



December 7, 2011

Manucher Alemi
Department of Water Resources
1416 9th Street
Sacramento, CA 95814

RE: Comments on Draft Report on Quantifying Agricultural Water Use Efficiency

Dear Mr. Alemi:

On behalf of the Natural Resources Defense Council, which has 250,000 members and activists in California, I am writing to provide comments on the Department's November 15, 2011 draft report on Quantifying the Efficiency of Agricultural Water Use. We appreciate that the Department is responding to our prior written comments, which we believe will improve the final report. Although the draft report has been revised in response to some of our prior comments, other comments have not been satisfactorily addressed and are reiterated again. In addition, in light of the substantial gaps in the current draft, we appreciate the Department's commitment to providing members of the Agricultural Stakeholder Committee ("ASC") another opportunity to comment on the new and revised text in the next draft.

With respect to this version of the draft report, we support the draft report's recommendation for a substantial implementation plan on the suite of metrics, including crop productivity and value of production metrics, and we strongly agree that the report should identify and recommend implementation of metrics at the field level as well as at higher spatial scales. However, we have several concerns with some of the language and some of the metrics in the current draft, which are discussed in detail on the pages that follow.

Thank you for consideration of our views. Please contact us if you have any questions or want to discuss these comments in more detail.

Sincerely,

Doug Obegi

1. The Purposes Identified in the Draft Report Should be Revised and Expanded to Include Economic and Productivity Benefits to Farmers and Districts

We recommend that DWR revise the current purpose of the report and expand the discussion of purposes for the various methods and at the various scales. We recommend revising the overall purpose on page 7 of the report (“...to evaluate current and potential water management paradigms and opportunities for modification in the management, distribution, and efficient use of water in agriculture.”), to focus on improving agricultural water use efficiency, consistent with the statutory purpose described in SB 7x 1 (*see, e.g.*, Water Code § 10608.4(a)). Likewise, we strongly agree that the objectives of improved efficiency on page 9 should include maintaining and improving environmental quality, which can include reduced surface water diversions, maintaining and improving water quality, reduced greenhouse gas emissions, and maintaining and improving wildlife habitat. However, the objectives should also include improved crop and economic productivity and cost savings for farmers and districts as objectives, and the report should acknowledge that these objectives can be complimentary.

Similarly, the draft purposes for the methods/indicators also should be revised and expanded. We recommend deleting purpose #6 on page 18, as it is not a purpose for quantifying efficiency at the field level. On page 20, we support purpose #3, but we also recommend adding an additional purpose that focuses on increased productivity and financial savings for farmers and districts, as improved efficiency can reduce costs of acquiring surface and groundwater, generate water to irrigate additional fields or for water transfers, and to improve crop productivity and economic returns.

2. The Discussion of Crop Productivity and Value of Production Metrics Should be Revised

We support inclusion of this metric at the field scale, and suggest that it be included and implemented at the water supplier scale as well. However, as currently drafted, the report seems to unfairly discount and criticize the crop productivity and value of production metrics. The draft report overemphasizes the caveats and limitations of these methods, including the text on pages 13, 14 and 24, particularly given the existing use of these indicators, including in the California Water Plan (as the document notes on page 13).¹ While other factors clearly affect crop productivity and value of production, the report fails to acknowledge how averaging values over longer periods of time can minimize the effects of crop disease, pests, or other factors in any single year and make these indicators even more useful. The report also fails to acknowledge the differences between these two metrics; for instance, the variability of crop prices does not affect the crop productivity metric. In addition, we recommend deleting the discussion on page 13-14 of using ETAW (instead of applied water) with the productivity indicators, as that method is not carried forward and we agree it does not appear to be a useful indicator of water use efficiency.

¹ For instance, page 2-6 of the 2009 Water Plan Update states, “One indicator of agricultural water use efficiency improvement is that agricultural production per unit of applied water (tons/acre-foot) for 32 important California crops increased by 38 percent from 1980 to 2000. Another indicator is that inflation-adjusted gross crop revenue per unit of applied water (dollars/acre-foot) increased by 11 percent from 1980 to 2000.”

As the report grudgingly acknowledges on page 24, the crop productivity and value of production metrics can be useful in identifying differences in water use efficiency between regions, between fields, and over time. While this metric does not answer the question of what causes the differences in water use and production between fields/districts/regions, it allows farmers, districts, and policy makers to recognize that significant differences may exist. The exploration of the reasons for those differences and their implications for public policy is a separate exercise.

3. The Discussion of Agronomic Water Use Should be Revised and Expanded to Acknowledge the Significant Limitations in Using an “Accepted Professional Practice” Standard to Define Agronomic Uses

We continue to have substantial concerns with using “accepted professional practice” to define agronomic water use in the methods, as indicated on pages 15 and 16 and elsewhere in the report. As we wrote in our prior comments to DWR,

NRDC believes that the lack of objective standards for agronomic use must be acknowledged, and that any metric which essentially assumes that 100% of agronomic use is efficient will understate the potential efficiency gains that can be had in improving these uses. Indeed, reduced agronomic uses have significant potential to reduce on-farm water use without sacrificing productivity (for instance, with reduced water use for rice decomposition, or better matching crop and soil types to reduce agronomic water use for salt leaching).

