

# Frequency of Volume and Freshwater Events Leaving the Arctic Ocean: A Numerical Study

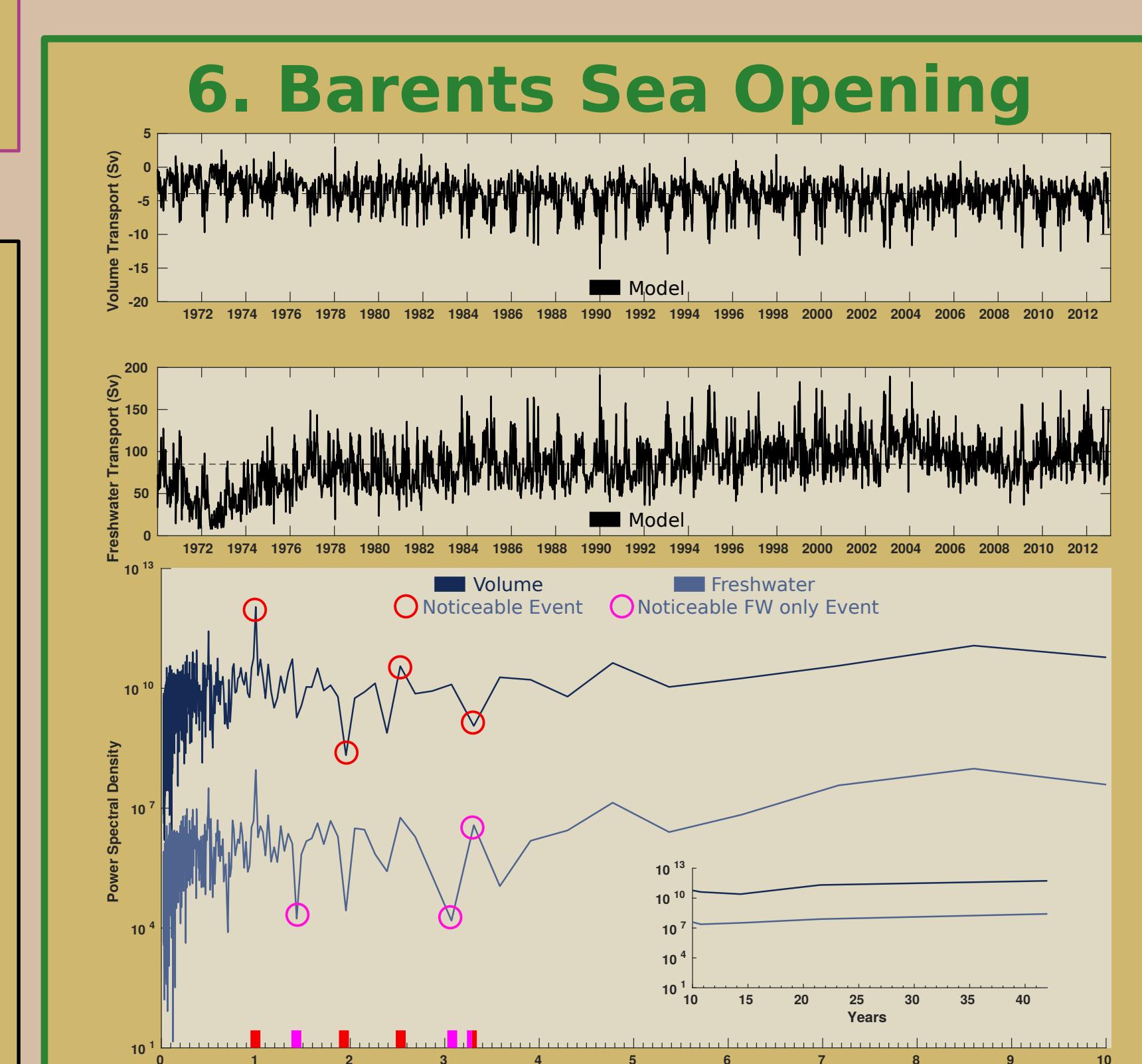
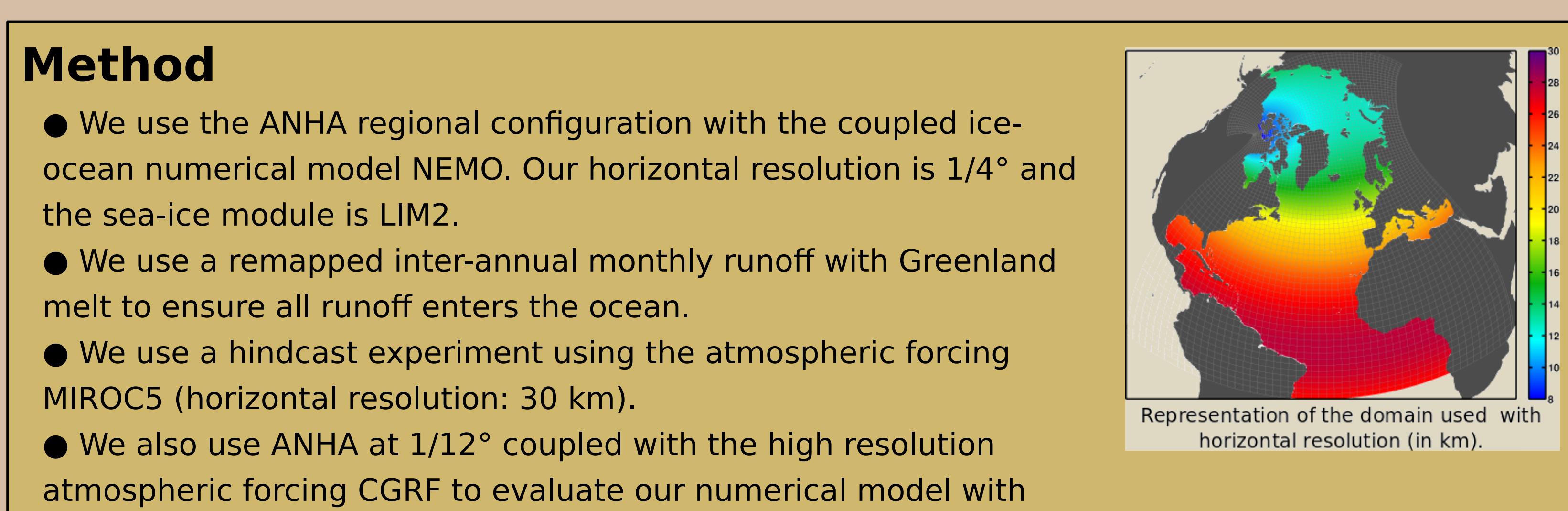
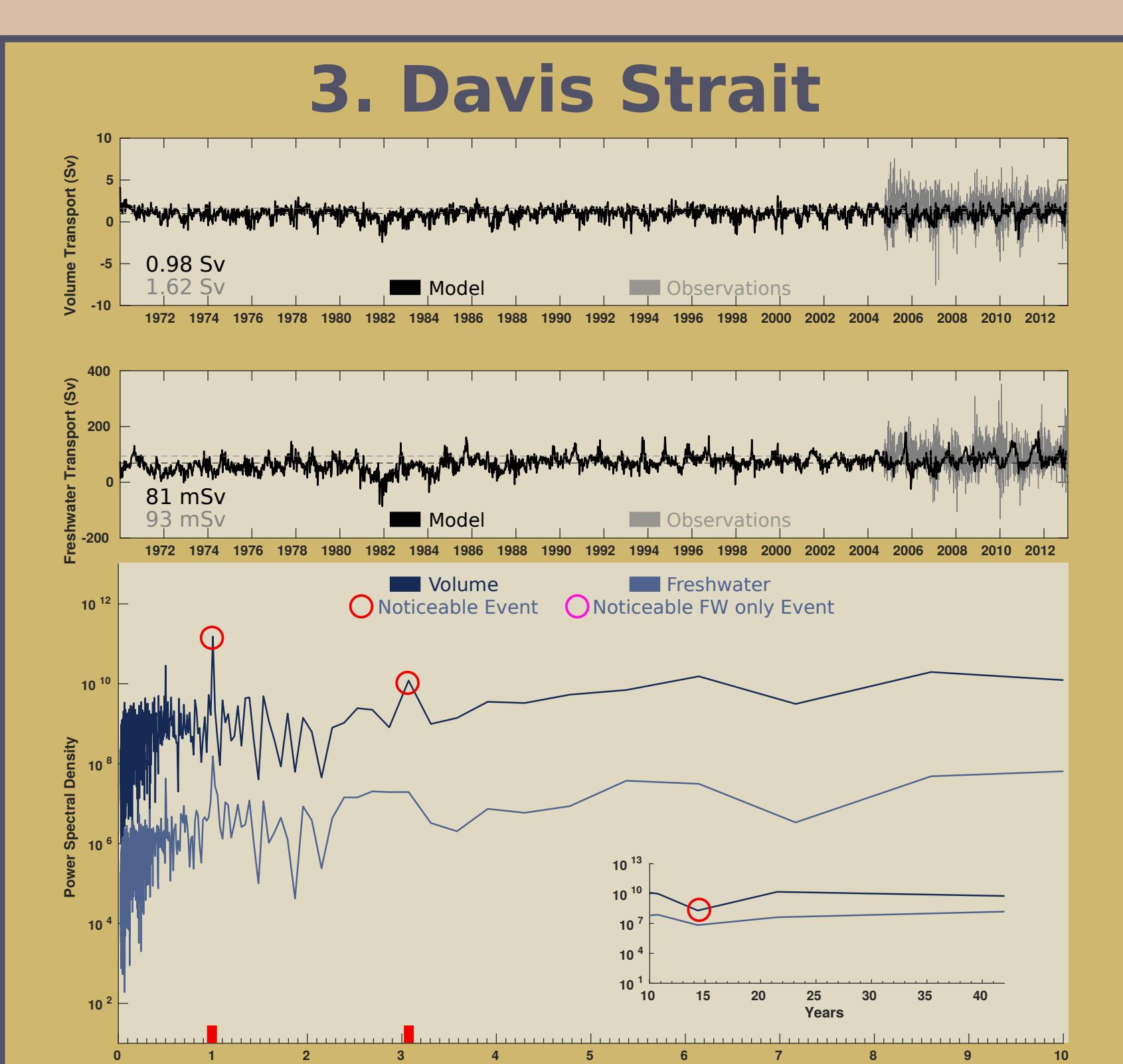
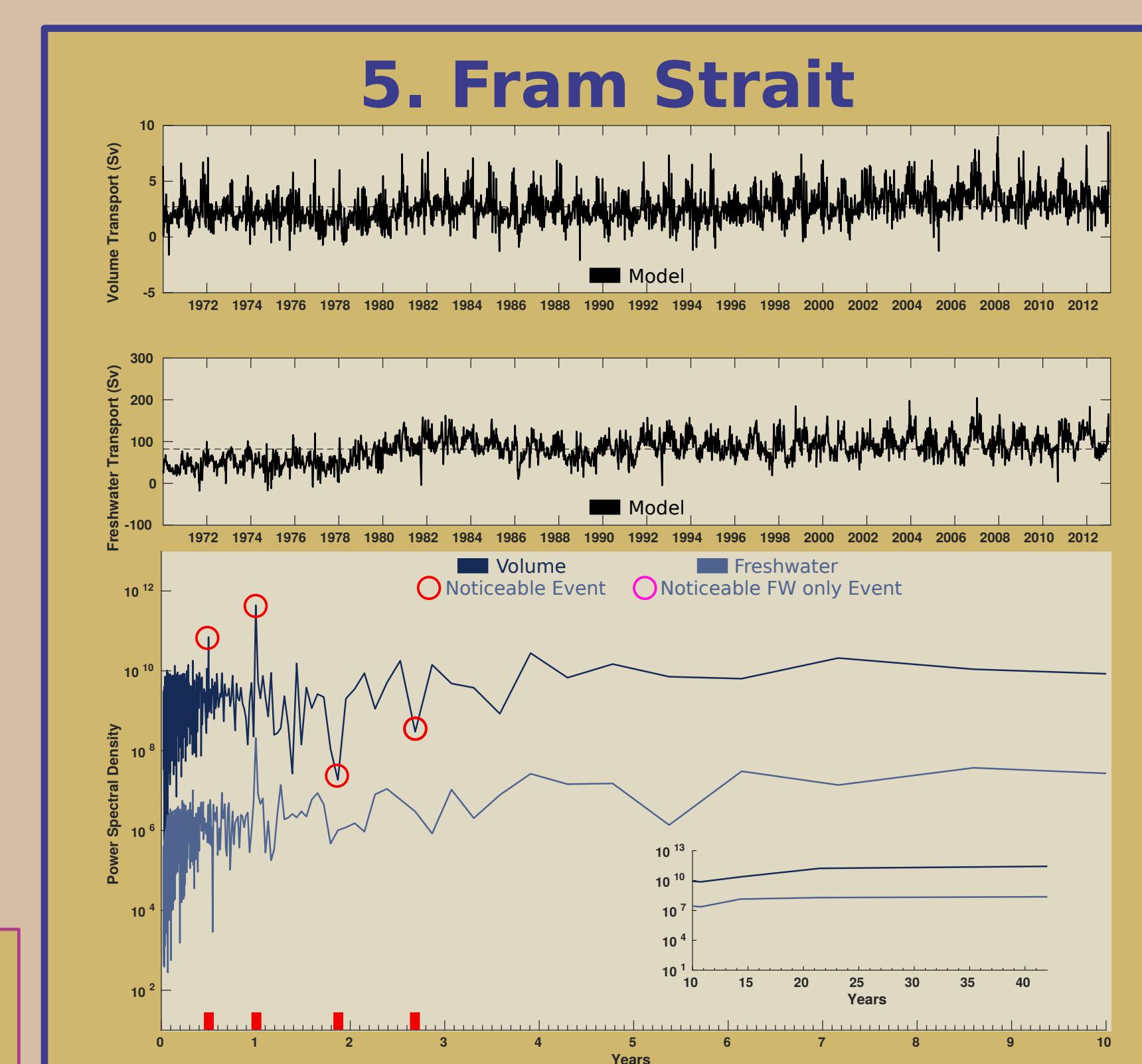
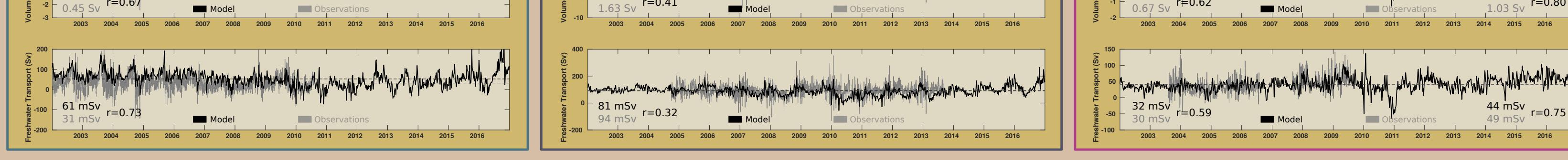
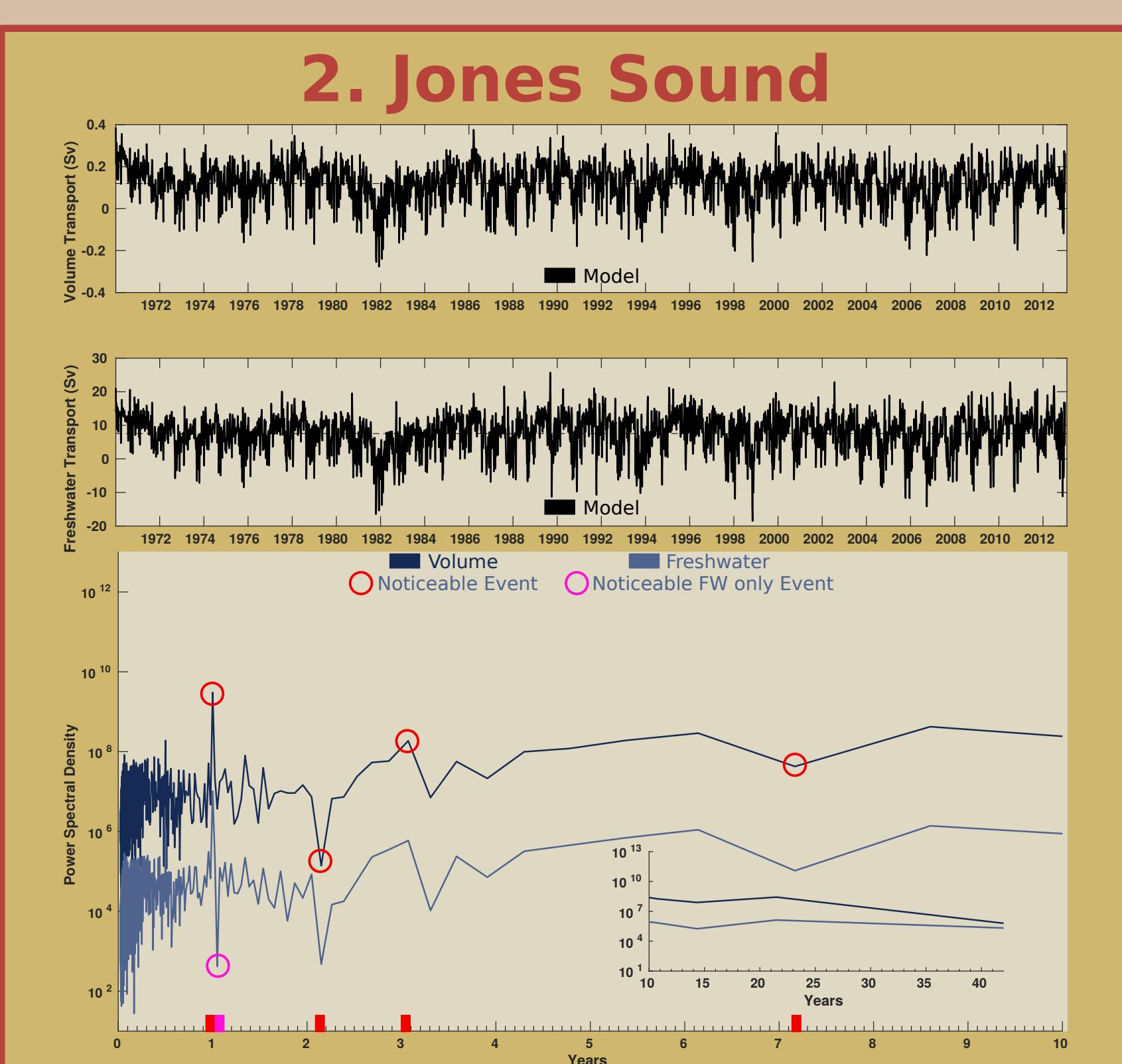
