

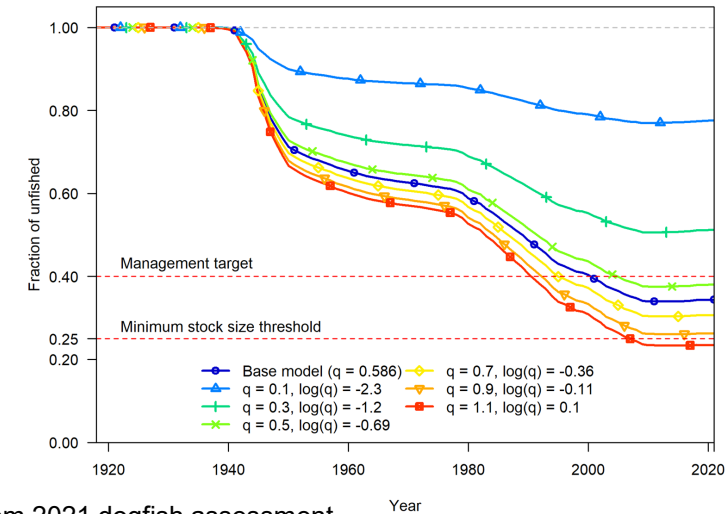
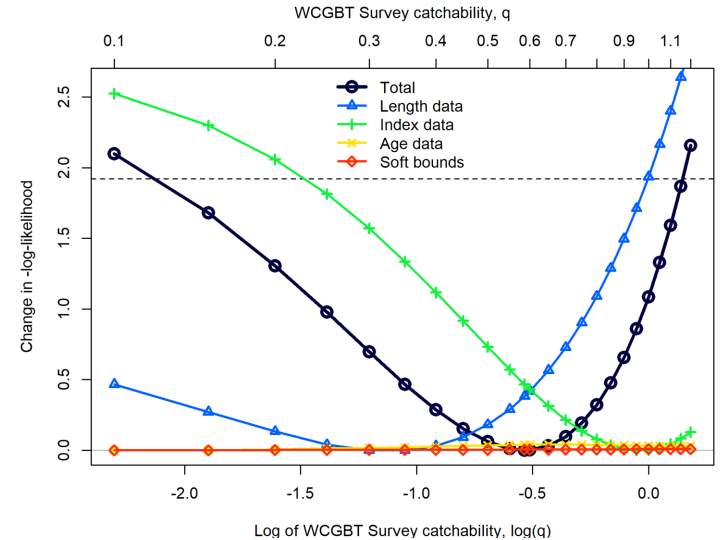
# Additional NWFSC analyses for spiny dogfish

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(presented by Ian and John)

29 September 2021  
Groundfish Subcommittee of the SSC

# Background (1 of 3)

- Data available for 2021 spiny dogfish stock assessment had relatively little information about scale of the population
- Point estimate of catchability ( $q$ ) for West Coast Groundfish Bottom Trawl Survey (WCGBTS) was 0.586
- Factors that influence  $q$  include latitudinal, vertical, and depth availability and species behavior in response to the trawl gear
- Estimate of  $q$  in the model appeared reasonable and information available to inform a prior was limited so no informative prior was developed for the assessment.



from 2021 dogfish assessment

# Background (2 of 3)

- Questions were raised after the review about the possible effect of seasonal migrations on survey catchability

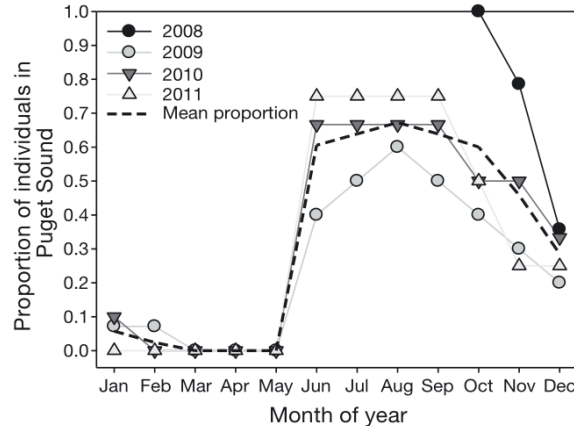


Fig. 5. *Squalus suckleyi*. Proportion of tagged spiny dogfish detected in Puget Sound from 2008 to 2011

from Andrews and Harvey (2013)

