Comparison Of Atmospheric Forcing In The Four Sub-arctic Seas

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James Overland[2] and Nicholas Bond[1]

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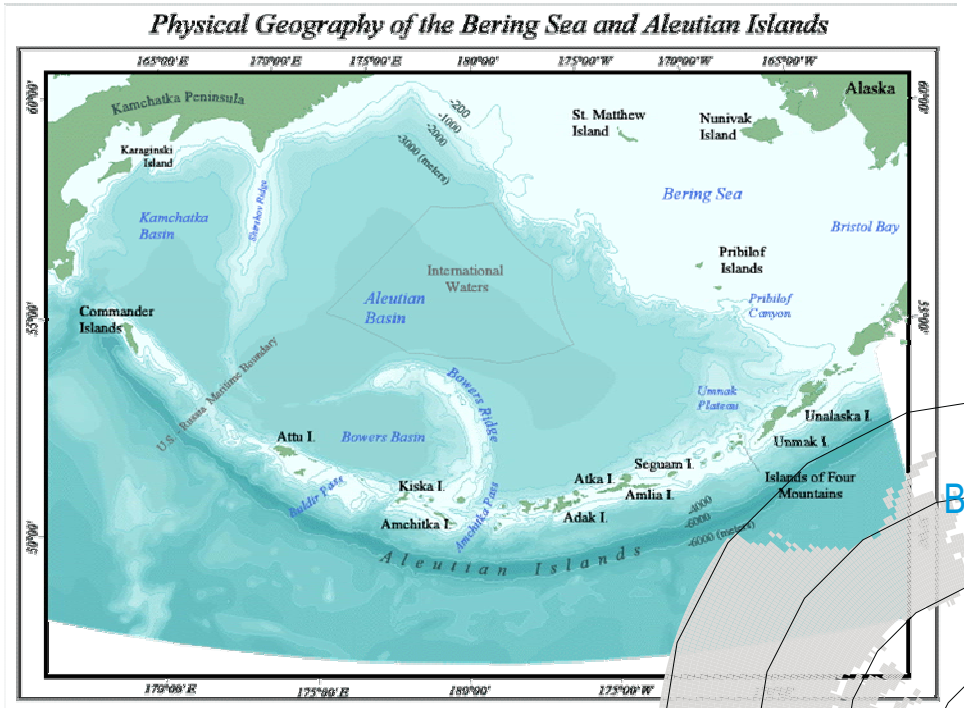
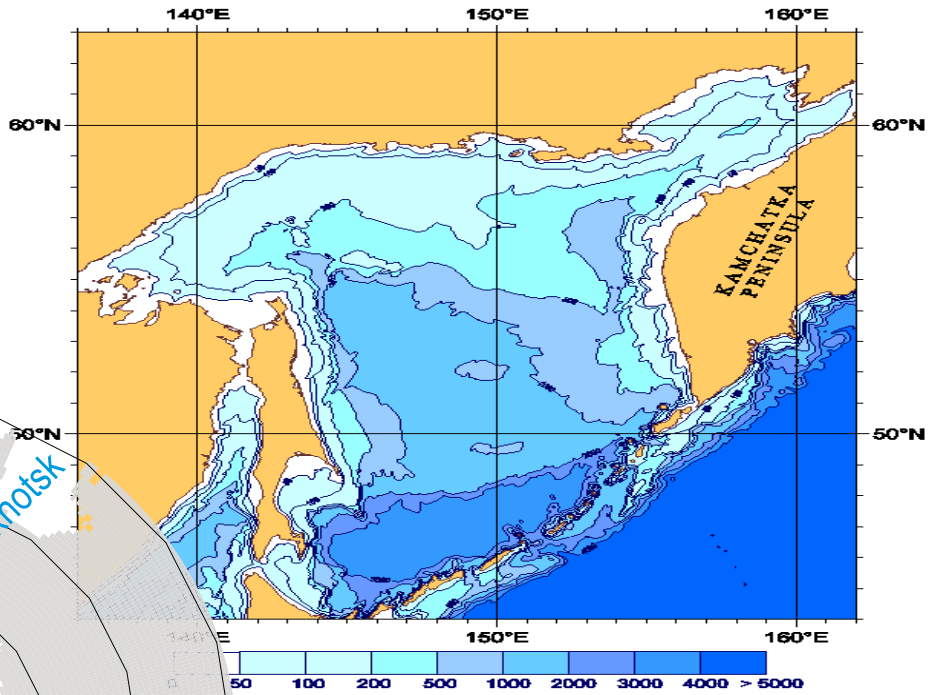
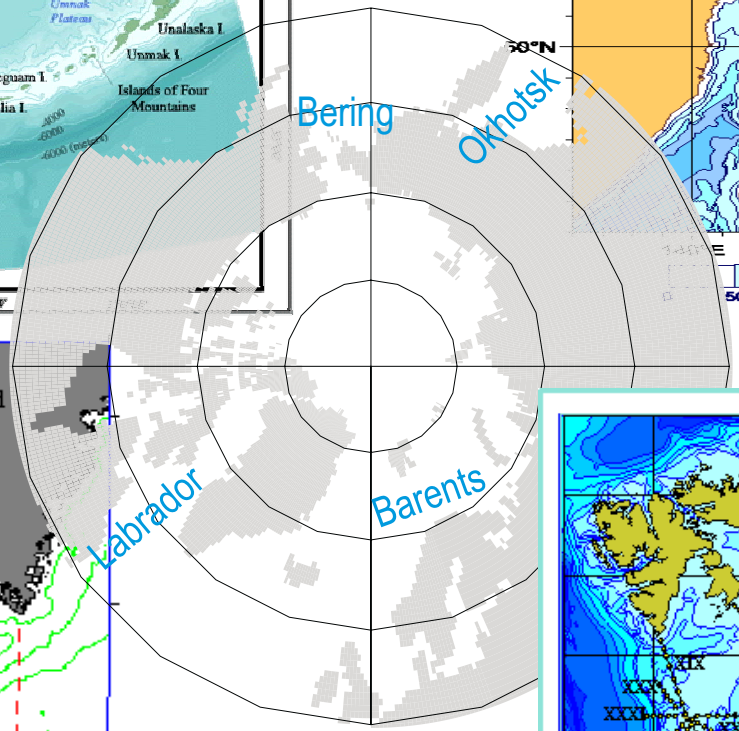
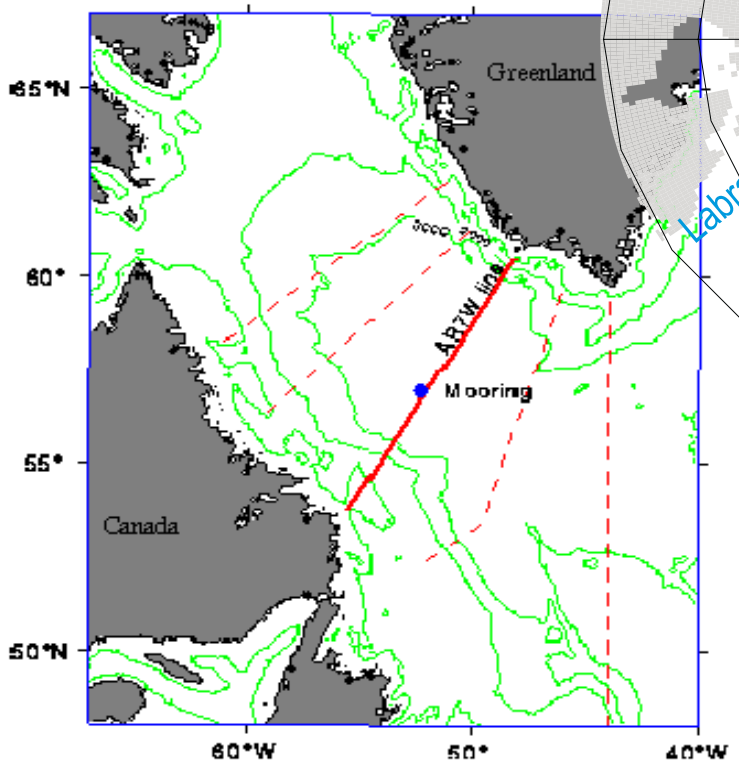
Seattle WA

