

# The importance of large scale sea ice drift and ice type distribution on ice extent in the Weddell Sea

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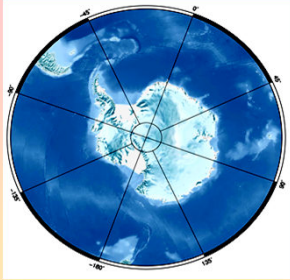
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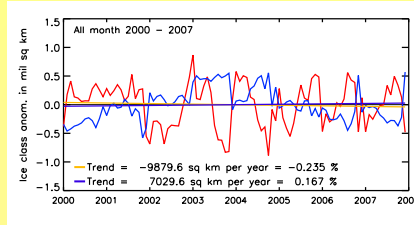


# Contents



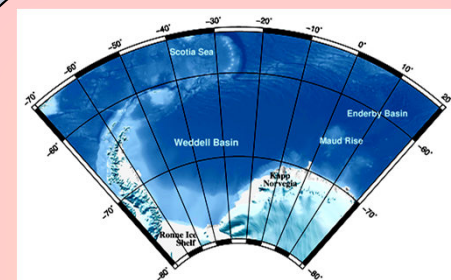
## Introduction

- Motivation
  - Ice extent changes
  - Temperature trend



## Results

- Ice drift
- Wind field
- Ice classes