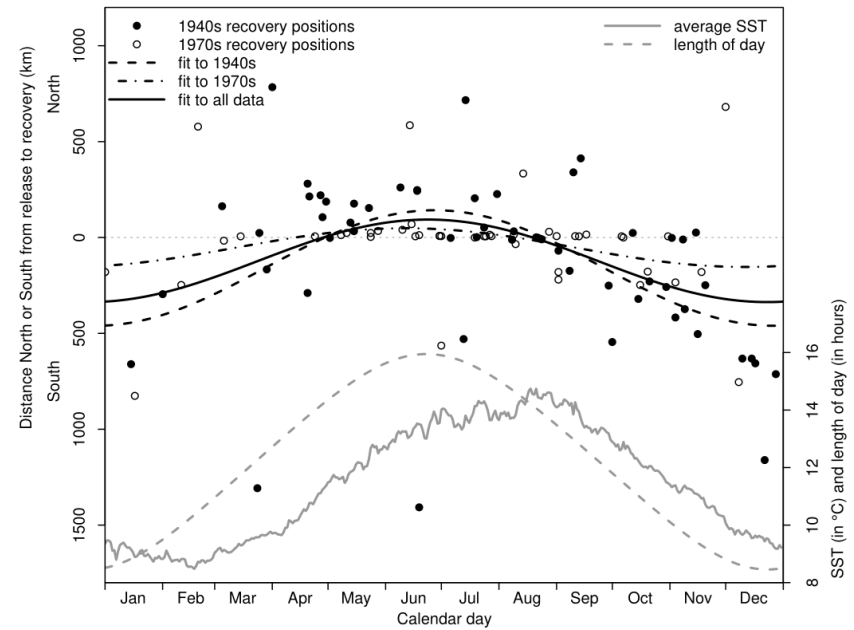


Figure 3.7: Distance north or south from release to recovery for dogfish tagged and recaptured in outside waters, with best fit sinusoids for each tagging study, and the combined data from both studies. The solid gray line gives the average daily sea surface temperature from 1989 to 2005 at the Cape Elizabeth buoy, 45 nm northwest of Aberdeen, WA. The dashed gray line is the length of day from sunrise to sunset at that same location. Parameter estimates are provided in Table 3.2.

