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Figures

Figure 1. Relationship between average December-March flow in Old and Middle rivers and the salvage of delta smelt in the same averaging period.

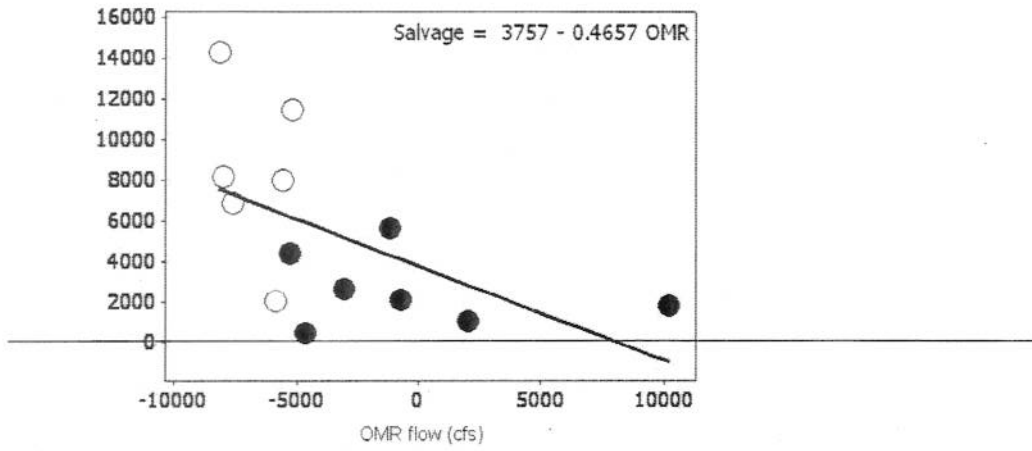


Figure 2. Boxplot summary of CALSIM II operations study outputs of median December - March flows in Old and Middle rivers for five water year types (1 = wet; 5 = critical).

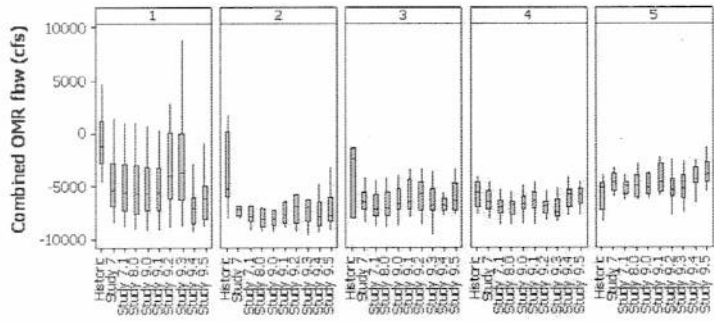


Figure 3. Historic median in salvage in the 25th and 75th percentile versus the preceding years FMWT Recovery Index (1987 to 2007..

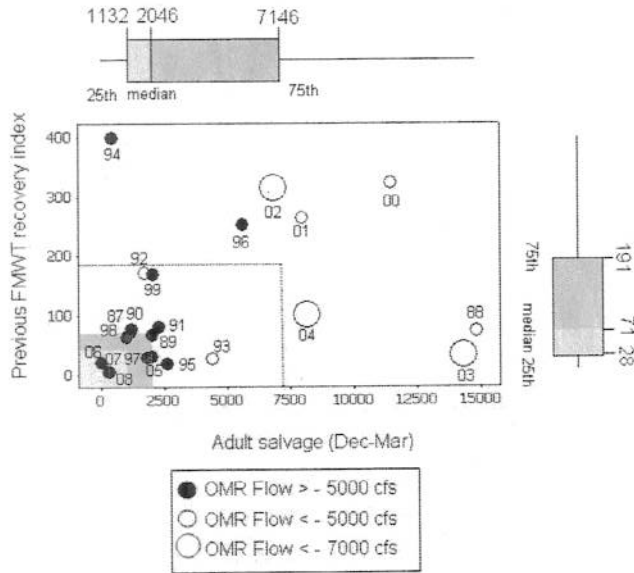


Figure 4. Plot of event probabilities of adult salvage exceeding five numeric thresholds based on a logistic regression analysis of Old and Middle river flow effects on adult delta smelt salvage.

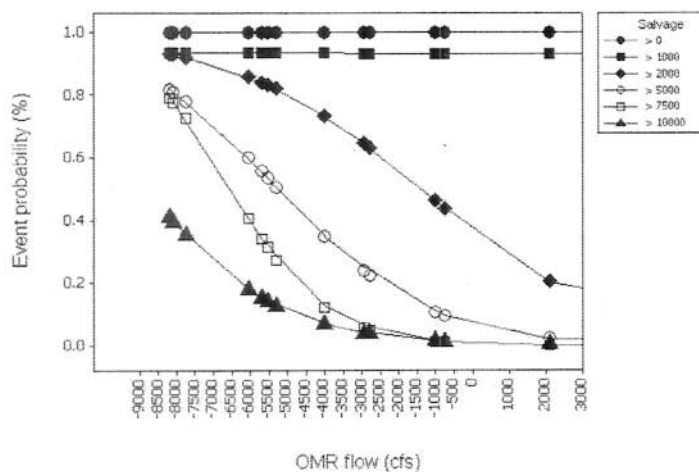


Figure 5. Scatterplot of average flow in Old and Middle rivers (upper panel = March – June; lower panel = April – May) and the percentage of the larval and juvenile delta smelt population entrained in the SWP and CVP export pumps. The entrainment estimates were taken from Kimmerer (2008). The bubble sizes are scaled to the average Delta outflow for the same averaging periods as the OMR

flows.

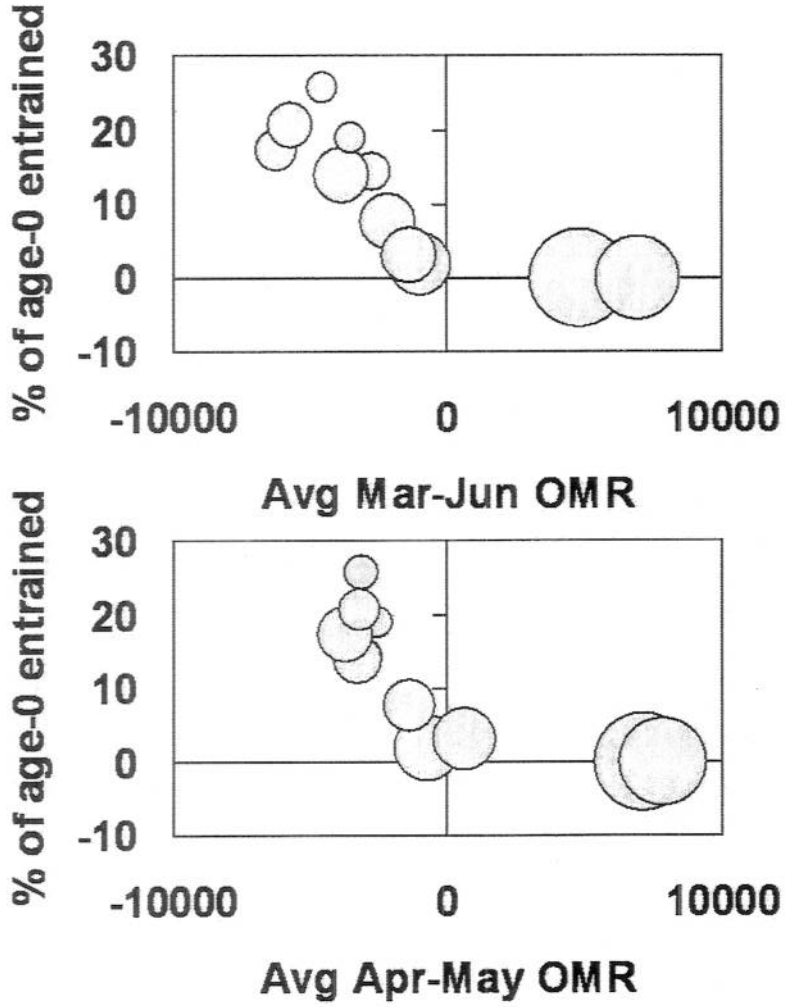


Figure 6. Time trend in average March – June flow Old and Middle river flow, 1967-2007. Data for 1980-2006 are empirical data based on ADCP measurements. Data for 1967-1979 and 2007 are estimated as described in the text. The spline is a LOWESS regression

| line.