While the report explains how agronomic water uses may contribute to the evapotranspiration of applied water (ETAW) and how to avoid double-counting those water uses, the discussion of agronomic water use should be substantially expanded to address our prior comments. Language like that on page 35 of the current draft should be included up front, as part of an expanded discussion of the limitations of using accepted professional practice for measuring agronomic water use. In addition, improving the efficiency of agronomic water uses (and of assessing what constitutes efficient levels of agronomic water uses) should be identified as important data gaps and research needs.

4. The Report Should Omit Discussion of “Beneficial” Uses and Avoid Confusing Beneficial Use with Efficient Water Use

As discussed at the last ASC meeting, we strongly recommend deleting the word “beneficial” from the description of the agronomic and total water use fraction equations, and deleting this phrase from descriptions of agronomic or other specific water uses in the report. “Beneficial use” is a legal term of art, and its inclusion in the report creates confusion. We recommend using the terms “Agronomic Use Fraction” and “Total Use Fraction” for these methods instead. In general, the report should strive to avoid all discussion of reasonable and beneficial use; as our prior comments noted, and as we have noted throughout the ASC process, efficient water use is not the same thing as reasonable and beneficial use.

5. The Delivery Fraction Methodology Appears Inconsistent and Should be Revised

The definition of the delivery fraction method appears to be inconsistently applied in the report, and we recommend that DWR revise the method to focus on potential water losses in the conveyance system. The definition of this method on page 17 suggests that the focus is on conveyance losses, with farm gate deliveries as the numerator and total diversions and withdrawals by the district as the denominator. This understanding seems consistent with the example on page 27. However, the numerator and denominator in the equations on pages 20-21 appear to be inconsistent with this understanding, utilizing field scale applied water as the numerator and supplier scale applied water as the denominator. We strongly suggest refocusing this equation on the difference between the farm-gate deliveries and the suppliers' total diversions/withdrawals, which is more consistent with the example on page 27 and appears more useful as a tool to measure and improve efficiency. If the equation is focused on the ratio between farm gate deliveries and supplier diversions/withdrawals, then it would appear that the ratio cannot be above 100%, and that language on page 17 should be deleted.

6. Distribution Uniformity Should Not be Included as Method of Quantifying Efficiency

This draft adds Distribution Uniformity as a new method at the field level (it was not included in the November 1 draft), and we recommend that it be excluded from the report. The draft appropriately discusses how distribution uniformity is a useful measure of how effective an irrigation system is at distributing water, and we agree that it can be a useful tool for improving the efficiency of a field level irrigation system.

However, distribution uniformity is not a method for quantifying water use efficiency. As the draft notes, “[a]lthough DU provides insight into irrigation system performance and opportunities to improve the application of irrigation water, it does not signify the appropriate quantity of water for a specific crop.” Measuring DU answers a specific question – does the irrigation system deliver water uniformly across the field. But it cannot answer the question of whether water deliveries are efficiently meeting crop water needs. We recommend that the report exclude it as a methodology for quantifying water use efficiency, while still endorsing the use of this tool for improving the efficiency of irrigation systems.

7. Overemphasis on the Water Balance Approach Should be Tempered

In general, we continue to believe that the water balance approach generally seems more suited to an analysis of reasonable and beneficial uses, rather than an analysis of water use efficiency. We believe more discussion of the Water Management Fraction is also appropriate before it is included in the report. For instance, it is unclear why, on pages 15-16, the report states that recoverable flows are utilized but irrecoverable flows are not used. More importantly, groundwater recharge is extremely important and can be a reasonable and beneficial use of water; however, that does not mean that recharging groundwater as a result of incidental canal seepage is an efficient use of water. The Water Management Fraction appears to confuse water efficiency and beneficial use.

We do not agree with the criticism of field level metrics on page 9, and we disagree with the statements on page 9 and page 12 that a water balance approach that includes an understanding the fate of all water within the boundary is necessary to discuss and quantify water use efficiency. We agree that a general understanding of these water uses is useful and particularly important to understand the implications of improving water use efficiency, but we are concerned that language could be read to mean that the lack of data to compute some of the water balance approaches justifies paralysis in the assessment of water use efficiency.

In contrast to the complex nature of a complete water balance approach, the consumptive use fraction metric is a very useful measure of water use efficiency precisely because it is a simple, and objective, measure of whether water deliveries are meeting crop water needs. As a minor point, we recommend that the discussion of this metric on pages 12-13 (and potentially others metrics as well) should be revised to more explicitly discuss the situation of a field that grows multiple crops during a single year. The field level example of the consumptive use fraction metric provided on page 29 is very useful.