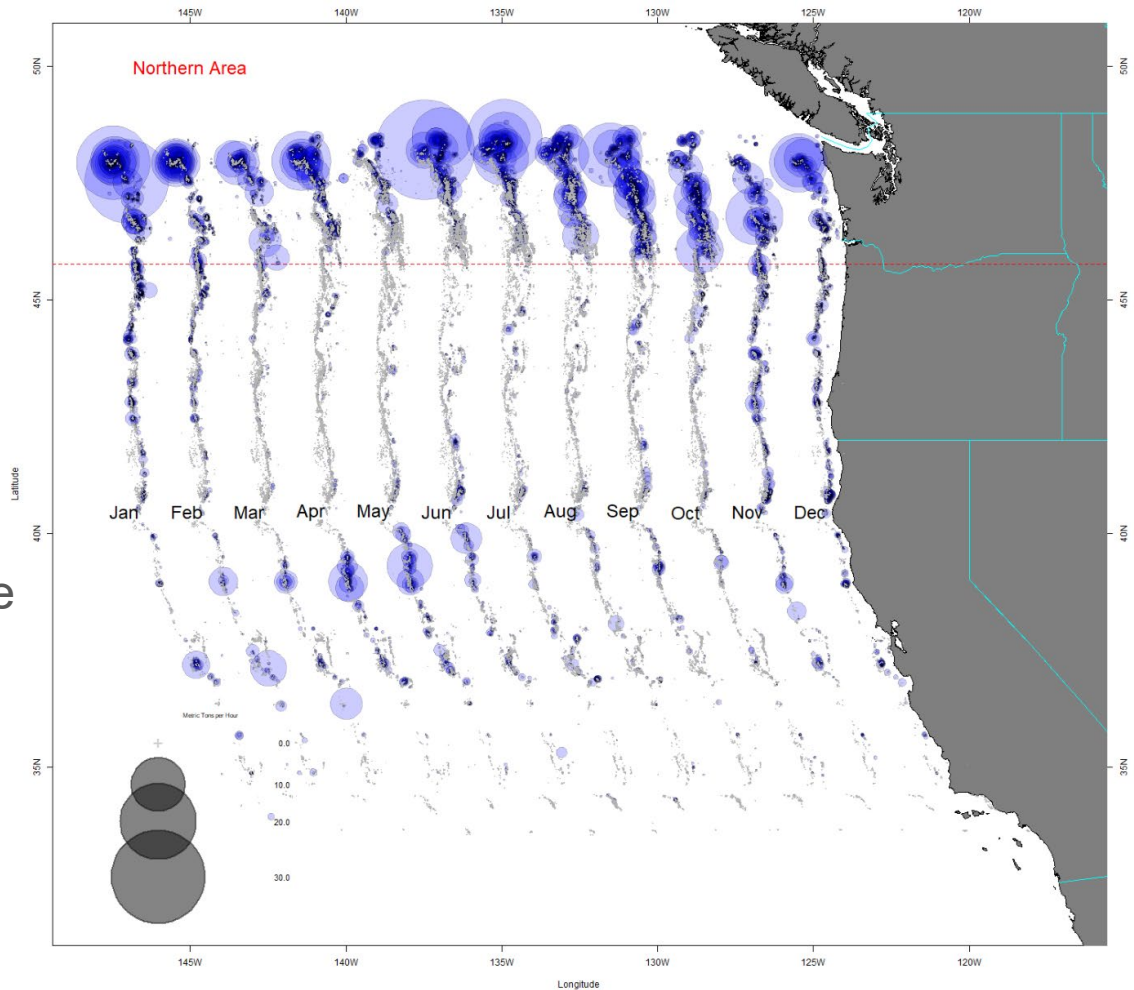
from Taylor (2008) dissertation

## Background (3 of 3)

- An analysis of the seasonality of bycatch rates of spiny dogfish in commercial fisheries was requested by the SSC groundfish subcommittee
- Time was short and NWFSC staff had limited availability

# Big picture conclusions

- All data sources are noisy across space and time
- Bottom trawl fishery is the best source of monthly observations (at-sea hake fishery is too patchy in space and time)
- Seasonal differences in distribution are apparent
- No definitive evidence that  $q = 0.586$  is too high

