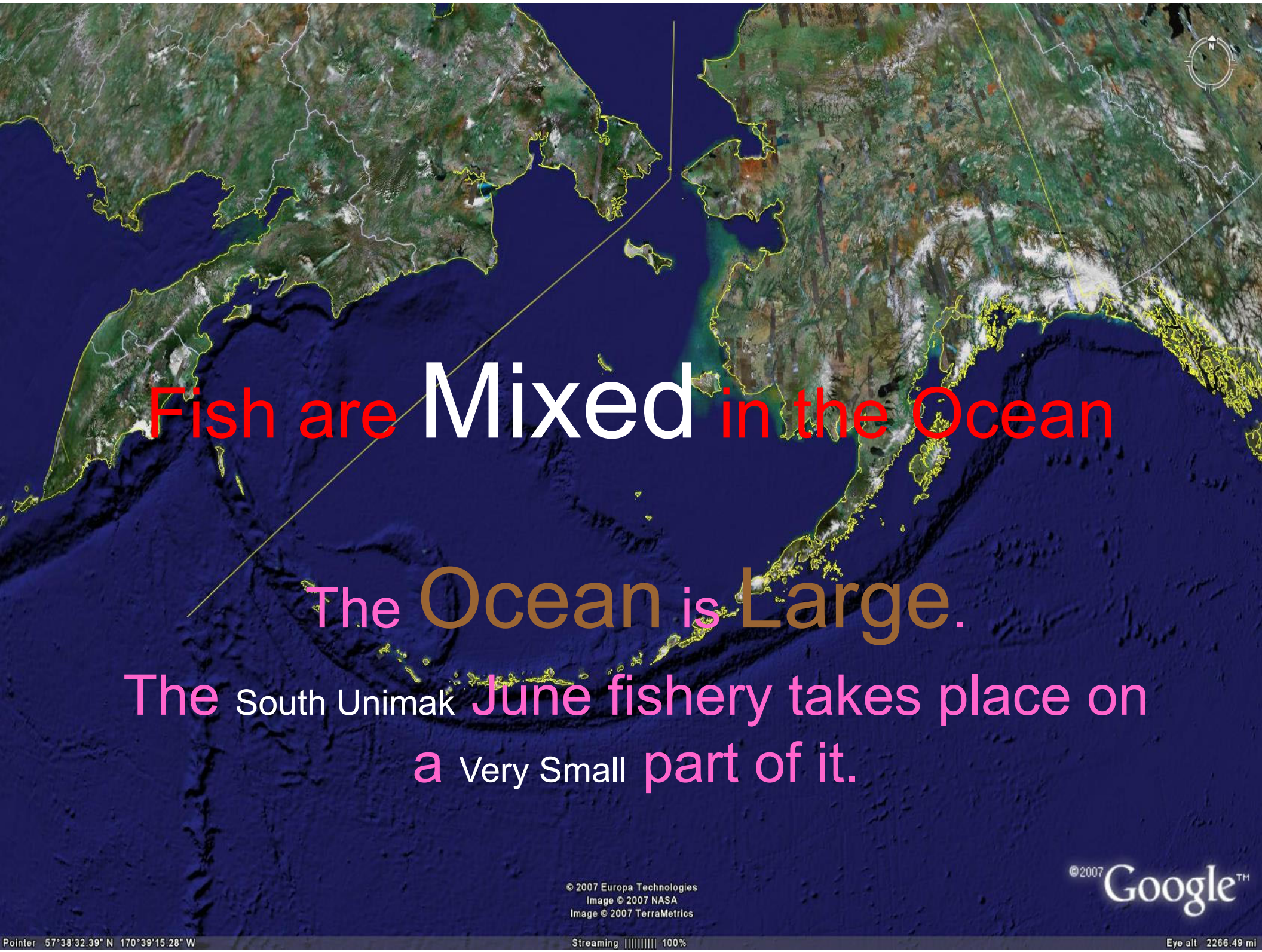
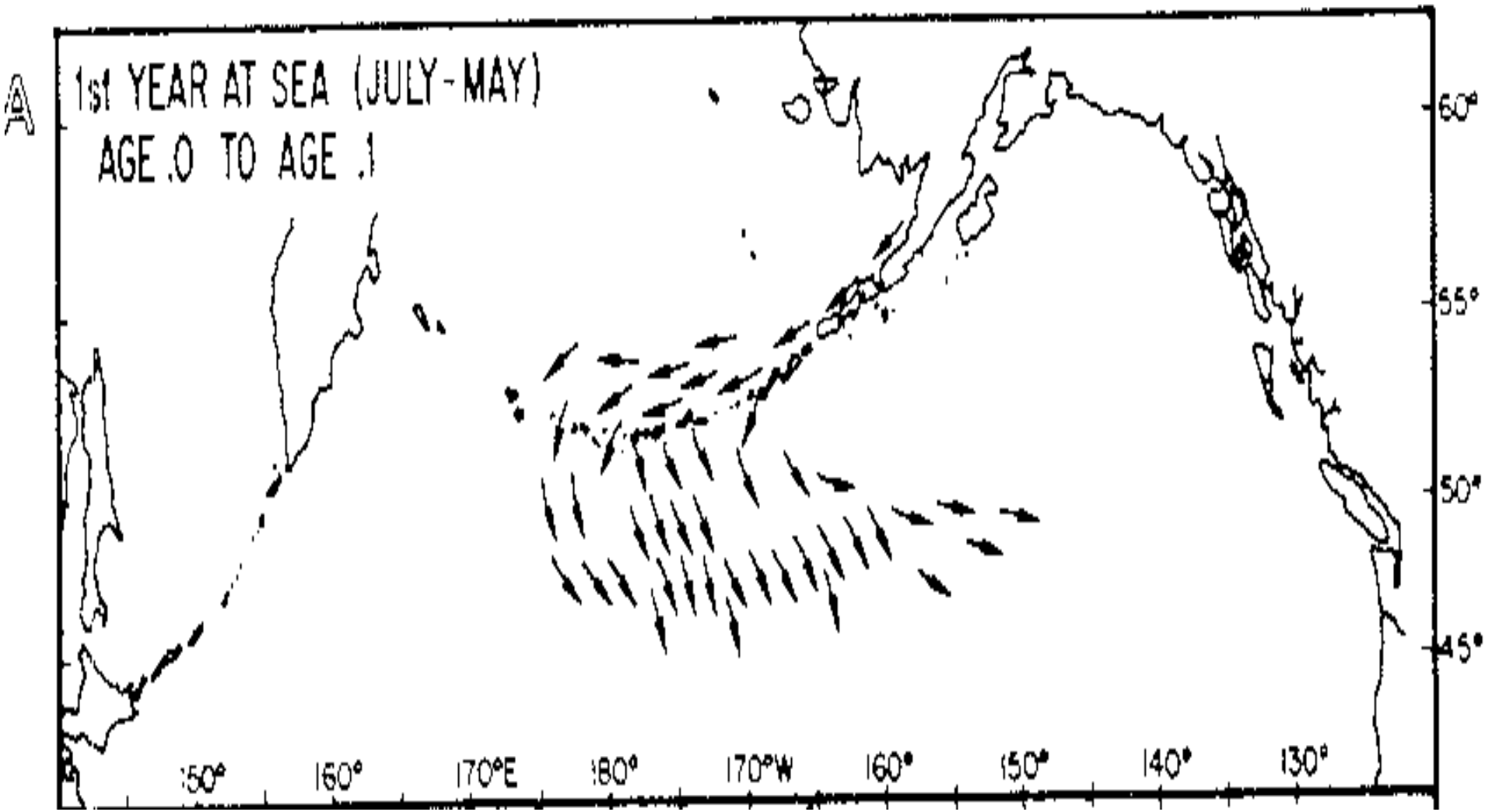

Fish are Mixed in the Ocean
The Ocean is Large.
The South Unimak June fishery takes place on a Very Small part of it.
© 2007 Europa Technologies
Image © 2007 NASA
Image © 2007 TerraMetrics
©2007 Google™
Pointer 57°38'32.39" N 170°39'15.28" W
Streaming 100%
Eye alt 2266.49 mi

