Climate Change Workshop 21 April 2009

Potential effects of climate change on eiders in Alaska

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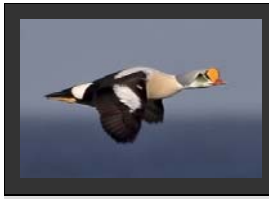
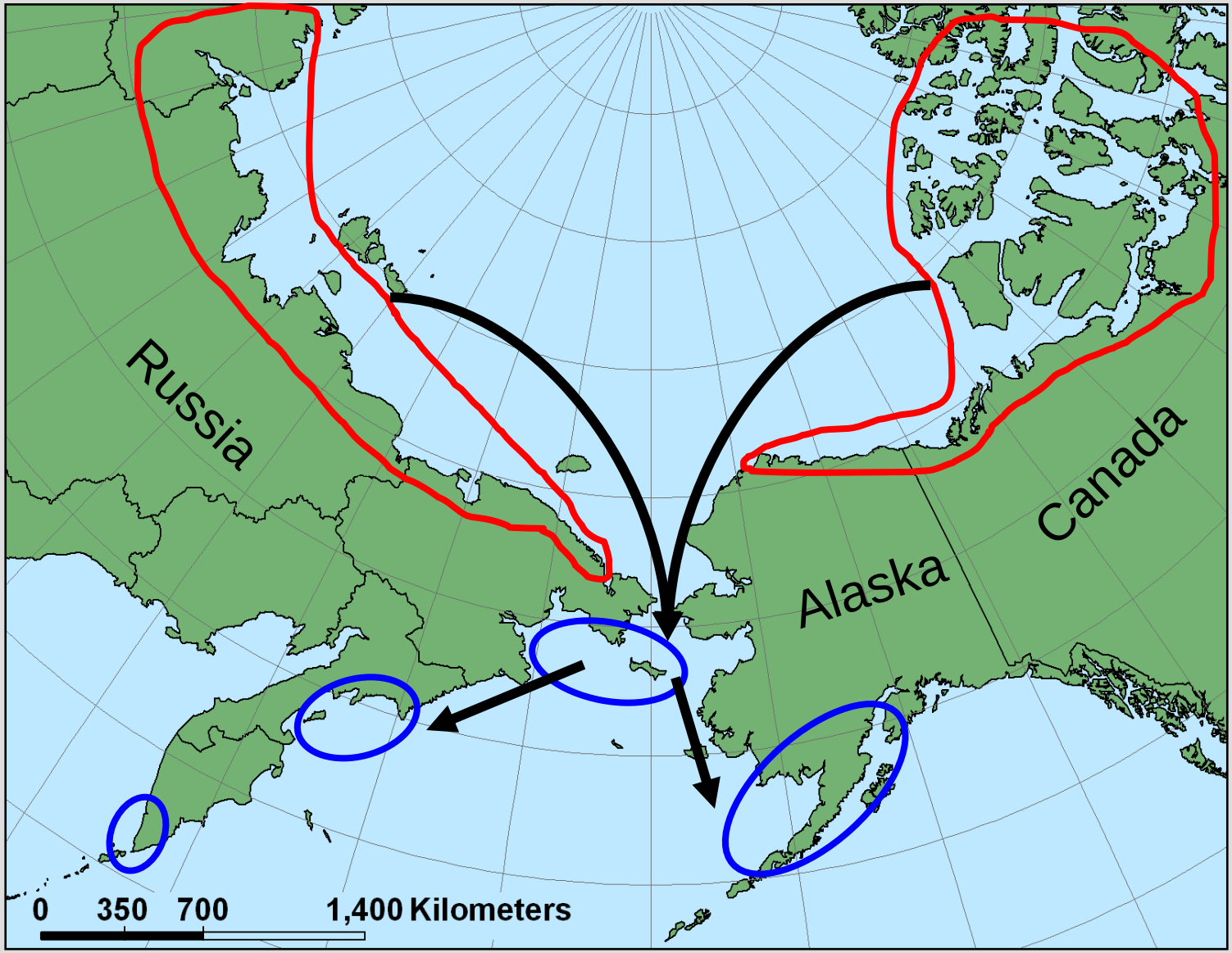
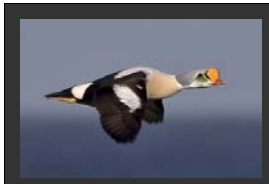


