described how urban water use had been determined for *Bulletin 160-98*. Staff sought input regarding the description of current urban water use for *Update 2003*. After time for general discussion, the matter was referred to the initial work groups.

The matter was first discussed at the Urban Water Use Work Group meeting on March 20, 2001. Following that meeting, DWR staff put together a series of options for addressing current urban water use in *Update 2003*. These were presented at the follow-up work group meeting held on April 20, 2001. After extensive discussion during that meeting, the work group reached consensus on the proposal set out at the start of this section.

d) Range of Advisory Committee Perspectives

At the May 3 Advisory Committee meeting, members were presented the Work Group proposal. After time for discussion, members were asked to communicate any fundamental disagreement to designated staff by the week after the meeting. Otherwise, they were told, the Work Group proposal would be sent to DWR as a consensus-based suggestion.

No one raised any fundamental concerns either before or after the meeting. During the meeting, however, one member offered some suggestions for language that he felt better captured the work group proposal. Staff promised to work with the member following the meeting to fine-tune the proposal. Following the meeting, the member indicated agreement with the wording set out at the beginning of this section.

2. DWR Review and Response

DWR agrees with the Advisory Committee's suggestion to improve to the extent possible (time and resources) urban landscape water use estimates. During the Work Group meetings, staff presented a number of DWR's on-going activities addressing this topic, which were incorporated in the committee's suggestion. DWR plans to address the committee's suggestion as follows:

- Use the suggested method for combining information from existing studies on landscape area and water use, and extending those results to other areas of the State by various means.
- Estimate landscape area based on existing studies of landscape area in California, including studies using remote sensing methods. Study results would be extended by applying per unit (e.g., single family dwelling, multifamily dwelling) landscape area coefficients derived for the study area to other similar areas of sparse data.
- Apply landscape water use coefficients to the landscape area estimates to determine landscape water use. Water use coefficients would be derived from various sources including existing studies on landscape water use, the landscape coefficient method, and the minimum month method.
- Separately tabulate, to the extent possible, the area and water use of large turf landscapes such as parks and golf courses.

III. Additional Matters

A. Customer Survey

1. Specific Suggestion

Survey external stakeholders, such as those involved in Other Planning Processes and other potential "customers" of *Update 2003*, to get their input on "what will make *Update 2003* a useful plan" and to find out what information they can share with the *Update 2003* planning process.

2. Rationale

An external survey is a key element of strategic planning. In addition, many other planning processes have information involving planned water management options that *Update 2003* needs to take into consideration.

3. Background

Traditionally, DWR has surveyed water districts and other planning processes to identify planned water management options that are relevant to future water supply and use forecasts. Indeed, such a survey was conducted for *Bulletin 160-98*.

With the “strategic planning” focus for *Update 2003*, DWR has indicated that it intends to broaden the focus of the “customer survey.” Typically, an external customer survey is part of any strategic planning process. Such surveys attempt to find out what an organization does well and what needs improvement. In the context of *Update 2003*, the proposed survey would identify how to make *Update 2003* “a useful plan.”

One of the initial Work Groups met on March 29 to address the general relationship of *Update 2003* and other planning processes. The group considered criteria for determining which processes needed coordination and how that coordination could take place. In particular, the Work Group considered how to get information from other planning processes regarding “how to make this a useful plan,” and how to calculate other groups’ effects on water supplies and uses.

To get information about “how to make this a useful plan,” group members suggested using focus groups. To study other groups’ effects on water supplies and uses, the Work Group suggested a detailed customer survey.

DWR staff presented the Work Group suggestions to the full Advisory Committee at the April 25 meeting. The facilitation team announced that a shorter survey would be developed especially for Advisory Committee members; this survey would be presented at the June 20, 2001 Advisory Committee meeting.

4. Range of Advisory Committee Perspectives

The perspectives of Advisory Committee members were not formally sought. Members received the presentations and were given an opportunity to comment or raise any concerns or suggestions for improvement. Four Advisory Committee members volunteered to help assist DWR staff to develop the customer survey. No other concerns or suggestions were raised.

5. Follow-up

The Work Team met to develop the customer survey idea and to develop the focus group suggestion.

B. Assumptions and Estimates Document

1. Specific Suggestion

With as much detail as possible given the available time, prepare a “process map” to describe the assumptions and estimates to be used in preparing *Update 2003*. At a minimum, for each legislatively required component of the Assumptions and Estimates report, indicate where DWR will use observed data, where it will make assumptions or estimates, and where it will report the output of specific calculations. At a minimum, where output comes from specific calculations, identify the specific steps of each calculation.

2. Rationale

A detailed process map will allow DWR to document and make fully transparent the steps taken to prepare *Update 2003*.

3. Background

As noted in the Introduction to this report, legislation enacted in 2000 requires DWR to release, by January 1, 2002 a preliminary report of the assumptions and estimates it will use in preparing *Update 2003*.

Both DWR and facilitation team staff noted this required report and its deadline during the January 18 and March 8 Advisory Committee meetings. During the March 8 meeting, Advisory Committee members were invited to attend an initial work group meeting to explore in greater detail the possible content and manner of preparation of the report.

On March 30, 2001 the Work Group met. DWR staff outlined the minimum statutory requirements. Staff also presented “process mapping” as a tool to integrate the statutory requirements and DWR’s own goals of fully documenting the steps to be taken in developing *Update 2003*. DWR staff indicated that there would likely be three types of information that would be relevant to the Assumptions and Estimates Report - observed data used as an input to a calculation, assumptions and estimates used as input to a calculation, and the output of calculations. For each component of *Update 2003* - and the corresponding portion of the Assumptions and Estimates Report - the process map would indicate the particular type of information to be used or developed. For components indicated as “output of calculations,” DWR would specify the steps used in the specific calculations.

Work Group members discussed both the statutory requirements and process mapping. Members generally supported the process-mapping concept. Discussion principally centered on the degree to which DWR needs to include, in the Assumptions and Estimates report, results of any specific calculations to be performed. DWR staff indicated that time pressures meant that, for *Update 2003*, the Assumptions and Estimates report would for the most part identify the steps to be performed in making any calculations rather than reporting the numerical output of any such calculations.

Most Work Group members indicated support for this approach. Other staff, however, indicated their expectations that the report contain as many of the results of the calculations as possible.

DWR staff presented the statutory requirements and the process mapping idea to the full Advisory Committee at the April 25 meeting.

4. Range of Advisory Committee Perspectives

The perspectives of Advisory Committee members were not formally sought. Members received the presentations and were given an opportunity to comment or raise any concerns or suggestions for improvement.

5. Follow-up

Drafting elements of the Assumptions and Estimates report will occupy much of staff's and Advisory Committee's time over the summer and fall of 2001. Over the summer, DWR will develop a draft of the process map that will be used to describe "where we are now," which will be presented at the September 7, 2001, Advisory Committee meeting.

In addition, with input from the Advisory Committee at the June and September 2001 Committee meetings, staff will prepare a draft of the process map that will be used to describe "where we are going." This draft will be developed by September 30, 2001. Advisory Committee members will be given an opportunity to brief their organizations during October 2001.

The full draft process map will then be the principal focus of discussion at the October 25, 2001, Advisory Committee meeting. Following that meeting, DWR staff will prepare any necessary revisions to the draft and produce the required report in November 2001. DWR staff will preview the report for the Advisory Committee at the December 2001 Advisory Committee meeting.