Sockeye leave Bristol Bay to feed in North Pacific and Bering Sea

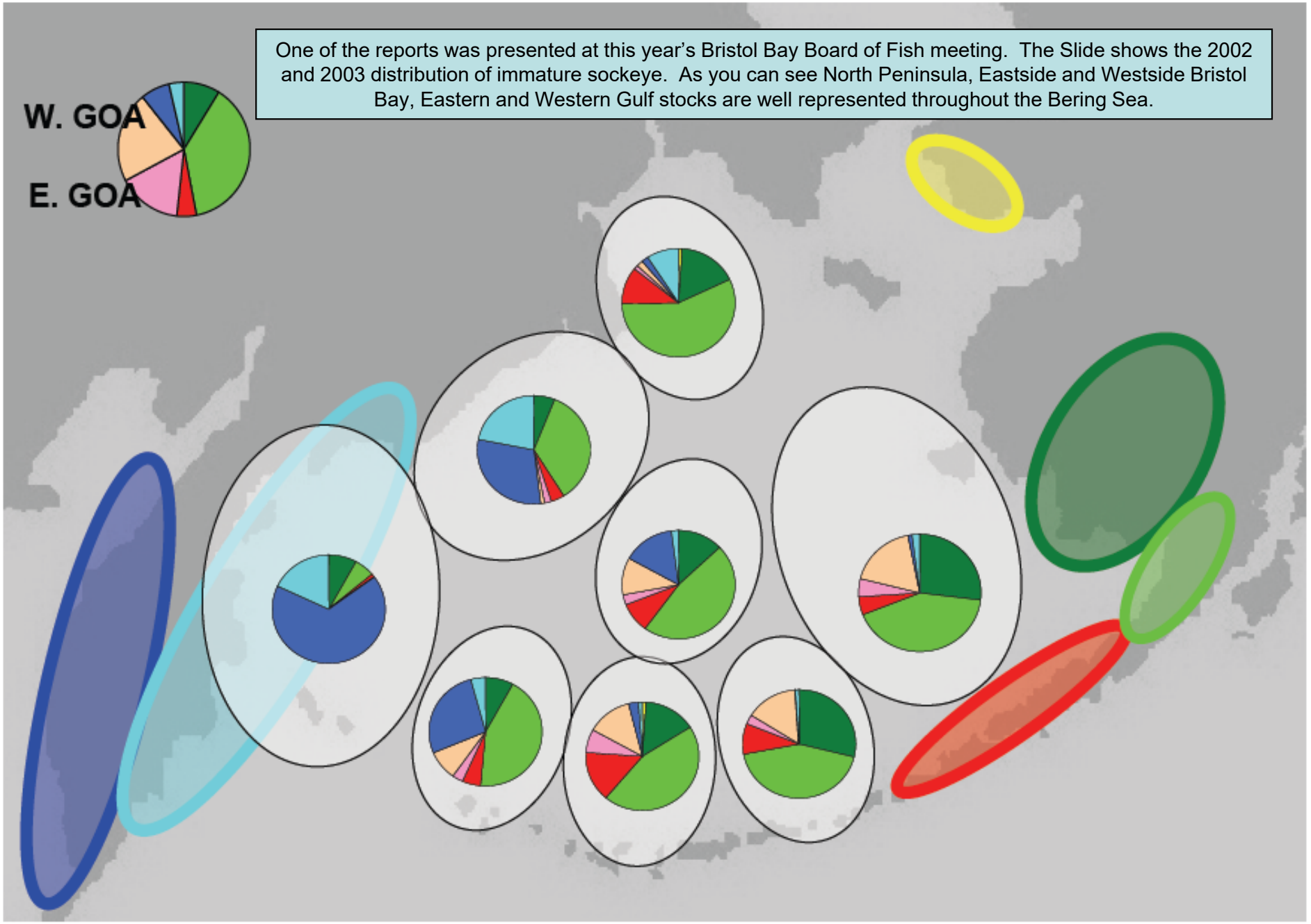


Source INPFC Bulletin #34 based on research from 1956 to 1971

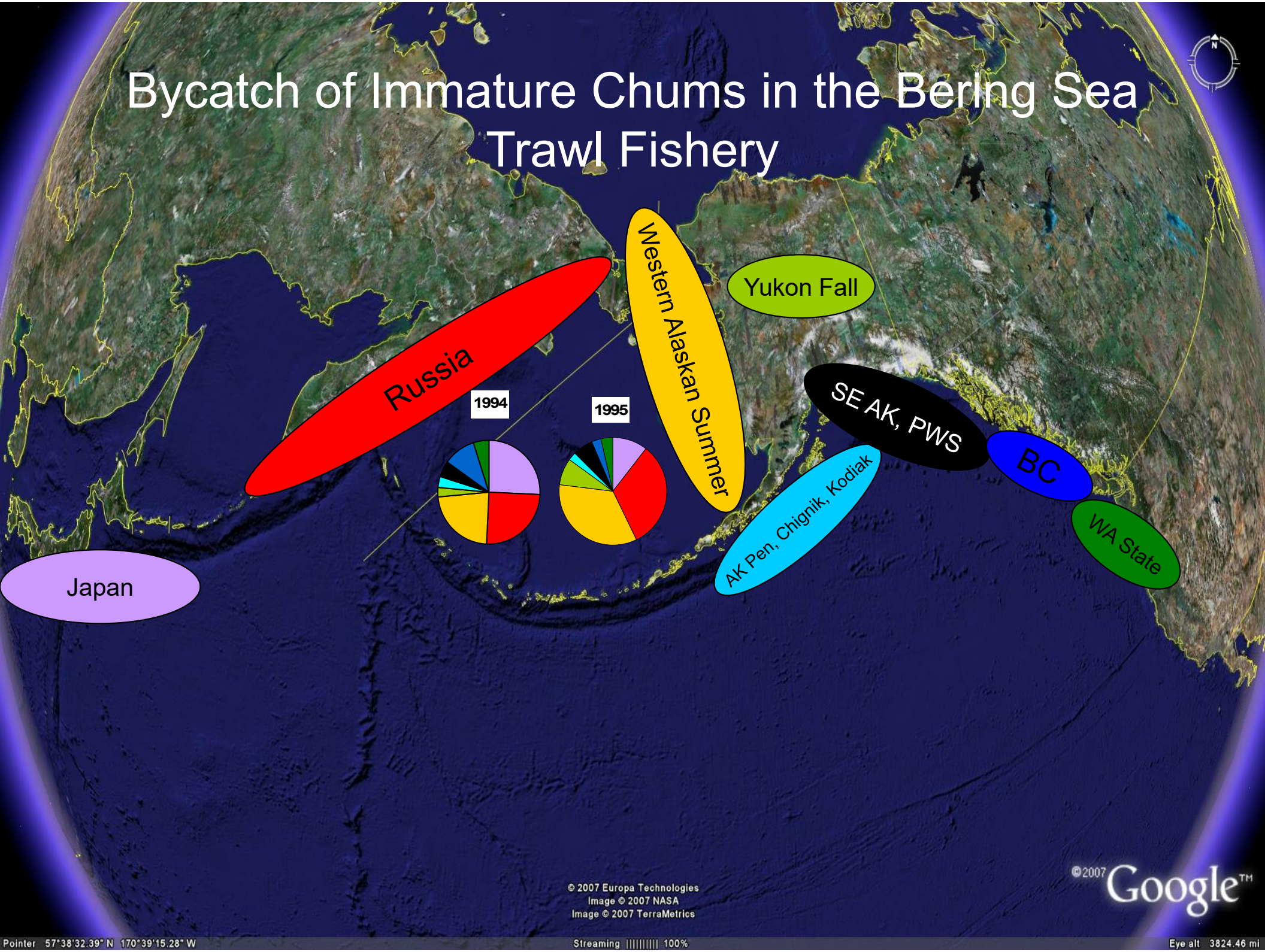
Fish mix early in life

- ADFG Genetic Lab report "Migration patterns of sockeye salmon in the Bering Sea (October 2004)"
- NPAFC Bulletin No. 1 "Genetic Stock ID of Chum Salmon Harvested Incidentally in 1994 and 1995 Bering Sea Trawl Fishery" (Wilmot et al, NOAA)
- ADFG Report to the BOF at the Bristol Bay meeting (2006)

