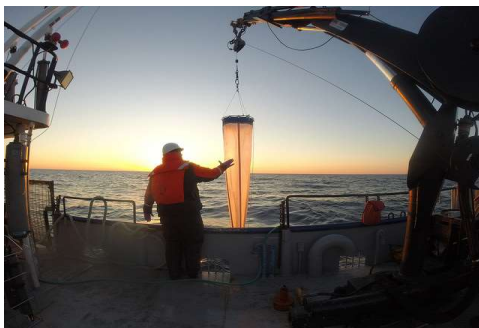
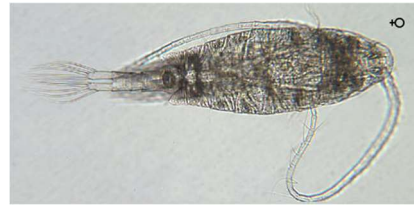
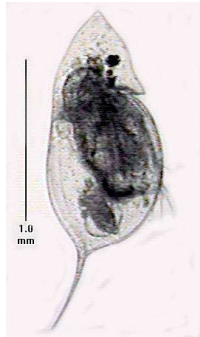


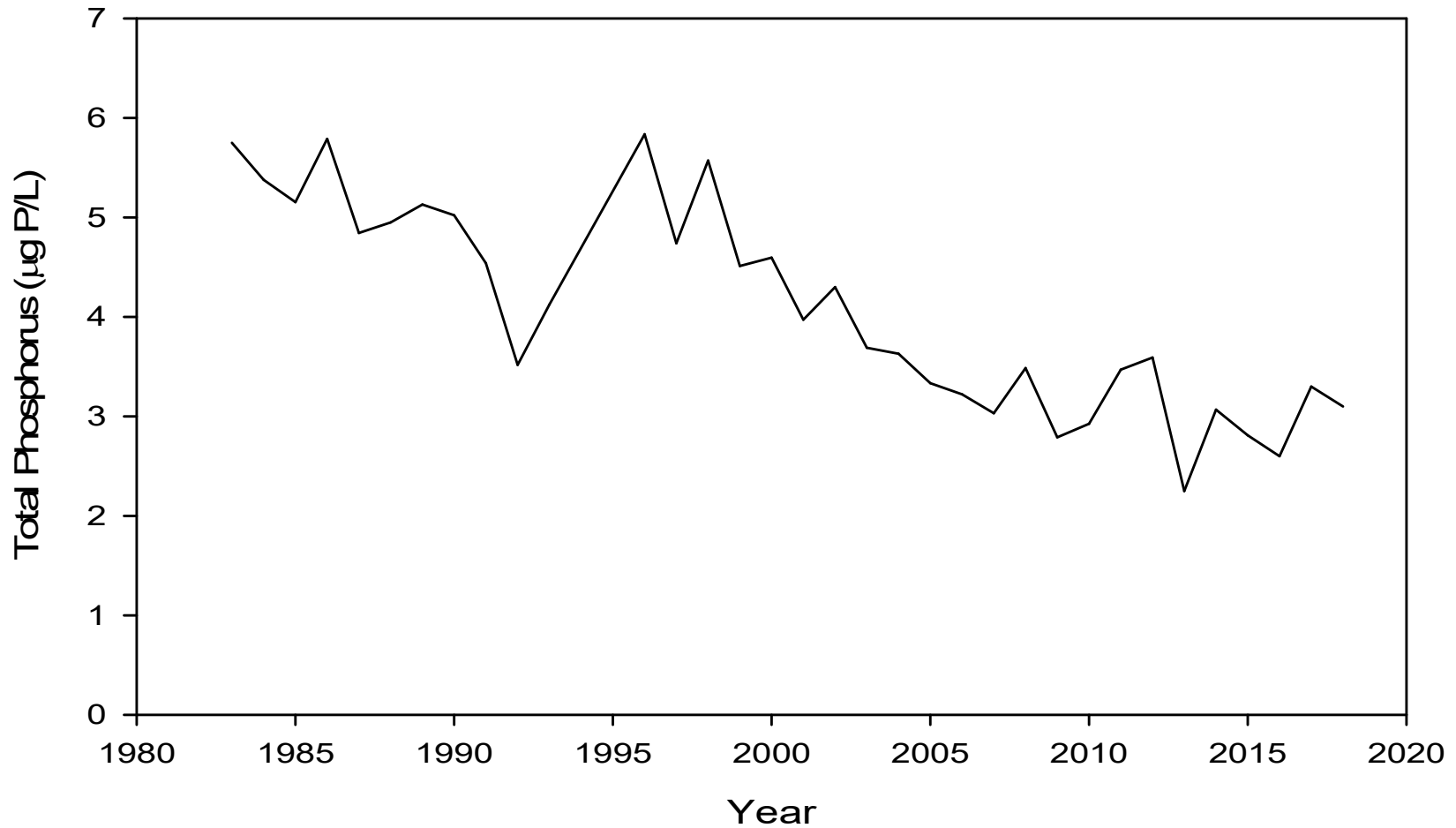


# Recent Trends for Lake Michigan Lower Trophic Levels



Offshore spring total phosphorus has declined substantially since the 1980s. Values have fallen from over 5.5 to under 4.0 reducing the overall productivity of Lake Michigan.

