

‘Whale wave’:  
Results of decade of surveys by Gitga’at and NCCS

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July 16, 2016

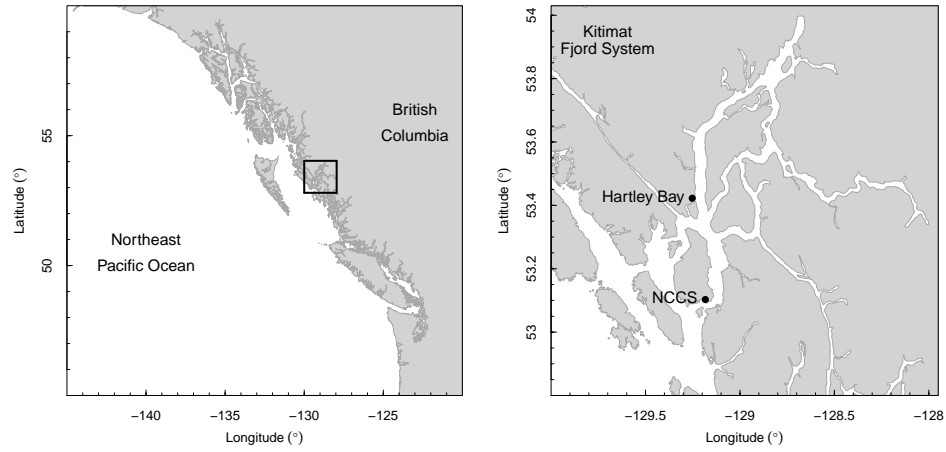


Figure 1: Study area. Kitimat Fjord System, within the Gitga'at First Nation in British Columbia, Canada.

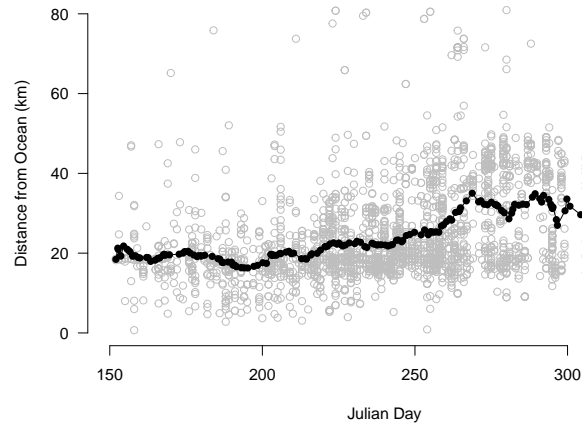


Figure 2: The swimming distance to the ocean of humpback groups seen within the Kitimat Fjord System generally increases as summer turns to fall. Running 10-day mean with raw data underneath. Sightings ( $n=2,527$ ) are from Gitga'at and NCCS surveys 2004-2014.

