diverted into Montezuma Slough. However, the volumes exchanged are arguably small enough for salinity levels at C-2 to be used as a baseline condition.

Seasonal operation of privately and publicly owned managed wetlands also influences salinity levels in Suisun Marsh. Wetland managers flood and circulate water during the waterfowl hunting season and conduct leaching cycles after hunting season. Flooding typically begins in October and circulation continues through February. Incoming water is pumped from sloughs onto the wetlands, in effect removing less-saline water from the sloughs and allowing more-saline tidal water to move farther into the marsh. The leaching cycles, necessary to decrease soil salinity in the wetlands, involve a series of short-duration flooding and draining cycles. Leaching usually begins in February and continues for 1-4 months. Drain water is much more saline than flood water, contributing to higher salinity levels in the marsh. In 1996, the highest salinity levels were in October, coinciding with the flooding cycle. During the early part of 1996, salinity was relatively low despite the leaching cycles, probably due to the high Delta Outflow Index.

Tributary flow is a primary source of fresh water in Suisun Marsh, especially the western marsh. The two main tributaries are Green Valley Creek (S-10) and Suisun Creek (S-15). Creek flow affects salinity in the western marsh in the same manner as the Delta Outflow Index; higher creek flows result in lower salinity, lower creek flows result in higher salinity. During the first half of 1996, higher creek flows are accompanied by lower salinity levels (Figure 4). As the year progressed, creek flows decreased and salinity levels increased. Creek flows are presumed to have increased during December, given the amount of rainfall at the end of the year (data unavailable), corresponding with decreased salinity levels during December.

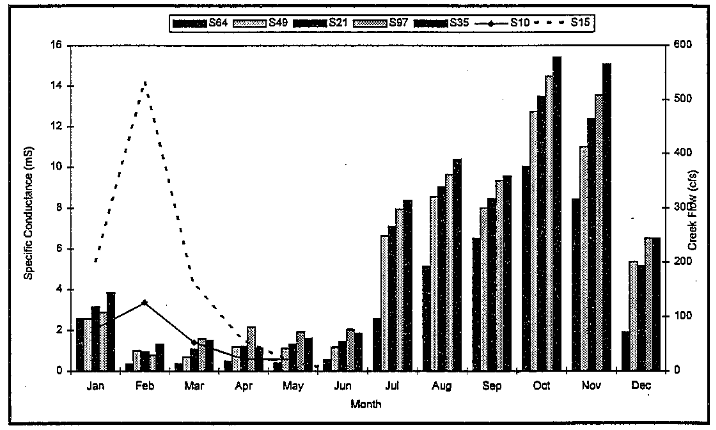

Figure 4
1996 TRIBUTARY INFLOW AND SPECIFIC CONDUCTANCE

Neomysis/Zooplankton Abundance

Jim Orsi, DFG

Compared to 1994 and 1995, there were no marked changes in abundance of any taxon of mysid shrimp or zooplankton in 1996 except the brackish water rotifer, *Synchaeta bicornis*, which rose sharply (Figures 1-4). *Synchaeta bicornis* is most abundant in summer and fall — too late in the year for it to be responding to high spring outflow.

Abundance of the copepod *Eurytemora affinis*, an important larval striped bass food, has remained fairly constant since 1989. Its abundance appears to have "bottomed out" and the volume of outflow seems to have little influence on its abundance. It is typically most abundant in the San Joaquin River at Stockton and in Disappointment Slough, upstream from the influence of the Asian clam, *Potamocorbula*, which is believed to feed on its early life stages and on its food supply, phytoplankton. *Eurytemora* tends to peak in April and May, declines in June, and is absent from our catches by July. It reappears in late fall and early winter.

The abundance of the introduced *Sinocalanus doerrii* has also "bottomed out". It showed little variation in abundance in 1994-1996. Its last year of moderate abundance was 1993. The abundance of *Pseudodiaptomus forbesi*, a copepod from China that has replaced *Eurytemora* in the entrapment zone, has varied somewhat since its introduction in 1988. Its abundance peaked in 1992. Its lower abundance in 1993-1996 has not been accompanied by an increase in *Eurytemora*, although it is suspected of competing with *Eurytemora* for food. This does not negate the competition hypothesis, because *Pseudodiaptomus* may still be abundant enough to supress *Eurytemora*.

The coastal marine copepod *Acartia*, which comprises several species and is most abundant downstream from our sampling area, has not been abundant since 1992. Its abundance in our catches was formerly influenced strongly by outflow, but since 1992 its abundance has been low regardless of the volume of outflow. Both *Potamocorbula* and a predatory copepod from Korea, *Tortanus dextrilobatus*, could be affecting *Acartia*.

The introduced mysid shrimp *Acanthomysis* remained more abundant in 1996 than the native *Neomysis mercedis* but did not show any increase over 1994 and 1995. Both of these mysids may be food-limited by the grazing of *Potamocorbula*.