August Stock Compositions



Bycatch of Immature Chums in the Bering Sea Trawl Fishery



The Bering Sea has more food than the Pacific

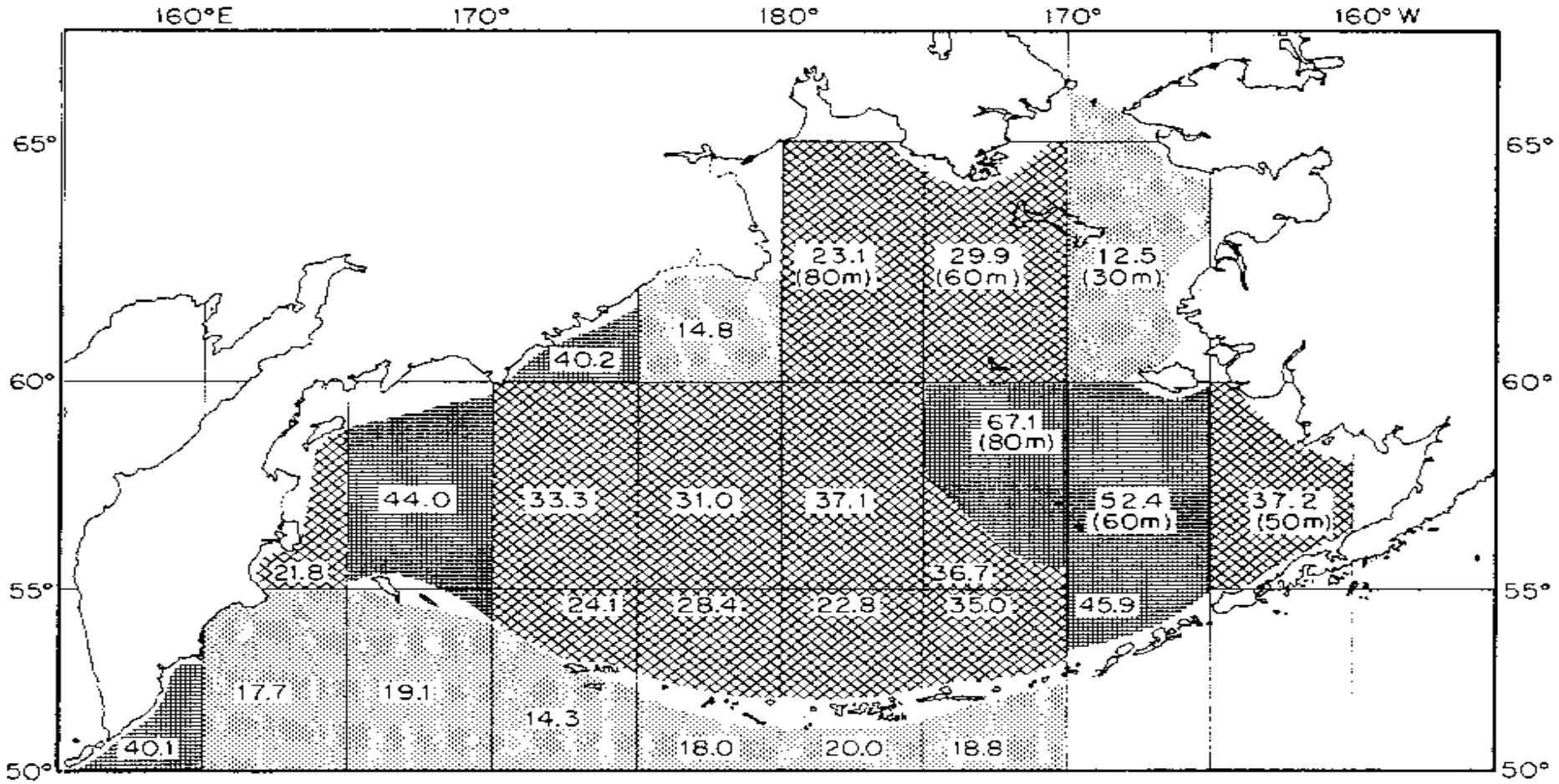
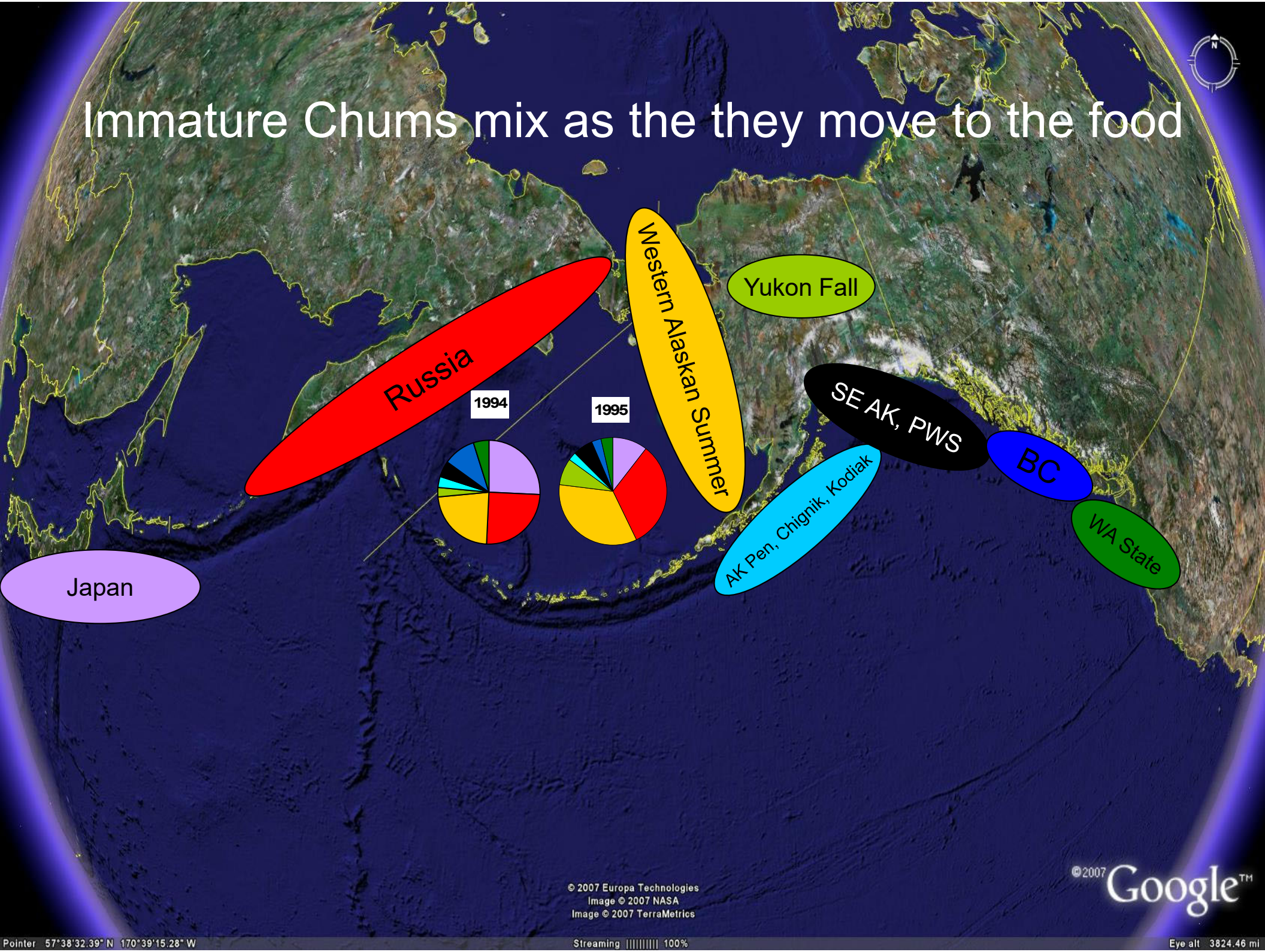


FIG. 30. Mean wet weight (g/m^2) of zooplankton taken with vertical tows in the summers of 1956 to 1970 (from Motoda, 1972). Unless otherwise shown, the water column sampled was from 0–80 m.

Immature Chums mix as the they move to the food



Immature Sockeye Move and Mix with the seasons and they're Widely Distributed

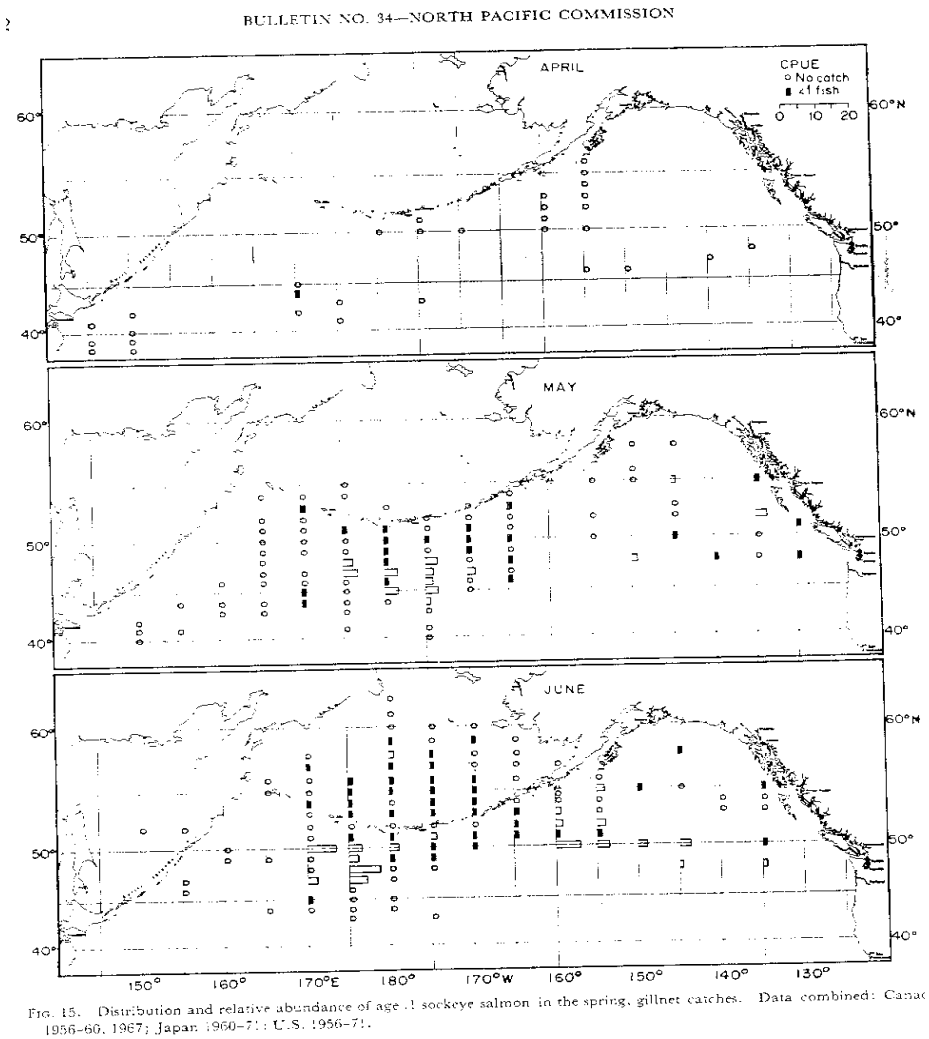


Fig. 15. Distribution and relative abundance of age .1 sockeye salmon in the spring, gillnet catches. Data combined: Canada 1956–60, 1967; Japan 1960–71; U.S. 1956–71.