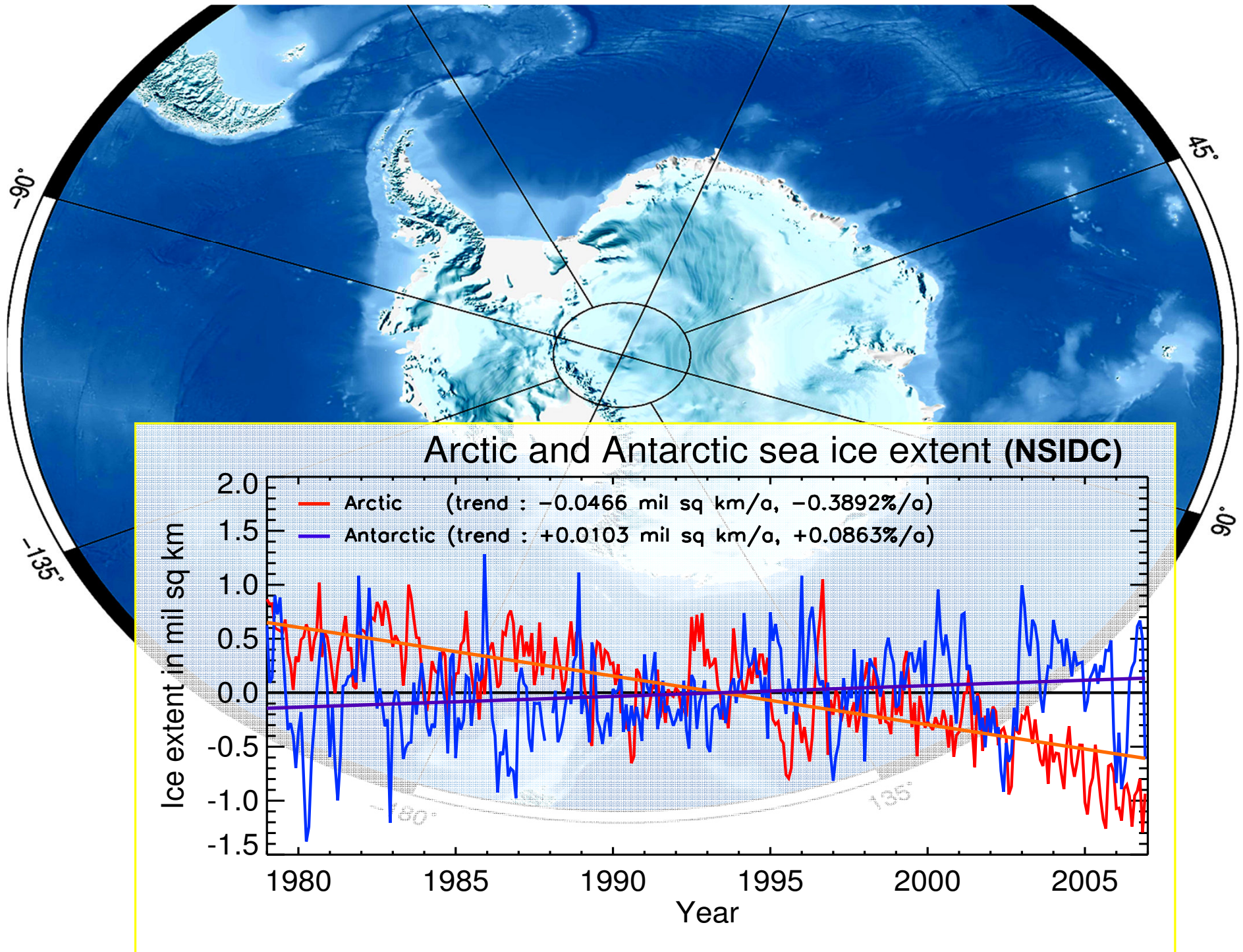


## Conclusion

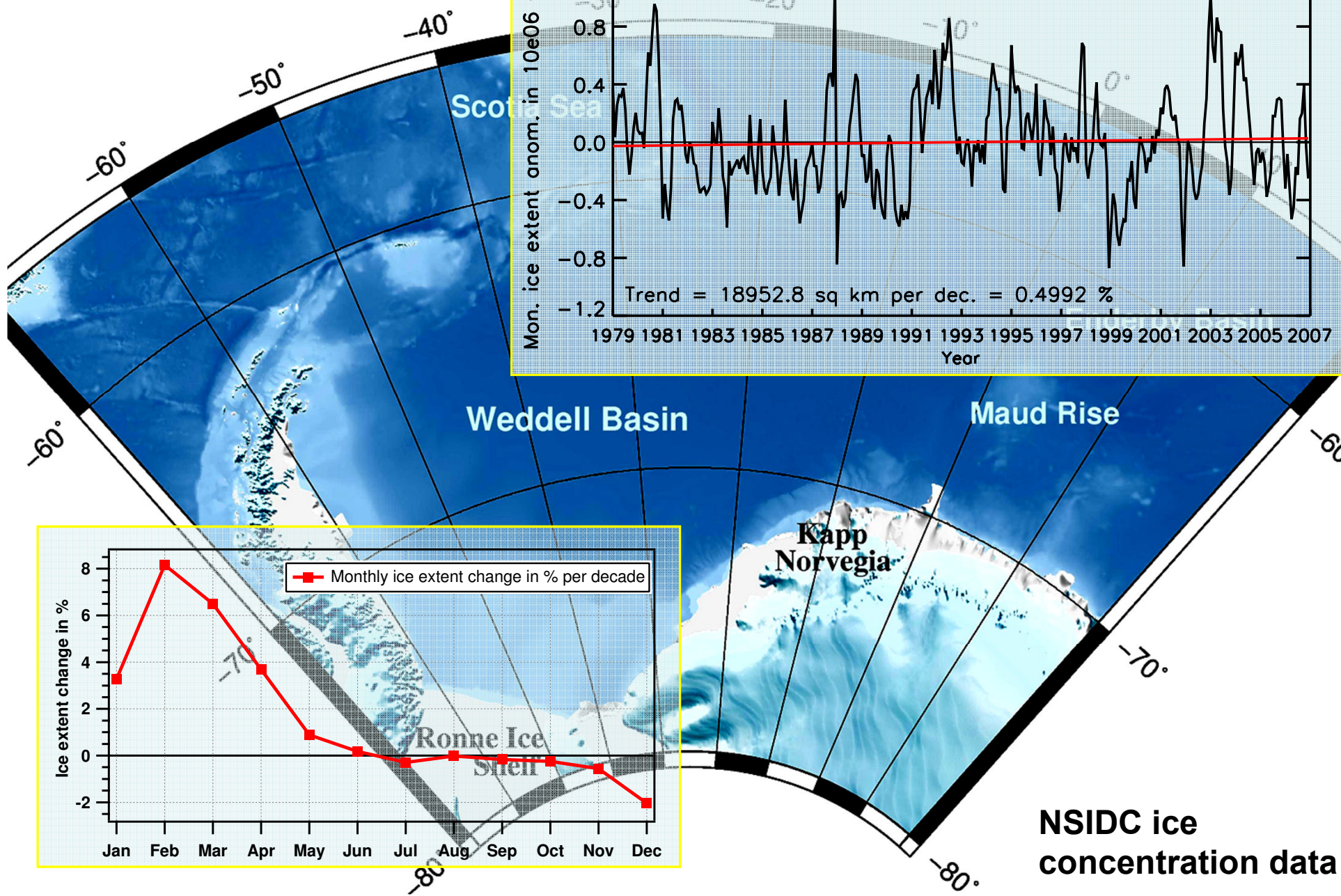
- Summary
- Outlook

# Used Data

- Ice concentration data from National Snow and Ice Data Center (NSIDC) for ice extent (IE) analysis
- Polar Pathfinder Daily 25 km EASE-Grid Sea Ice Motion Vectors from NSIDC for drift trends
- 2m air temperature and 10m wind data from NCEP/NCAR Reanalysis
- QuikSCAT/ SeaWinds scatterometer data for calculations of first (FYI) and second year ice (SYI) coverage