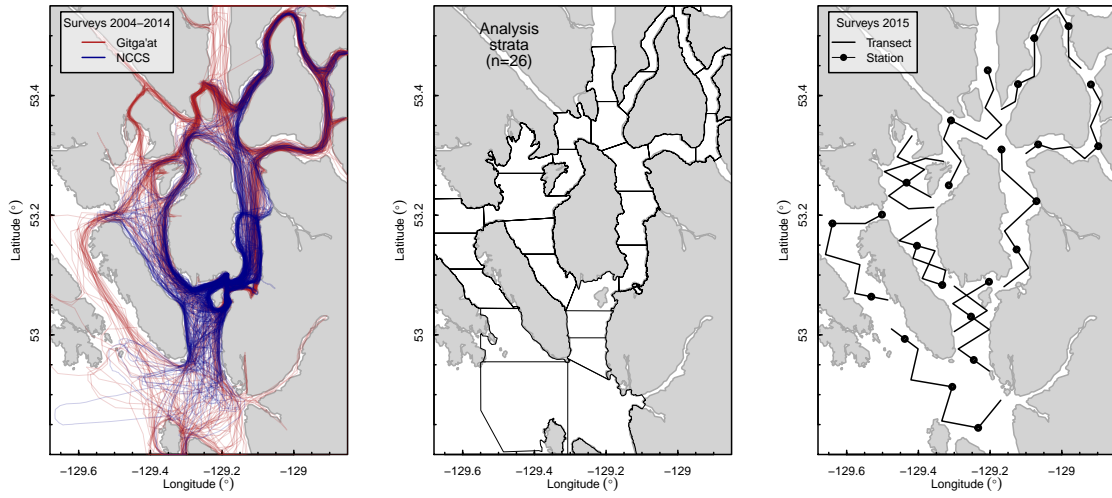


Figure 3: *Left:* Survey effort by Gitga'at (red) and NCCS (blue), 2005 -2014. *Center:* To analyze these surveys for spatial pattern in humpback distribution, we stratified the study area into 26 blocks. *Right:* Sampling plan for 2015 field campaign of concurrent visual and oceanographic surveys aboard *RV Ban-garang*.