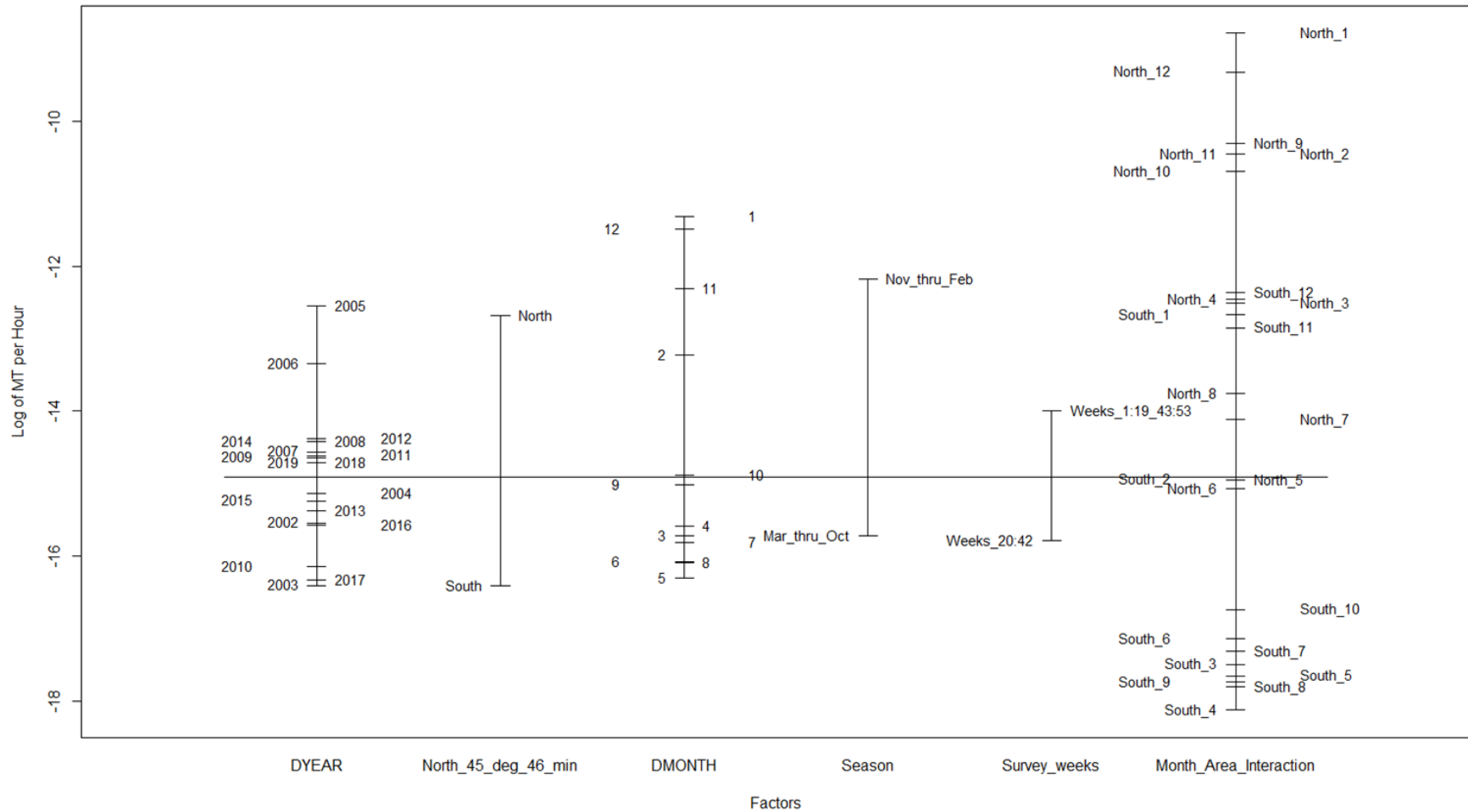


**Figure 1.** Map of catch rates for bottom trawl fishery hauls (as observed by WCGOP) by month (2002-2019 combined).

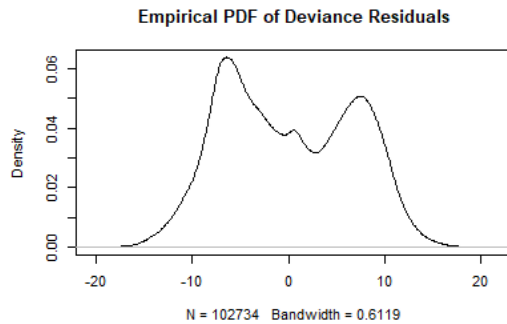
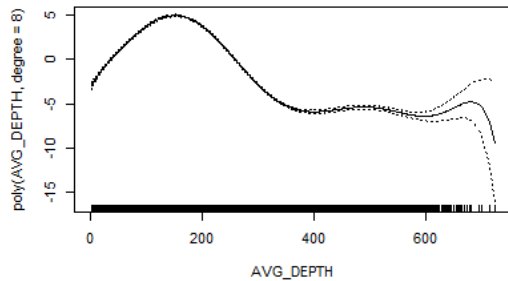
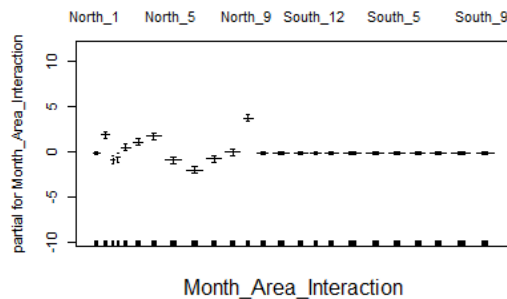
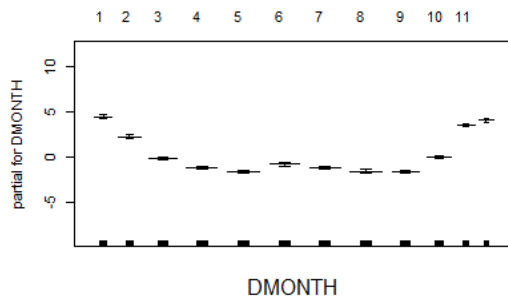
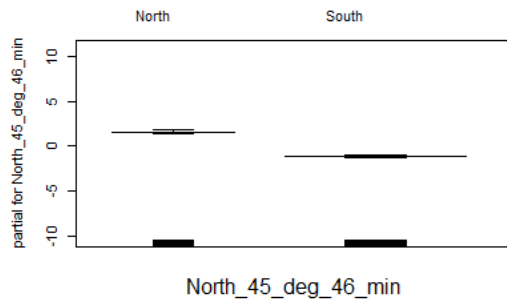
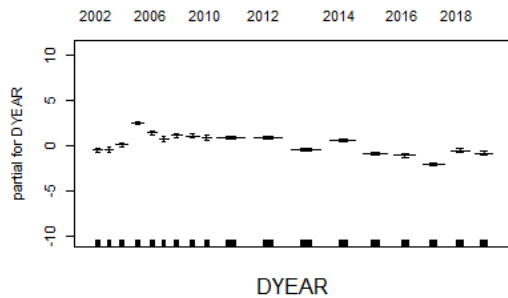
# Unanswered questions