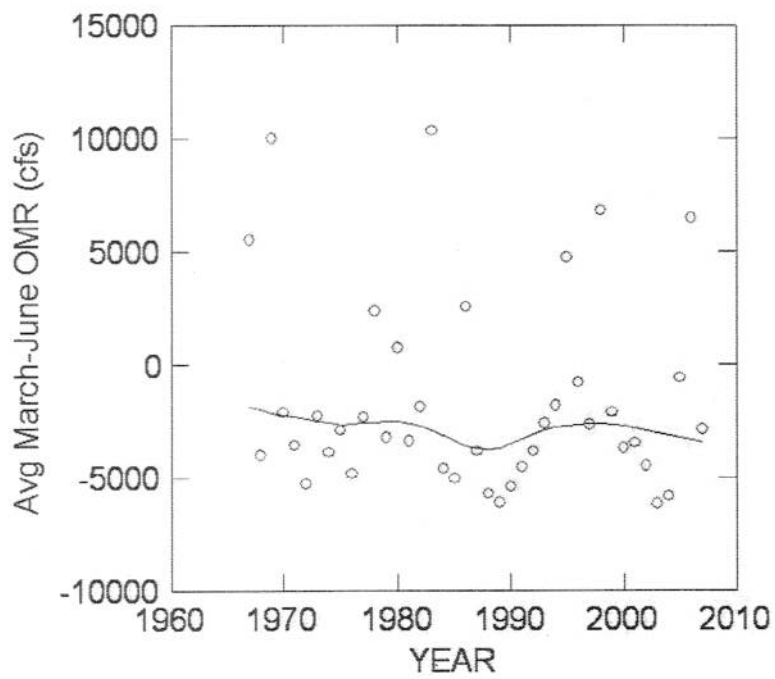


Figure 7. Time trend in average April-May flow Old and Middle river flow, 1967-2007. Data for 1980-2006 are empirical data based on ADCP measurements. Data for 1967-

1979 and 2007 are estimated as described in the text. The spline is a LOWESS regression line.

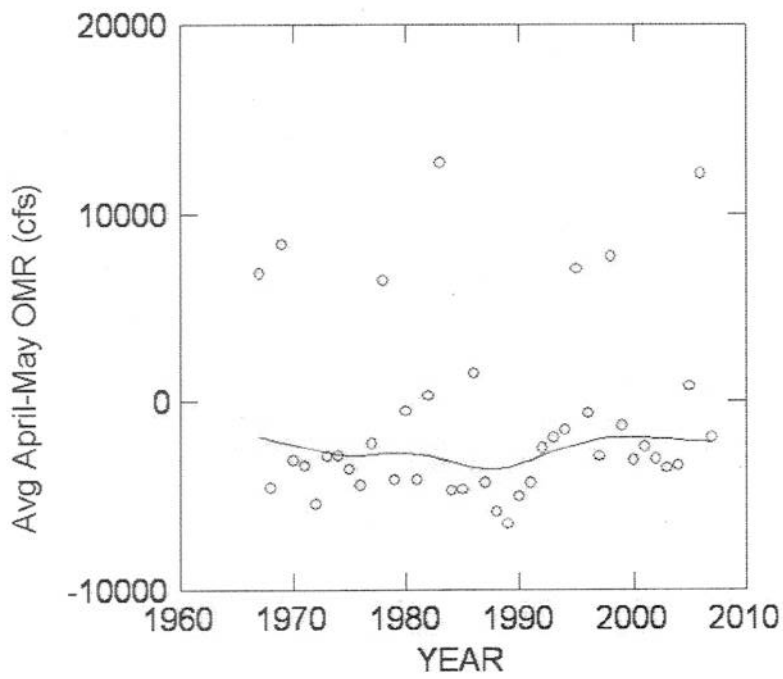


Figure 8. Time trend in average March – June Delta outflow, 1967-2007. The spline is a LOWESS regression line.

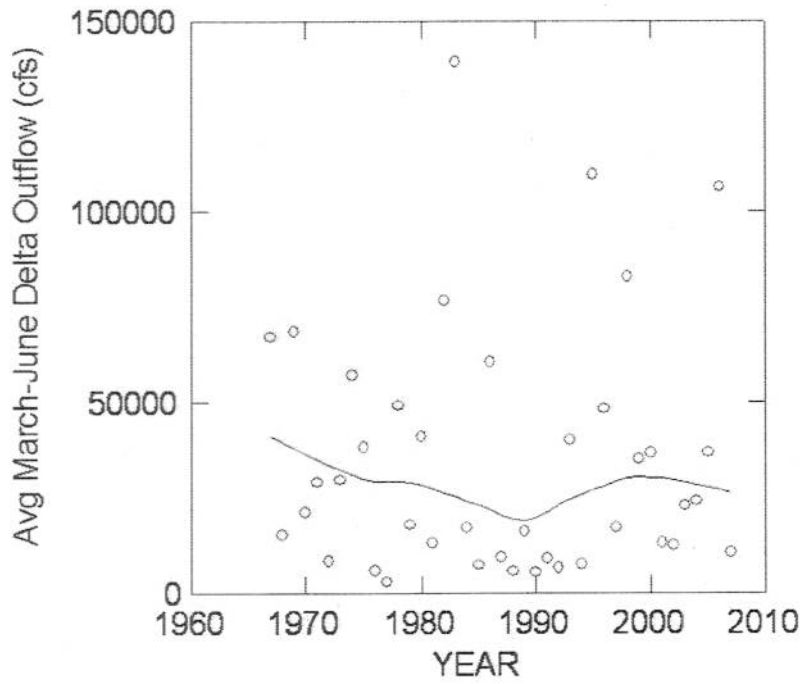


Figure 9. Time trend in average April - May Delta outflow, 1967-2007. The spline is a LOWESS regression line.

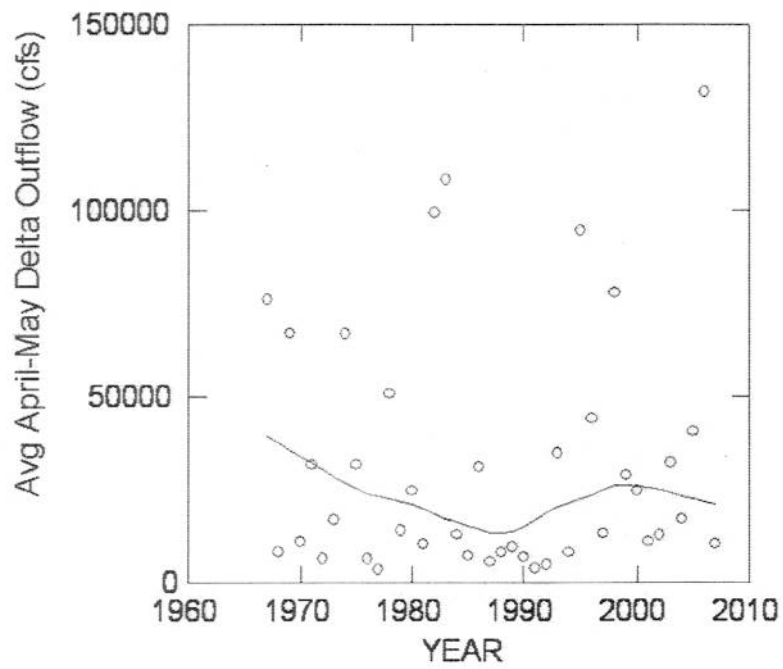


Figure 10. Scatterplot of average March – June Delta outflow versus average March – June flows in Old and Middle rivers. The spline is a LOWESS regression line.