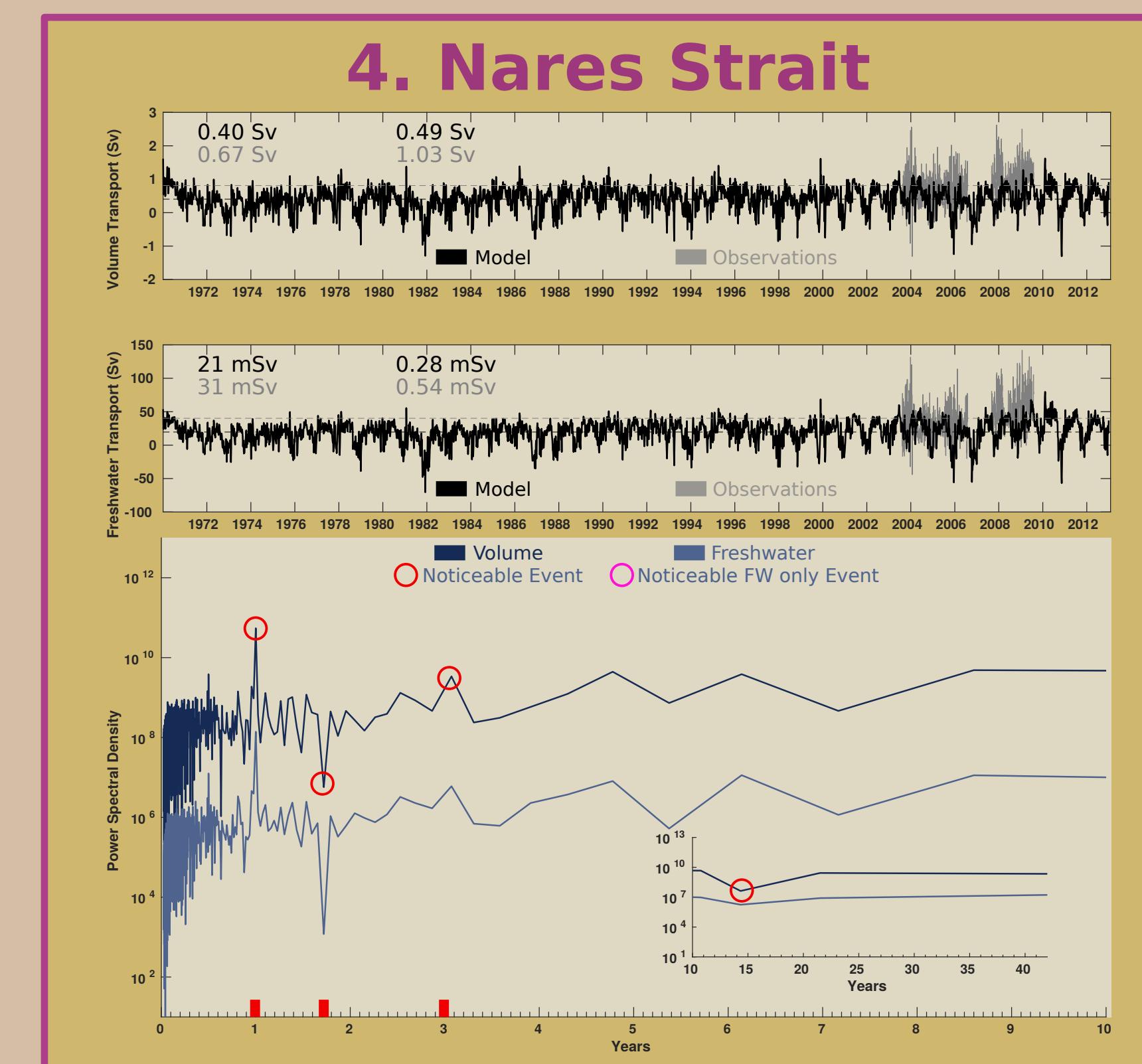
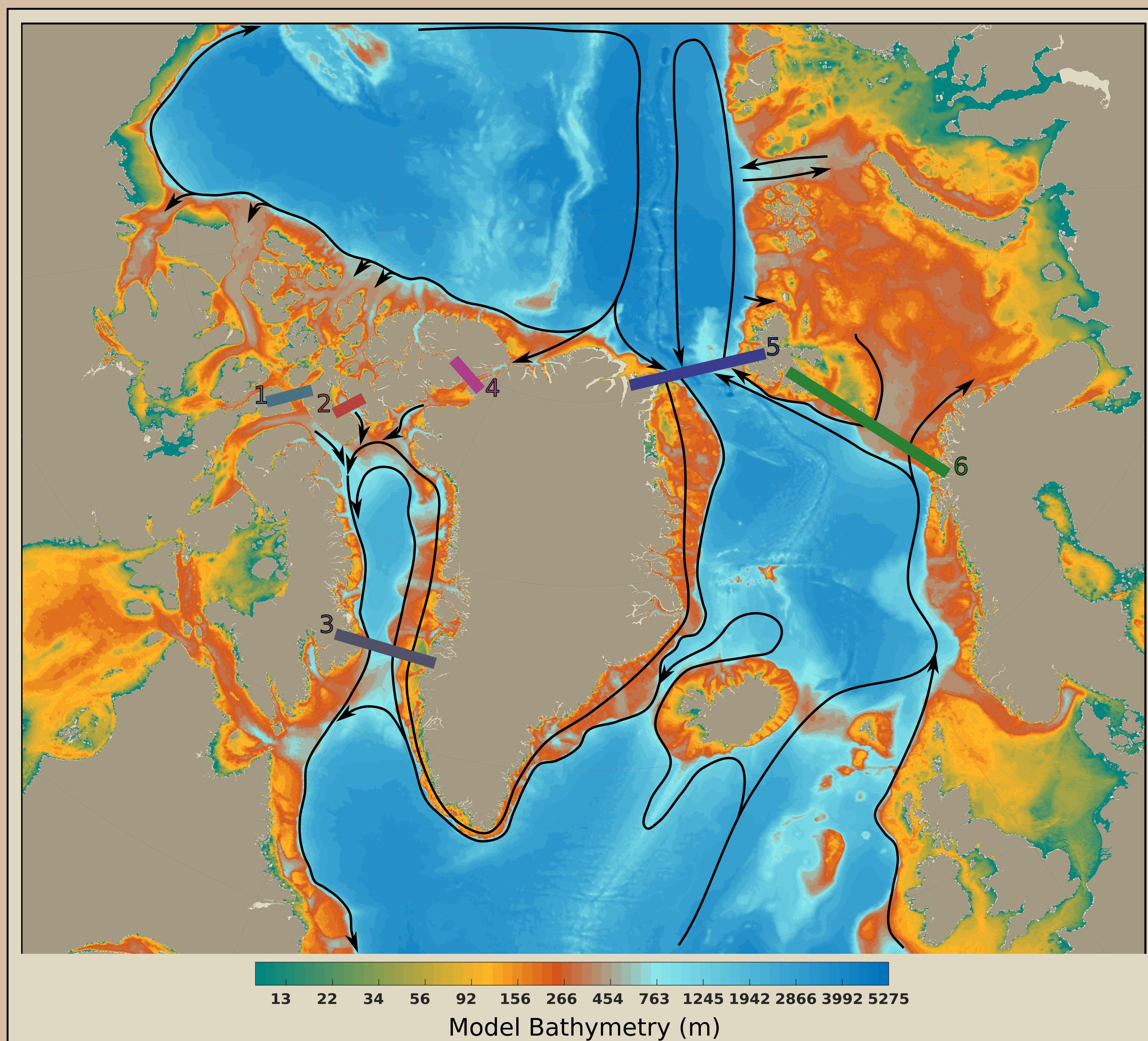
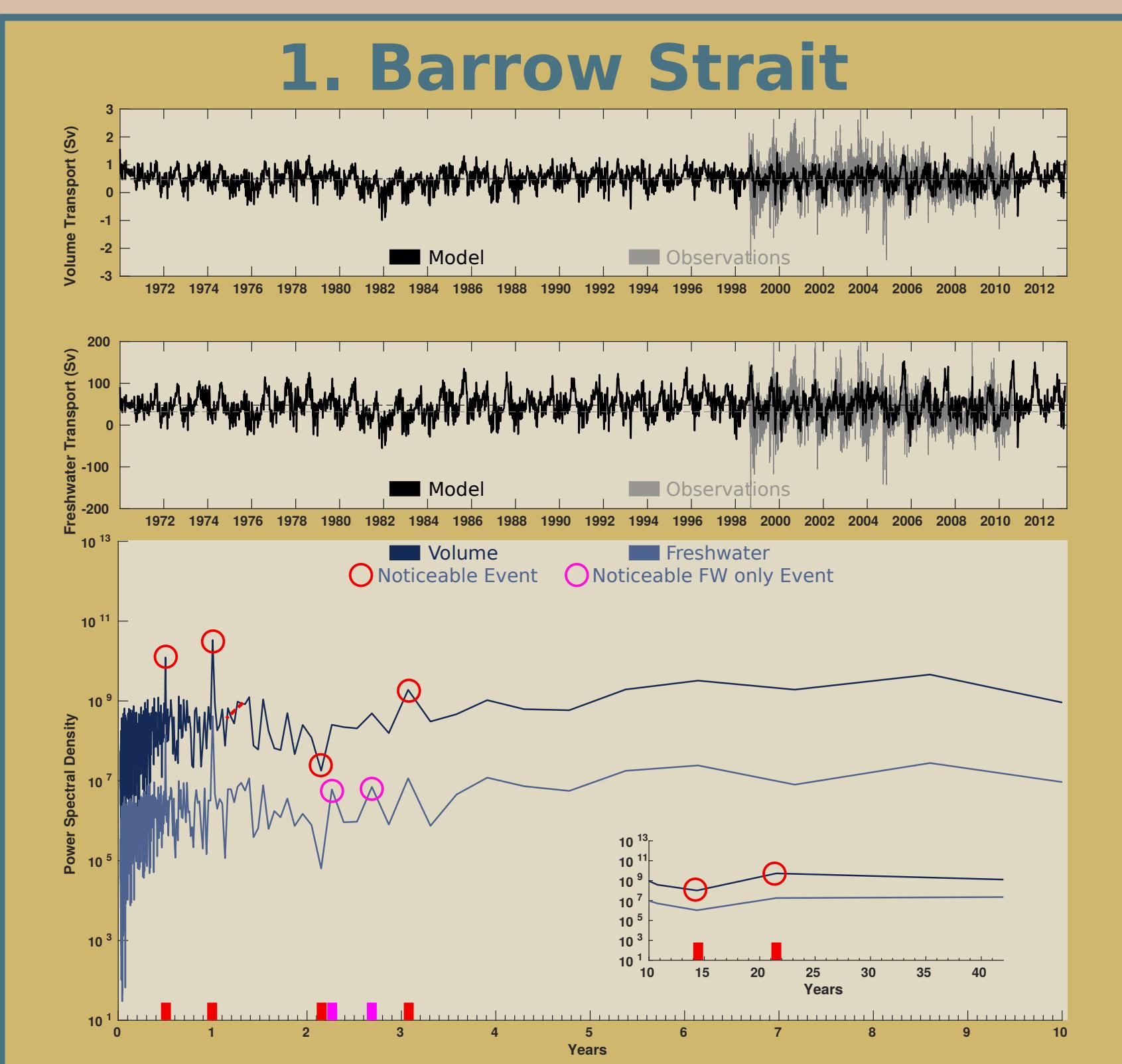
HE24A-2867 **Nathan Grivault, Laura Castro de la Guardia and Paul G. Myers**  
 Department of Earth & Atmospheric Sciences, University of Alberta