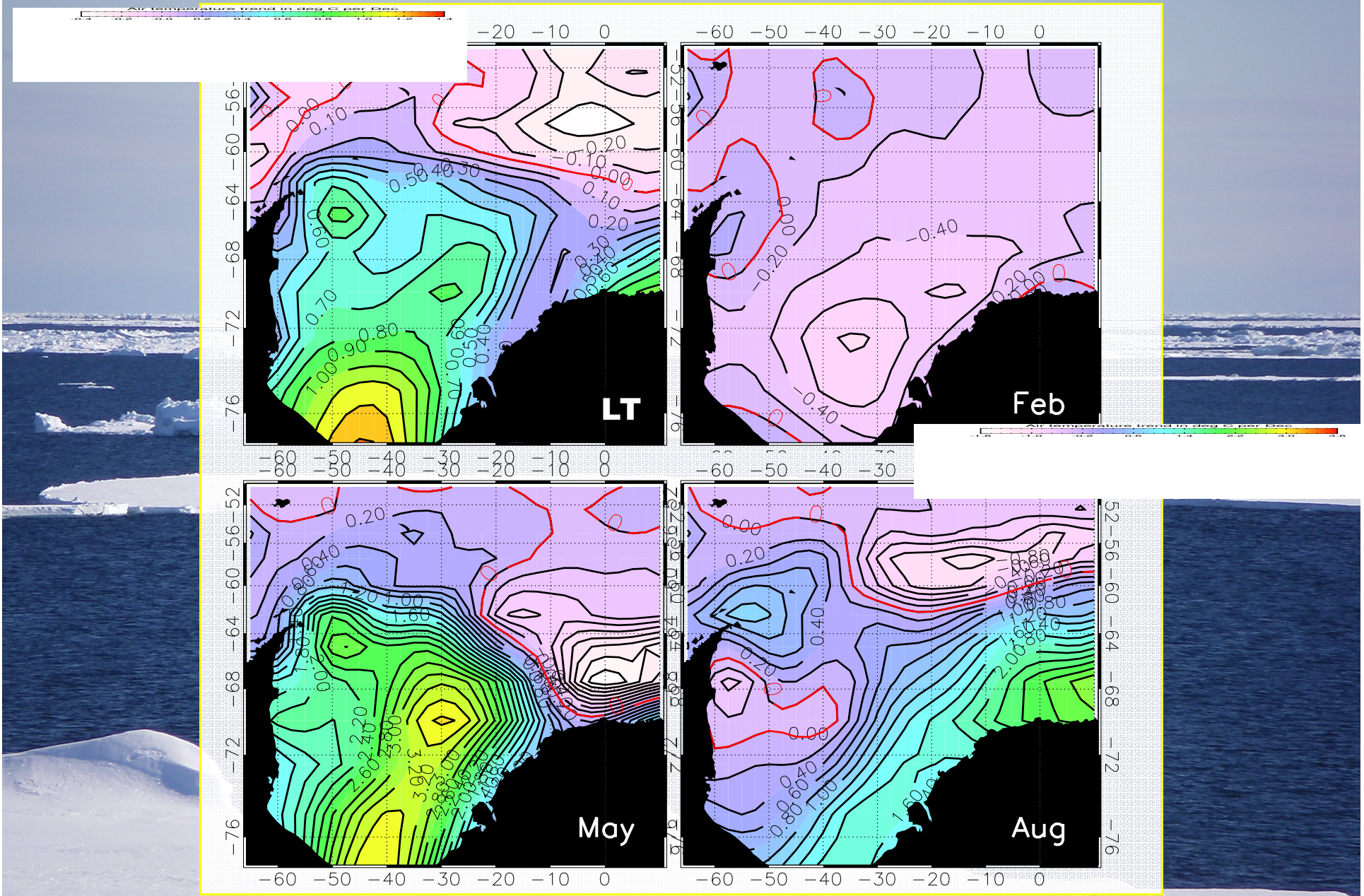


# Weddell Sea

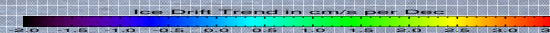
