

## **Erden's ETA (Estimated Time of Arrival) Competition**

### **Exercise 1: Analyzing Erden's Rate of Travel**

#### **Online tools**

- (1) Data and Information page: [http://www.oceanrowing.com/ErdenEruc\\_Pacific/dist.htm](http://www.oceanrowing.com/ErdenEruc_Pacific/dist.htm)  
 (2) Distance Generator: <http://www.indo.com/distance/>  
 (3) Map Maker: <http://www.aquarius.geomar.de/>  
 ([http://www.aquarius.geomar.de/make\\_map.html](http://www.aquarius.geomar.de/make_map.html))  
 (4) Analysis Tools page: <http://whale.wheelock.edu/whalenet-stuff/Erden/ErdenTools.html>

#### **Exercise 1: How Far did Erden Travel?**

**Pick any seven-day period of Erden's travels and post the location (latitude and longitude) and distance (nautical miles) he travels each day using the data from the Data and Information page (Link 1 in Online Tools).**

**Table 1: Erden's Progress Table**

1	2	3	4	5	6
Day	Date	Latitude	Longitude	Distance Per Day (nm)	Distance Per Week (nm)
1					
2					
3					
4					
5					
6					
7					
	<b>Total per Wk</b>				

**Q1. How many nautical miles did Erden travel in a week when you find the total of each day's travel? \_\_\_\_\_ (Remember to label your units!)**

NAME: \_\_\_\_\_ Level in School: \_\_\_\_\_

## Exercise 2: How far did Erden Travel in the week?

Using the Distance Generator (Link 2 in Online Tools) calculate the distance Erden traveled from Day 1 to Day 7 in the week you chose for Table 1.

(Link 2) Distance Generator: <http://www.indo.com/distance/>

How to use the Distance Generator:

In the "From" box, write the latitude and longitude of Erden's location on Day 1. In the "To" box, write the latitude and longitude of Day 7. Click on "Look it up!" button and record the distance traveled in the Total per Week box under column 6 in Table 1.

**Q2. Does the sum of the individual days distance traveled (Column 5 Total) match the distance traveled for the week (Column 6 Total) using the Distance Generator? Why or why not? Explain.**

**Q3. What is Erden's average distance traveled each day using this method?**

\_\_\_\_\_

**Q4. a) What is Erden's rate of travel, in knots, for the week? \_\_\_\_\_**  
(knots = nautical miles per hour)

**b) What is the difference between a nautical mile and a statute mail?**

### Exercise 3: Mapping Erden’s Travels

Using the Map Maker (Link 3 in Online Tools): (<http://www.aquarius.geomar.de/>) and ([http://www.aquarius.geomar.de/make\\_map.html](http://www.aquarius.geomar.de/make_map.html)), make a map of Erden’s daily travels.

Procedure:

\*\* In the **PLOT LOCATIONS** area the Latitude and Longitude must be re-written in decimal form.

In order to change the 131:27:36W which means 131 degrees, 27 minutes, 36 seconds west to decimal degrees divide the 27 minutes by 60 and then add that decimal to the 131 degrees. Do not worry about the 36 seconds in this exercise.


- divide the 27 minutes by 60 :  $27 / 60 = 0.45$
- add that decimal to the 131 degrees :  $131 + 0.45 = 131.45$
- then for this Map Maker make the 131.450 negative because it is west.  
West is negative, east is positive  
South is negative, north is positive

Open the Map Making link ([http://www.aquarius.geomar.de/make\\_map.html](http://www.aquarius.geomar.de/make_map.html)) and write the longitude, then a comma “,”, then the latitude, then a comma “,”, and then the date as 8/17 on each line for the week. The longitude must be written with a negative sign “-“ because it is west.

Sample data for Map making box

- 131.617, 23.883, 8/13
- 131.916, 23.417, 8/14
- 131.216, 23.067, 8/15
- 131.450, 22.600, 8/16**

**BASIC PARAMETERS**

 **MAP BOUNDARIES!**

North:

West:  East:

South:

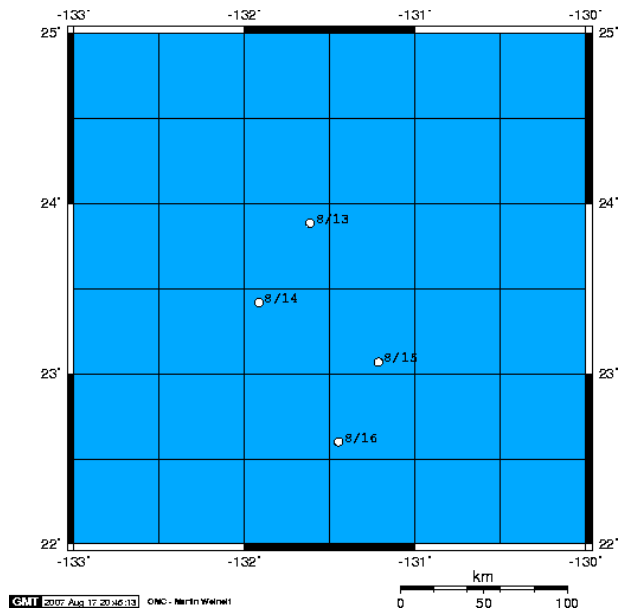
In the **BASIC PARAMETERS** area you must put in the “box” in which your locations are located. Choose a close but more northerly latitude than your largest location latitude and then a close but more southerly latitude than your most smallest latitude. And then repeat this exercise for the most easterly and westerly points as explained on the Map Maker web page.

