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Subject: **Expert Witness Nov.-18, 2008**
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Dear Dr. Kirwan:

The court has received the following questions with regard to the lawsuit of the State of Hawaii vs. City of Los Angeles whose subject is the potential trapping of objects floating in the surface layers of the central Pacific Ocean:

Group-1 (Plaintiff):

1. What is a bifurcation point? What can you tell us about how they are formed in the northern Pacific Ocean? How do these points affect floating plastic objects?

2. How can plastics or other floating objects escape the gyre?

3. What effect might El Nino have on the general currents in the Pacific? What else may have similar effects?

4. It is pretty easy to recognize the North Pacific Current at around 38* North. Where is the Subarctic Current? How do these currents relate to the Pacific Gyre?

5. This study was done about 30 years ago. The paper talks about errors involving the trackers. This is so much of a problem that a correction effect was looked into but apparently not used due to its own errors. What kind of errors could we be looking at in the tracker maps? What kinds of improvements have been made in the last 30 years?

6. How closely do these trackers model the movement of plastics in the ocean?

Group-2 (Defence):

1. Would the more diffuse and weaker nature of the California current compared to the Kurishio current make it less likely for particulates from California to enter the gyre, as opposed to particulates from the west coast?

2. Is ARGO data a good representation of plastic particulate movement, or does the different depth make it irrelevant?

3. Once a piece of plastic enters the gyre, what are its options for leaving?

4. How accurate would you consider the OSCURS model to be?

5. If we model a bottle that leaves LA (inputting friction coefficent), and isnt a bottle when it gets halfway through, is the model still reasonably valid?

6. What sort of time period was OSCURS intended for? Is it reasonably accurate over a 10 year peroid?

OSCURS is the "Ocean Surface CURent Simulatons," a numerical tool for retrospective analyses developed by scientists at the Alaska Fisheries Science Center (Dr. Ingraham). It uses atmospheric sea surface pressure predictions from the US Navy Fleet Numerical Meteorology and Oceanography Center to estimate wind stress and ocean surface currents generated by the weighted sum of (a) those wind stresses and (b) long-term climatological geostrophic ocean currents. These Eulerian velocities on a 92x180 grid with a spacing of 90-km are integrated forward in time to simulate particle trajectories. Details are at

http://www.afsc.noaa.gov/REFM/docs/oscurs/Default.htm

which includes a link to actually run the model via the web (slow).

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