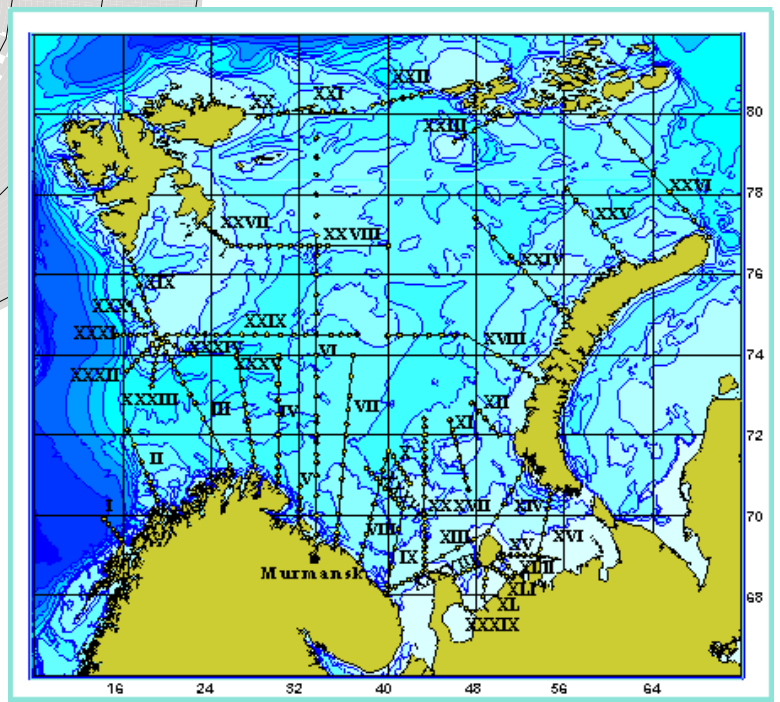

Physical Geography of the Bering Sea and Aleutian Islands
Alaska
Kamchatka Peninsula
St. Matthew Island
Nunivak Island
Karaginski Island
Bering Sea
Kamchatka Basin
Bristol Bay
Pribilof Islands
International Waters
Aleutian Basin
Commander Islands
Pribilof Canyon
Bowers Ridge
Unmak Plateau
Unalaska I.
Unmak I.
Attu I.
Bowers Basin
Segnam I.
Atka I.
Amlia I.
Islands of Four Mountains
Kiska I.
Amchitka I.
Adak I.
Aleutian Islands


140°E
150°E
160°E
60°N
50°N
KAMCHATKA PENINSULA
50
100
200
500
1000
2000
3000
4000
> 5000


Bering
Okhotsk
Labrador
Barents


Greenland
Canada
ARCW line
Mooring
65°N
60°
55°
50°N
60°W
50°
40°W


Background
Programme
Dates
Abstracts
ESSAS
Registration
Publication
SSC
Local Info


Murmansk
80
78
76
74
72
70
68
16
24
32
40
48
56
64

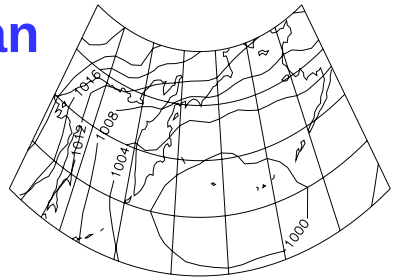
Variables From NCEP/NCAR Reanalysis

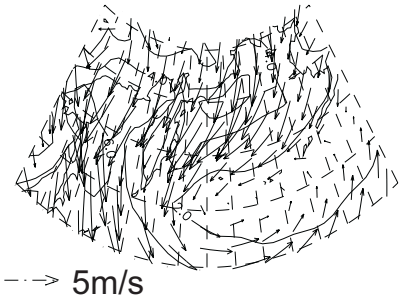
Variable Name	Class	Units
Sea Level Pressure	A	hPa
Air Temp at 2m	B	K
Specific Humidity	B	Kg/Kg
Wind (u,v) at 10m	B	m/s
Latent/ Sensible Heat Flux	C	W/m^2
Net L/S Wave Radiation Flux	C	W/m^2
Surface Wind Mixing		$(m/s)^3$

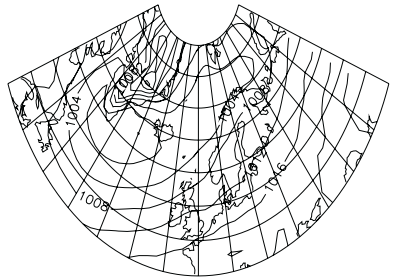
A	The variable is strongly influenced by observed data. It is the most reliable class.
B	Although there observational data that directly affect the value of the variable, the model also has a very strong influence on the analysis value.
C	There are no observations directly affecting the variable, so it is derived solely from the model fields.

