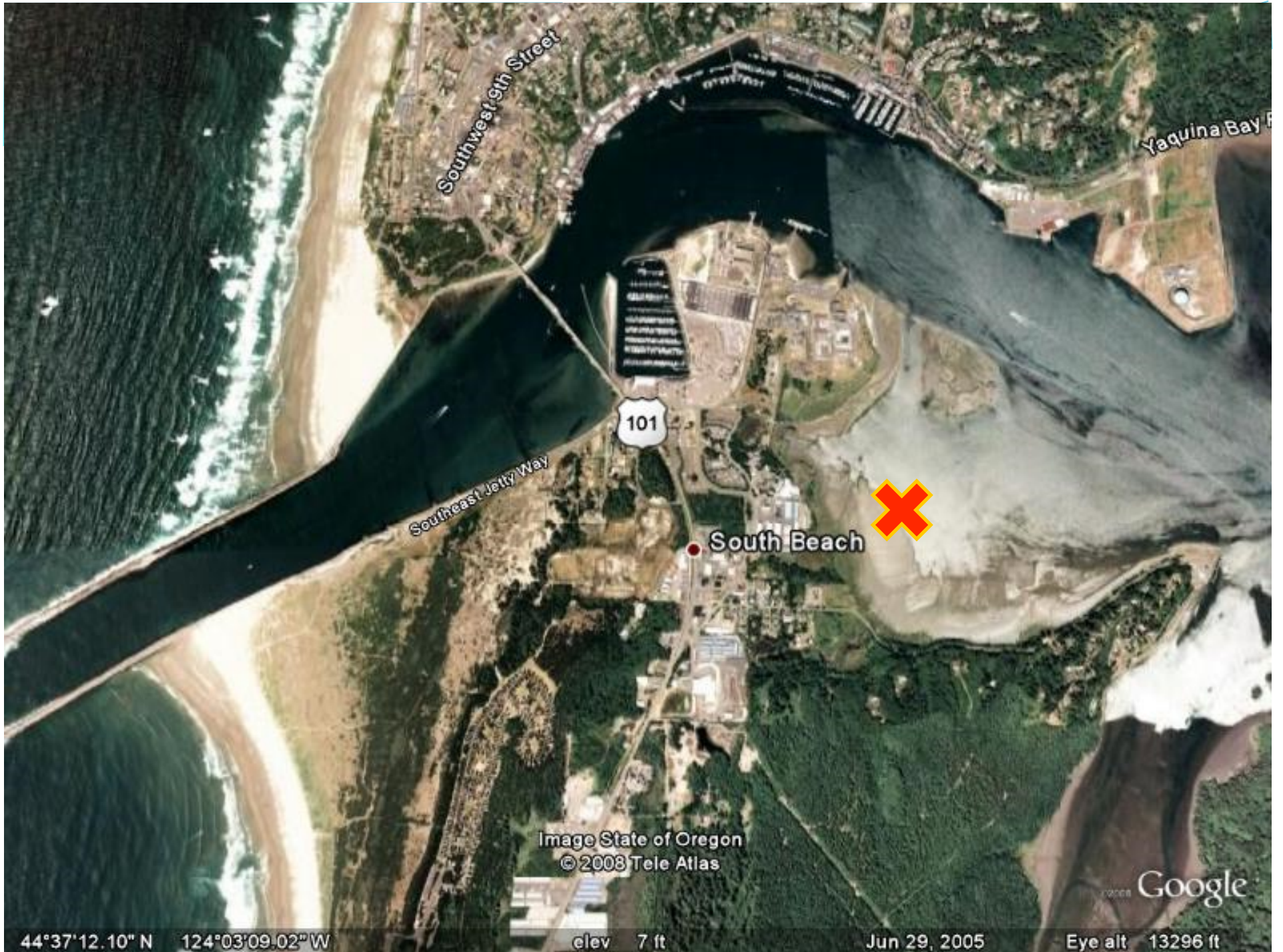


The Blue Mud Shrimp Mystery

Newport ,Oregon





Upogebia pugettensis

Blue Mud Shrimp

- A native species that lives in the mud flats of estuaries in the Pacific Northwest
- Can grow up to 15 cm (about 6 in)