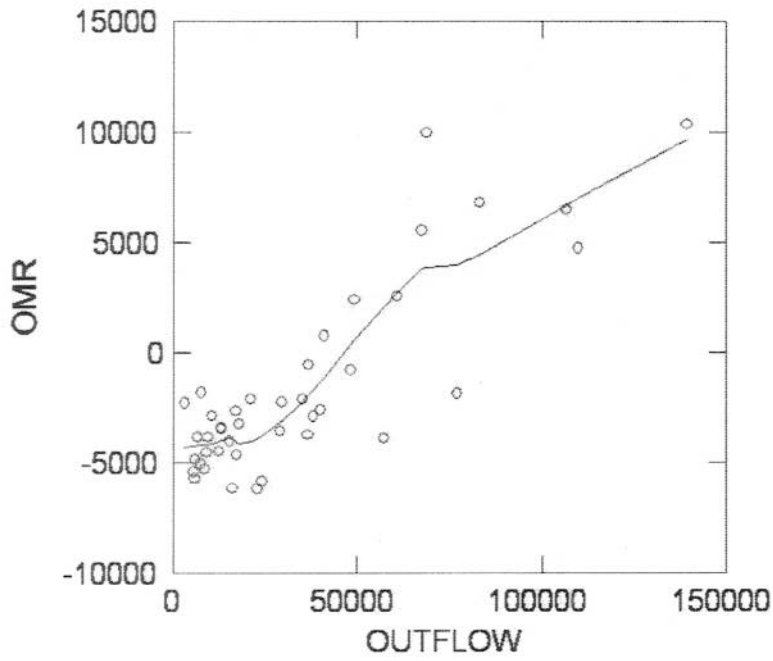


Figure 11. Scatterplot of average April - May Delta outflow versus average April - May flows in Old and Middle rivers. The spline is a LOWESS regression line.

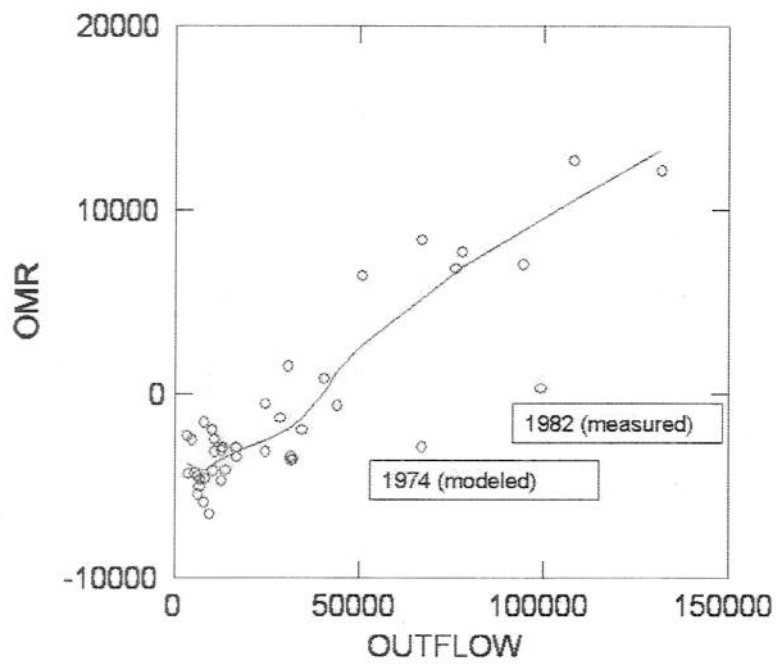


Figure 12. Boxplot summary of CALSIM II operations study outputs of average March – June flows in Old and Middle rivers for five water year types. The boxes depict the interquartile range which is the distance between the 25th and 75th percentiles. The lines within the boxes show the medians, more extreme values are shown by the lines and asterisks. “Actual” is estimated and measured OMR flows from 1967-2007.

March-June OMR

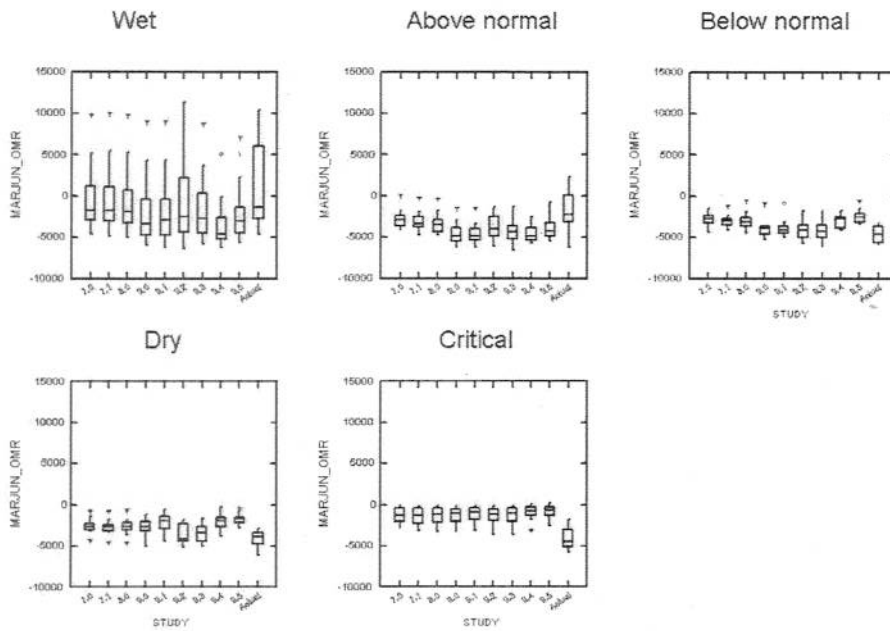


Figure 13. Boxplot summary of CALSIM II operations study outputs of average April – May flows in Old and Middle rivers for five water year types. The boxes depict the interquartile range which is the distance between the 25th and 75th percentiles. The lines within the boxes show the medians, more extreme values are shown by the lines and asterisks. “Actual” is estimated and measured OMR flows from 1967-2007.

April-May OMR

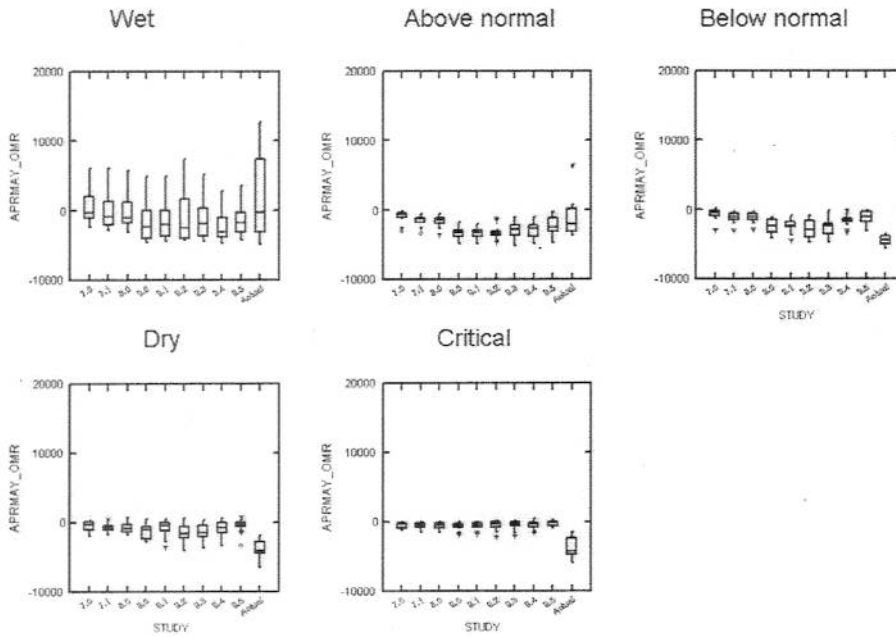


Figure 14. Boxplot summary of CALSIM II operations study outputs of average March – June X2 positions for five water year types. The boxes depict the interquartile range which is the distance between the 25th and 75th percentiles. The lines within the boxes show the medians, more extreme values are shown by the lines and asterisks. “Actual” is X2 from 1967-2007.

