Summary: Hudson River Food Webs

Using the graphs provided, write the pre- and post-invasion estimates for biomass in the chart, and then calculate the percent change. The first one has been done for you. For some organisms, we do not know the biomass, but we do know the relative percent change, so that has been filled in as well.

Organism	Pre-Invasion	Post-Invasion	% Change
Microzooplankton	0.28g	0.15g	*a* = percent 0.15g = *a* % x 0.28g 0.15g/0.28g = *a* % 0.54 = *a* % If 0.15g is 54% of 0.28g, then the microzooplankton community decreased by 46%.
Macrozooplankton			
Phytoplankton			
Freshwater mussels & clams			
Zebra Mussels	0	21000	N/A

Using a scale of 10 mg=1mL, set up containers of water to represent the food webs in the Hudson before and after the zebra mussel invasion, using the organisms above for which you have pre and post biomass figures. You will have five organisms in your pre-invasion food web, and six in your post-invasion food web. This will help you visualize the magnitude of the changes.

Then, use the space below to write a description of how the Hudson River food web has changed over time in response to the zebra mussel invasion. Besides the information contained in the chart above, include a discussion of the changes to the following organisms:
Littoral fish increased 97%, pelagic fish decreased 28%, SAV increased 38%, deep benthic invertebrates decreased 40%, shallow benthic invertebrates increased 50%.

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References:

Caraco, N.F., J.J. Cole, S. Findlay, D. Fischer, G. Lampman, M. Pace, and D. Strayer. 2000. Dissolved Oxygen Declines in the Hudson River Associated with the Invasion of the Zebra Mussel (*Dreissena polymorpha*). *Environmental Science Technology,* 34:1204-1210.

Fernald, S.H., N.F. Caraco, and J.J. Cole. 2007. Changes in Cyanobacterial Dominance Following the Invasion of the Zebra Mussel: Long-term Results from the Hudson River Estuary. *Estuaries and Coasts*, 30(1), p163-170.

Pace, M.L. and D.J. Lonsdale. 2006. Ecology of the Hudson River Zooplankton Community. The Hudson River Estuary, J. Levinton and J. Waldman, editors.

Pace, M.L., S.G. Findlay, and D. Fischer. 1998. Effects of an invasive bivalve on the zooplankton community of the Hudson River. *Freshwater Biology*, 39:103-116.

Strayer, D.L., N.F. Caraco, J.J. Cole, S. Findlay, and M. Pace. 1999. Transformation of Freshwater Ecosystems by Bivalves. *BioScience*, 49: 19-27.

Strayer, D.L, and L.C.Smith. 1996. Relationships between zebra mussels and unionid clams during the early stages of the zebra mussel invasion of the Hudson River. *Freshwater Biology*, 36:771-779.

Strayer, D.L., K.A. Hattala, and A.W.Kahnle. 2004. Effects of an invasive bivalve on fish in the Hudson River estuary. *Canadian Journal of Fisheries and Aquatic Sciences*, 61:924-941.