Journal of
Student Research
on Puget Sound

Glacier Peak High School
11th & 12th Grade
Snohomish, WA
Citizen Science Research

By: Emily Rose and Mikayla Ingram
Our question

- How does the tide level effect the number of Sea Stars (both Purple and Mottled) present on the beach at high tide (+2), middle tide (0), and low tide (-1.6)?
A little background info...

- The Purple Sea Star (*Pisaster Ochraceus*) juveniles are often found under rocks in the lower tidal area.
- The Mottled Sea Star (*Evasterias Troschelii*) are most abundant in protected areas.
- Both are carnivores, feasting on mussels.
- Gulls and crabs love to eat sea stars.
Our hypothesis

- If there is a low tide then, there will be more sea stars present because, sea stars thrive in cool wet places and the closer to the water, the cooler and wetter it is.
Location of Research

- Mukilteo Beach
  - 3rd St, Mukilteo, WA 98275
- Date of Collection: Wednesday May, 14th 2014
- Time of Collection: 9:50am-11:45am
- Group Members:
  - Emily Rose
  - Mikayla Ingram
Materials

- Pen
- Paper
- Tide line
- Profile line
- Measuring tape
- Quadrat
- iPad (for pictures)
Our Procedure

1. Identify and mark profile line
2. Identify and mark tide line
3. At the +2 tide line, measure out 50 feet to the right (south) of the right and mark
4. Repeat step 3, but go 50 to the left (north) and mark
5. Walk down the right side of the 50 foot line you marked, and every 5 feet place the quadrat down and look for sea stars.
6. Count sea stars if they are present
7. Put back any rocks that you flipped over
8. Record your observations
9. Repeat steps 3-7 at 0 and -1.6 tide lines
10. Record all data
Habitat and Substrate

-2
- Habitat: 80% Gravel/Cobble/Shell  10% Sand  
- Substrate: 80% Gravel  10% Sand

0
- Habitat: 60% Gravel/Cobble/Shell  30% Sand  
- Substrate: 70% Gravel  20% Sand

-1.6
- Habitat: 80% Sand  10% Seaweed
- Substrate: 80% Sand  10% Gravel
Analysis

After looking through our data, we have found that the lower the tide level, the more sea stars we found. At +2 tide there were very few sea stars but, the further we went down, the more we saw.
Our findings to the left of the line

<table>
<thead>
<tr>
<th>Tidal Height</th>
<th>Distance from profile line in feet (Left Side)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High +2</td>
<td>0 0 0 0 0 0 0 0 0 0 1 0 0 0 1</td>
<td></td>
</tr>
<tr>
<td>Middle 0</td>
<td>1 0 2 0 0 0 1 0 0 0 0 0 0 4 4</td>
<td></td>
</tr>
<tr>
<td>Low -1.6</td>
<td>1 1 3 0 2 3 3 2 0 1 16</td>
<td></td>
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</tbody>
</table>
Our findings to the right of the line

<table>
<thead>
<tr>
<th>Tide Height</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>Total</th>
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<tbody>
<tr>
<td>High +2</td>
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<tr>
<td>Middle 0</td>
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<td>5</td>
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<tr>
<td>Low -1.6</td>
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<td>0</td>
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<td>2</td>
<td>1</td>
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<td>4</td>
<td>14</td>
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# of Sea stars found to the left of the line

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<tbody>
<tr>
<td><strong>Left +2</strong></td>
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<td>0</td>
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<td>0</td>
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<tr>
<td><strong>Left 0</strong></td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td><strong>Left -1.6</strong></td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
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<tbody>
<tr>
<td>Right +2</td>
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<td>Right -1.6</td>
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Our Conclusion

- Our hypothesis was correct. We hypothesized that the lower the tide, the more sea stars we would find. We believe this is due to the perfect, cool, wet, living conditions that are provided by the rocks close to the shore.
- If we could do this again, we would look every two feet so that we could find more sea stars. We would also like to measure the size of the sea stars to see if there is any correlation between size and tide height.
How can scientists use this research?

- Scientist can use our research to help protect the sea star species as a whole. By using our data, scientists can be able to see if there is a correlation between sea stars and other species of different tidal zones.
References

- http://animalguide.georgiaaquarium.org/home/galleries/cold-water-quest/gallery-animals/mottled-sea-star
Thank You!