Eider distribution in the western Arctic

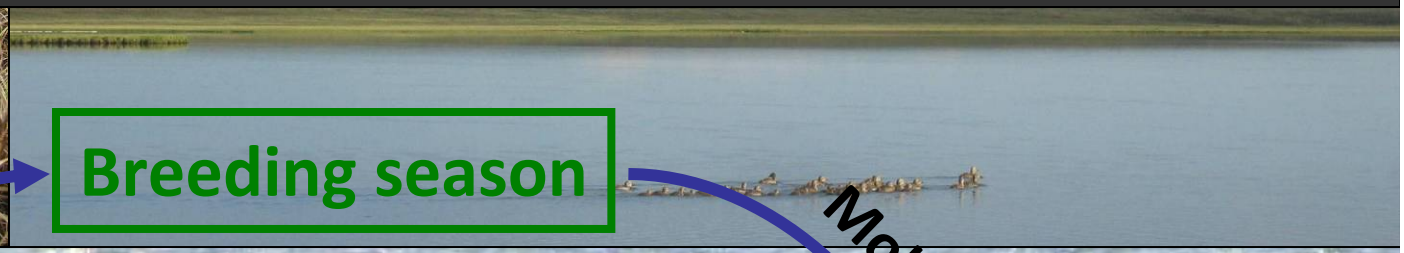


breeding range

wintering regions



Eider annual cycle



Breeding season

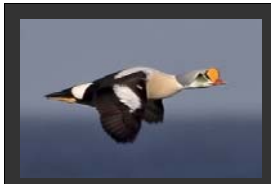
Molt migration

Wing molt

Fall migration

Winter

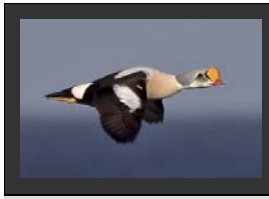
Spring migration



Eiders and climate change

Climate change may affect eiders in two ecosystems:

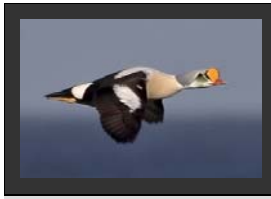
- on marine staging, molting and wintering areas
- on tundra breeding areas



Effects of climate change at sea

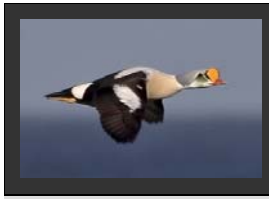
- eiders forage on benthic invertebrates
- warming water may change benthic invertebrate communities

- northward range expansion of competitors and parasites



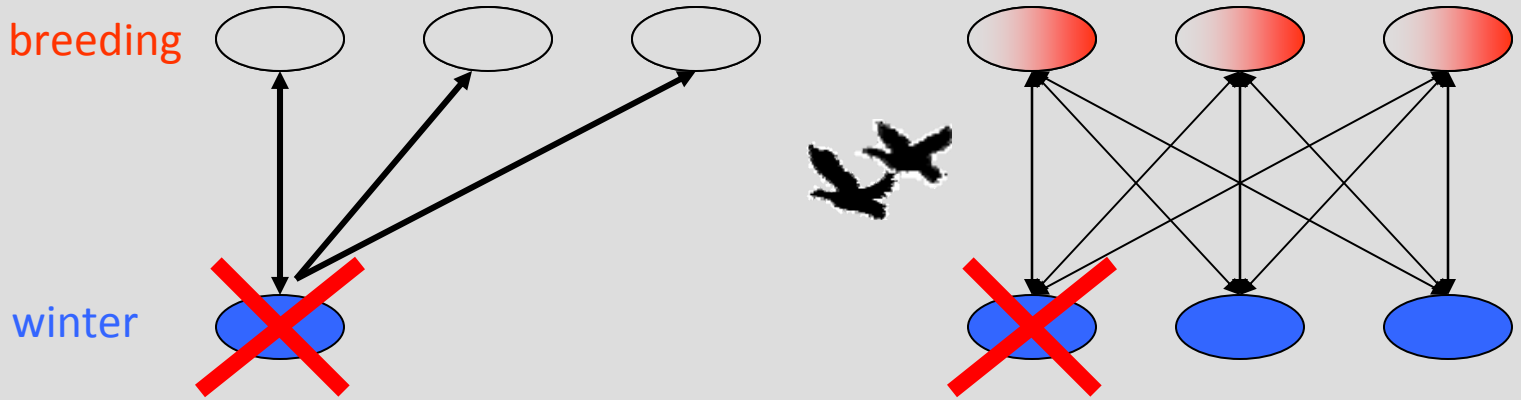
Effects of climate change at sea

- reduction in sea ice may disrupt food web
- increase in wave action may change energy expenditure



