





Factors influencing King Eider winter movements in the Bering Sea

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- Sea-ducks winter at sea
- forage on benthic prey by diving to sea bed
- winter in areas that become ice covered



• 'home range' used in winter generally small:



Harlequin Duck (ind) ~ 12 km² (Iverson and Esler 2006)



Common Eider (ind) ~ 50 km² (Merkel et al. 2007)



Spectacled Eider (pop) ~ 2,900 km² (Petersen and Douglas 2004)

• King Eider winter 'movement range' > 12,000 km²



Background – King Eiders





Why do King Eiders leave wintering sites?

What factors affect the decision of individual King Eiders to move away from a wintering site in the Bering Sea?



- PTT implanted on breeding grounds in June
- 94 King Eiders tracked throughout winter
- winter movement defined as > 50 km





Sea ice difference at departure location



Sea Ice difference: Sea ice conc. time=b – Sea ice conc. time=a = 90% - 60% = **30%**



Methods – food availability

Modeled benthic biomass in Bering Sea (g/m²)

Predictor variables:

Sea Surface Temperature Sea ice coverage Depth





- 240 random points of stationary birds
- for each location data for 8 variables
 - sex
- logistic regression with ID as fixed effect
 - latitude
 - day length
- AIC model selection



Model	AIC	ω,
Sea ice dif (-), day length (+), sea ice bef*dif (-), sea ice dif*lat (+), sea ice dif *day length (-)	0.0	0.27
Sea ice dif (-), day length (+), sea ice bef*dif (-), sea ice dif*lat (+), sea ice dif *day length (-), benthic biomass (+)	1.13	0.13
Sea ice dif (-), day length (+), sea ice bef*dif (-), sea ice dif*lat (+), sea ice dif *day length (-), benthic biomass (+), body size (-)	1.27	0.12



- day length (+), sea ice difference (-)
- sea ice interactions
- models without 'ID' performed poorly



- large individual variation in response
- movements not when conditions deteriorate
- movements may be of exploratory nature



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Questions?