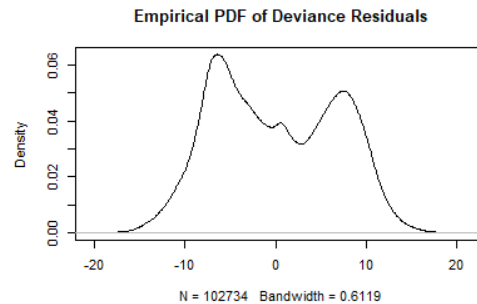
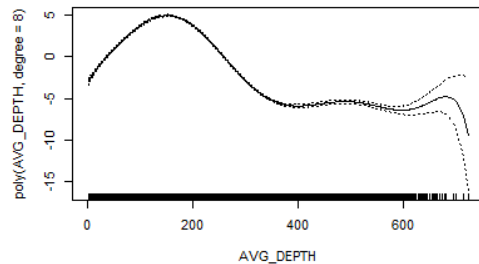
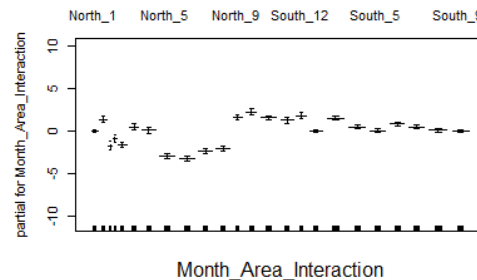
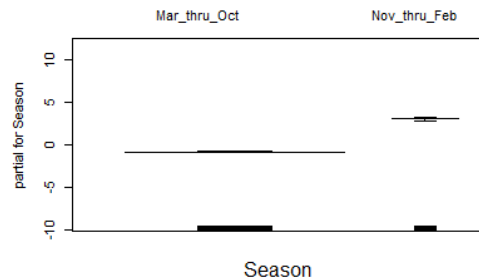
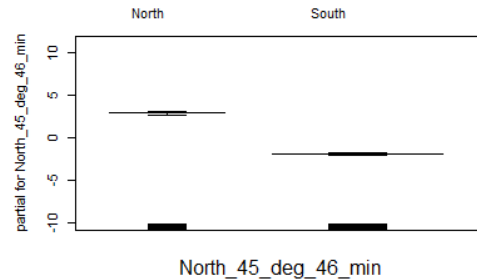
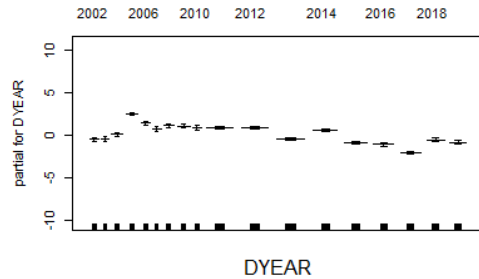
- How do you define the stock in the context of seasonal migrations?
- Are there long-term shifts in distribution?
- What fraction of the dogfish population at a given location is within the depth range of the bottom trawl net?
- How do you appropriately translate information about seasonal migrations into catchability?
- Many more...

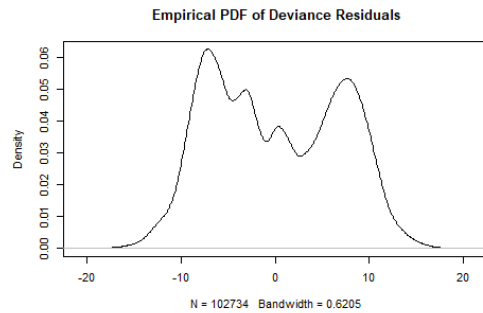
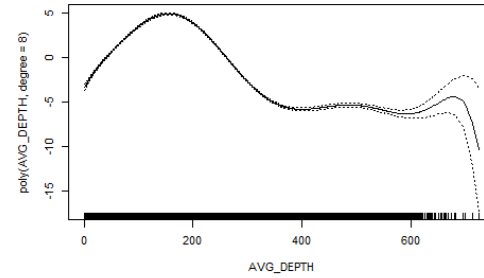
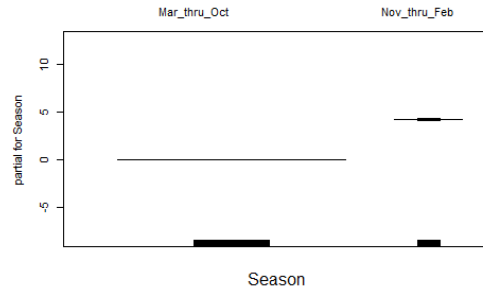
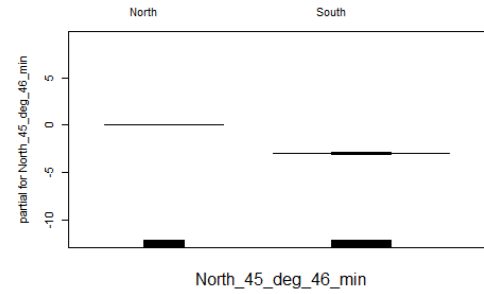
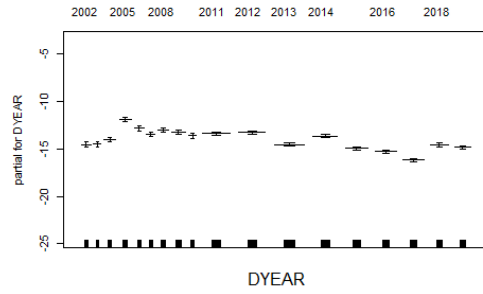
Details on GLM analysis by John Wallace