NAME: \_\_\_\_\_ Level in School: \_\_\_\_\_

Then click the "Create Map" button at the bottom of the page.

Sample Map:

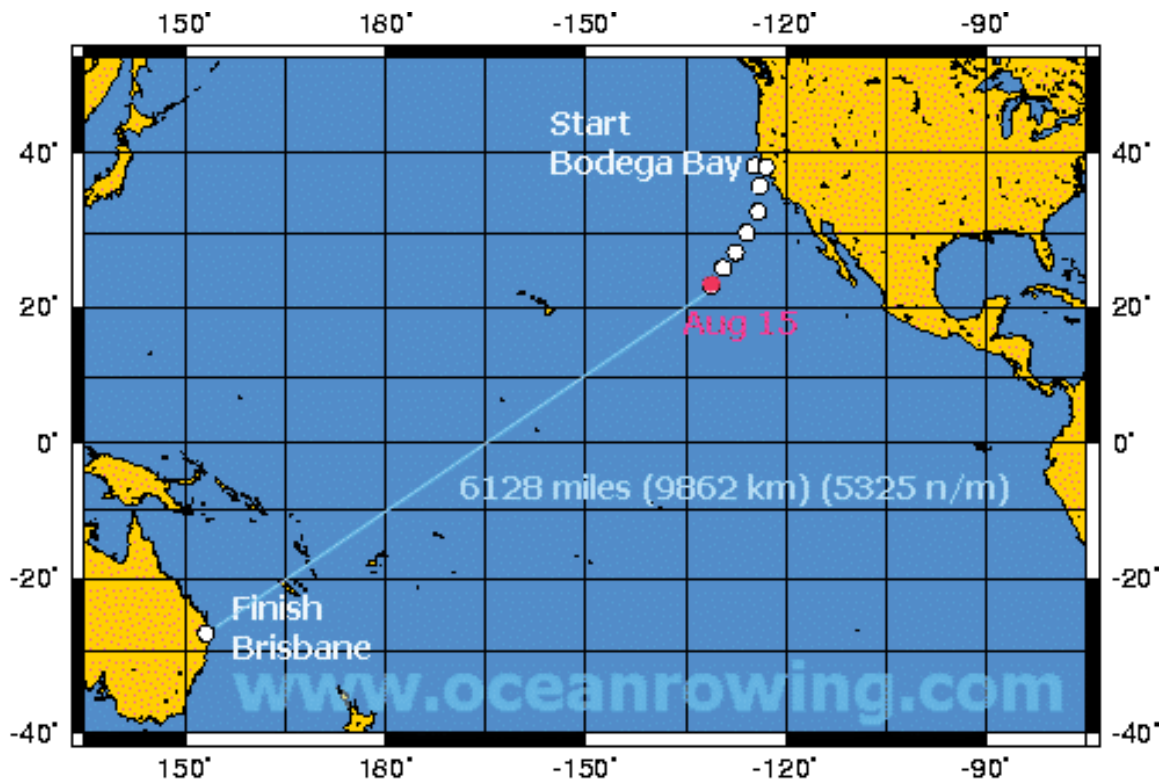
**Q5. How does Erden's track differ if you use the locations of all seven days as compared to using the locations of only Day 1 and Day 7?**



Revisit Question Q2.

Q2. Does the sum of the individual days distance traveled (Column 5 Total) match the distance traveled for the week (Column 6 Total) using the Distance Generator? \_\_\_\_\_ Why or why not? Explain.

### Exercise 4: When will Erden Arrive in Australia?



NAME: \_\_\_\_\_ Level in School: \_\_\_\_\_

**Given the information that you discovered or calculated in Exercise 1 through 3 answer the following questions to enter the Erden's ETA Competition.**

**Q6. At that rate of travel, how many days will it take Erden to reach Australia?**

**Q7. On what day and time do you predict Erden will set foot on Australia?  
(Remember to use the 24-hour clock or specify a.m. or p.m.!)**

**Q8. Write a paragraph of no more than 100 words explaining how you arrived at your calculations.**