Effects of climate change at sea

- traditional areas may become less suitable
- strong migratory connectivity is disadvantage
- King Eiders less vulnerable than Spectacled Eiders



strong

weak

Effects of climate change on breeding grounds

increasing summer temperature, thawing of permafrost

Effects of climate change on breeding grounds

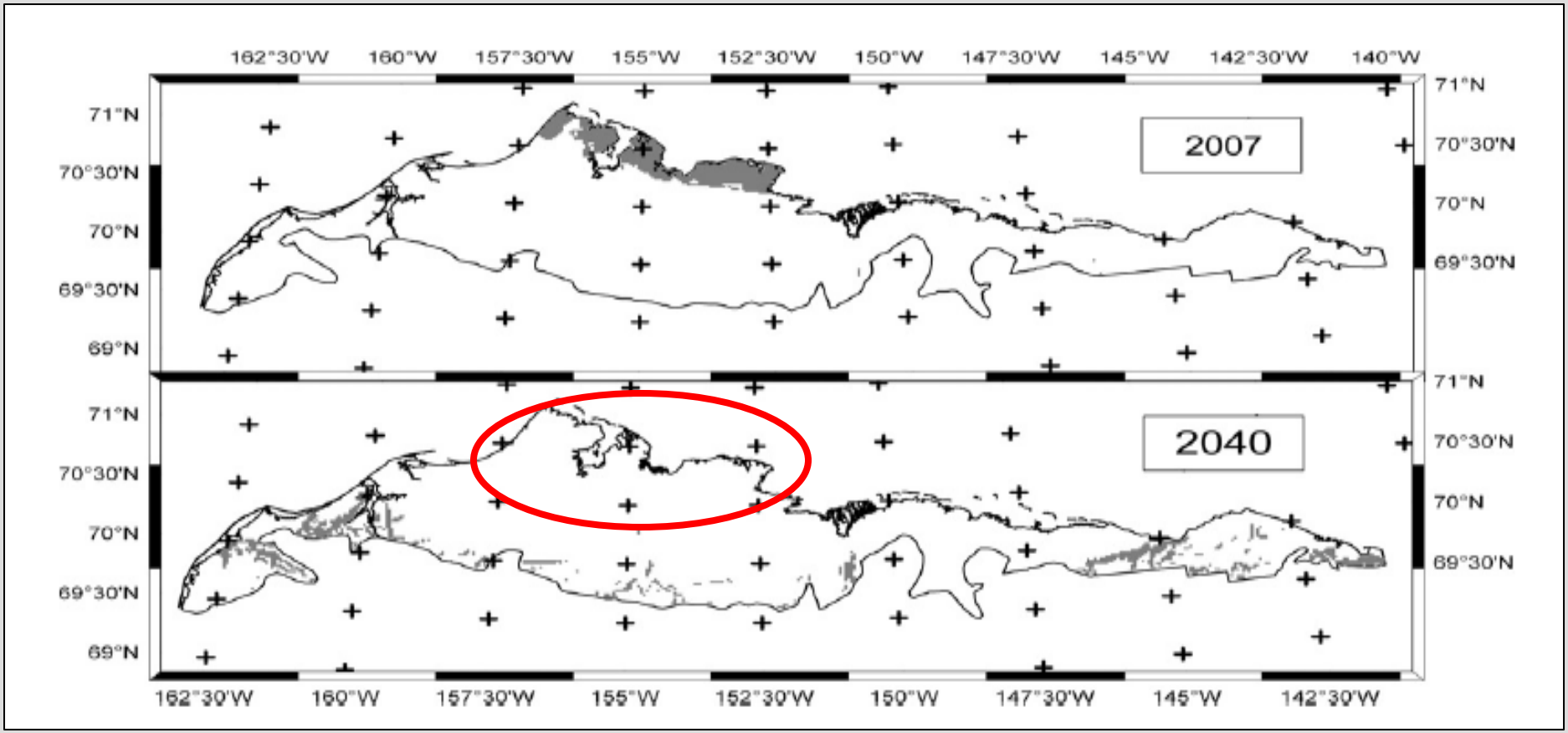
- drying of ponds and wetlands
- loss of foraging habitat
- eiders prefer to nest on little islands
- nests more accessible to terrestrial predators

Effects of climate change on breeding grounds

- females have high incubation constancy
- increasing temperature may increase water loss rate
- higher nest predation due to more ‘water breaks’?

Effects of climate change on breeding grounds

- increase in shrub cover
- loss of nesting habitat?



Fuller et al. 2008

Knowledge gaps for sea ducks

- dietary breadth at sea and on land – what are energetic consequences of altered prey availability?

- rate of spring advancement at sea vs. on land – is there potential for phenological ‘mismatch’?


Questions?
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