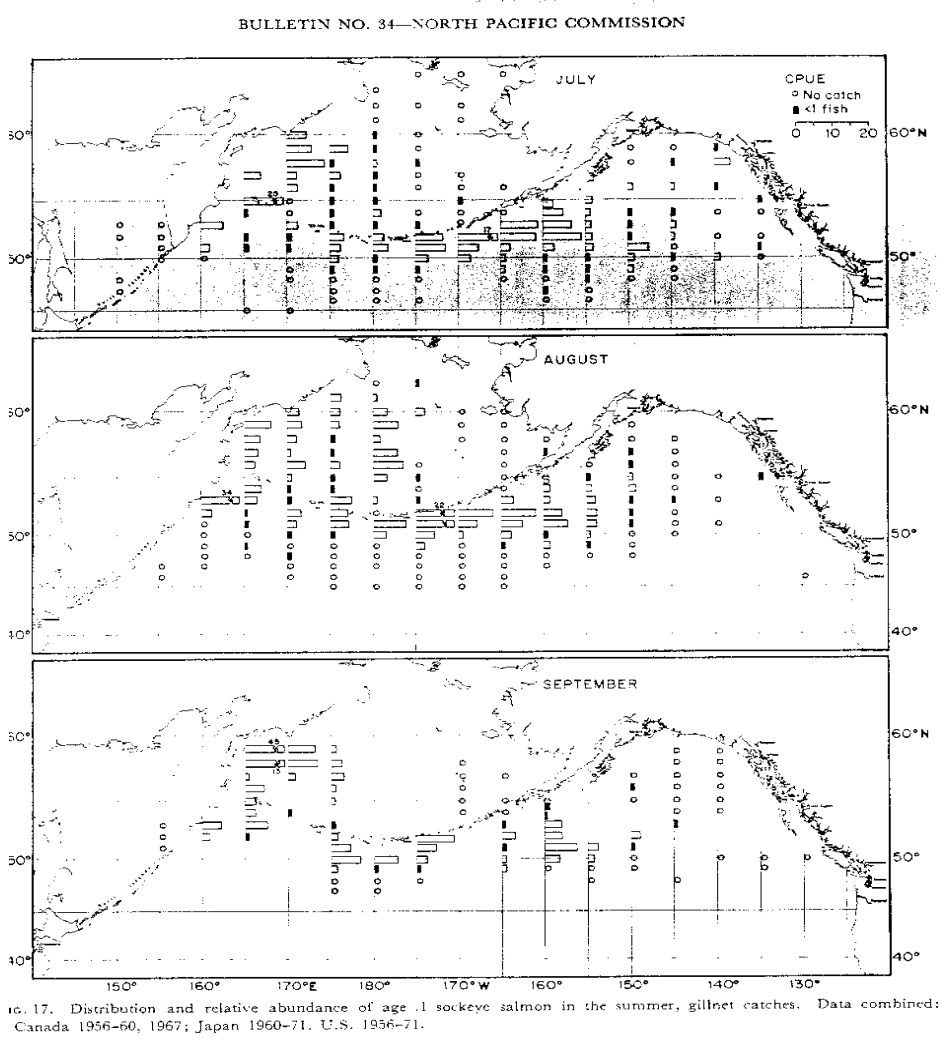


Fig. 17. Distribution and relative abundance of age .1 sockeye salmon in the summer, gillnet catches. Data combined: Canada 1956–60, 1967; Japan 1960–71. U.S. 1956–71.

Immature sockeye move north as summer approaches. The graph shows a month by month distribution of immature sockeye in the North Pacific and Bering Sea. The horizontal bars represent higher abundance, The black bars lower abundance and circles no catch.