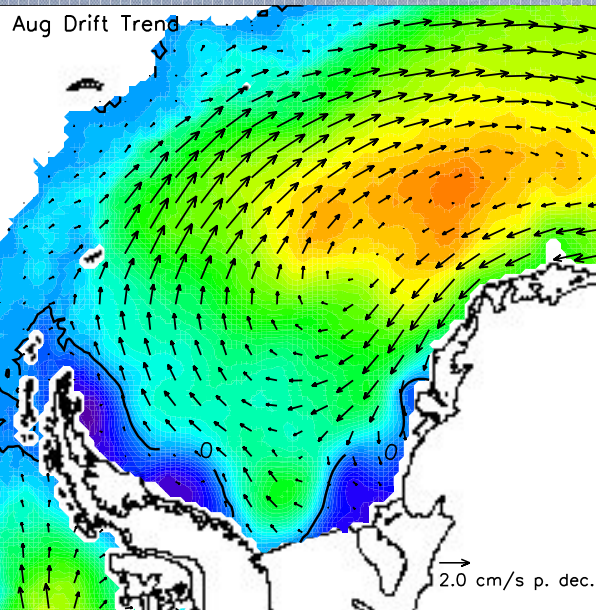
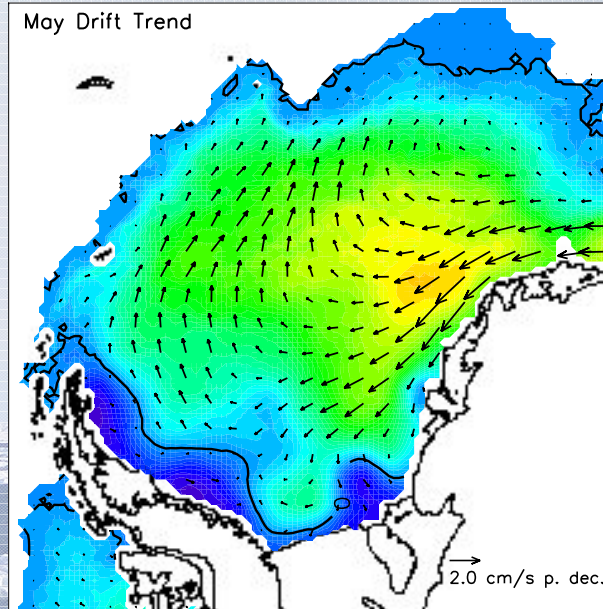
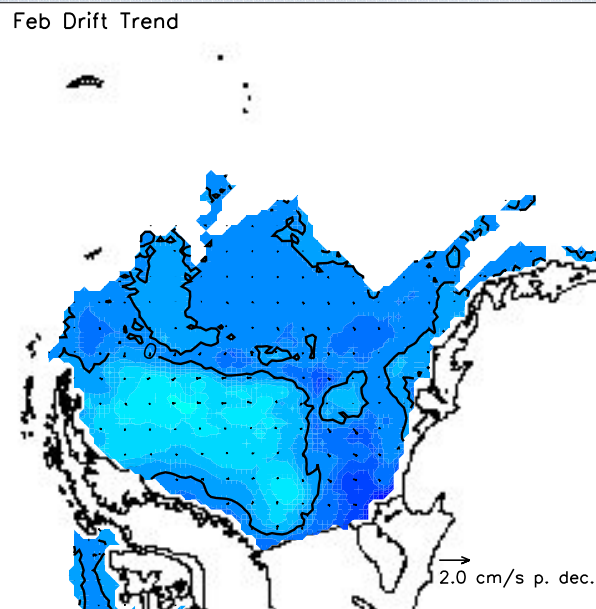