March-June X2

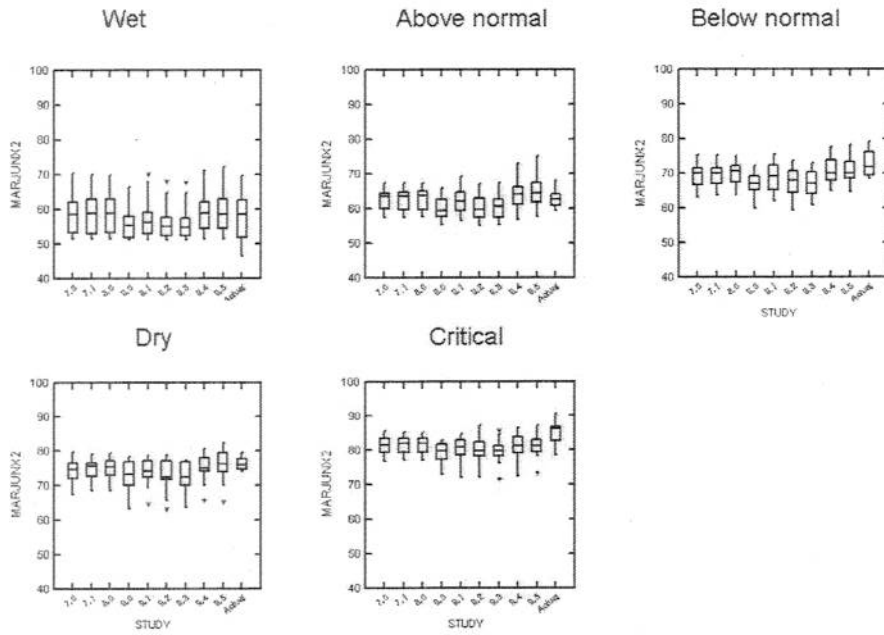


Figure 15. Boxplot summary of CALSIM II operations study outputs of average April – May X2 positions for five water year types. The boxes depict the interquartile range which is the distance between the 25th and 75th percentiles. The lines within the boxes show the medians, more extreme values are shown by the lines and asterisks. “Actual” is X2 from 1967-2007.

April-May X2

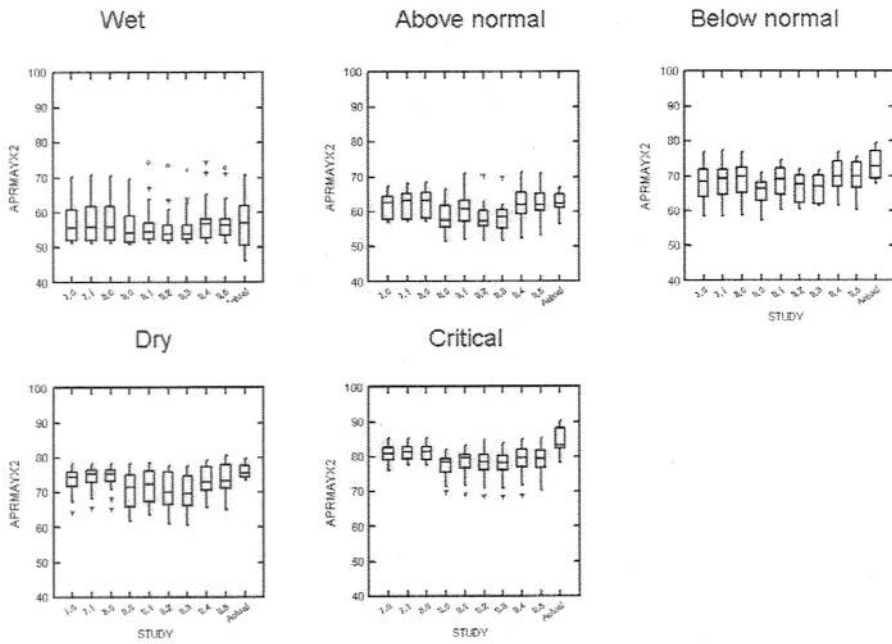


Figure 16. Time series of estimated percentages of the larval-juvenile delta smelt population entrained in the SWP and CVP south Delta water export diversion facilities. Error bars were estimated by linear regression of Kimmerer's (2008) entrainment estimates versus the upper and lower 95% confidence intervals of the estimates using the following equations: upper confidence interval = $0.7814 * (\text{entrainment estimate}) + 0.0053$; $r^2 = 0.84$ and lower confidence interval = $0.5599 * (\text{entrainment estimate}) + 0.0009$; $r^2 = 0.92$.

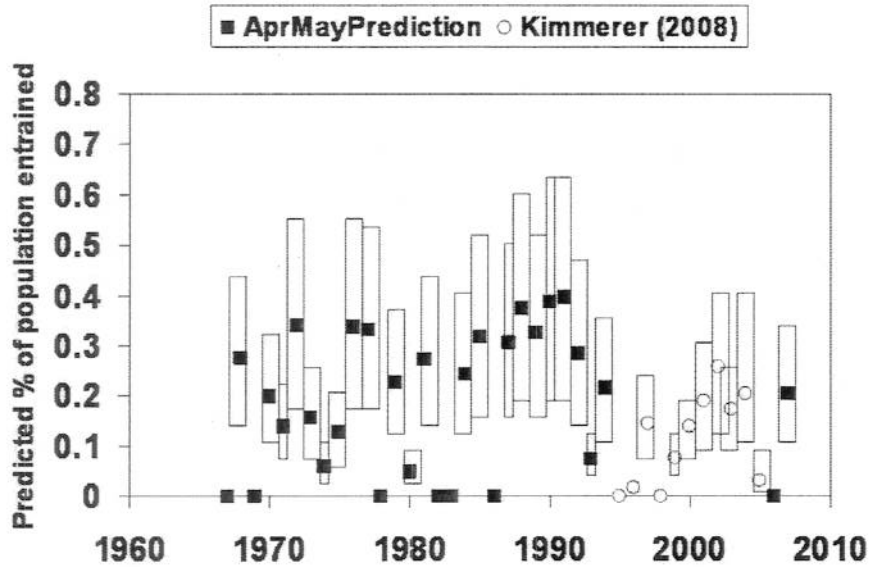


Figure 17. Frequency distribution of estimated proportions of larval-juvenile delta smelt entrained at Banks and Jones for 1967-1994 and 1995-2007. The data were extrapolated to an 82-year period to make them comparable to the CalSim II outputs in the Biological Assessment.