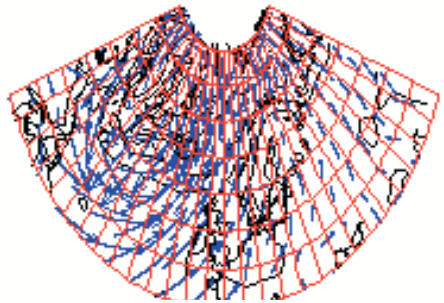
Seasonal SLP and 10m-Wind

Jan









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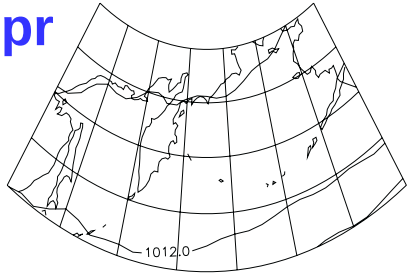
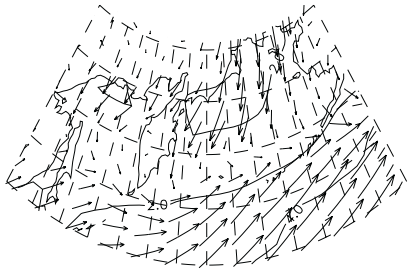
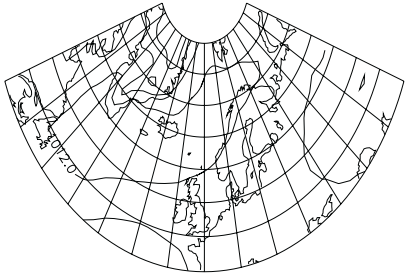
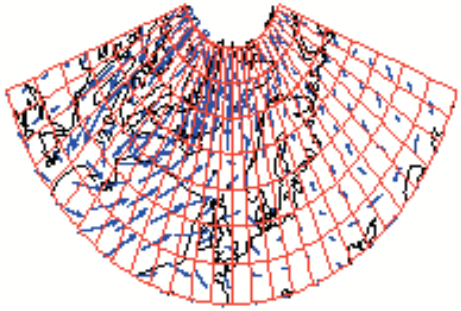
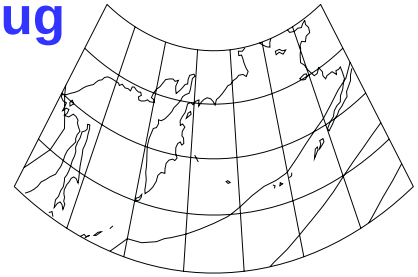