Chums are also Widely Distributed and the Ocean is Large

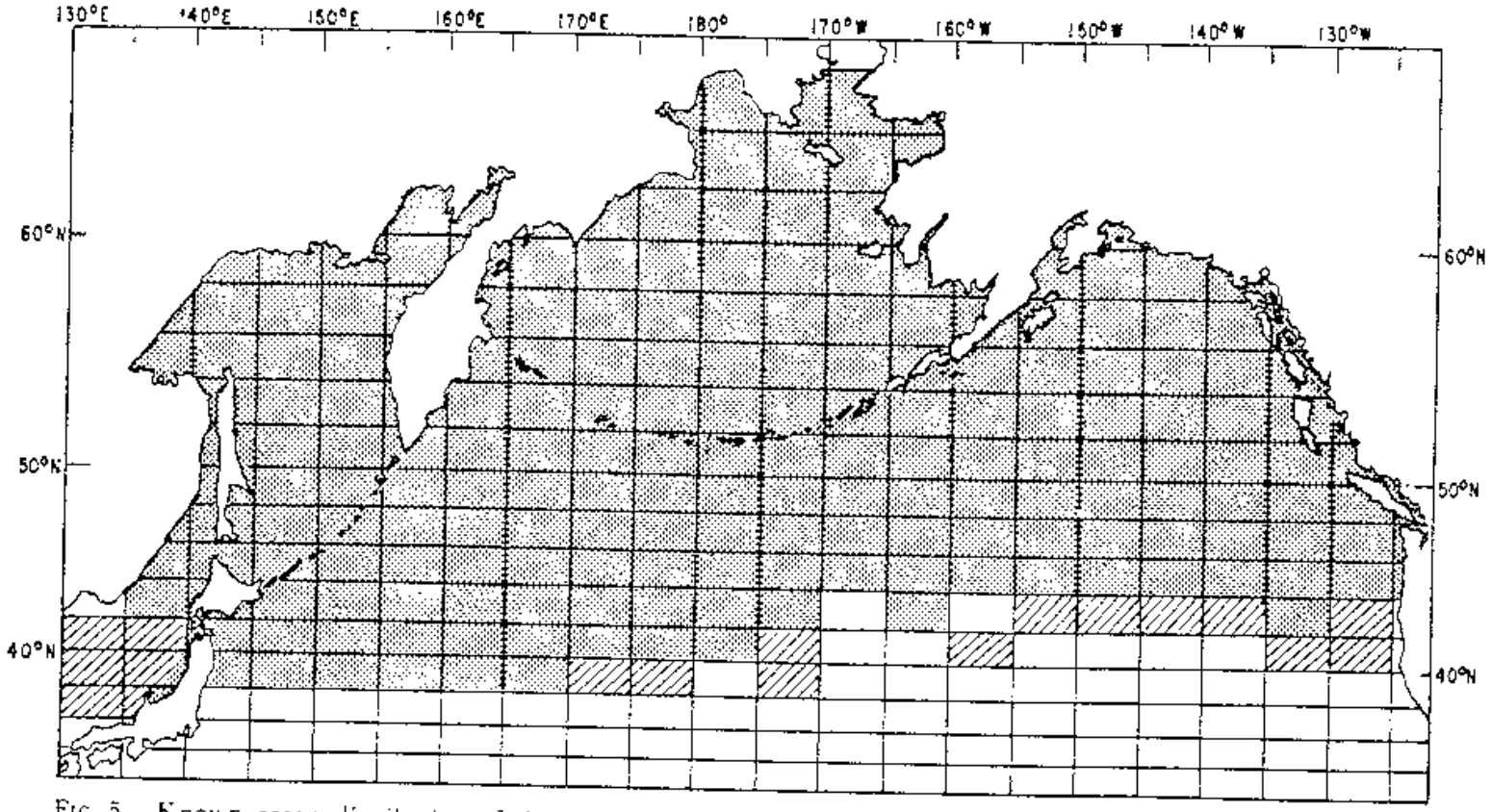
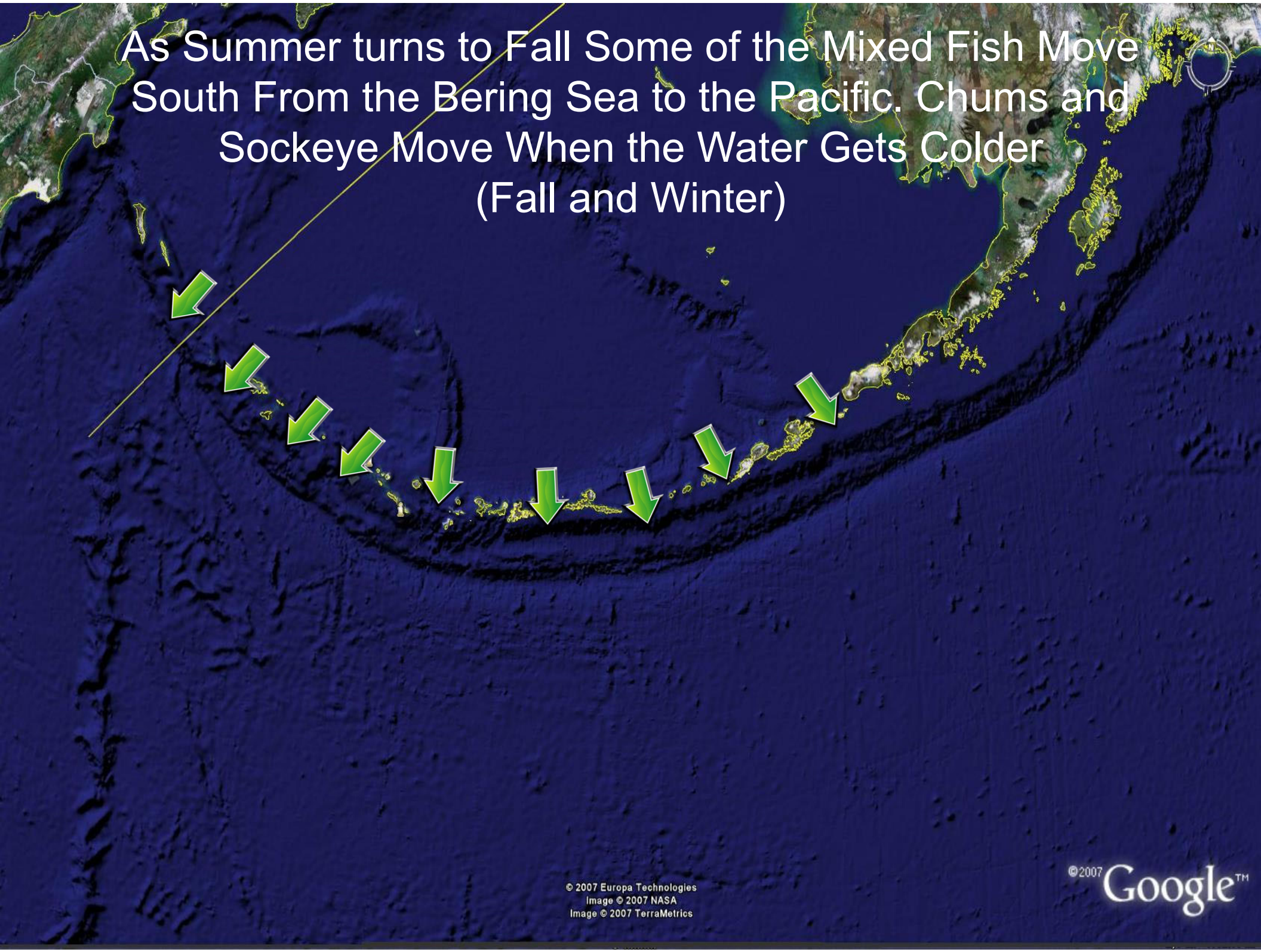
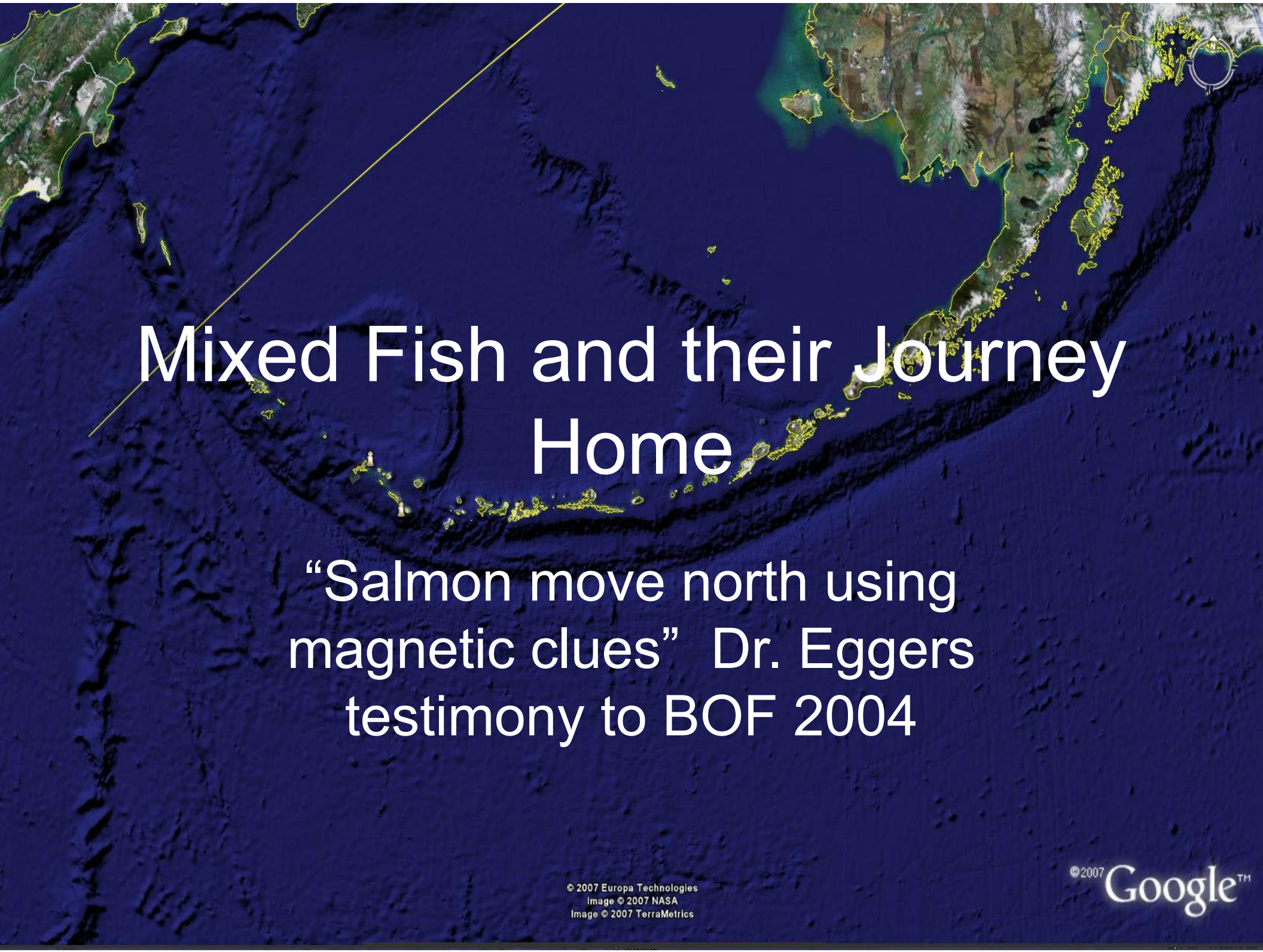


FIG. 5. Known ocean distribution of chum salmon. Dark areas are those where chums were caught. In hatched areas fishing failed to take chum salmon.

The known distribution of sockeye covers the entire North Pacific from the latitude of Northern California to Kotzebue.


As Summer turns to Fall Some of the Mixed Fish Move South From the Bering Sea to the Pacific. Chums and Sockeye Move When the Water Gets Colder (Fall and Winter)
© 2007 Europa Technologies
Image © 2007 NASA
Image © 2007 TerraMetrics
©2007 Google™


Mixed Fish and their Journey Home
“Salmon move north using magnetic clues” Dr. Eggers testimony to BOF 2004
© 2007 Europa Technologies
Image © 2007 NASA
Image © 2007 TerraMetrics
©2007 Google™

Don Rogers' depiction of Late Winter and Spring Migrations of Maturing Sockeye Salmon

