Maria Spivak: The Disappearance of Bees

1) How do bees extract pollen from plants?

2) How many different types of species of bees are there?

3) What are the four main causes of the decline in bees?

4) How did farming practices change after WW11?

5) How are pesticides affecting bees?

6) How can people help bees?

7) What are two economic consequences of the colony collapse disorder?

# The Exotic Zebra Mussel

**by Amy J. Benson**

The word "exotic" conjures up thoughts of faraway places where strange animals inhabit sun-drenched islands. But in the biological sciences realm, this word has come to be associated with unwelcome visitors to our shores. Over the past 500 years, more than 4,500 foreign species, including many harmful plants, vertebrates, invertebrates, and pathogens, have established populations in the United States.

One of these newcomers, the zebra mussel (*Dreissena polymorpha*), poses widespread ecological and economic threats. This small freshwater mollusk originated in the Black, Caspian, and Azov seas region of the former Soviet Union. By the late 18th and early 19th centuries, the construction of extensive canal systems enabled the spread of zebra mussels to almost all major drainages of Europe.

 In the United States, the first account of an established population occurred in 1988 from Lake St. Clair, located between Lake Huron and Lake Erie. By 1990, zebra mussels had been found in all five Great Lakes. Over the next two years they made their way out of the Great Lakes through canals and into the Illinois, Hudson, Arkansas, Cumberland, Hudson, Mississippi, Ohio, and Tennessee rivers. As of 2011, the following states had reported zebra mussels within, or in waters adjacent to, their borders: Alabama, Arkansas, California, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New York, North Dakota, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, and Wisconsin. The mussels have also been documented in over 600 lakes and reservoirs in the United States.

1) In what part of the U.S. was the zebra mussel first introduced?

 The species rapid dispersal throughout the Great Lakes and major river systems was due to its ability to attach to boats navigating these waters. Zebra mussels have an even more troubling characteristic: the ability to stay alive out of water for several days under moist and reasonably cool conditions. Thus, overland dispersal is another possible means of range expansion. An increasing number of small lakes near, but not connected to, the Great Lakes are now inhabited by zebra mussels. Beginning in 1993, many trailered boats crossing into California and other western states were found to have zebra mussels attached to their hulls. These mussels, discovered at agricultural inspection stations by informed officials, were removed before the boats were allowed to continue.

2) How did the zebra mussels enter the Great Lakes?

3) What do you believe is a plausible option for preventing the spread of zebra mussels into lakes?