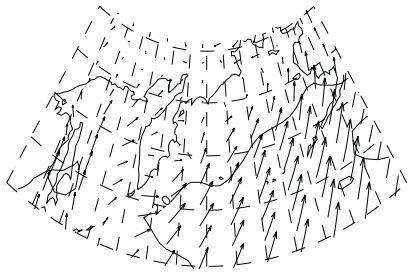


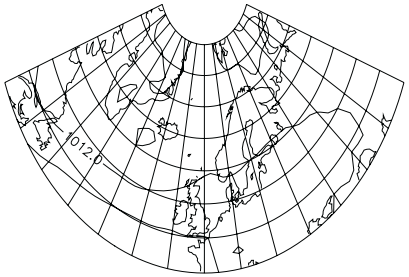


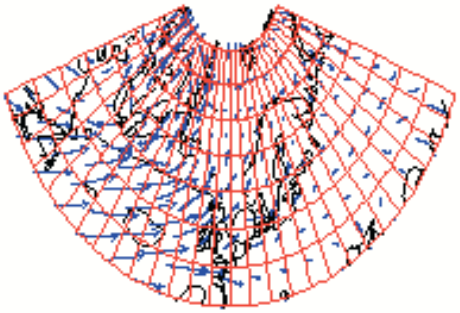


Aug









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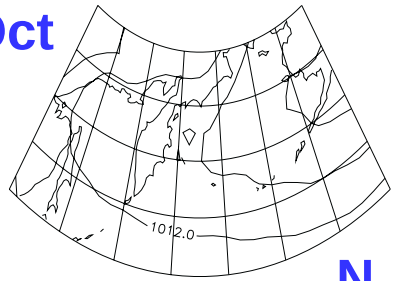
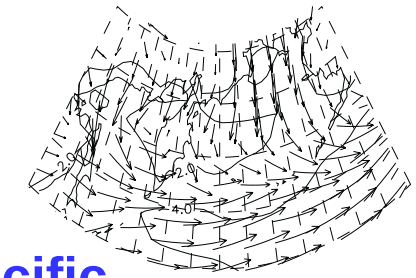
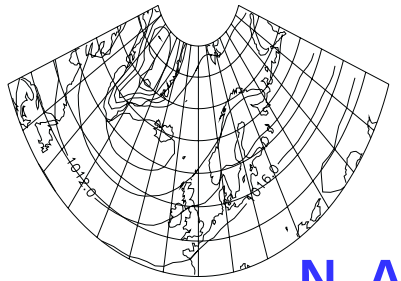
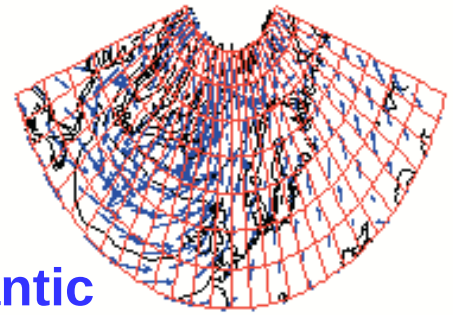