## Offshore Spring Total Phosphorus 1983-2018 Lake Michigan

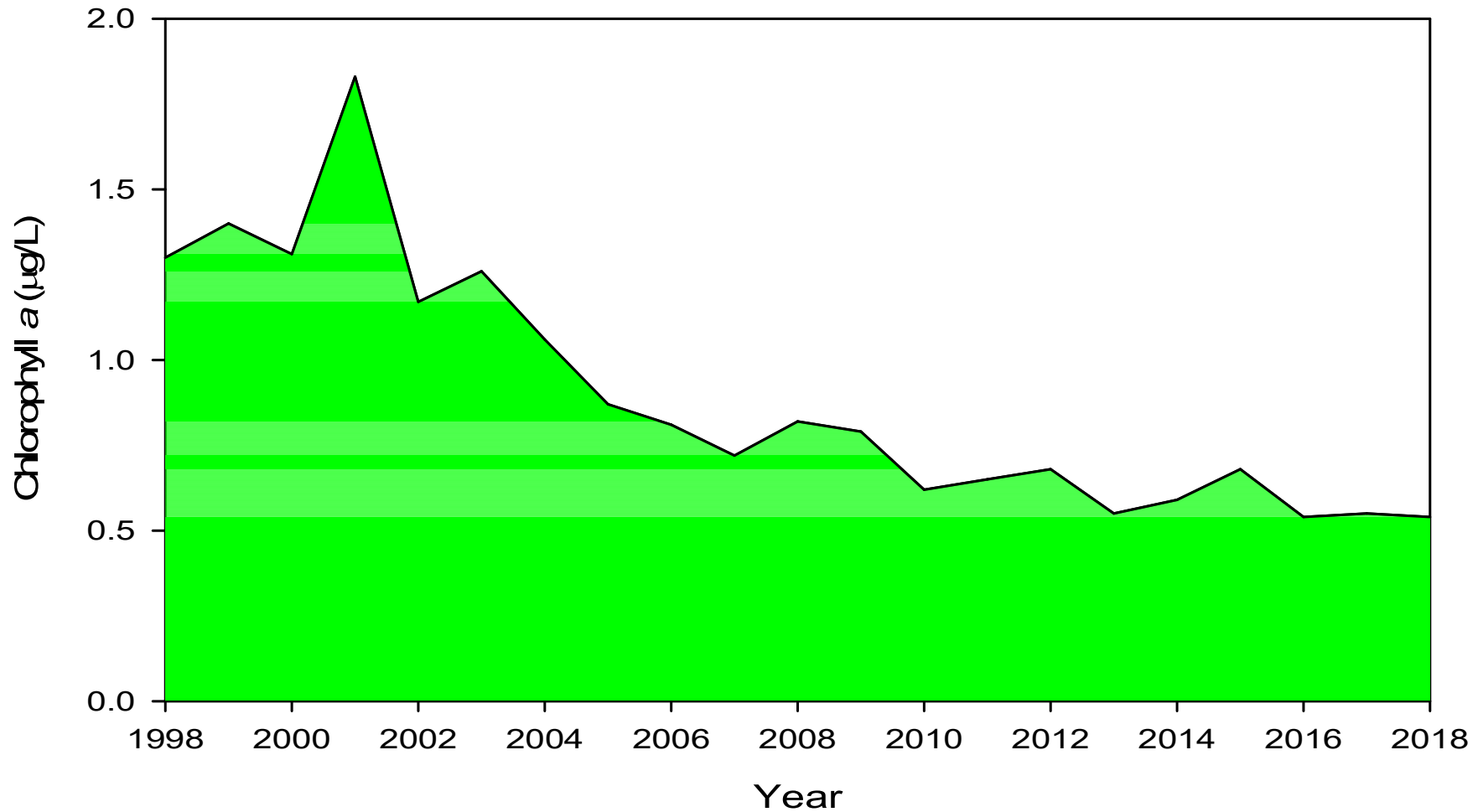


Offshore May Chlorophyll levels have dropped since 1998, showing that this declining level of chlorophyll have led to reduced spring algae blooms a key component for fish production.

