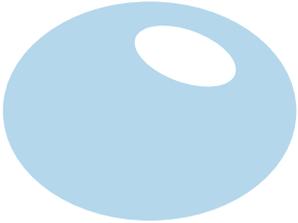
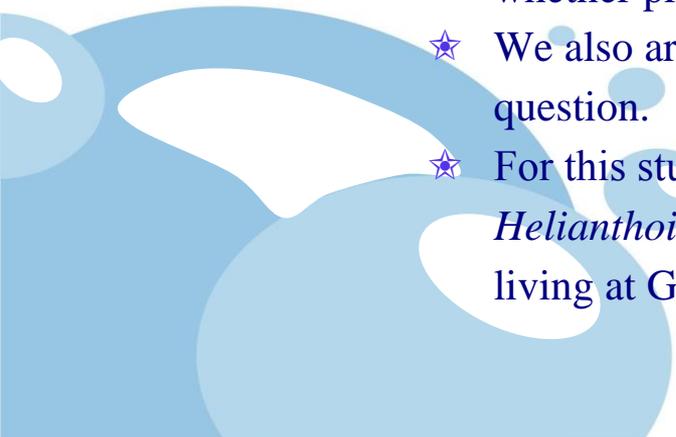


Sea Star Size and Susceptibility

A Study By Garfield High
School Students
Eva Zimney, Jessie Nguyen,
and Jonny Sabath



What's This Study About?

- ☆ The sea star wasting disease is a mysterious ailment which has brought a major drop in the sea star population of the Pacific Northwest, as it decomposes the organisms from the arms inward.
 - ☆ This study focuses on the difference in effect of the sea star wasting disease (SSWD) on differently sized sea stars to determine whether proportion affects susceptibility to the sickness.
 - ☆ We also are using size to approximate the age of the sea stars in question.
 - ☆ For this study, we've targeted the species *Pycnopodia Helianthoides*, *Pisaster Ochraceous*, and *Evasterias Troschelii* living at Golden Gardens beach.
- 

Expository Comparison Diagrams

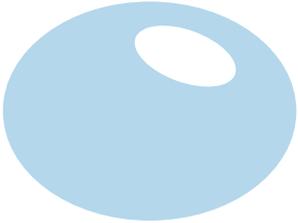
Infected *Pycnopodia*



Healthy *Pycnopodia*



Goopy and greying arms



The Variables and Materials

Controlled Variables

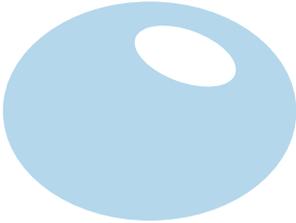
- ★ The beach which we studied at (Golden Gardens).
- ★ The genuses we studied (*Pycnopodia*, *Pisaster*, and *Evasterias*).
- ★ The disease studied (Sea Star Wasting Disease).
- ★ Tide level.

Manipulated Variable

- ★ Size of the sea stars we studied.

Materials

- ★ 3 Rulers
 - ★ 3 Clipboards
 - ★ 3 Pairs of Eyes
- 



The Procedure

Beginning at 10:45 AM, we divided the available beach into three 70m sections and each took a ruler, a data table, and a clipboard, and began to locate sea stars in our respective areas.

For every sea star we found, we would...

- ★ Identify the genus (*Pycnopodia*, *Pisaster*, or *Evasterias*).
- ★ Examine the state of the arms to determine whether or not the sea star was infected.
- ★ Measure the diameter of the radial disc in centimeters.
- ★ Record the length in the genus and health-specific category of the data table

At 12:30, we ended our fieldwork and grouped together to compare and compile our findings.