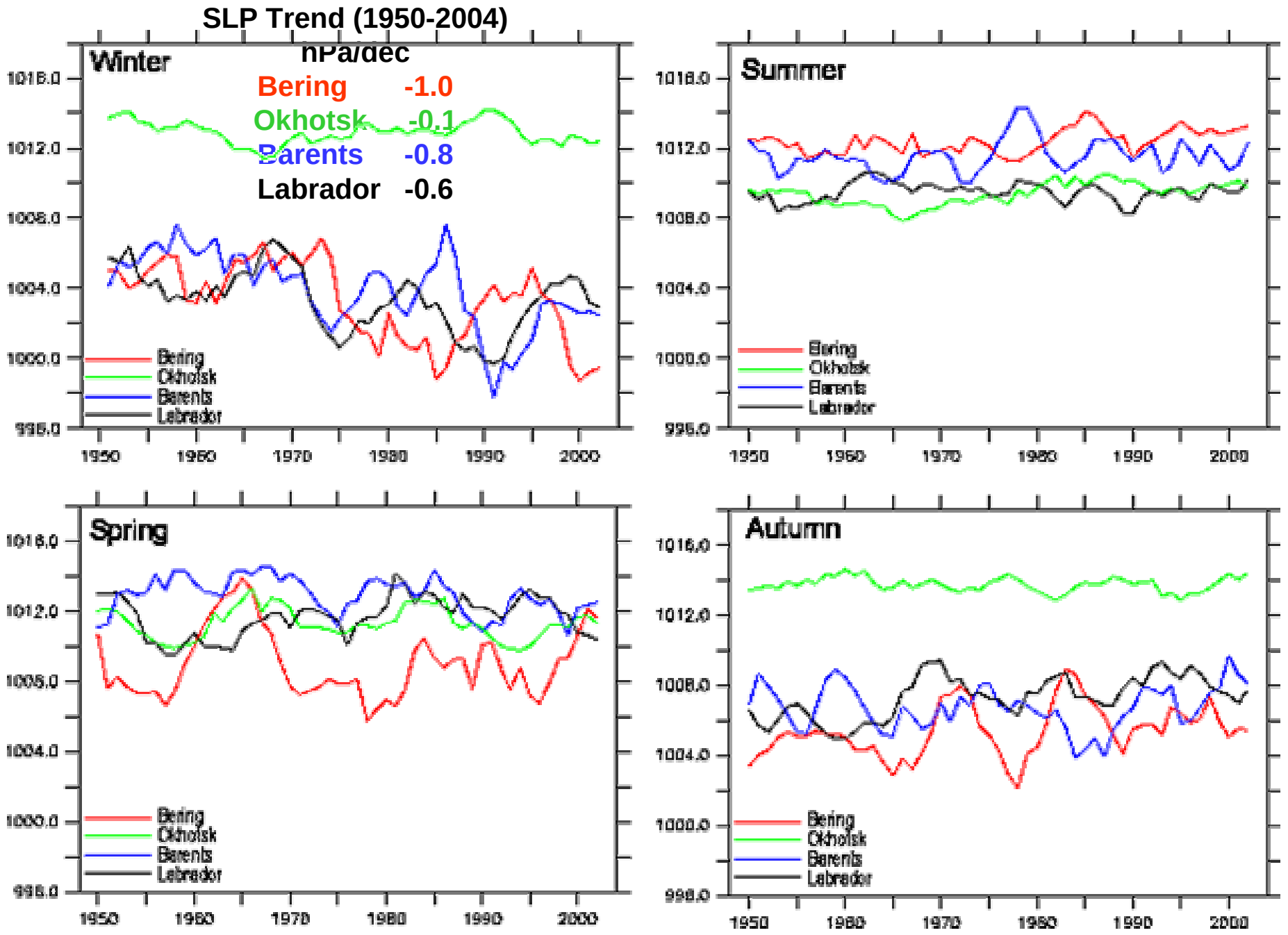




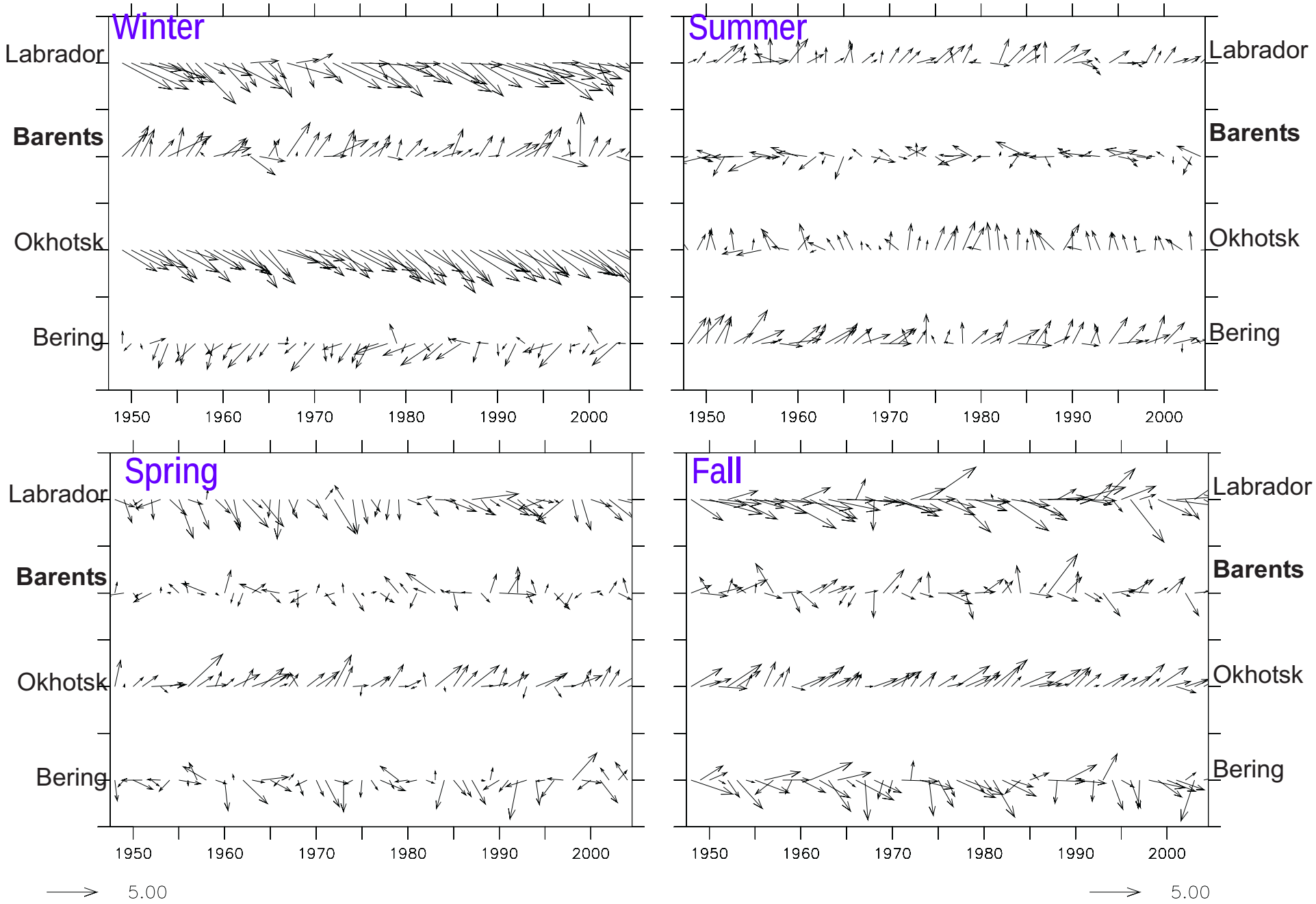
N. Pacific