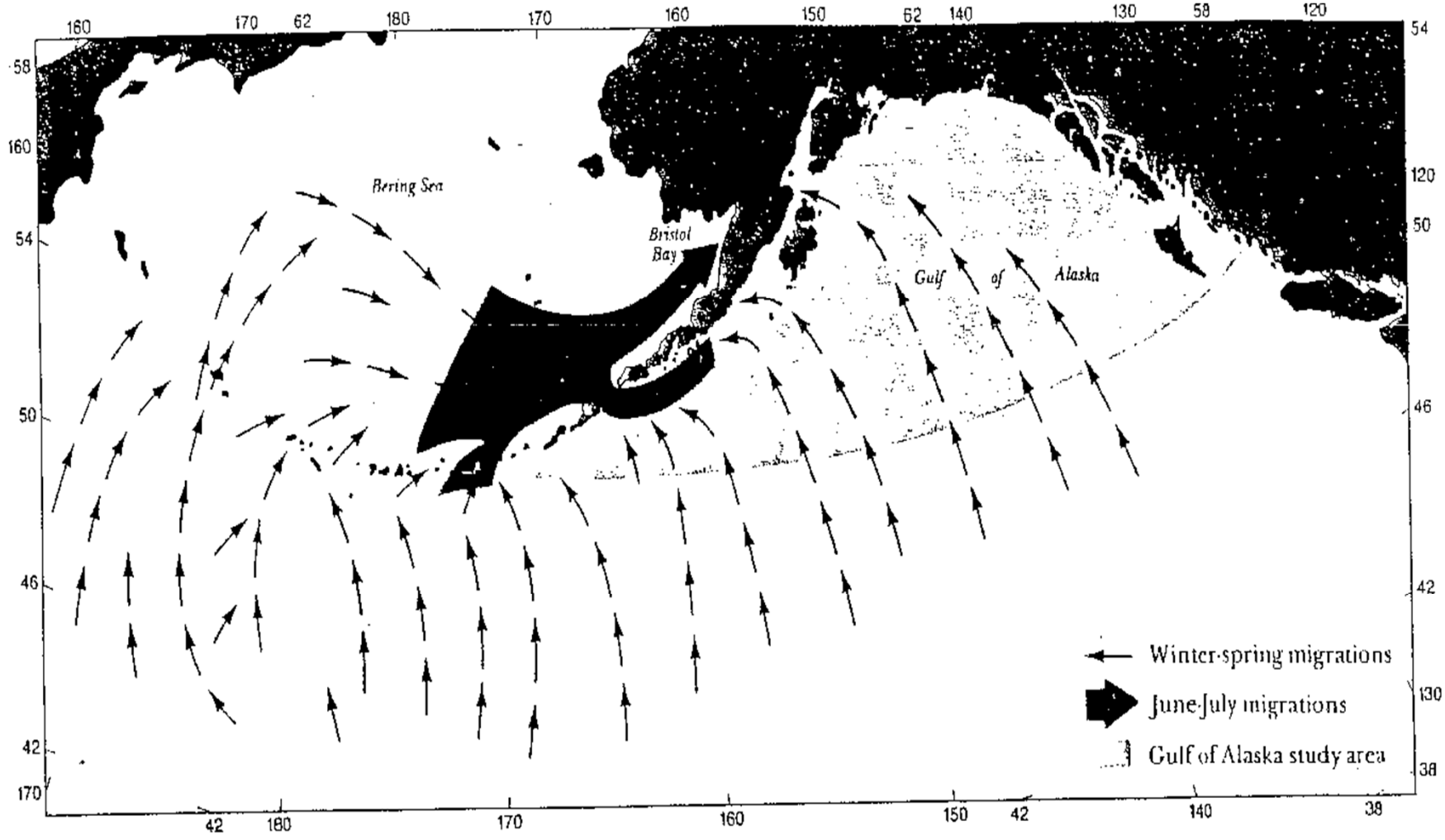
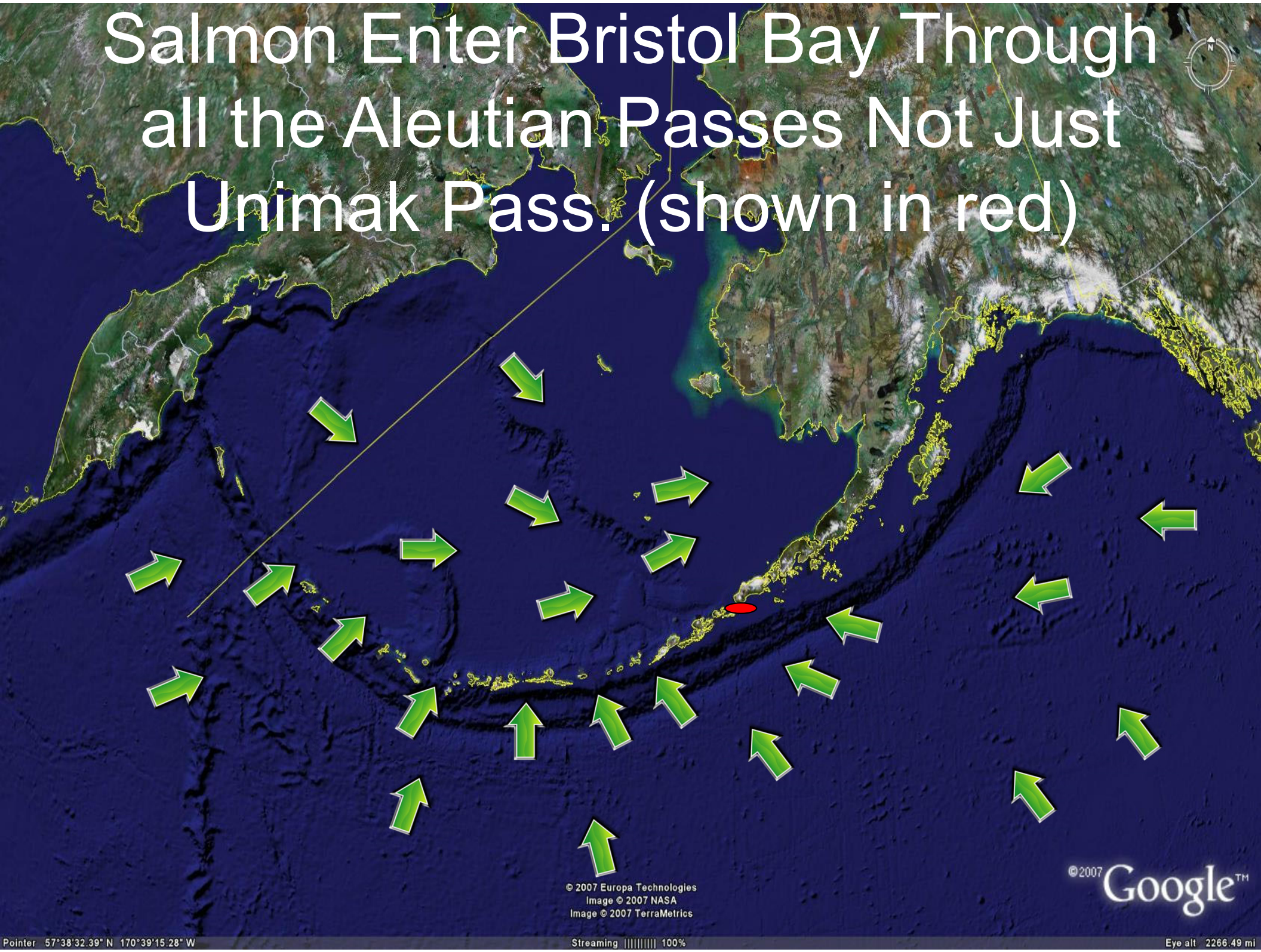
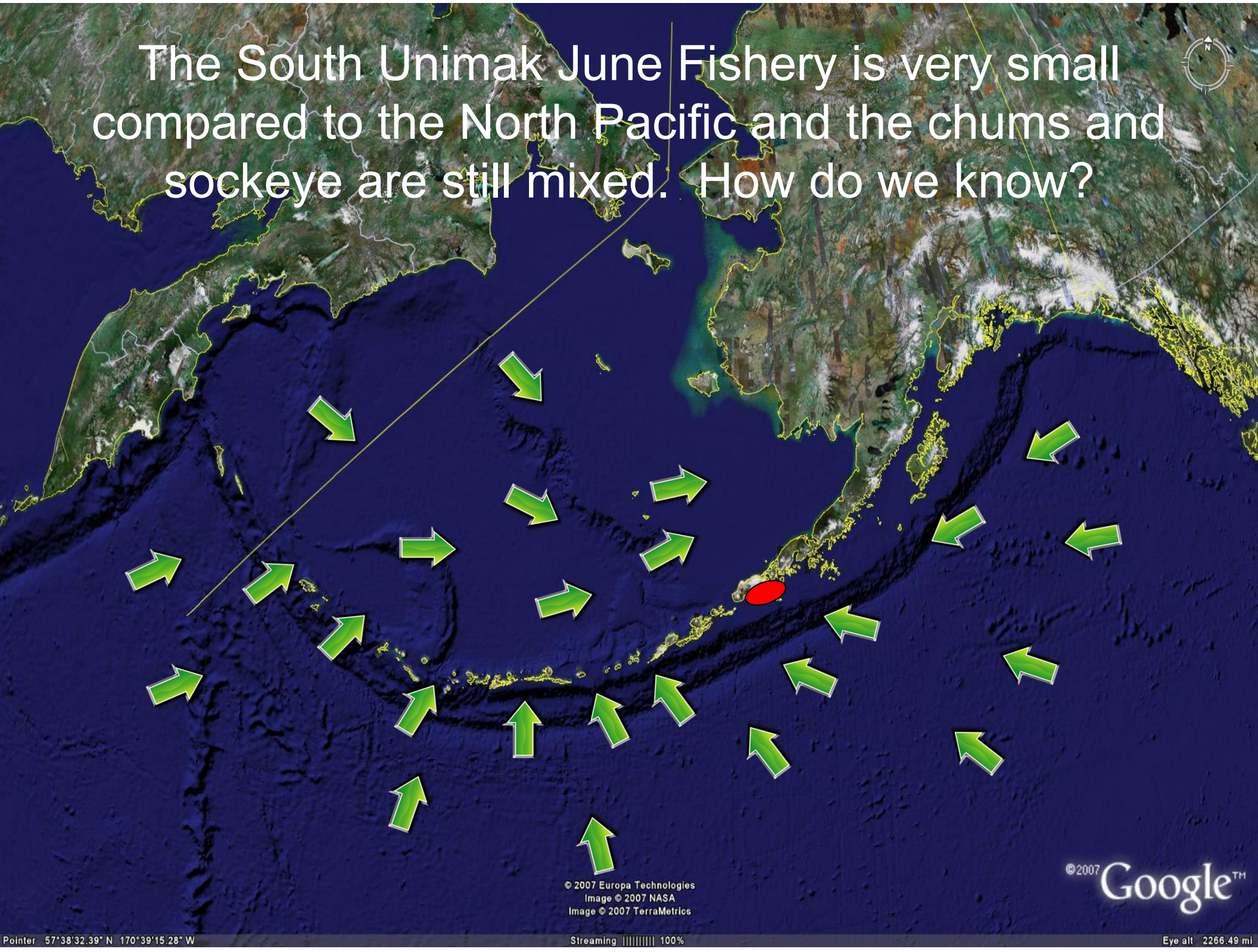


Figure 15–1. Principal migratory routes to Bristol Bay followed by maturing salmon.