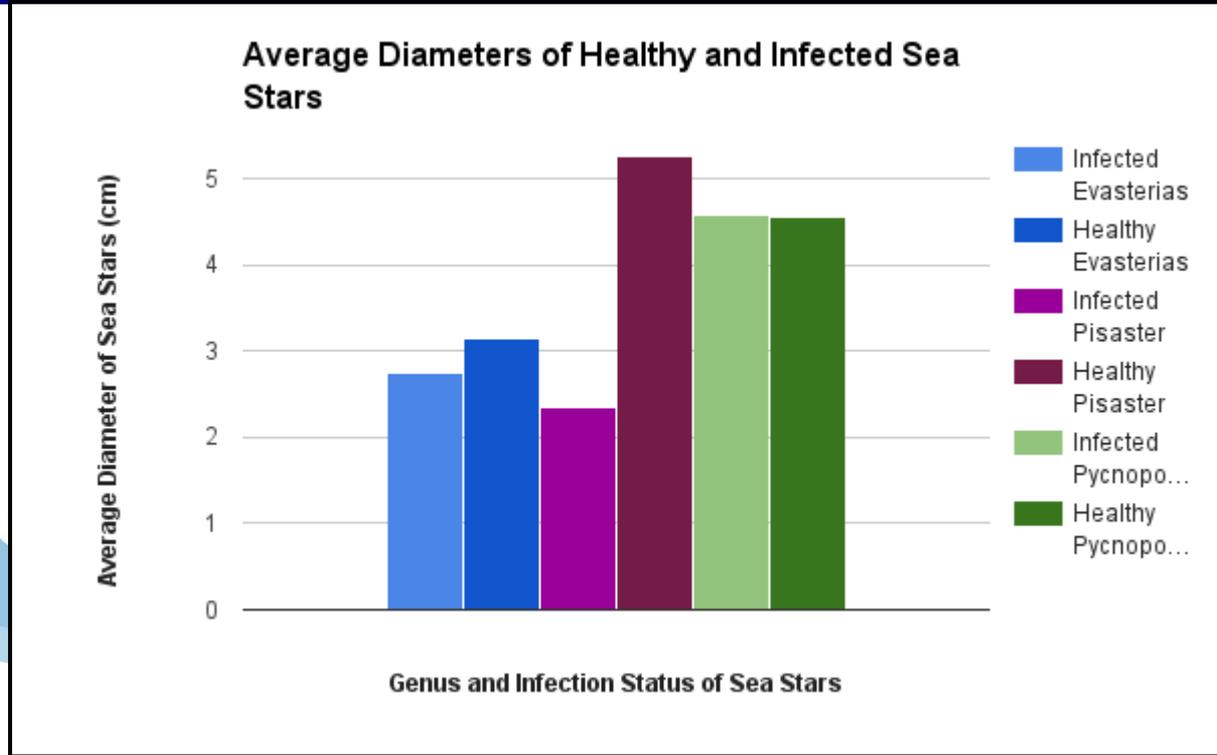
The Results

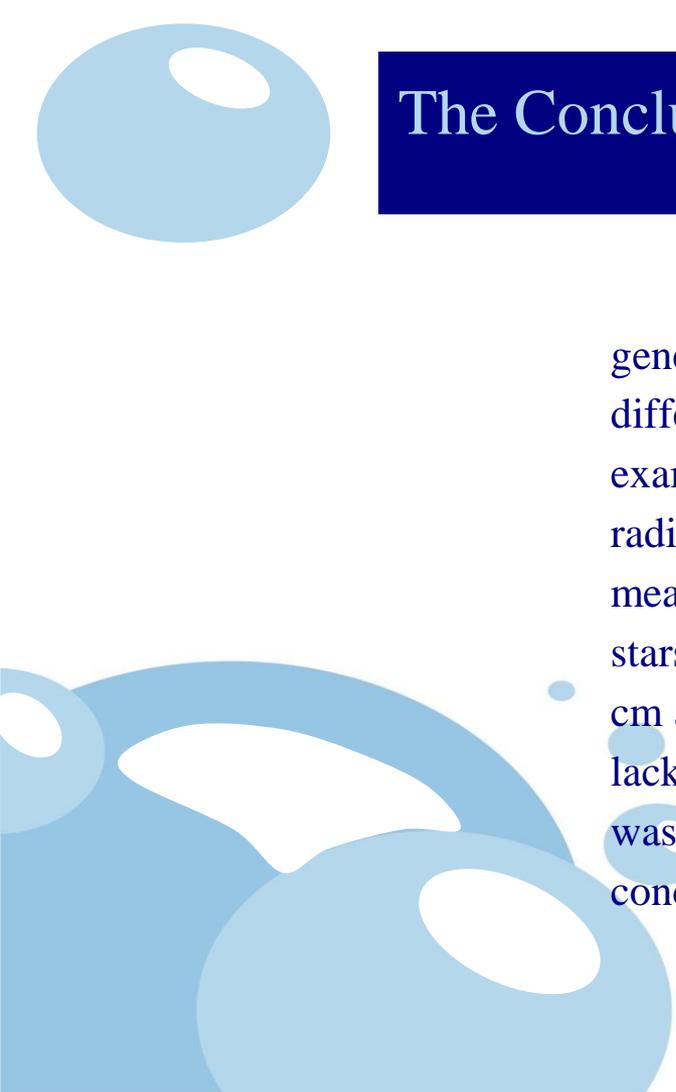
<i>Evasterias</i> (Mottled Star)		<i>Pisaster</i> (Common Star)		<i>Picopodia</i> (Sunflower Star)	
Diameter of the Infected (cm)	Diameter of the Healthy (cm)	Diameter of the Infected (cm)	Diameter of the Healthy (cm)	Diameter of the Infected (cm)	Diameter of the Healthy (cm)
5	3	2	4	5	4.5
1	1.5	3	7	5	4.5
3	2	3	6	4	5
2	4	1.5	11	4	4
	4	2	7	5	6
	3.5	4	6	4	2