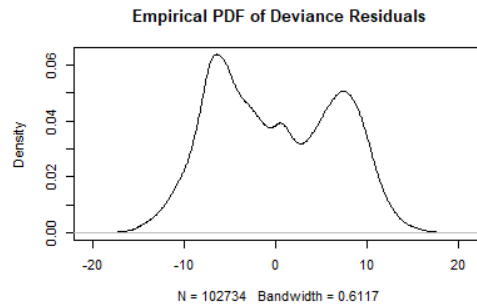
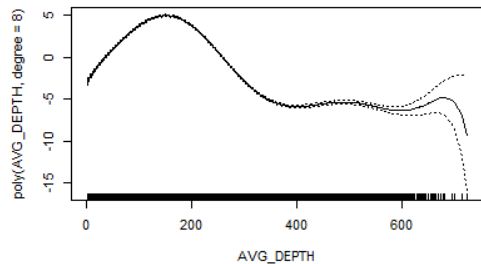
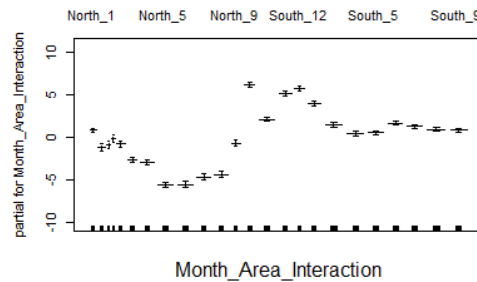
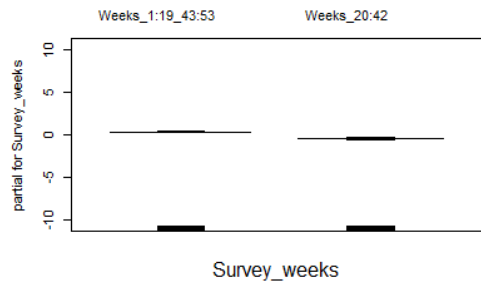
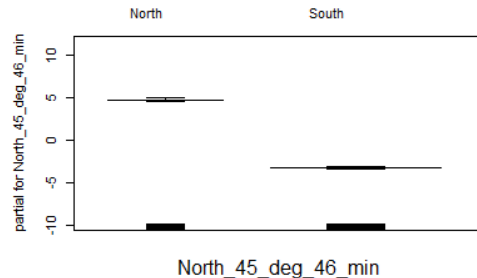
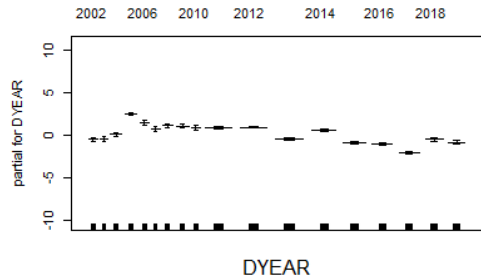


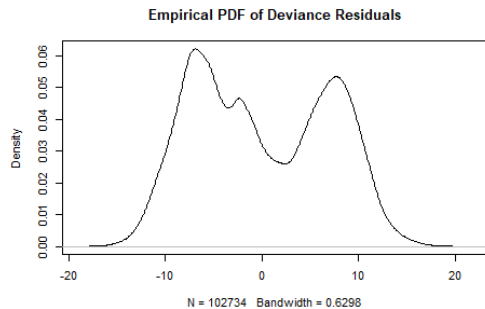
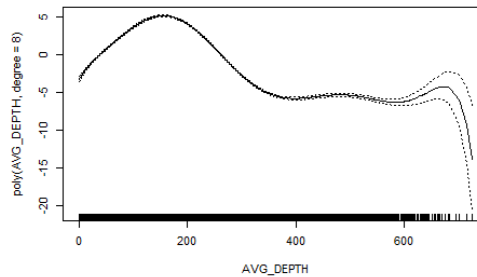
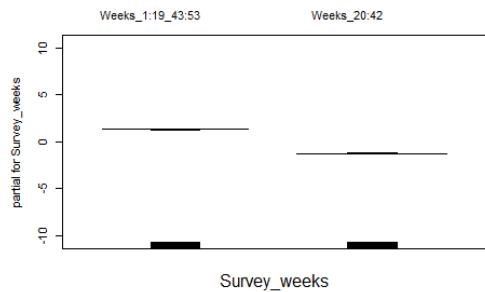
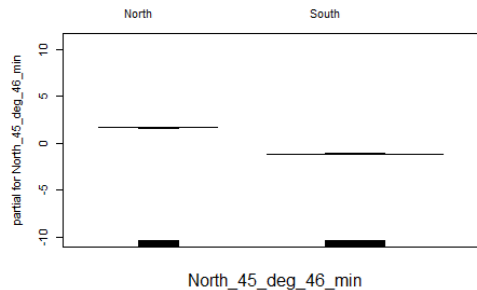
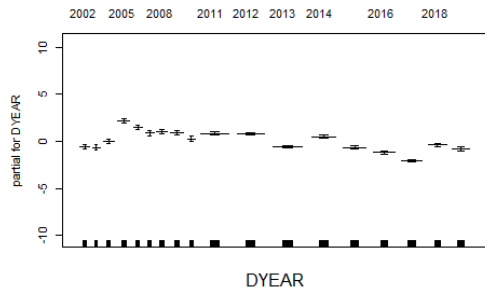


