Jellyfish Throwdown: Invasive versus Native

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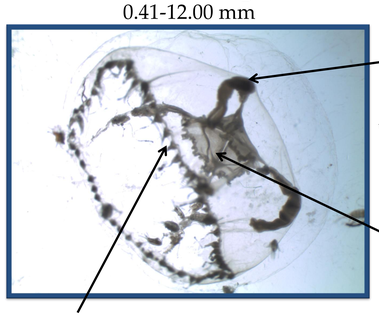
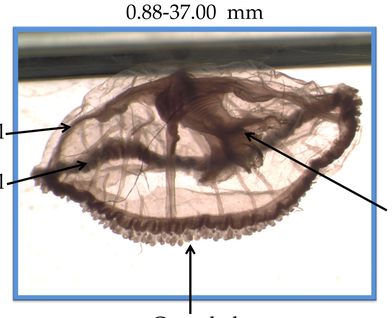
Identification

Jellyfish are characterized by their gelatinous bodies (~95% water) and two tissue layers (endoderm and ectoderm). Morphological traits assist in further categorizing jellyfish by species.

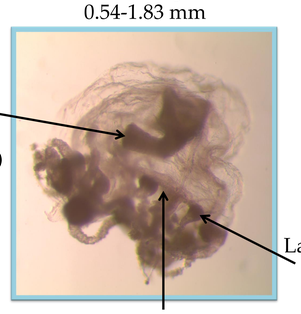
Blackfordia virginica
0.41-12.00 mm



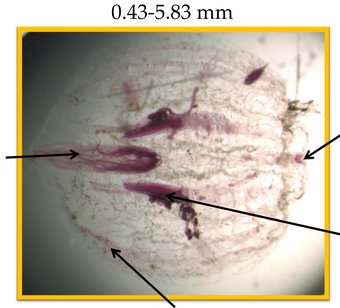
Maeotias marginata
0.88-37.00 mm



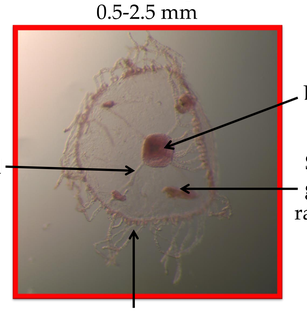
Moerisia lyonsi
0.54-1.83 mm



Pleurobrachia bachei
0.43-5.83 mm



Obelia sp.
0.5-2.5 mm



Background

Since the 1950s three invasive (non-native) species of gelatinous zooplankton (jellyfish) have established populations in the San Francisco Estuary. As jellyfish populations increase they compete for resources in the ecosystem. Jellyfish and endangered delta smelt share the same food source: crustacean zooplankton, especially copepods. Determining the abundance and species composition of jellyfish in the estuary can provide a better understanding of their role in the food web.

Objective

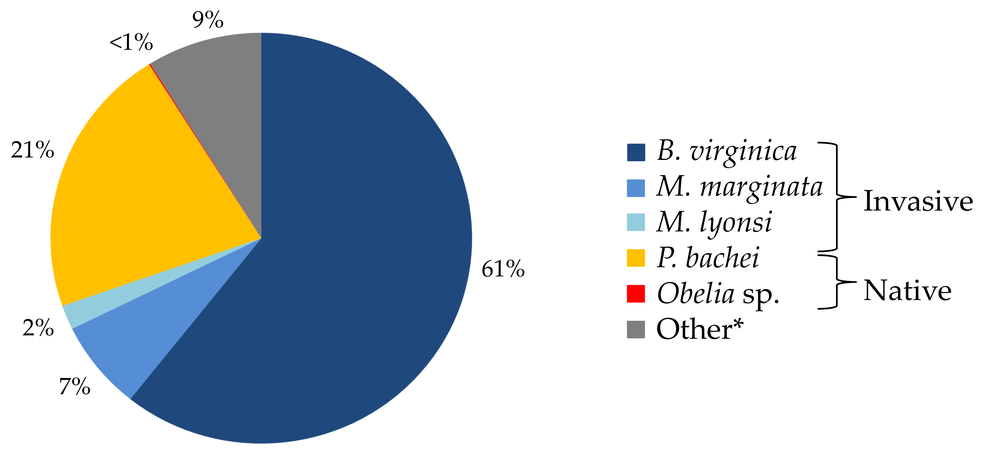
Determine the diversity (number of species) and abundance of jellyfish in the San Francisco Estuary

Methods

- Monthly plankton tows were used to collect samples at 9 stations across the San Francisco Estuary from 2010-2012
- Samples were preserved in formaldehyde and stained with rose bengal
- Samples were removed from formaldehyde, transferred to water and placed in plexiglass trays
- Trays were placed atop a light box and manually scanned for jellyfish using a magnifying glass and probe
- Jellyfish were removed from samples, placed under a microscope, and identified
- Using a camera-equipped microscope, photographs and measurements were taken on a computer

Results

Percent Composition of Jellyfish in the San Francisco Estuary



*Other jellyfish did not have enough identifying features to determine species.

Conclusions

- The most abundant species in the San Francisco Estuary are *B. virginica, M. marginata*, and *P. bachei.*
- 70% of jellyfish found in the estuary are invasive species. As new competitors for food, they could impact delta smelt and native jellyfish populations.

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