

## Memorandum

Date: September 14, 2009

To: Jeanine Townsend  
Clerk to the Board  
State Water Resources Control Board  
P.O. Box 100  
Sacramento, CA 95812-2000

Via electronic mail to: [commentletters@waterboards.ca.gov](mailto:commentletters@waterboards.ca.gov)

From: Department of Water Resources

Subject: Crop Salt Tolerance Study Report Comments

The Department of Water Resources (DWR) appreciates the opportunity to provide comments for the draft study report entitled *Salt Tolerance of Crops in the Southern Sacramento-San Joaquin Delta* (Study Report). The Study Report's purpose of providing the state of knowledge on the irrigation water quality needs of the southern Delta is critical to the current review and update of the southern Delta salinity water quality objectives and the program of implementation in the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan). For the most part, DWR supports the Study Report's conclusions and recommendations and believes they will facilitate the development of an appropriate objective that will reasonably protect agricultural production in the southern Delta under various hydrologic conditions.

The Study Report is an excellent report. It analyzes, in depth, the multiple factors influencing the growth of agricultural crops in the southern Delta, including the water quality needed to protect southern Delta agriculture. DWR believes the Study Report provides strong evidence that existing soil and irrigation water conditions in the southern Delta are favorable for growing agricultural crops, including beans, and that the current salinity objectives are overly protective. As stated in the Study Report, all of the models presented predict that the water quality standard could be increased and all of the crops normally grown in the southern Delta would be protected.

Importantly, while the Study Report recommends that a field experiment be conducted to ensure that the salt tolerance of bean is established for local conditions, DWR does not believe such an experiment should delay the current review and potential modification process. The best available information before the State Water Resources Control Board (State Water Board) supports the modification of the southern Delta salinity objectives and their program of implementation. As indicated by the Study Report, the current state of knowledge demonstrates that a 0.7 EC objective is not necessary to protect agriculture in the southern Delta. Therefore, DWR recommends that the State Water Board proceed at this time with modifying the Bay-Delta Plan and conduct a water rights hearing, if appropriate, to implement the Plan. If the above field experiment is conducted, the State Water Board could address the results of the experiment as part of a future periodic review.

Below are DWR's comments that will hopefully assist Dr. Hoffman in finalizing the Study Report. The comments focus primarily on land use data contained in the report.

General Comments:

The Study Report includes tables of crop acreages from several land use surveys conducted by DWR. Our land use data is available in digital map format that contains information on the crops grown on each field within a survey area. An understanding of the structure of the attributes associated with each field is needed to use these maps to calculate acreages and identify the spatial distribution of crops. The land use attributes are structured to store information on up to three crops grown during a single year. DWR's more recent surveys, such as the 2007 land use survey of the Delta, also identify the irrigation method used on each field.

In the Study Report, the table of crop acreages that was based upon DWR's land use surveys does not accurately reflect the acreages of crops that were mapped. DWR would like to provide the corrected crop acreages and have included them in four attached tables, one for each land use survey. The crops are listed individually to permit flexibility in aggregating the acreages.

The report also contains crop acreage data acquired from the San Joaquin County Agricultural Commissioner. Agricultural Commissioners develop digital maps of crops to track pesticide application permits. These maps may contain multiple copies of polygons that represent a single field. This enables the commissioner to track the pesticides applied to multiple crops grown on that field. In some cases, one or more crops are grown on a portion of a field, but the pesticide application permit and crop are associated with the entire parcel. More than ten polygons may be stacked at a single location. This is useful for tracking pesticide application permits, but it can generate errors if the polygons are used to calculate crop acreages. Some of the acreage discrepancies shown in the table on page 12 of the report may have resulted from this situation where multiple polygons represent a single field.

The spatial distribution of crops from DWR's land use maps was used in conjunction with digital soil maps to summarize relationships between soil characteristics and crops. Because some fields of beans and other crops were not represented in this analysis, we recommend reprocessing the land and soil data to provide a more accurate summary of the relationships.

Specific Comments:

In Section 2.21, page 5: The relationship between the two electrical conductivity units is not clear. Units of microSiemens per centimeter are 1000 times smaller than deciSiemens per meter. The authors may have meant that the numbers representing a given salinity value are 1000 times larger when you use microSiemens per centimeter because the unit is smaller.

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In Section 3.5.2, Table 3.6, page 31: Although the average annual precipitation along the transect between Red Bluff and Bakersfield is fairly linear, the South Delta is in the rain shadow of Mount Diablo, so a value of 13.8 for mean annual precipitation is probably high for that area. A more detailed map of average annual precipitation for this area is included in the *Soil Survey of San Joaquin County, California*, published by the USDA Natural Resources Conservation Service. The precipitation input to the model from the Tracy Carbona weather station is more consistent with the map published by the NRCS.