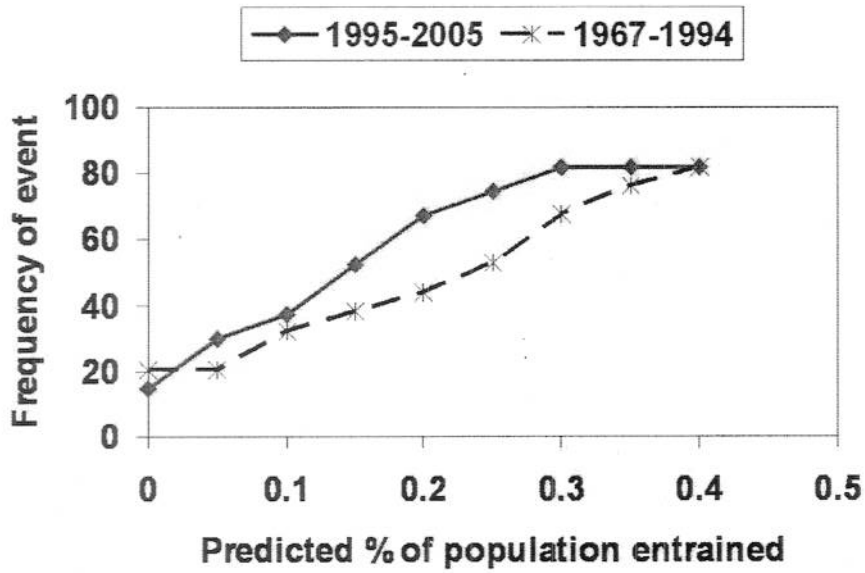


Figure 18. Same as Figure 17, but including estimates based on X2 and OMR summaries from studies 7.0, 7.1, 8.0, 9.0-9.5 from the Biological Assessment.

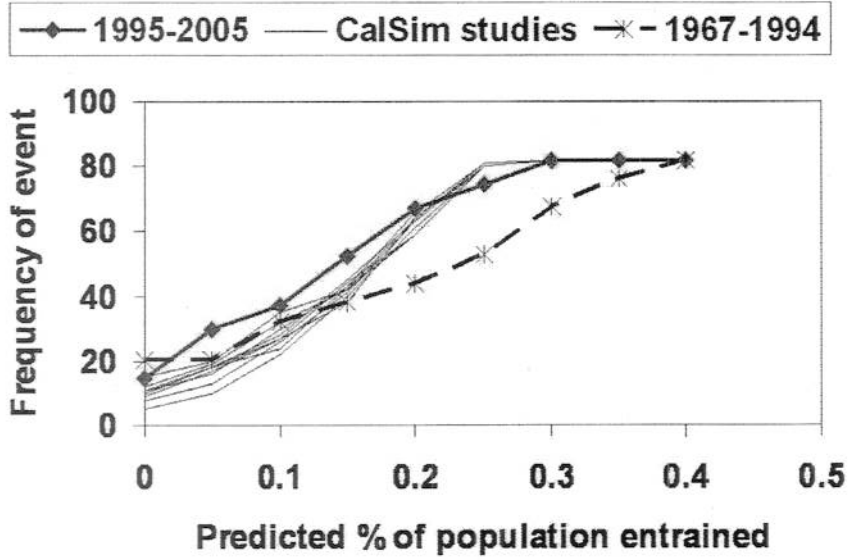


Figure 19. Scatterplot of the average density of *Pseudodiaptomus forbesi* at Suisun Bay stations versus the export to inflow ratio, June – September 1988-2006.

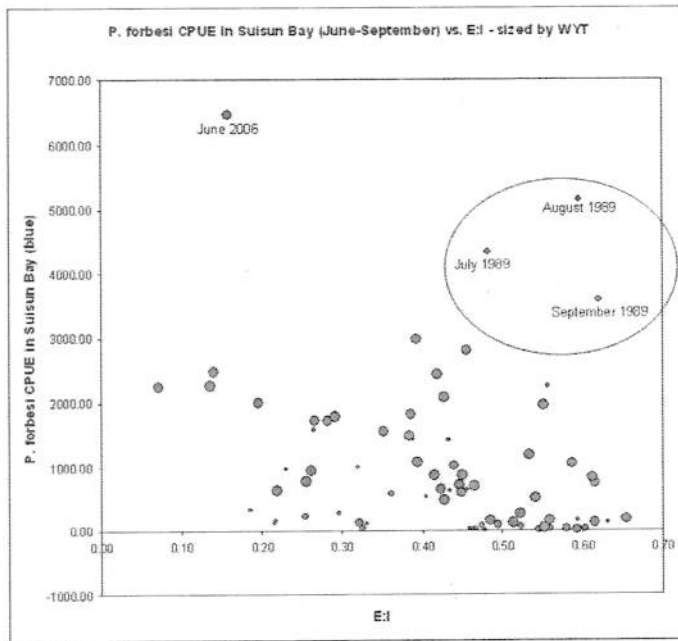


Figure 20. Scatterplot of the the average density of *Pseudodiaptomus forbesi* at South Delta stations versus export to inflow ratio, June – September 1988-2006.

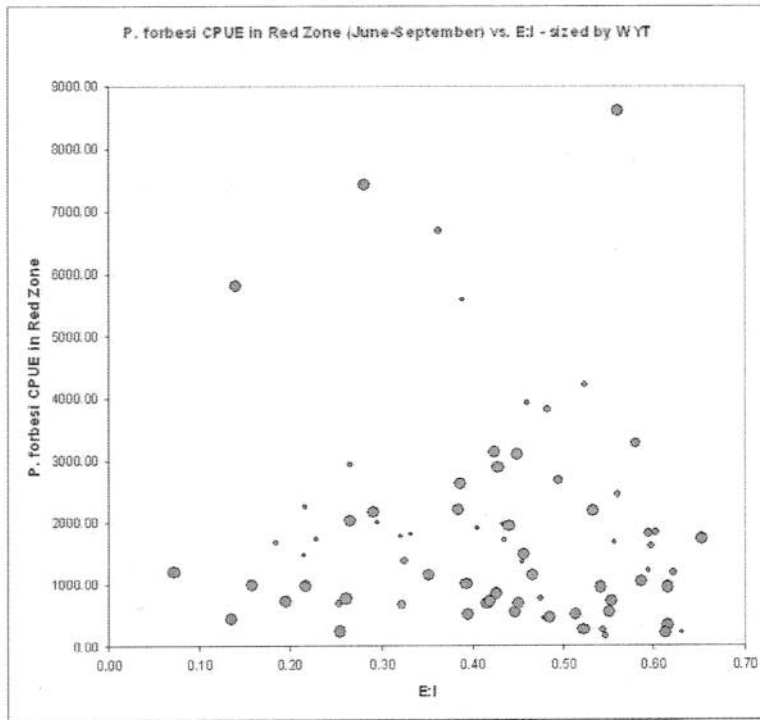


Figure 21. Boxplot summary of CALSIM II operations study outputs of average June export to inflow ratios for five water year types. The boxes depict the interquartile range which is the distance between the 25th and 75th percentiles. The lines within the boxes show the medians, more extreme values are shown by the lines and asterisks. "Actual" is E:I ratios from DAYFLOW, 1988-2006.

June since 1988

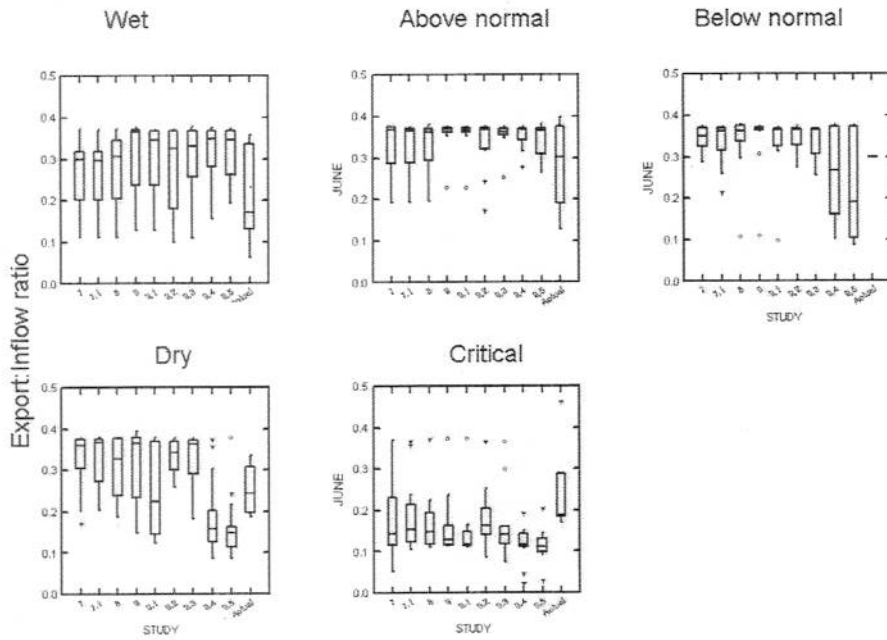


Figure 22. Boxplot summary of CALSIM II operations study outputs of average July export to inflow ratios for five water year types. The boxes depict the interquartile range which is the distance between the 25th and 75th percentiles. The lines within the boxes show the medians, more extreme values are shown by the lines and asterisks. "Actual" is E:I ratios from DAYFLOW, 1988-2006.