Salmon Enter Bristol Bay Through all the Aleutian Passes Not Just Unimak Pass. (shown in red)



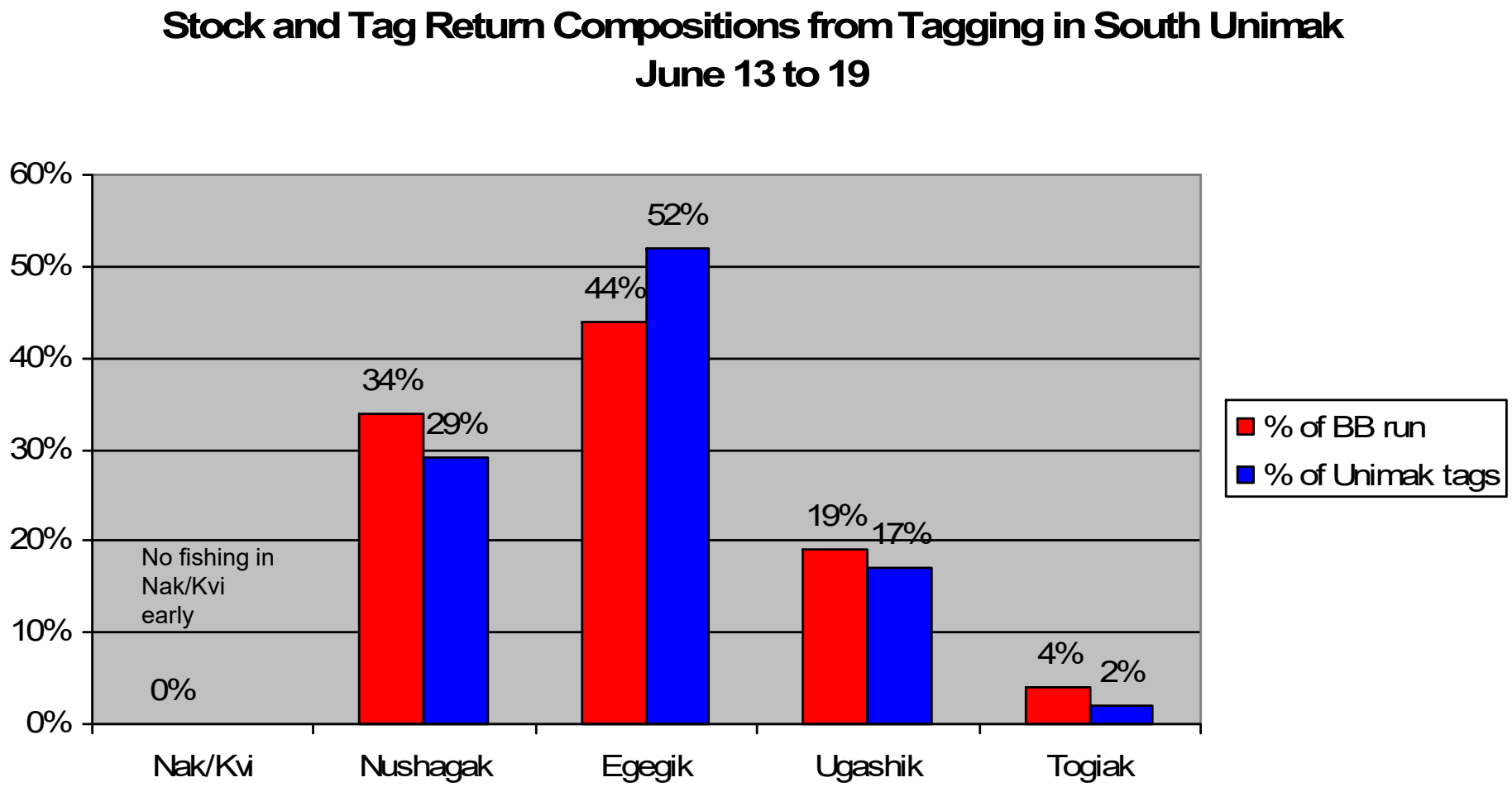

The South Unimak June Fishery is very small compared to the North Pacific and the chums and sockeye are still mixed. How do we know?
© 2007 Europa Technologies
Image © 2007 NASA
Image © 2007 TerraMetrics
©2007 Google™
Pointer 57°38'32.39" N 170°39'15.28" W
Streaming 100%
Eye alt 2266.49 mi

The Late Dr. Don Rogers proved it.

- He looked at tags put on early and late in the South Unimak fishery.
- He compared tag returns to the total Bristol Bay run
- He was looking to see if Ugashik and Togiak runs were present in greater abundance later in the June Fishery which would correspond to their later timing in Bristol Bay.

This is what he found. The relative abundance of each Bristol Bay stock in the June Fishery is in close proportion to the relative abundance of each stock in the Bristol Bay run.

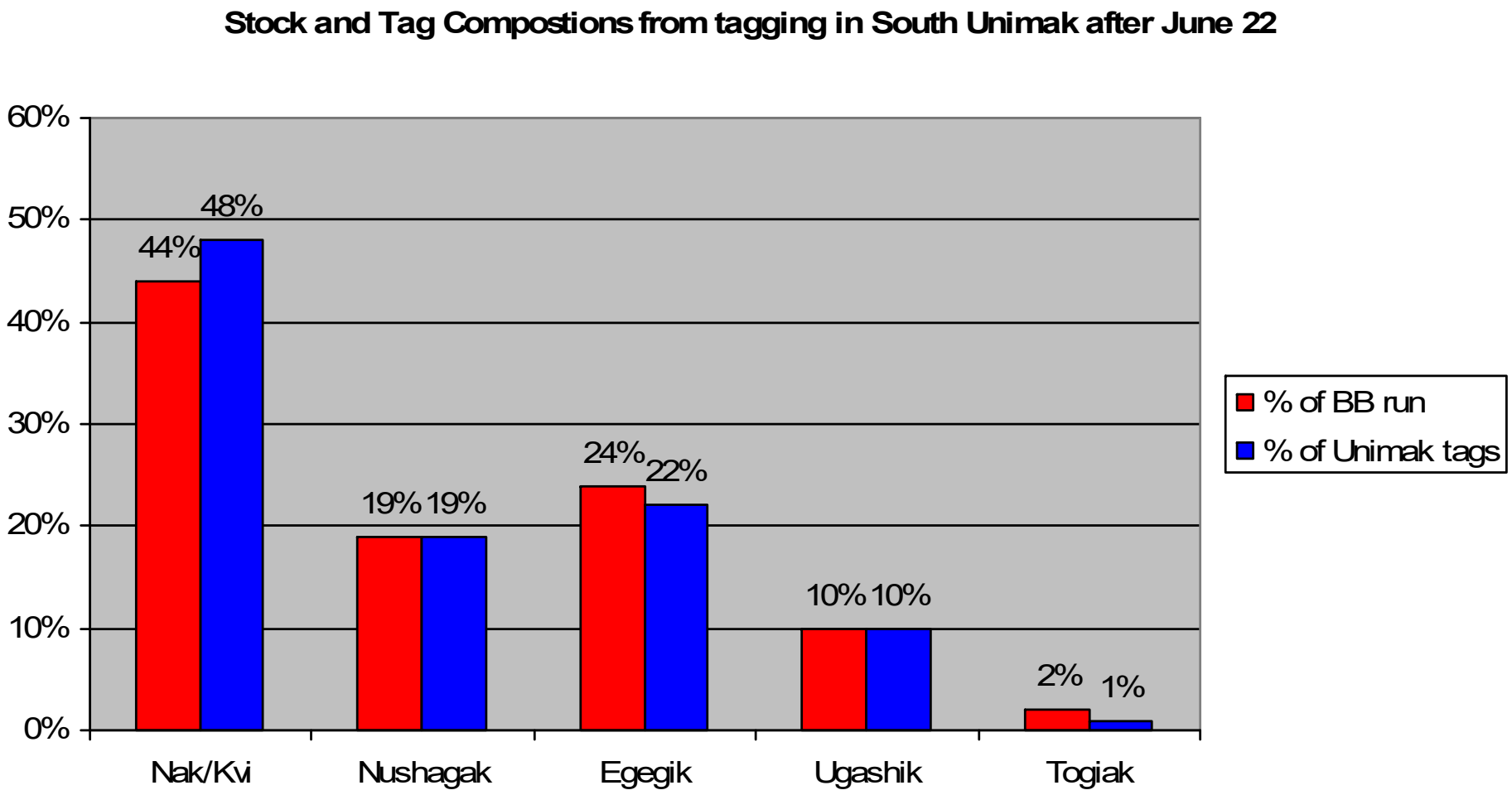
Early tagging



Here are the results of early tagging in South Unimak. The red bar represents the relative abundance of each stock in the Bristol Bay run. The blue bar represents sockeye tagged in Unimak that were recaptured in the district listed on the X-axis. There was no fishing in the Naknek-Kvichak district, which mean there were no chance to recover tags.

