Woods Hole Oceanographic Institution

Special Biology Department Seminar

Thursday, May 25, 2017
Redfield Auditorium – 3:30 PM

Pint of Science

20-Minute Talks by WHOI Scientists

Dr. Stephanie Jenouvrier

Associate Scientist, WHOI Biology Department

Influence of dispersal processes on the global dynamics of the Emperor penguin, a species threatened by climate change

Dr. Carin Ashjian

Senior Scientist, WHOI Biology Department

Mesozooplankton are not herbivores: the importance of microzooplankton in mesozooplankton diets

Refreshments provided in Redfield Lobby

(See abstracts on next page)

Dr. Stephanie Jenouvrier
Associate Scientist, WHOI Biology Department
Influence of dispersal processes on the global dynamics of the Emperor penguin, a species threatened by climate change

Species endangered by rapid climate change may persist by tracking their optimal habitat; this depends on their dispersal characteristics. The Emperor Penguin (EP) is an Antarctic seabird threatened by future sea ice change, currently under consideration for listing under the US Endangered Species Act. Indeed, a climate-dependent-demographic model without dispersion projects that many EP colonies will decline by more than 50% from their current size by 2100, resulting in a dramatic global population decline. Here we assess whether or not dispersion could act as an ecological rescue, i.e. reverse the anticipated global population decline projected by a model without dispersion. To do so, we integrate detailed dispersal processes in a metapopulation model---specifically, dispersal stages, dispersal distance, habitat structure, informed dispersal behaviors, and density-dependent dispersion rates. For EP, relative to a scenario without dispersion, dispersal can either offset or accelerate climate driven population declines; dispersal may increase the global population by up to 31% or decrease it by 65%, depending on the rate of emigration and distance individuals disperse. By developing simpler theoretical models, we demonstrate that the global population dynamic depends on the global landscape quality.

Dr. Carin Ashjian
Senior Scientist, WHOI Biology Department
Mesozooplankton are not herbivores: the importance of microzooplankton in mesozooplankton diets

Large copepods, such as *Calanus* spp., typically are described as herbivores, although it has been hypothesized that microzooplankton could constitute a significant component of their diet. Nonetheless, the concept of *Calanus* spp. as herbivores persists in the literature. Grazing experiments conducted in the Bering and Chukchi Seas over several years demonstrated that microzooplankton are important prey for both copepods and euphausiids, with the relative importance of microzooplankton in the diet varying between species and seasons. Microzooplankton were a greater proportion of the copepod diet during summer relative to spring, coincident with a greater proportion of microzooplankton in the available prey field. These results further support the growing evidence that most mesozooplankton are not herbivorous, but are omnivorous even during periods of high primary productivity.