Burrow Dwellers

- Mud shrimp live in Y-shaped burrows they create
- The burrows are about 3 feet deep
- Many other organisms live with the shrimp in the burrow
- They take advantage of the “home” created by the mud shrimp
- The other organisms include phytoplankton and clams



Blue Mud Shrimp Burrow

(Quarter shown for
size reference)



Fish Bait

- Mud shrimp are commonly used by the locals as fishing bait, but they are not eaten by people
- Mud shrimp eat detritus and phytoplankton



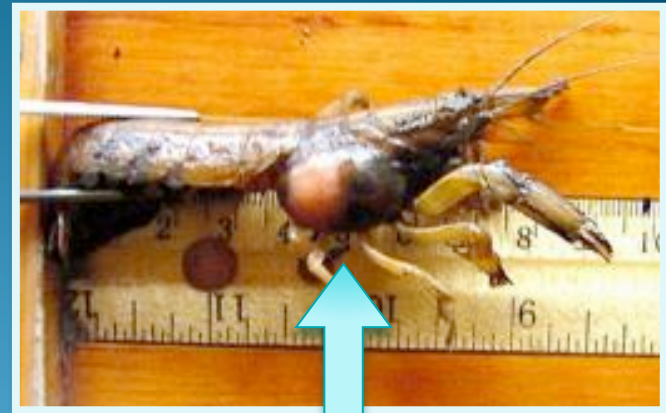
Invasive Species

- The isopod *Orthione griffenis* is an invasive species that arrived in the Pacific Northwest from Asia
- This isopod is similar to the more familiar pill bug or “rolly-polly”



Isopod Infection

- The isopod enters the shrimp's gill chamber and prevents the shrimp from reproducing by sucking its blood and stealing its nutrients
- The shrimp remains alive, but in a zombie-like state



Ballast Water Stowaways

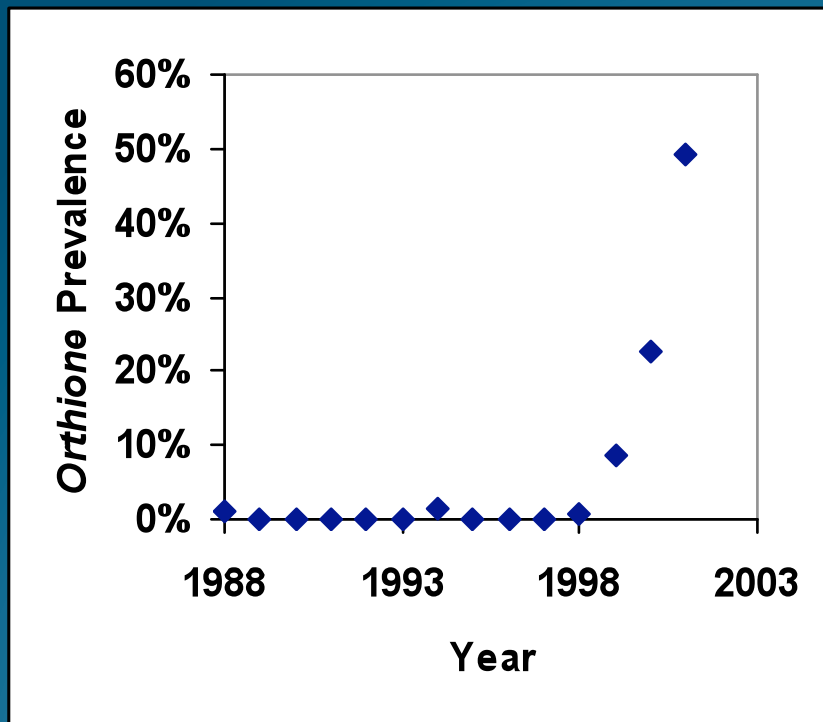
- Scientists believe the isopod was introduced to the West Coast by dumping of ballast water of ships