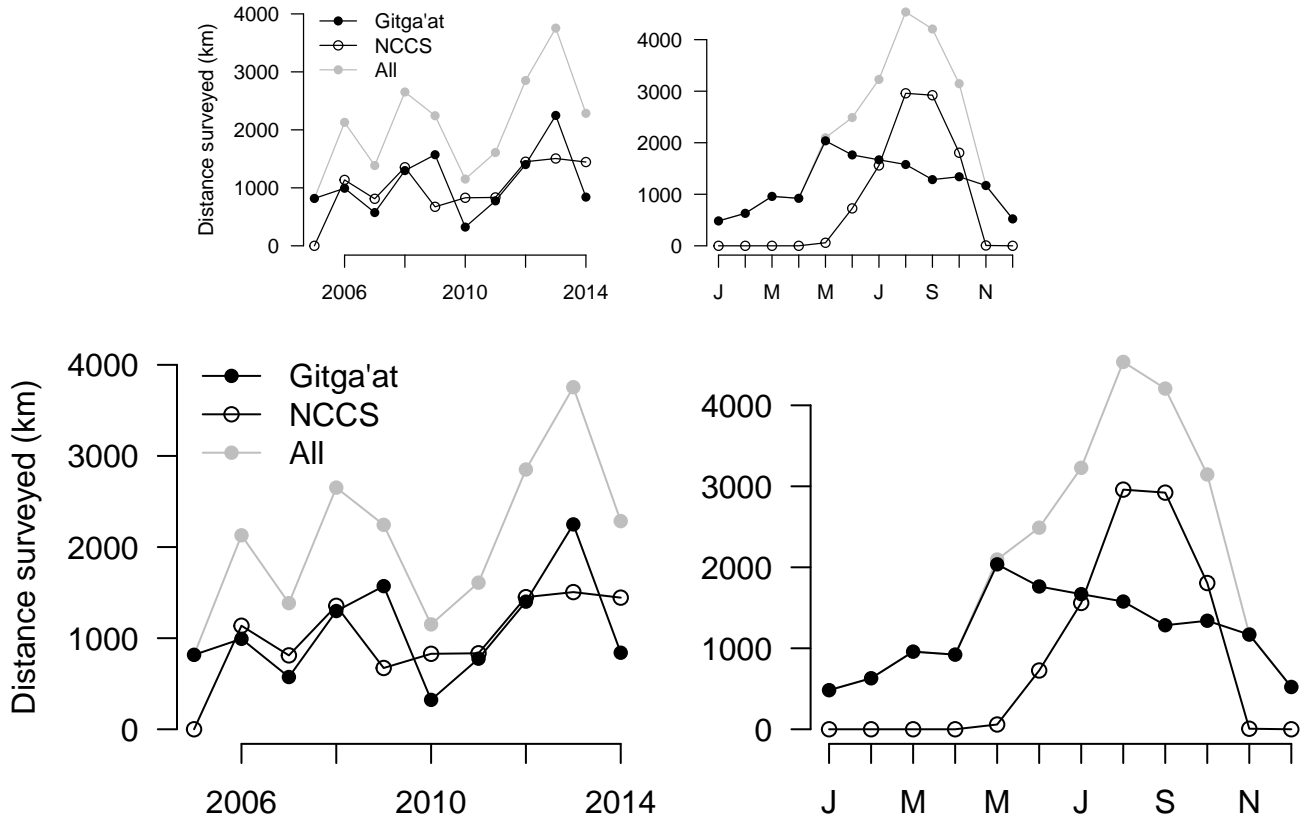


Figure 4: Survey effort (km) by Gitga'at and NCCS platforms, 2004-2014. Left: Annual survey effort (June through November only). Right: Monthly survey effort (all months).

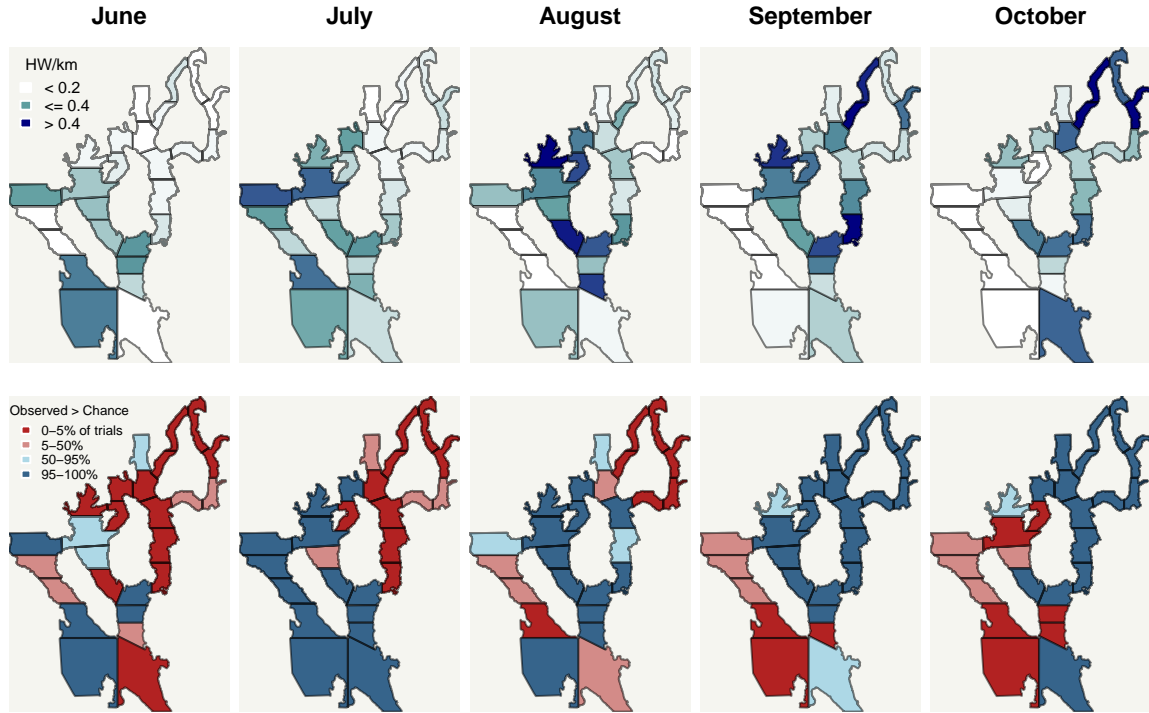


Figure 5: Top: A humpback wave propagates inland with the seasons. Spatially stratified humpback abundance in 8 geographic channels, based on density calculations from 10 years of Gitga'at surveys. White = 0 HWs/km of trackline. Navy blue = 65 or more HWs within the channel. Bottom: Results of randomization significance test for June - November. Channels are color-graded as follows: Dark red = Observed density was lower than at least 95% of the random trials. Pink = Observed density was lower than the median of the randomizations. Light blue = Observed density was higher than the randomization median. Dark blue = Observed density was higher than 95% of the random trials.