NSIDC ice concentration data

# NCEP Temperature Trends



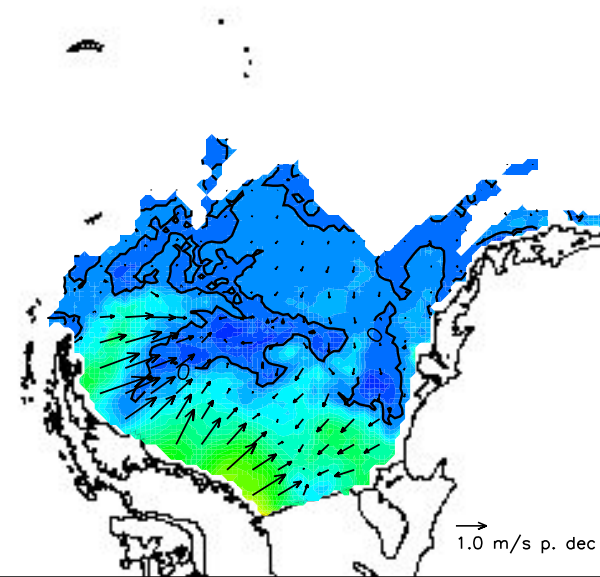
# Observed Ice Drift Trends



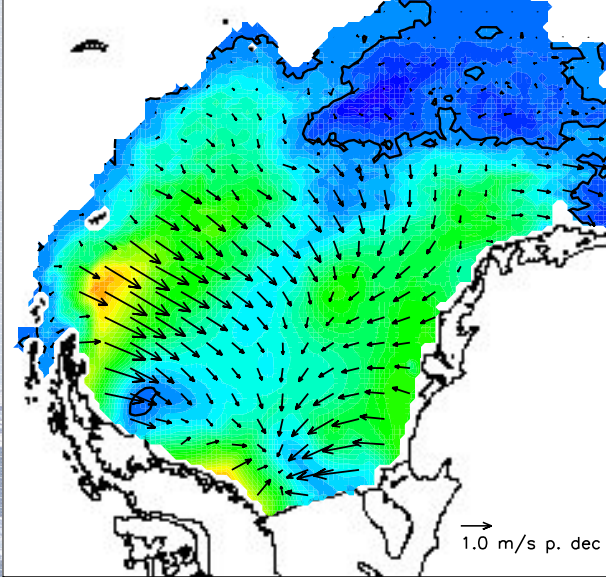
**Polar Pathfinder Daily 25 km  
EASE-Grid Sea Ice Motion  
Vectors from NSIDC**

