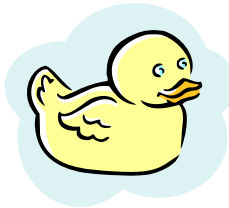


Nike Sneakers and Rubber Duckies

What do 80,000 Nike sneakers and 29,000 rubber duckies tell us about ocean surface currents?



Large ships loaded with containers are constantly traveling from the manufacturing centers in Asia to the markets of North America. On their way toward North America they travel what people in shipping call the great circle route: the vessels take a northern route to America and return to Asia using amore southern route. We can learn about currents from three unfortunate incidents involving containers which fell into the North Pacific Ocean.

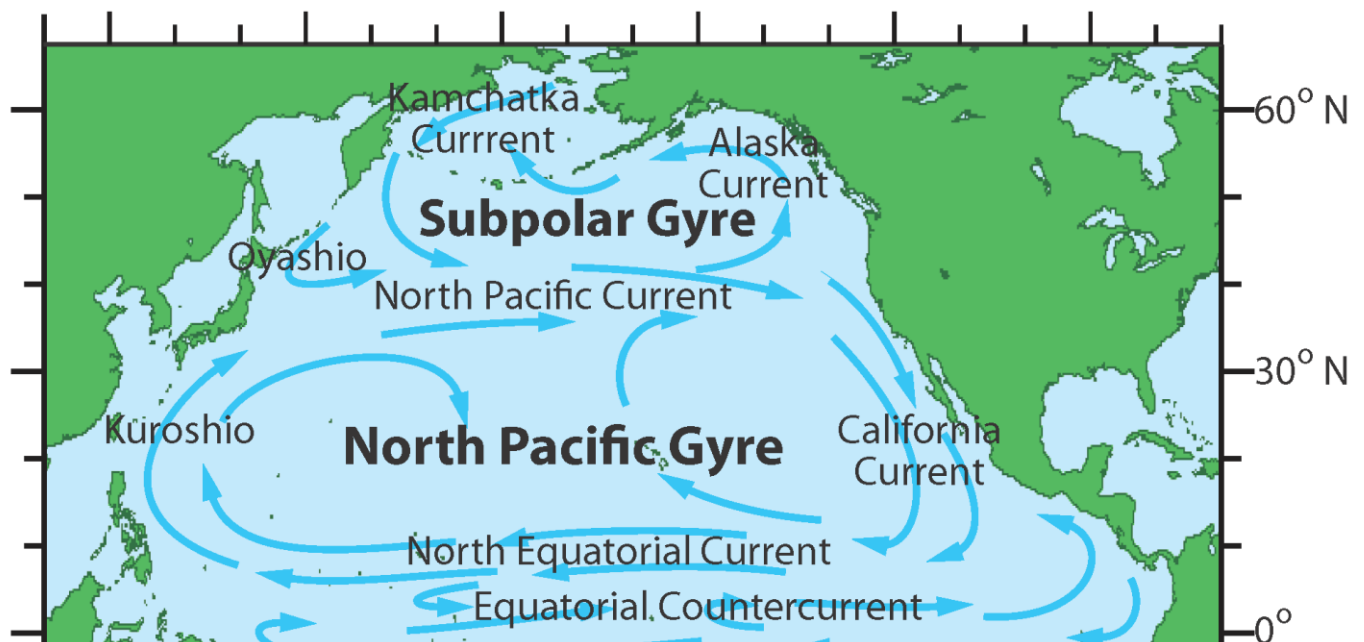
May 27, 1990: The Nikes →

The freighter Hansa Carrier, en route from Korea to the U.S., encountered a severe North Pacific storm. During the storm, a large wave washed five containers overboard, containing approximately 80,000 Nike shoes ranging from children's shoes to large hiking boots. It has been estimated that four of the five containers opened into the stormy waters, releasing over 60,000 shoes into the North Pacific Ocean. The shoes washed ashore one at a time but were wearable after a scrub-down to remove barnacles, algae, and tar. Beachcombers held swap meets to find matched pairs.



January 10, 1992: The Ducks →

A ship from Hong Kong lost 12 containers. One included 7,220 Rubber Duckies along with equal numbers of beavers, frogs, and turtles for a total of 28,880 floating bath tub toys.



Ocean Current Data

MATERIALS: Map of north Pacific, Coordinates, pencil/pen, map of surface currents

PROCEDURE: By plotting the locations of the container spills of the Nike shoes and rubber duckies, you will create a picture of the surface currents in the North Pacific.

1. Plot the following points and connect the coordinates with a **RED** line.

Nike Sneakers			
Date	Lat. in °N	Long. in °W	Comments
5/27/90	48	161	Containers lost overboard
12/90	48	125	Cape Flattery, WA (~200 shoes)
2/91	49	126	Vancouver Island, BC (~100 shoes)
3/91	53	132	Queen Charlotte Island, BC (~250 shoes)
3/91	47	124	Washington Coast (~200 shoes)
4/91	45	124	Columbia River (~350 shoes)
5/91	43	124	Oregon-California Coast (~200 shoes)
5/91	51	128	N. Vancouver Island (~200 shoes)
2/93	21	155	N. coast of Island of Hawaii (several)