In Section 3.12.1, Figure 3.16, page 46: Please label the two lines representing different soil textures.

In Section 5.2, Table 5.1, page 70: The model output indicates that in years with very low precipitation (e.g. 1960 and 1972), more irrigation water must be applied when precipitation is taken into account than when no precipitation is included in the calculation. One might expect the required irrigation water to be the same, but not more when precipitation is taken into account.

DWR appreciates the opportunity to comment on this draft Study Report and looks forward to working with the State Water Board as the process moves forward. If you or your staff have questions on these comments or would like additional information please contact Jean Woods, Senior Land and Water Use Scientist, at (916) 651-9650 or [jwoods@water.ca.gov](mailto:jwoods@water.ca.gov).

Sincerely,



Erick Soderlund  
Staff Counsel

Attachments

2007 Delta Land Use Survey -- South Delta Water Agency within the Legal Delta  
 CA Department of Water Resources  
 Jean Woods, 09/09/2009

	NET IRR ACRES
OLIVES	77
MISC. SUBTROPICAL FRUITS	3
APPLES	18
APRICOTS	204
PEACHES AND NECTARINES	0
PLUMS	5
MISC. DECIDUOUS FRUITS AND NUTS	47
MIXED DECIDUOUS FRUITS AND NUTS	6
ALMONDS	3,107
WALNUTS	2,051
PISTACHIOS	18
COTTON	34
SAFFLOWER	2,684
SUGARBEETS	135
CORN	15,481
SUDAN	1,286
DRY BEANS	4,417
SORGHUM/SUDAN HYBRID	71
GRAIN AND HAY	7,339
IDLE	2,114
ALFALFA	31,342
PASTURE	2,975
MISC. GRASSES	144
TURF FARMS	324
RYE GRASS	29
ASPARAGUS	3,651
GREEN BEANS	24
CARROTS	197
CELERY	105
LETTUCE	20
MELONS, SQUASH & CUCUMBERS	2,628
ONIONS	165
SPINACH	135
TOMATOES	16,444
FLOWERS, NURSERY, TREE FARMS	8
MIXED TRUCK	19
MISC. TRUCK	320
BUSH BERRIES	37
STRAWBERRIES	4
PEPPERS	253
BROCCOLI	13
CABBAGE	244
VINEYARD	2,902
OTHER TRUCK (UNSPECIFIED)	16
TOTALS	101,097

1988 Delta Land Use Survey -- South Delta Water Agency within the Legal Delta  
 CA Department of Water Resources  
 Jean Woods, 09/09/2009

	GROSS IRR ACRES	NET IRR ACRES
LEMONS	12	11
OLIVES	0	0
EUCALYPTUS	0	0
MISC. SUBTROPICAL FRUITS	0	0
APPLES	5	5
APRICOTS	1,311	1,246
CHERRIES	16	15
PEACHES AND NECTARINES	0	0
PEARS	62	59
PLUMS	0	0
MISC. DECIDUOUS FRUITS AND NUTS	18	18
MIXED DECIDUOUS FRUITS AND NUTS	0	0
DECIDUOUS - UNIDENTIFIED	192	182
ALMONDS	3,286	3,122
WALNUTS	4,182	3,973
PISTACHIOS	42	40
COTTON	0	0
SAFFLOWER	4,988	4,738
SUGARBEETS	12,204	11,594
CORN	8,034	7,632
SUDAN	611	581
DRY BEANS	7,864	7,471
SORGHUM	8	8
SORGHUM/SUDAN HYBRID	0	0
SUNFLOWER	544	517
MISC FIELD	8	8
GRAIN AND HAY	10,290	9,776
IDLE	2,386	2,266
ALFALFA	38,506	36,581
CLOVER	32	31
PASTURE	2,768	2,630
MISC. GRASSES	0	0
TURF FARMS	245	232
RYE GRASS	0	0
ASPARAGUS	7,782	7,393
GREEN BEANS	173	164
COLE CROPS	586	557
CARROTS	0	0
CELERY	0	0
LETTUCE	0	0
MELONS, SQUASH & CUCUMBERS	2,326	2,210
ONIONS	344	326
SPINACH	0	0
TOMATOES	16,698	15,863
FLOWERS, NURSERY, TREE FARMS	0	0
MIXED TRUCK	0	0

MISC. TRUCK	94	89
BUSH BERRIES	0	0
STRAWBERRIES	0	0
PEPPERS	81	77
BROCCOLI	0	0
CABBAGE	0	0
VINEYARD	549	521
TOTALS	126,248	119,936