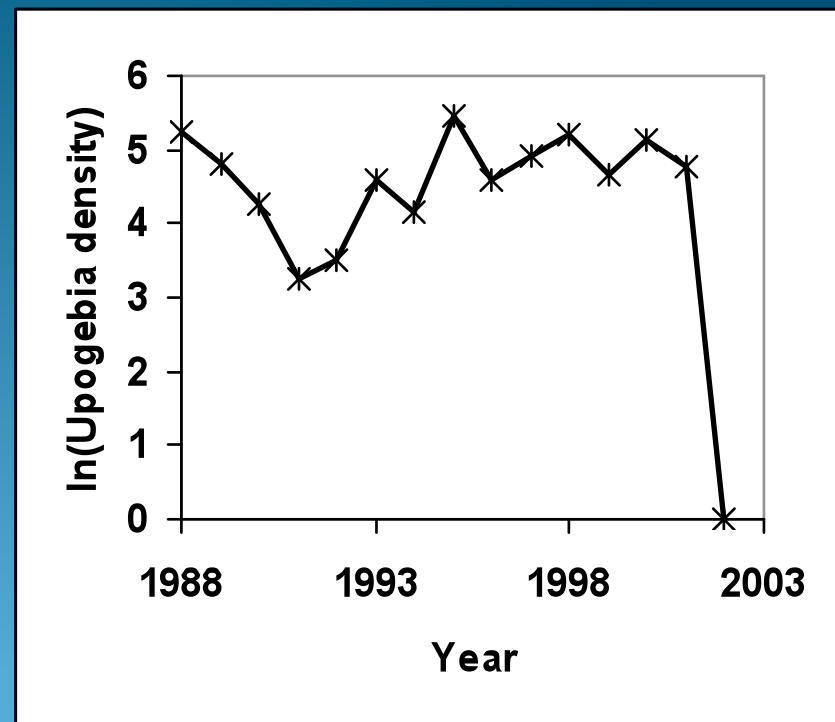
- A ballast is a compartment in a boat or ship that holds water. Filling the ballast allows for increased stability of a ship.
- A ship will fill its ballast in one area of the world and dump that same water in a different area of the world.
- Any organisms within that water are also dumped, introducing a species into a new ecosystem.

Population Effects

Isopod Population



Blue Mud Shrimp Population



Food Web Example



Critical Thinking Questions

Notebook Entry

- Predict the effects of the disappearance of the Blue Mud Shrimp on the ecosystem/food web. Please use at least three complete sentences.
- What are some other possible ways invasive species can be introduced to an area? Please be thorough.
- Explain at least one way that an invasive species affects your daily life. (“It doesn’t” is not a correct answer!)

So Now What?

- Scientists are studying invasive species around the world to determine their effects on ecosystems
- How can we learn more about the Blue Mud Shrimp and other species affected by the influx of invasive species?

Play ESP Animation

Environmental Sample

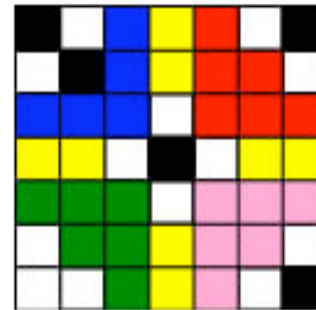
Processor

- ESP is one way that scientists collect bio-data in the field in real time over a sustained period
- ESP is a way to remotely collect information about which organisms are present in an aquatic environment
- ESP could be used to determine the number of shrimp and isopod larvae present using DNA signatures

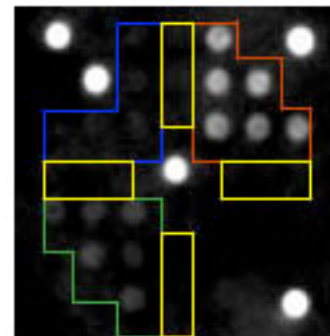
ESP at Work



ESP Arrays



Blue – Shrimp
Red – Isopods
Green – Plankton
Pink - Bacteria



ESP image showing few shrimp larvae present (blue) and many isopod larvae present (red)