2. Plot the following points and connect the coordinates with a **BLUE** line.

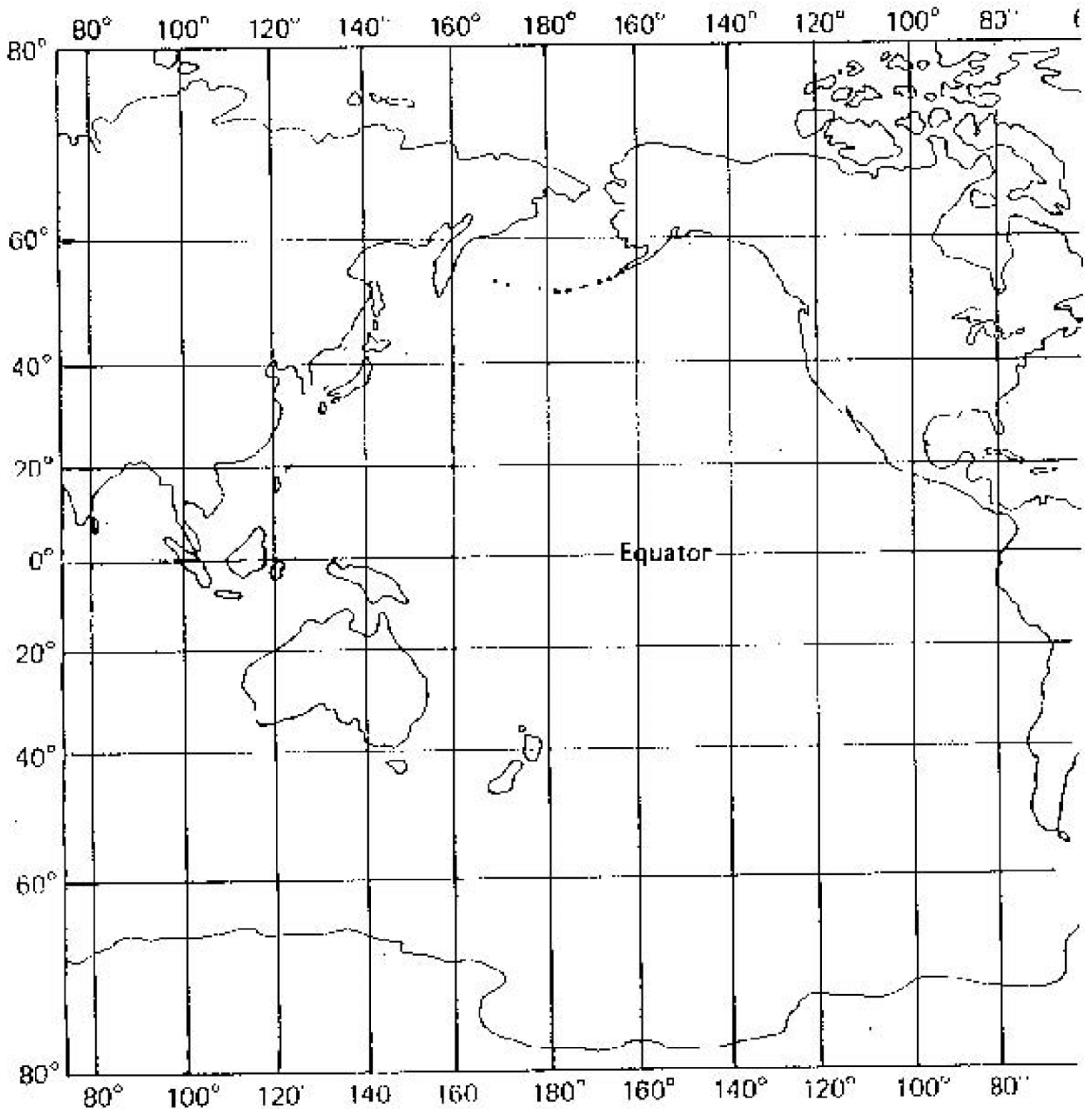
**Note the E & W longitude coordinates.*

Rubber Duckies			
Date	Lat. in °N	Long. in °E & °W	Comments
1/10/92	45	178 E	Containers lost overboard
11/92	57	136 W	Sitka, AK
2/93	58	137 W	Chickagof Island, AK
4/93	60	140 W	Yakutat, AK
5/93	62	145 W	Cordova, AK
7/93	57	153 W	Kodiak Island
5/95	59	164 W	Kipnuk, AK
7/95	57	170 W	Saint Paul Island

Name: _____ Period: _____ Date: _____

Nike Sneakers and Rubber Duckies

Directions: Use the latitude and longitude data to plot the progress of the shoes and ducks on the map.



Analysis Questions:

- 1) Which currents was the *Hansa Carrier* taking advantage of on its trip from Korea to Seattle, WA?
- 2) The first 200 shoes arrived in Dec. 1990 to the west coast of the Washington state. In April of 1991, several hundred shoes were found on both sides of the mouth of the Columbia River, which separates Washington and Oregon. Then a month later, 200 more shoes were found on beaches along the Oregon/California border. These three findings were probably due to the effects of which current?
- 3) In early 1993, Nike shoes washed ashore at the northern end of the island of Hawaii. What currents were involved in the shoes' trip from the point where they were lost in the ocean until they arrived in Hawaii?
- 4) Why did the rubber duckies travel twice as fast as the shoes?
- 5) Why did the ducks show up in the Gulf of Alaska instead of where the shoes were found?
- 6) Describe the route of the ducks from Cordova, AK (5/93) to the site located north of the Aleutian Islands in the Bering Sea (5/95).
- 7) Scientists expected the ducks to drift farther north during the spring thaw and become part of the westward rotating Arctic polar ice pack. Based on this, where should the ducks have ended up around the year 2000? Explain your answer.