# NCEP Wind Trends

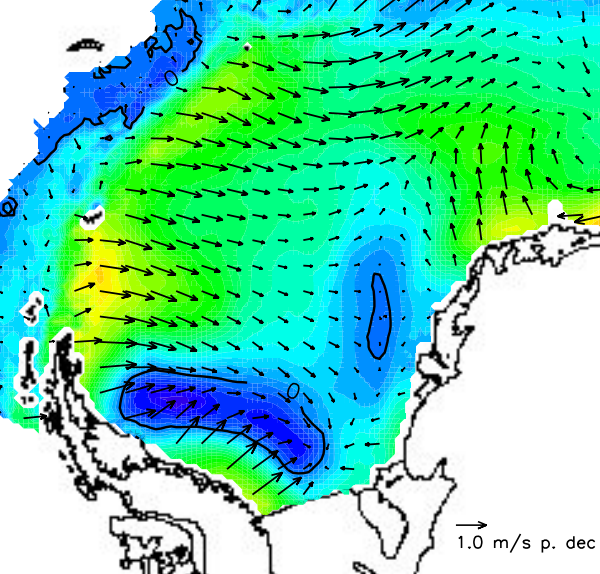
Feb Trend of wind speed



May Trend of wind speed

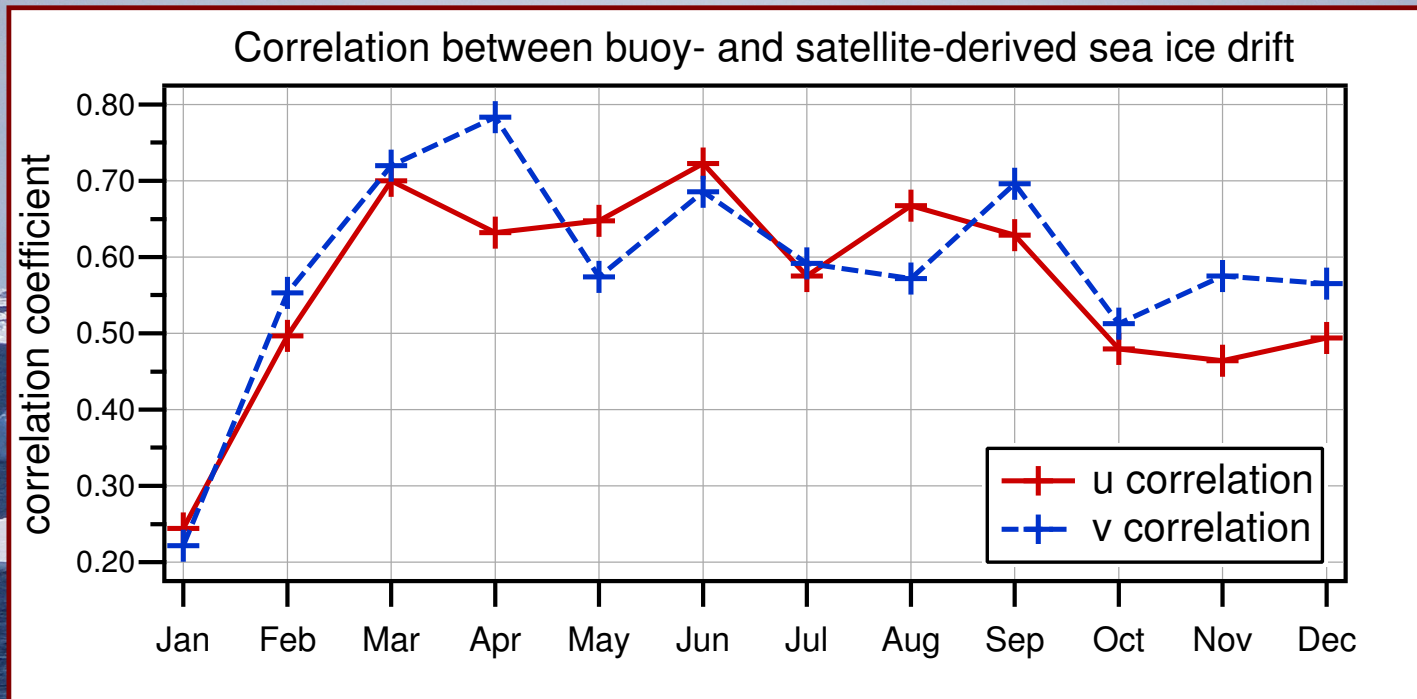


Aug Trend of wind speed



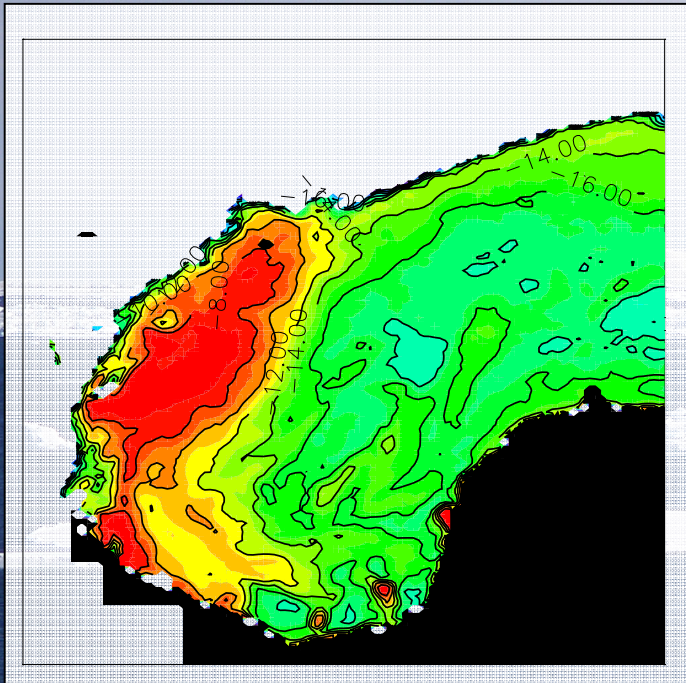


# Comparison of Buoy- and Satellite-derived Ice Drift

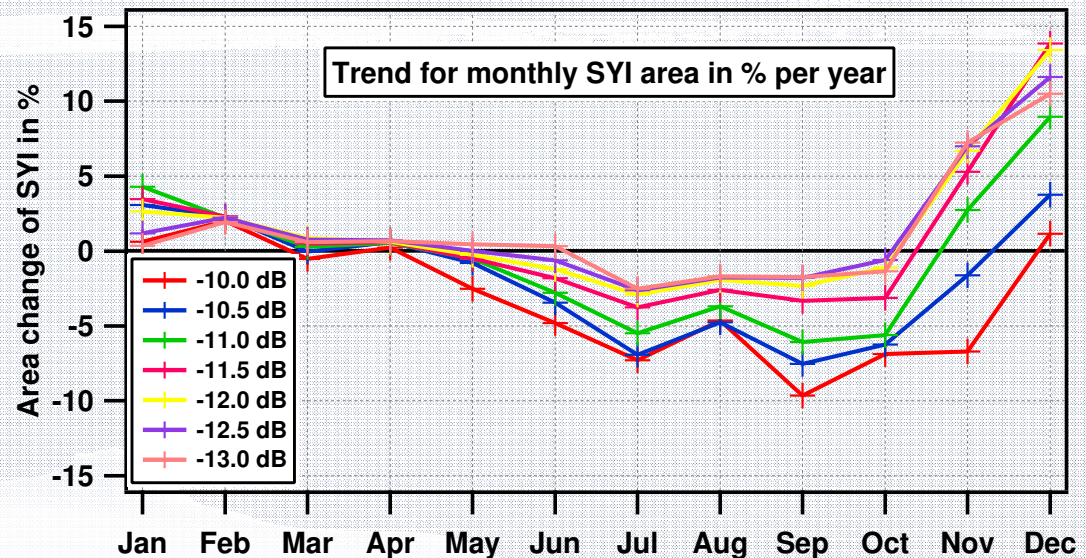
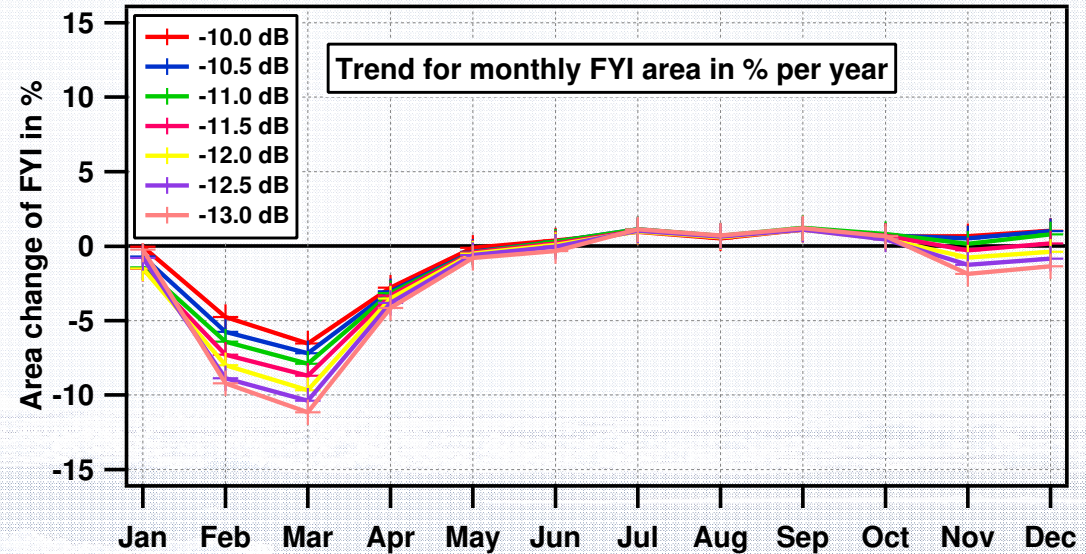


- Correlation coefficients most often above 0.5.
- Satellite-derived ice drift underestimates buoy-derived ice drift by up to 35%.

# Distribution of First and Second Year Ice



QuikSCAT/ SeaWinds  
scatterometer data  
from IFREMER



# Summary

- Ice extent is slightly increasing in the Weddell Sea.
- Highest increase of IE in February
- Decreasing temperatures in austral summer.
- Drift acceleration in austral winter.
- NCEP winds also show an acceleration.
- Decreasing FYI area in austral summer and SYI in austral winter, relatively independent on chosen backscatter coefficient.
- Decrease of SYI in winter correlates with drift acceleration.

# Outlook

- Comparison of ice drift fields with model results
- Analysis of modeled ice thickness distribution
- Backward calculation of ice type distribution by model results
- ECMWF vs. NCEP
- Shifted seasonal cycle?

**Thank you for your attention**