N. Atlantic

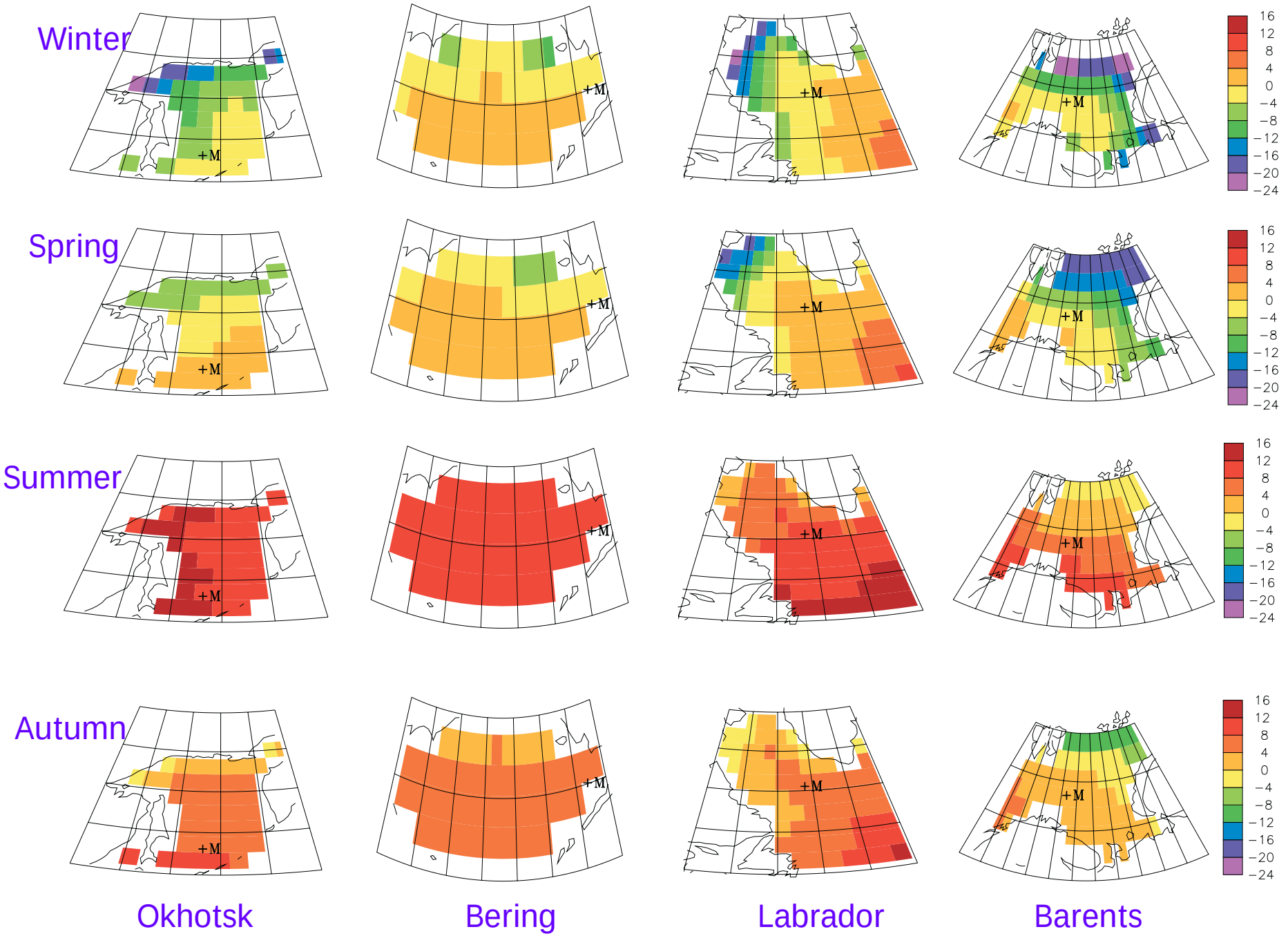
Seasonal SLP at Selected Stations