## Offshore May Chlorophyll<sub>a</sub>

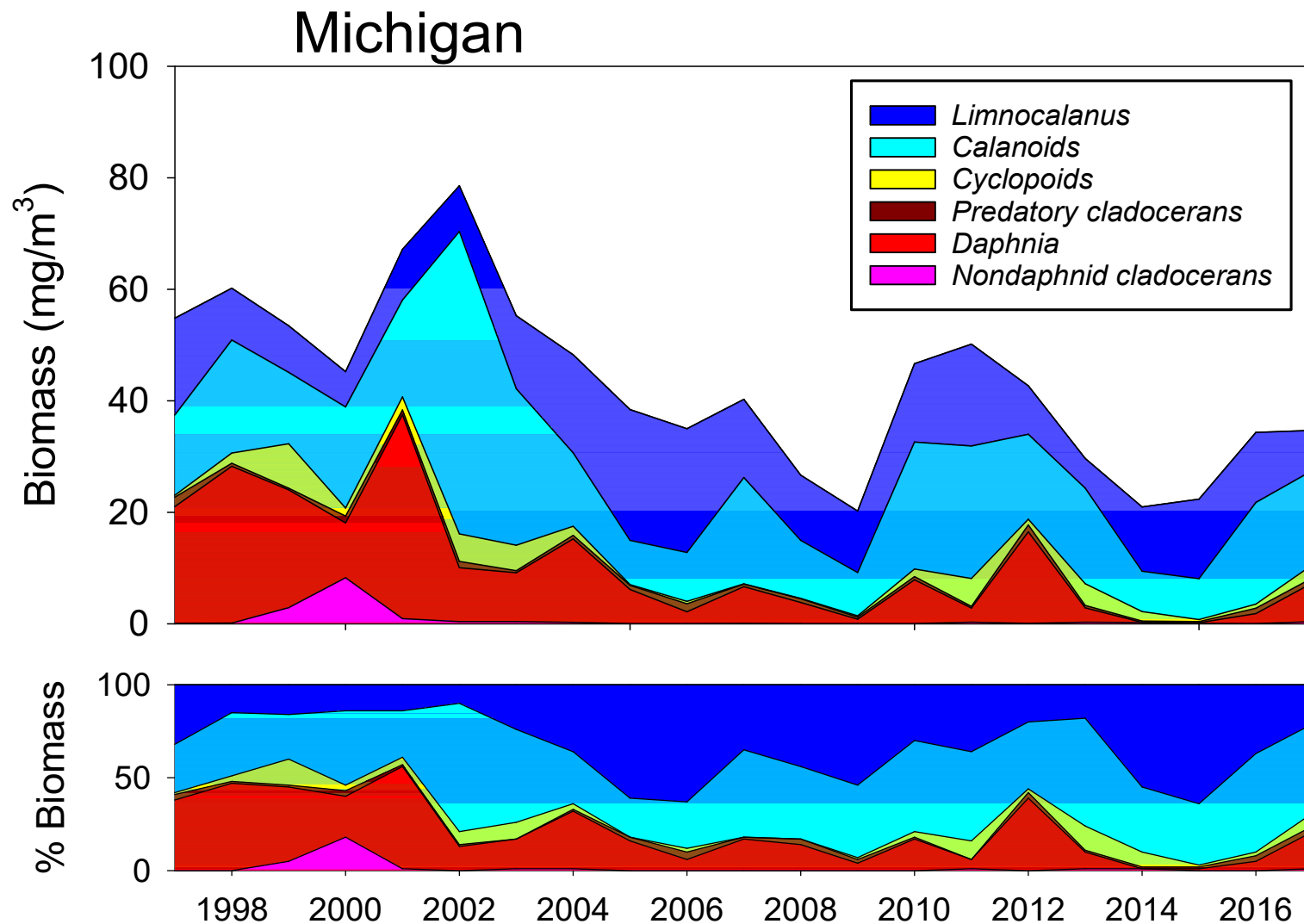
1997-2018

Lake Michigan



A key crustacean, *Daphnia*, has declined in offshore samples and larger bodied zooplankton have taken their place, namely *Limnocalanus* and calanoid copepods.

## Offshore Crustacean Zooplankton (August) 1997-2017



Offshore zooplankton at Muskegon has remained at about the same levels the past decade but remains lower than observed in the 1980s and 1990s.

## Offshore zooplankton (Muskegon 110-m)