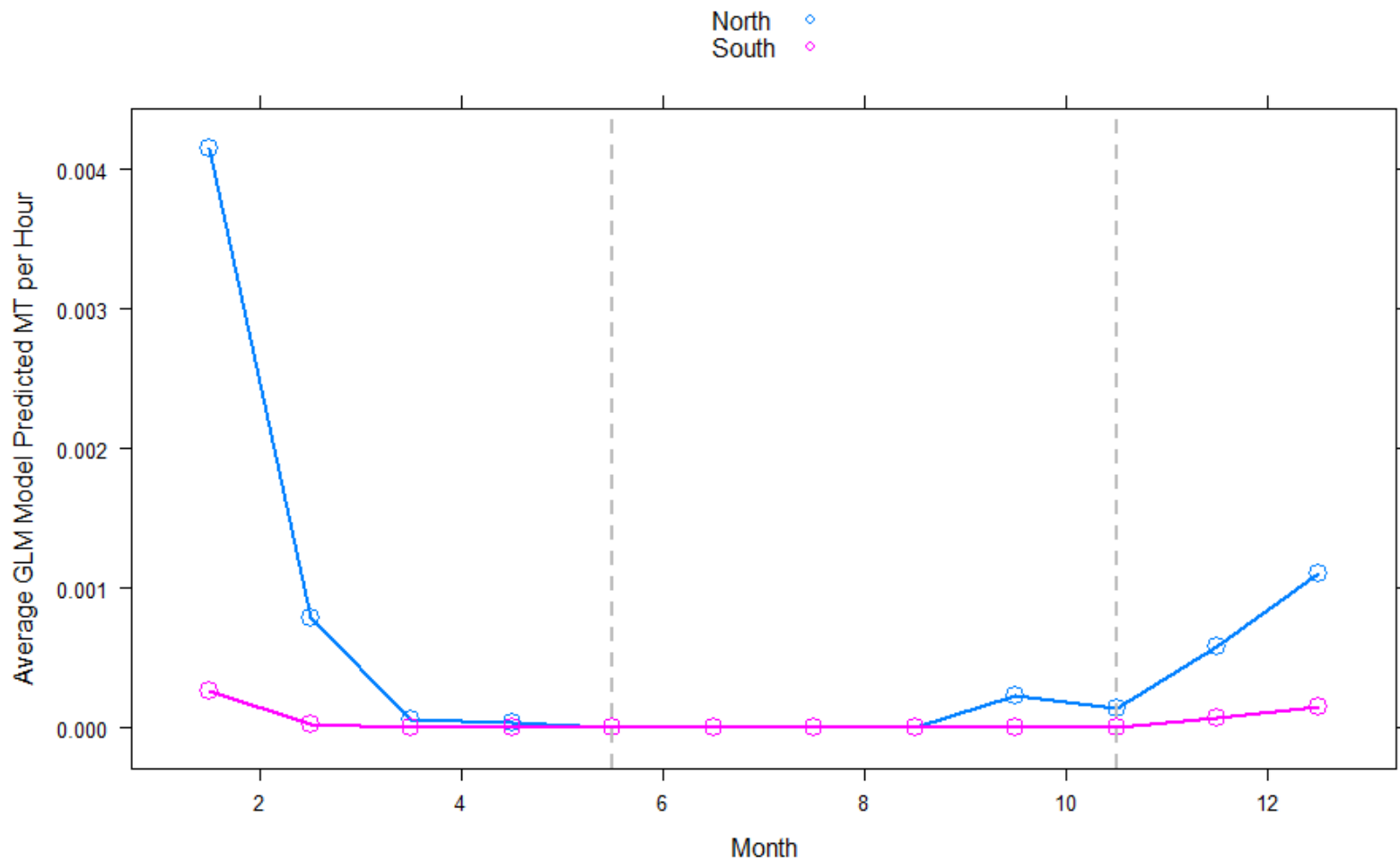










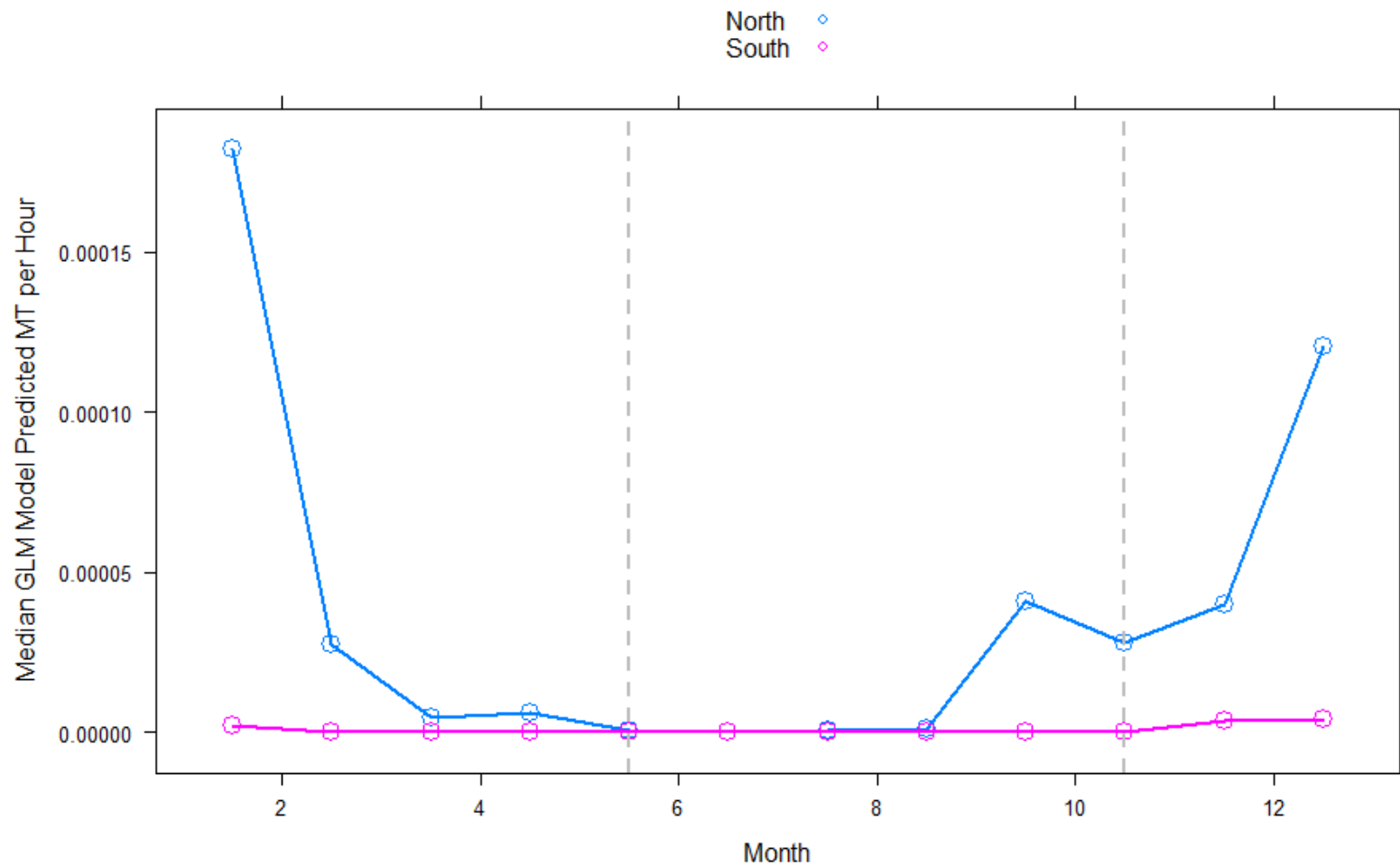


Mean:

MT per Hour

North\_45\_deg\_46\_min

	Month	Raw_North	Raw_South	Fit_North	Fit_South
1	1.5	0.077993565	0.011777200	0.004145919	0.000259563
2	2.5	0.037747291	0.007000963	0.000791175	0.000024084
3	3.5	0.016041436	0.003118245	0.000060512	0.000001158
4	4.5	0.019526604	0.004957710	0.000039246	0.000000488
5	5.5	0.005493727	0.005708150	0.000003004	0.000000394
6	6.5	0.021362622	0.004426221	0.000002079	0.000000786
7	7.5	0.025935607	0.003010843	0.000005716	0.000000546
8	8.5	0.022905526	0.001694887	0.000007479	0.000000387
9	9.5	0.044826303	0.002713054	0.000229286	0.000000403
10	10.5	0.037913327	0.002651895	0.000145358	0.000001188
11	11.5	0.041173531	0.011794299	0.000578041	0.000068222
12	12.5	0.043057212	0.010711471	0.001106990	0.000152321





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