July since 1988

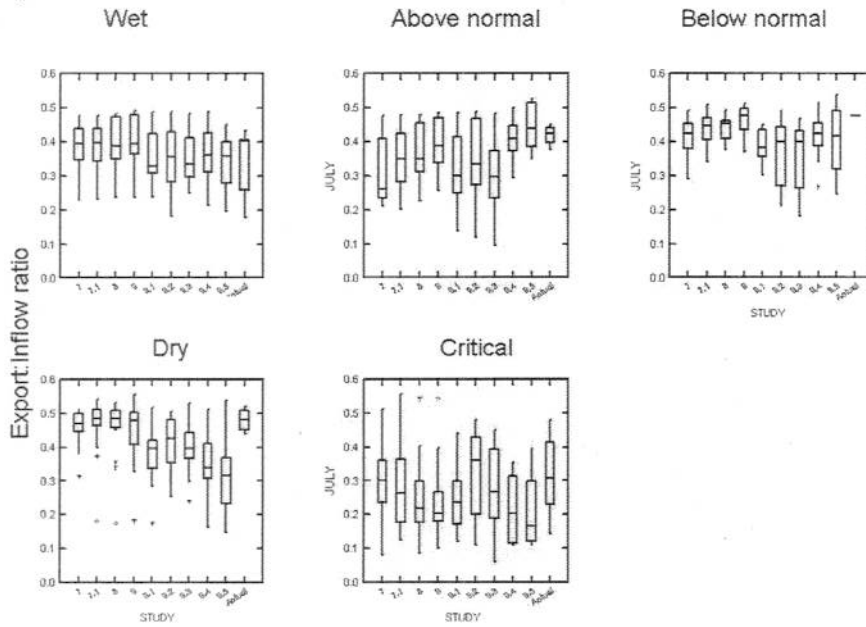


Figure 23. Boxplot summary of CALSIM II operations study outputs of average August export to inflow ratios for five water year types. The boxes depict the interquartile range which is the distance between the 25th and 75th percentiles. The lines within the boxes show the medians, more extreme values are shown by the lines and asterisks. "Actual" is E:I ratios from DAYFLOW, 1988-2006.

August since 1988

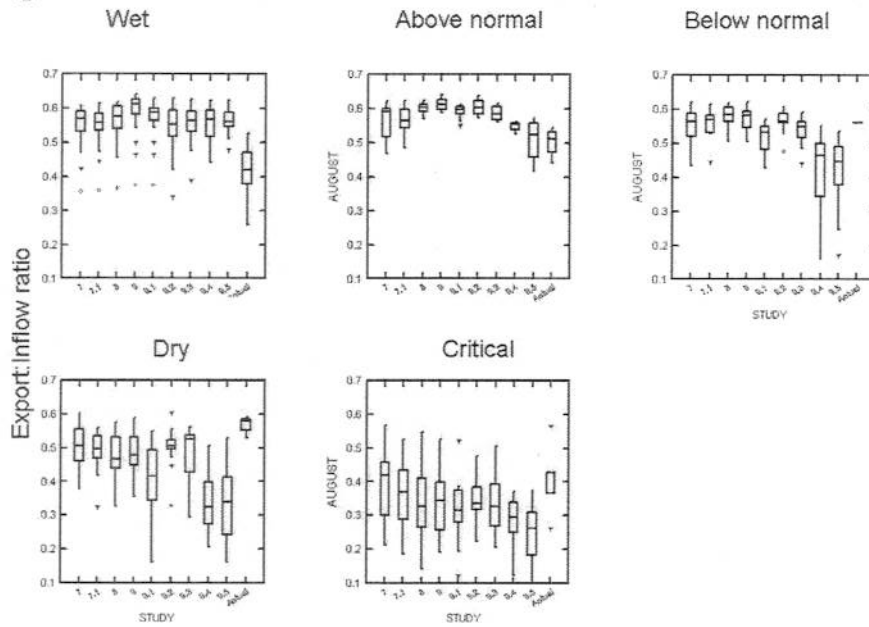


Figure 24. Boxplot summary of CALSIM II operations study outputs of average September export to inflow ratios for five water year types. The boxes depict the interquartile range which is the distance between the 25th and 75th percentiles. The lines within the boxes show the medians, more extreme values are shown by the lines and asterisks. "Actual" is E:I ratios from DAYFLOW, 1988-2006.

September since 1988

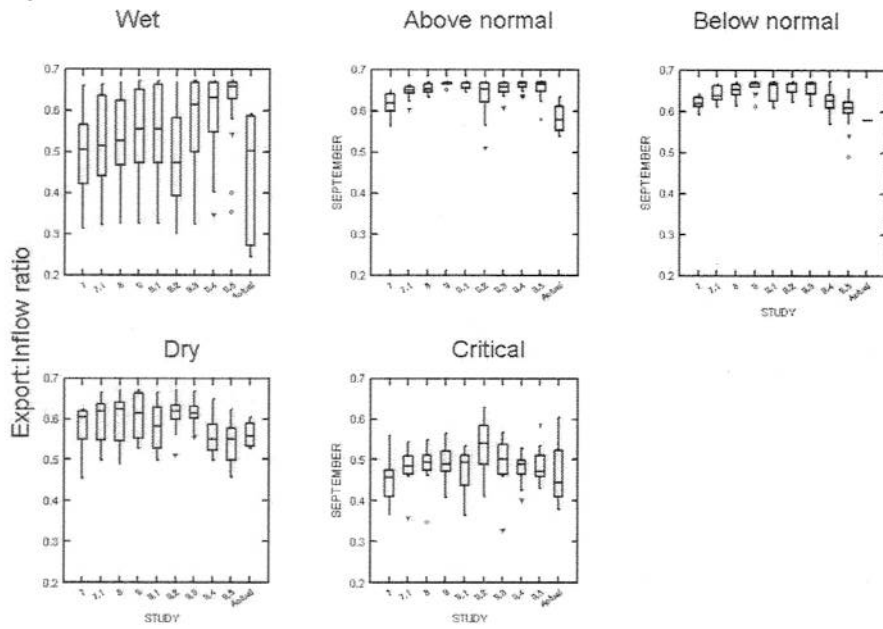


Figure 25. X2 (km) during September to December based on historic data and CalSim-II model results. The center line in the box is the median and the outer box boundaries are the first and third quartiles..