With the passage of each year it becomes more certain that abundance of the native copepods and *Neomysis* is controlled and kept at low levels by introduced species and that freshwater outflow has little impact on abundance.

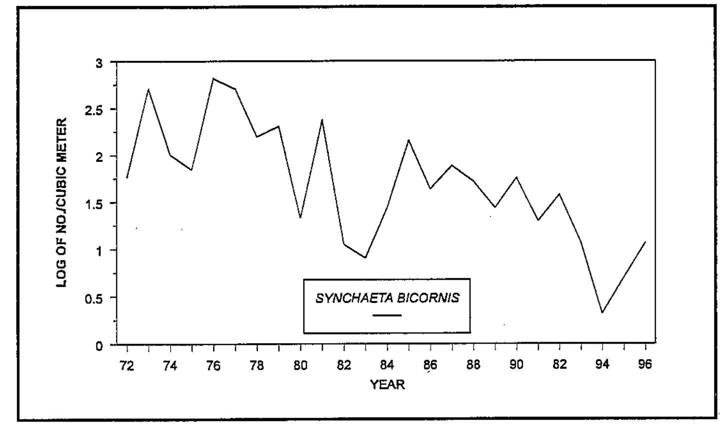

Figure 1
ABUNDANCE OF *SYNCHAETA BICORNIS*

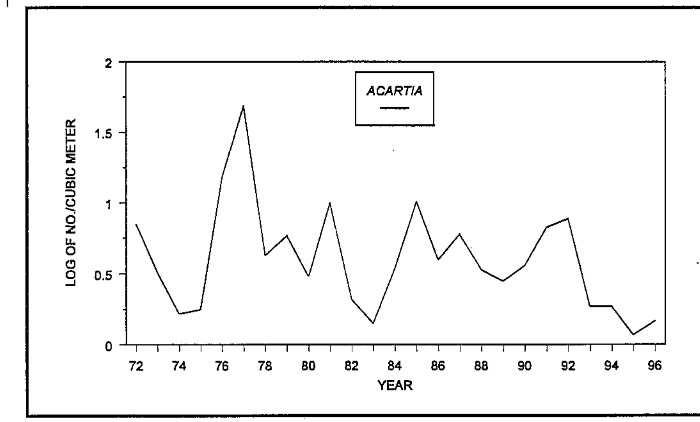

Figure 3
ABUNDANCE OF *ACARTIA*

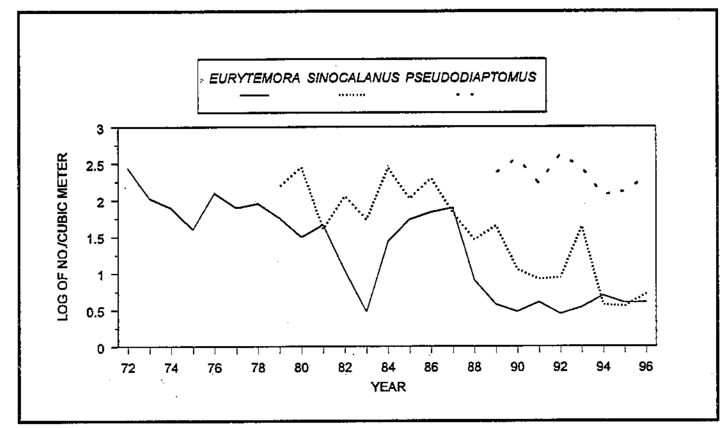

Figure 2
ABUNDANCE OF
EURYTEMORA, SINOCALANUS, AND *PSEUDODIAPTOMUS*

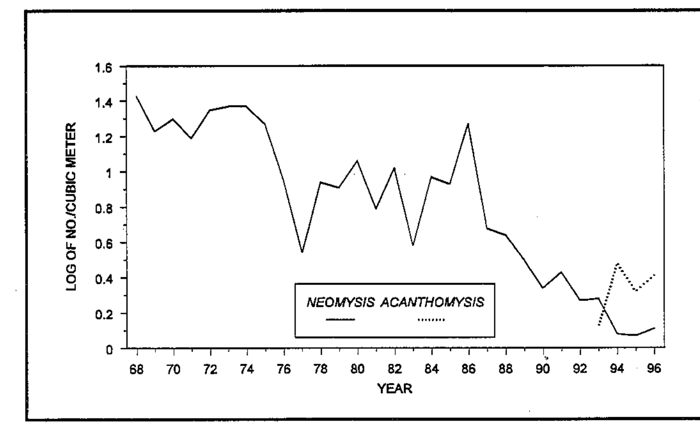

Figure 4
ABUNDANCE OF *NEOMYSIS* AND *ACANTHOMYSIS*