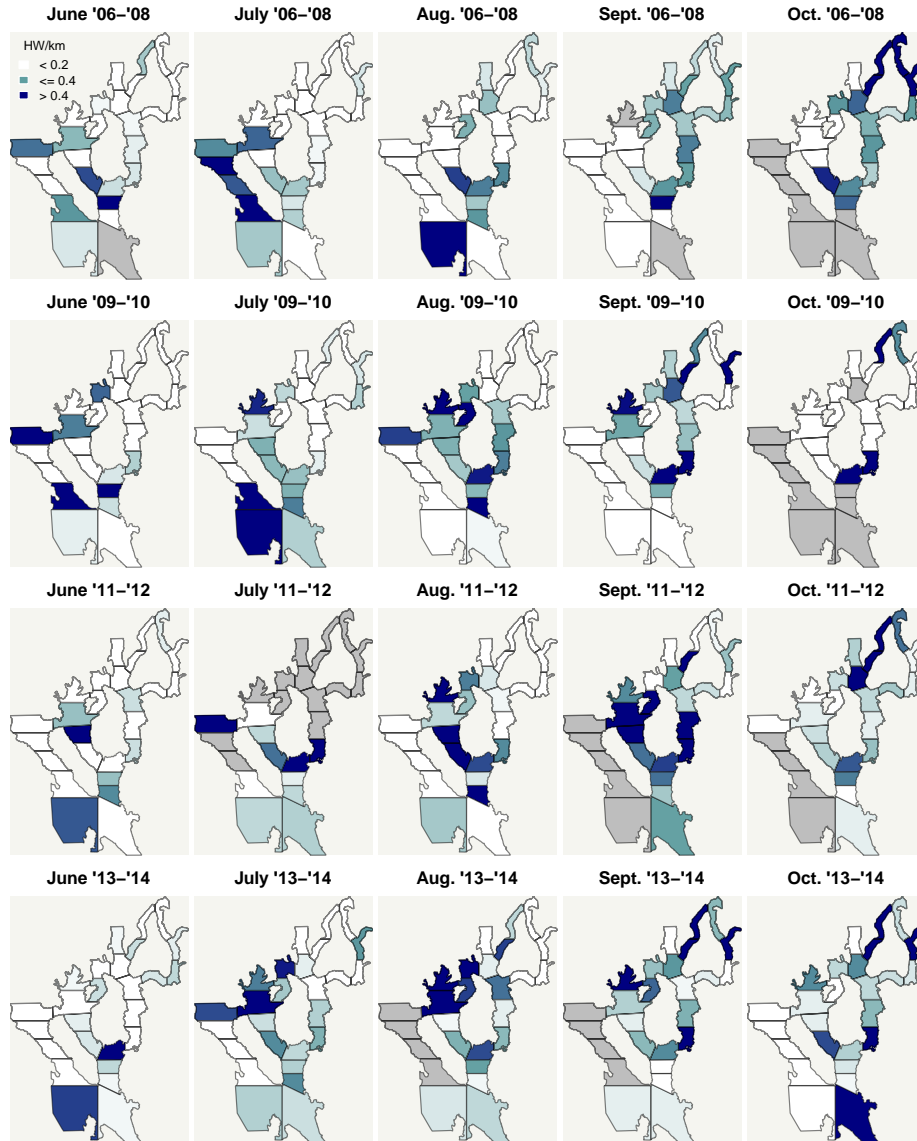


Figure 6: Annual persistence of the humpback wave. Each row represents 2-3 years of data between 2006 and 2014, same interpretation as Fig. 5, top.