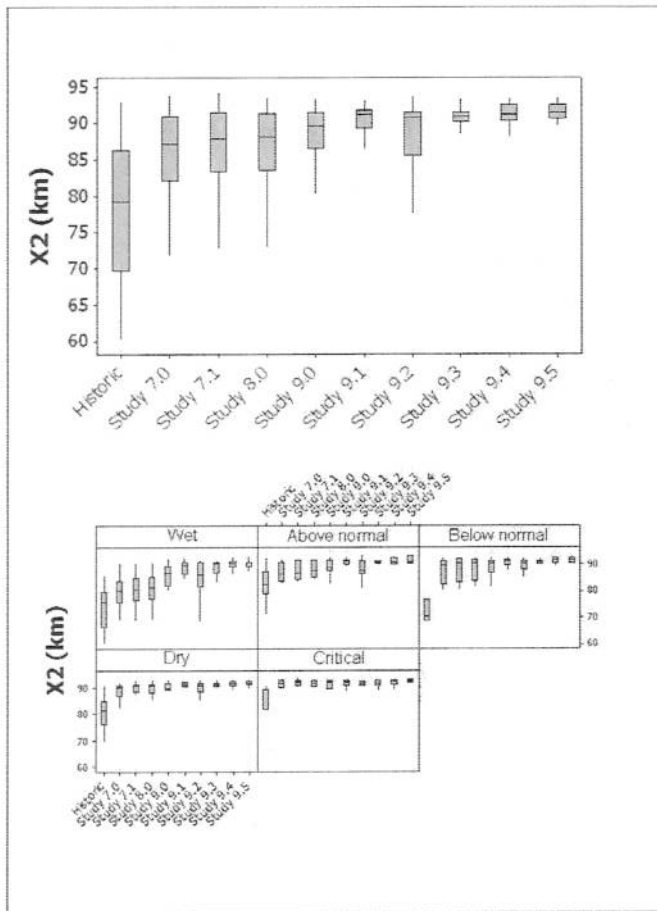


Figure 26. Summary statistics for the model relating the effect of X2 on the area of suitable abiotic habitat (ha) for delta smelt during September to December.

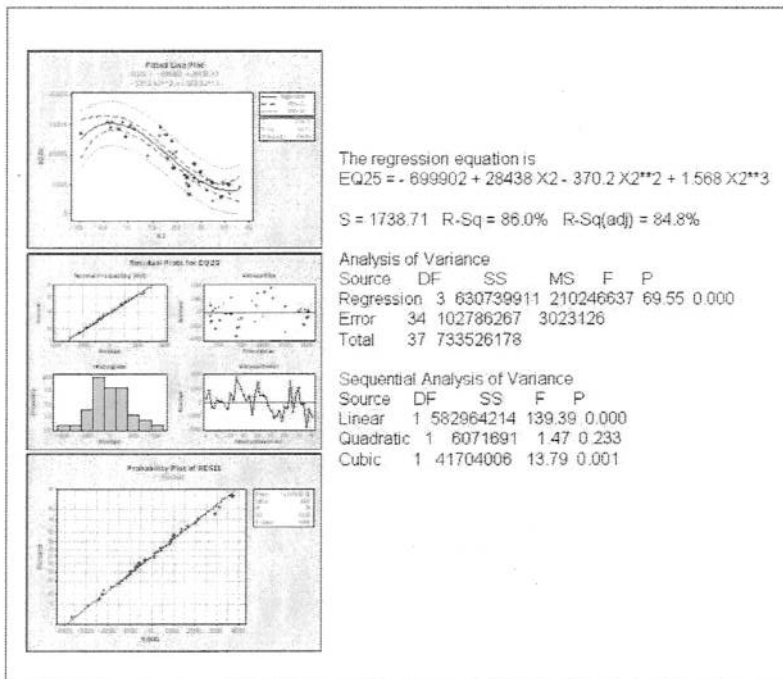


Figure 27. Area of suitable abiotic habitat (ha) during September to December) based on historic data and CalSim-II model results for X2. The center line in the box is the median and the outer box boundaries are the first and third quartiles..

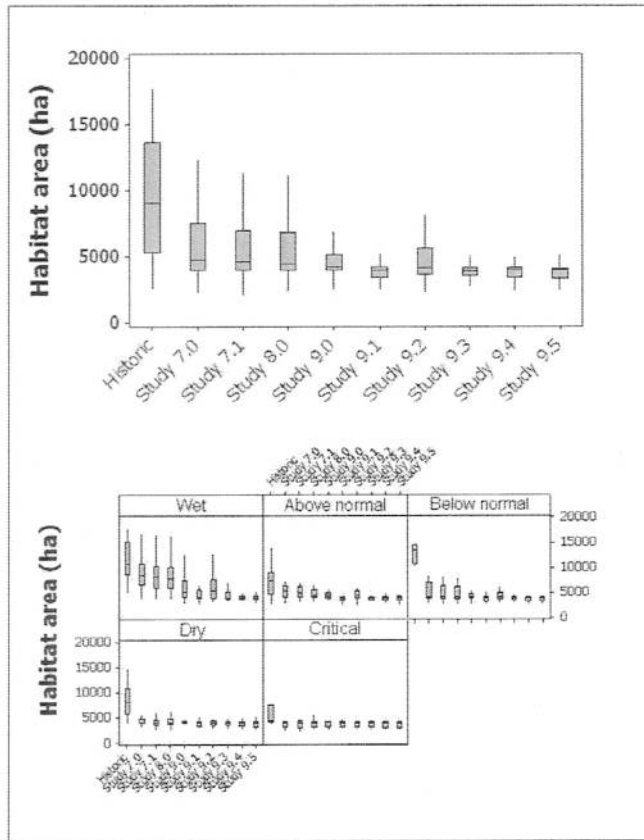


Figure 28. Summary statistics for the stock-recruit model for delta smelt that incorporates X2 position during September to December as a covariate.

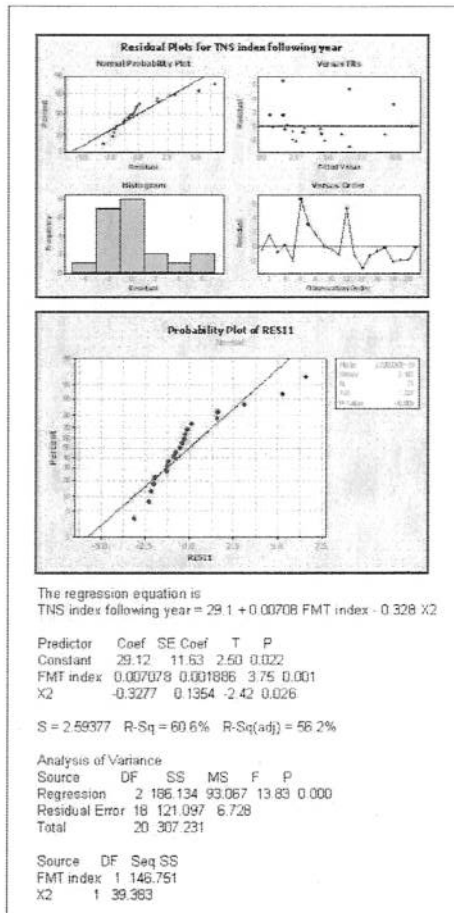


Figure 29. Predicted Summer Townet Index for delta smelt based on historic and CalSim-II-modeled values of X2 position. The center line in the box is the median and the outer box boundaries are the first and third quartiles..

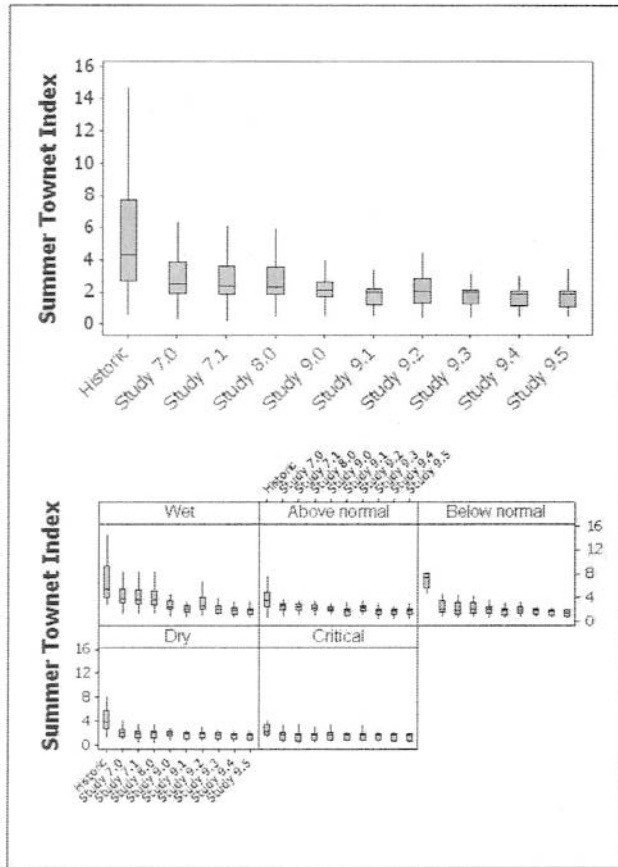


Figure 30. Time series of historic X2 and E:I ratio for fall (September-December) in the upper panels and their relationship in the lower panel.