## Introduction

- The Arctic Ocean's upper layer contains more than 70 000 km<sup>3</sup> of freshwater.
- Studies suggest that the residence time of freshwater storage is associated with decadal scale atmospheric patterns (e.g., Arctic Oscillation / North Atlantic Oscillation) as well as small scale features (e.g., eddies in the Beaufort Gyre).
- The export of freshwater from the Arctic has the power to change the Atlantic Meridional Overturning Circulation and thus impact the global climate.
- In this study we use a numerical model to analyze the frequency of volume and freshwater events out of the Arctic.
- By identifying the timescales of major events over the last 40 years we provide information as to how long observational measurements should be in place in order to capture all important features driving the variability of fluxes out of the Arctic.

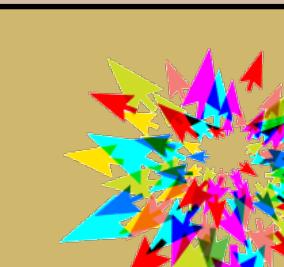
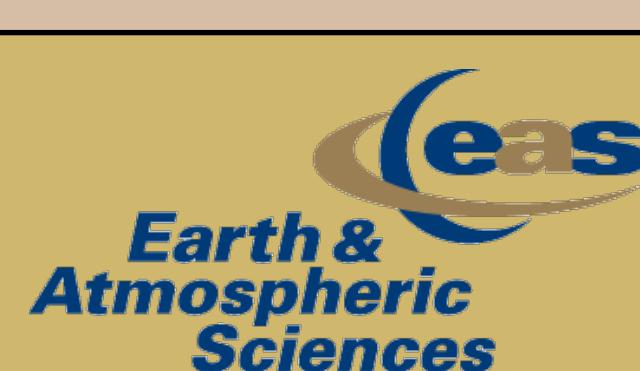
## Key points

- The model represents the large scale transports well.
- Small scale events contain an increasing amount of energy, with a maximum at ~ 3 months at Nares Strait, Davis Strait, and the Barents Sea Opening, while the maximum is at ~ 6 months at Barrow Strait, Jones Sound, and Fram Strait.
- A maxima of energy is contained at the 7-9 year frequency. This maxima occurs at a different frequency based on the strait.
- A local minima of energy is present at each strait at the 15 year frequency, with the exception of Fram Strait. At this frequency volume events do not correspond to freshwater events, and vice versa.
- Moorings should be installed for at least 5 years and preferably for ~ 20 years to capture the full spectrum of events.



## Acknowledgments

Barrow Strait observations from Prinsenberg et al. (2009) and Peterson et al. (2012)  
 Nares Strait observations from Münchow (2016)  
 Davis Strait observation from Curry et al. (2011, 2014)



Contact Information  
 grivault@ualberta.ca