The Results (Continued)

		3	3	4.5	5	4
		3.5	4	3.5		7
		3	4.5	5		4.5
		4	3	3.5		4
		3		4		
				5		
				3		
				4		
				6		
				2		
				7		
				6		
Averages	2.75	3.136	2.35	5.25	4.57	4.55

Look at this Graph





The Conclusion

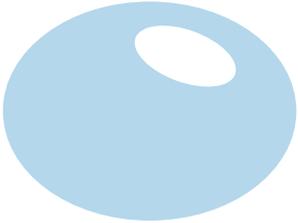
From our data, we can conclude that the larger sea stars were generally less infected than the smaller ones. This is most evident in the difference in size of the healthy and infected *Pisaster Ochraceus* examples. The largest observed healthy common star we recorded had a radial disc measuring 11 cm across, and the largest infected common star measured 4.5 cm across. In addition, the average size of the uninfected stars was 5.25 cm across, almost double that of the infected stars (2.35 cm across). It is worth noting that for the genus *Pycnopodia*, there was a lack of size variation, and for the genus *Evasterias*, while the same trend was present, there was not quite enough data to determine a convincing conclusion.



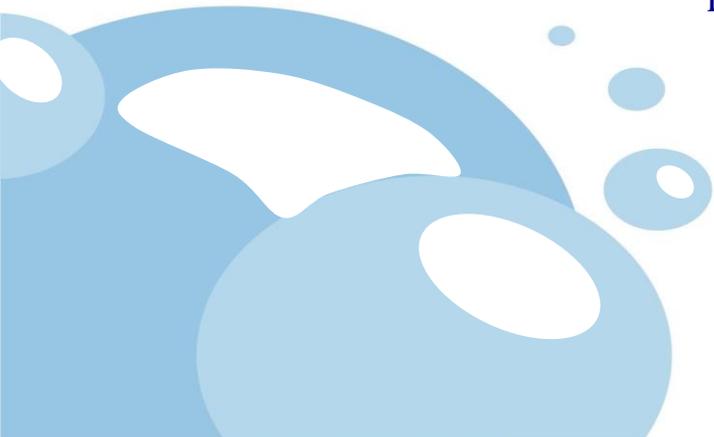
The Explanation

There are a few possible explanations for the pattern found in the *Pisaster* stars:

- ★ A popular belief is that the larger stars were resistant to the disease when they were young, allowing them to grow to maturity, while the susceptible species were killed while young, making the only observable infected stars smaller.
- ★ Another possibility is the idea that the SSWD is passed on genetically and size is a trait that is related to the stars susceptibility. However, this is just a theory and there is little evidence in the marine science community to back it up at the moment.



The Impacts

- ★ While we can see that there are some sea stars in the beaches, unfortunately the virus is still affecting their population.
 - ★ We can potentially use this data to find the correct target group of sea stars in order to find further information on SSWD.
 - ★ Hopefully this data can contribute to the knowledge of the beach ecosystems here in the Pacific Northwest, and help to figure out how to help the sea star population recover.
- 

Thanks for Listening!