Furthermore, it doesn't change over time.

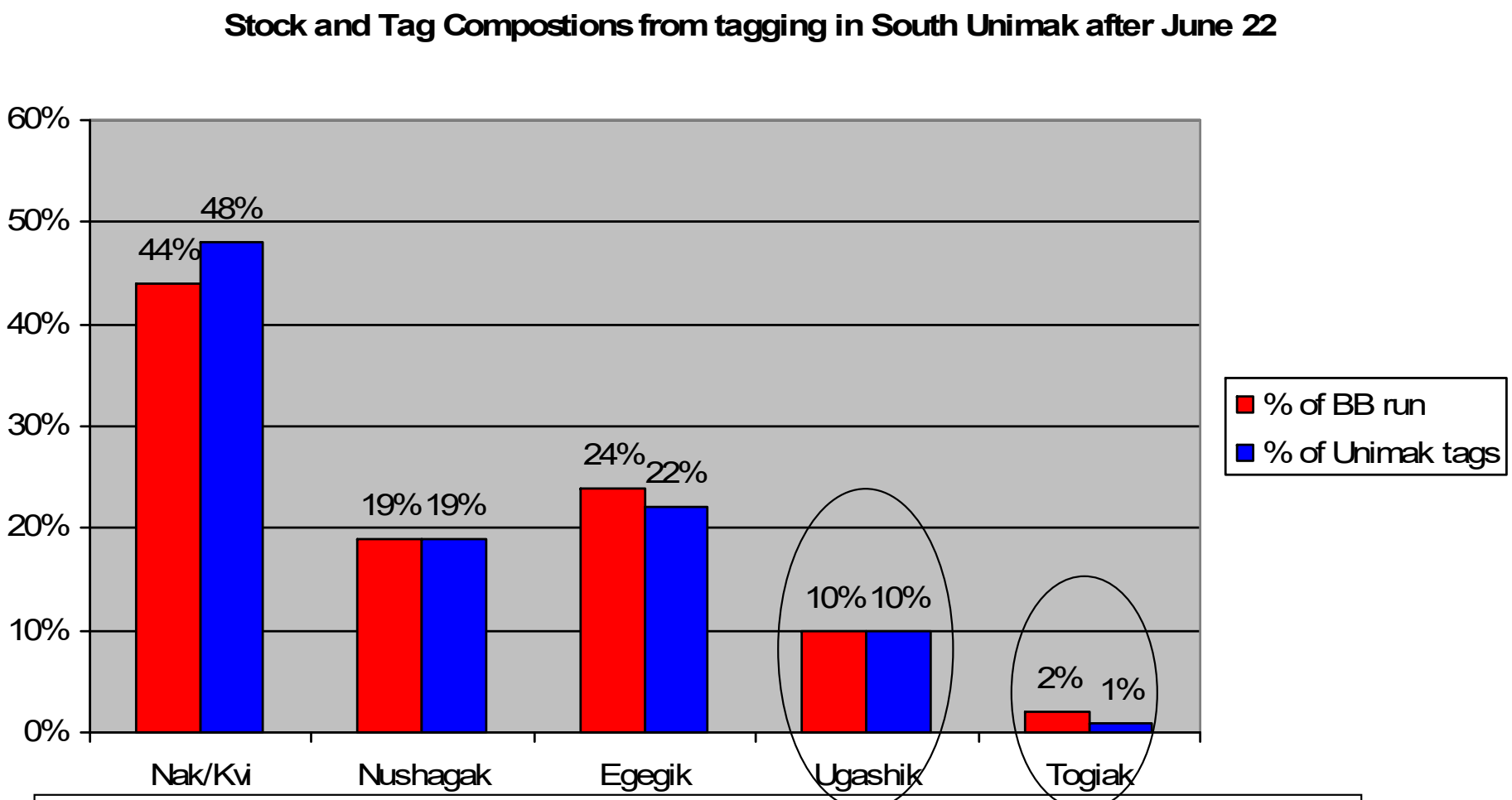
Late Tagging



Here are the results of late tagging in South Unimak. The red bar represents the relative abundance of each stock in the Bristol Bay run. The blue bar represents sockeye tagged in Unimak that were recaptured in the district listed on the x axis.

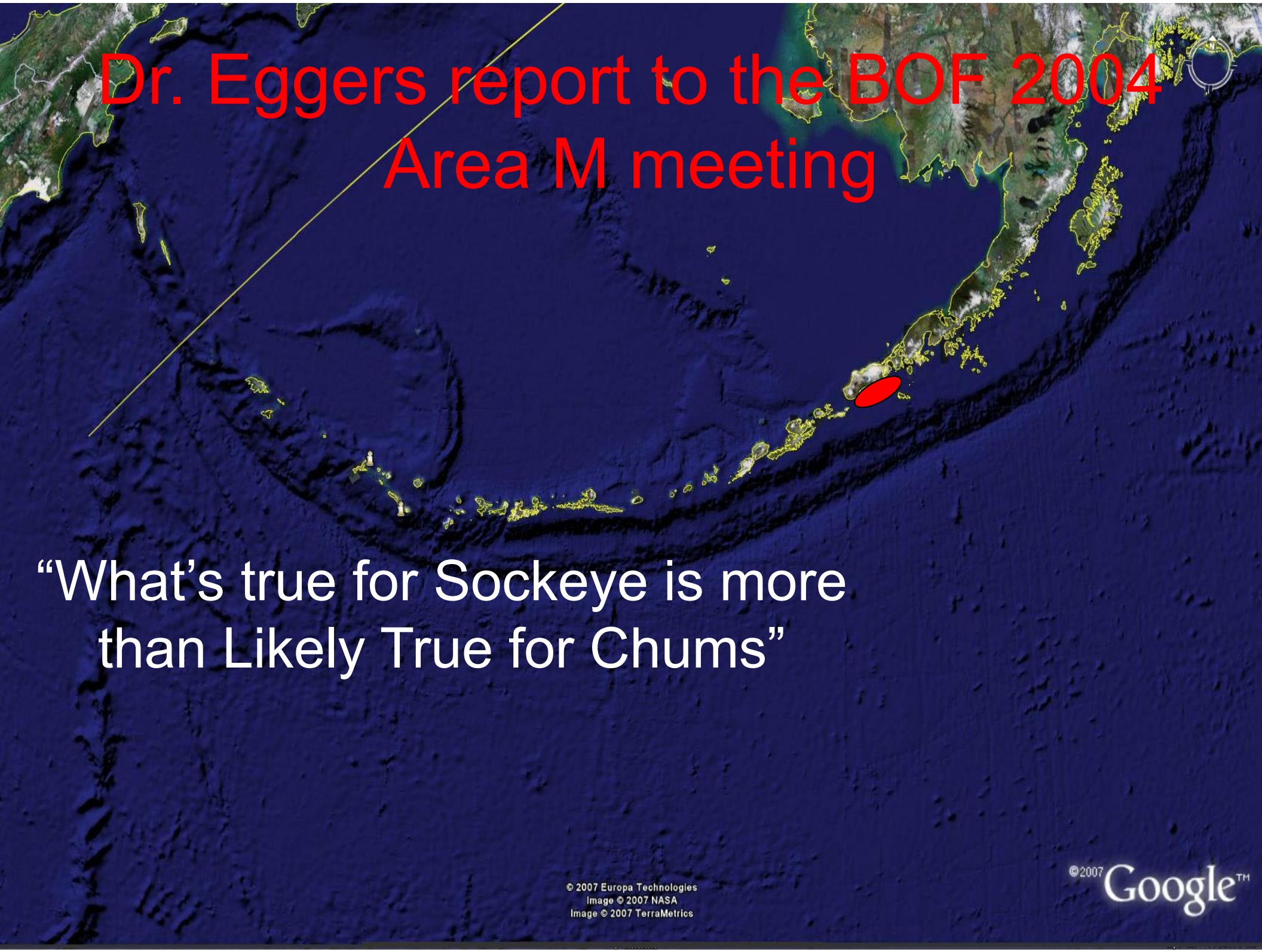
Even though the Ugashik and Togiak fisheries peak later, their relative abundance stays the same in South Unimak throughout June. In other words, fish are well mixed in the ocean and in the June Fishery.

Late Tagging



You can see if the fish were not mixed you expect to see a greater number of Ugashik and Togiak stocks late in June due to run timing, which is not the case.

Dr. Eggers report to the BOF 2004 Area M meeting



"What's true for Sockeye is more than Likely True for Chums"


That is, Fish Caught in the South Unimak June Fishery are in close proportion to their abundance throughout Western Alaska and Asia. Consequently, the fishery does not have the ability to select out one particular stock.
© 2007 Europa Technologies
Image © 2007 NASA
Image © 2007 TerraMetrics
©2007 Google™


Let's Review What We Know
• The Ocean is Large
• The South Unimak June Fishery takes place in a very small part of it
• The Fish are Mixed
© 2007 Europa Technologies
Image © 2007 NASA
Image © 2007 TerraMetrics
©2007 Google™
Pointer 57°38'32.39" N 170°39'15.28" W
Streaming 100%
Eye alt 3824.46 mi