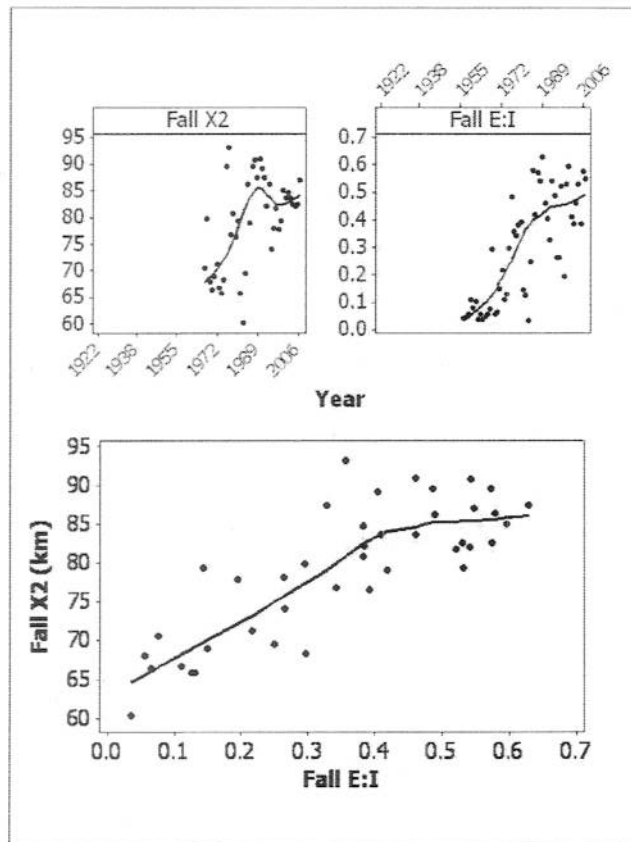


Figure 31. Smoothed trend lines for the time series of historic and CalSim-II-modeled fall X2.

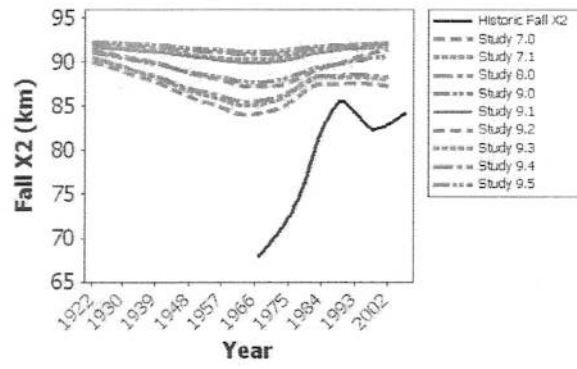


Figure 32. X2 (km) during individual fall months for historic data and CalSim-II model results. The center line in the box is the median and the outer box boundaries are the first and third quartiles..

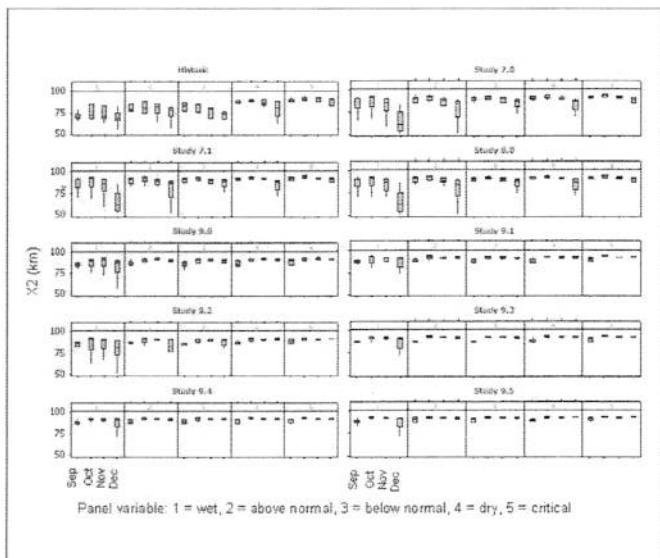


Figure 33. Time series of fall X2 (September-December) with years noted by water year type for the previous spring.

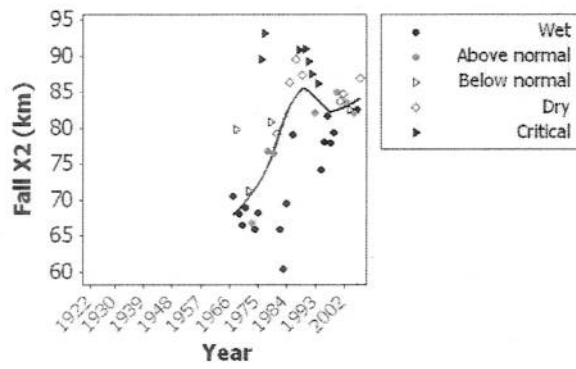


Figure 34. Top panel: Time series of fall (September-December) and spring (April-July) X2. Lower panel: Smoothed time series of the difference between fall and spring X2 based on historic data and the CalSim-II model results.

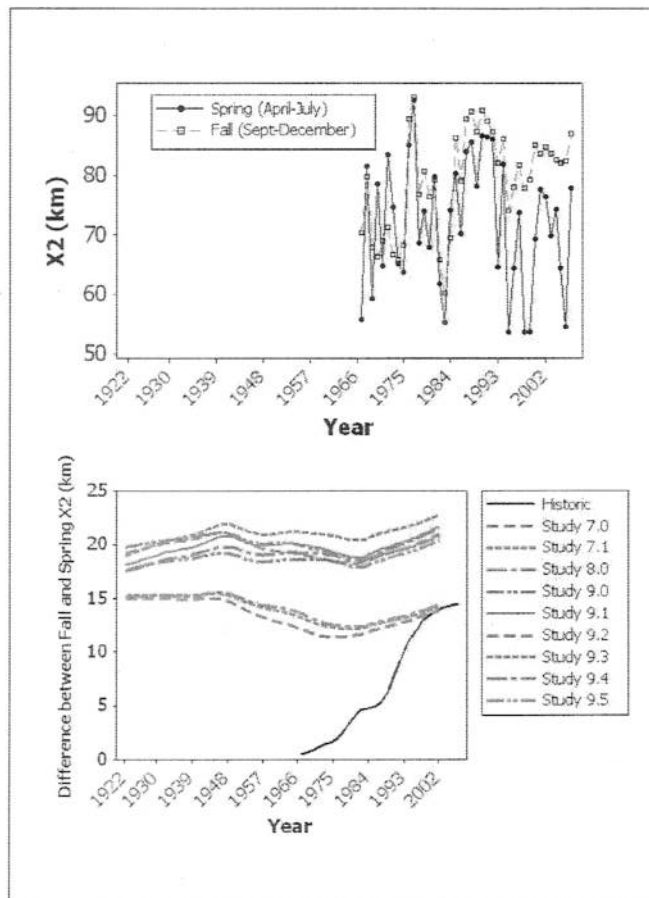


Figure 35. Time series of the historic difference between fall and spring X2 with years coded by the water year type for the previous spring.