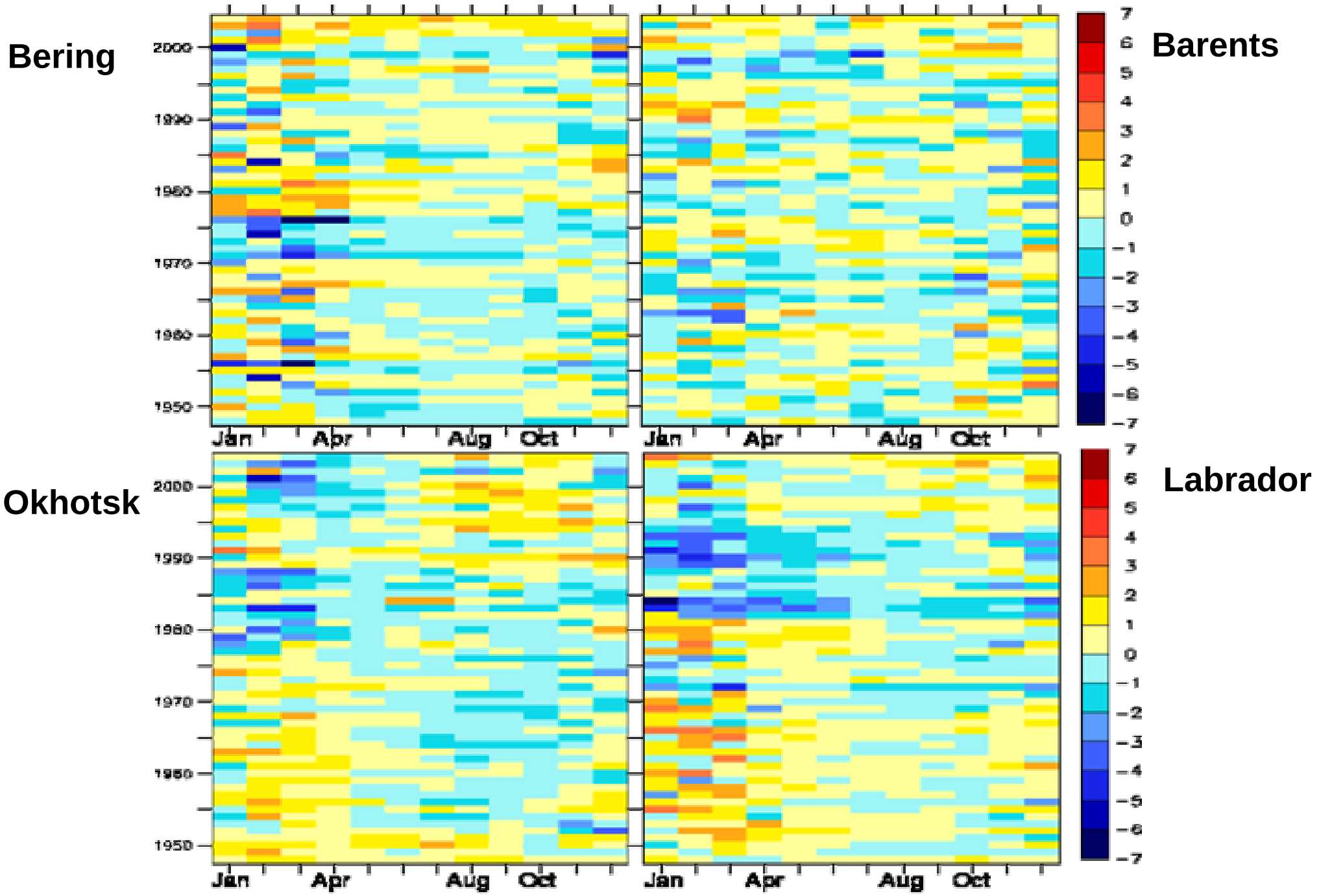
Seasonal Averaged Surface Wind Vector (at 10m)



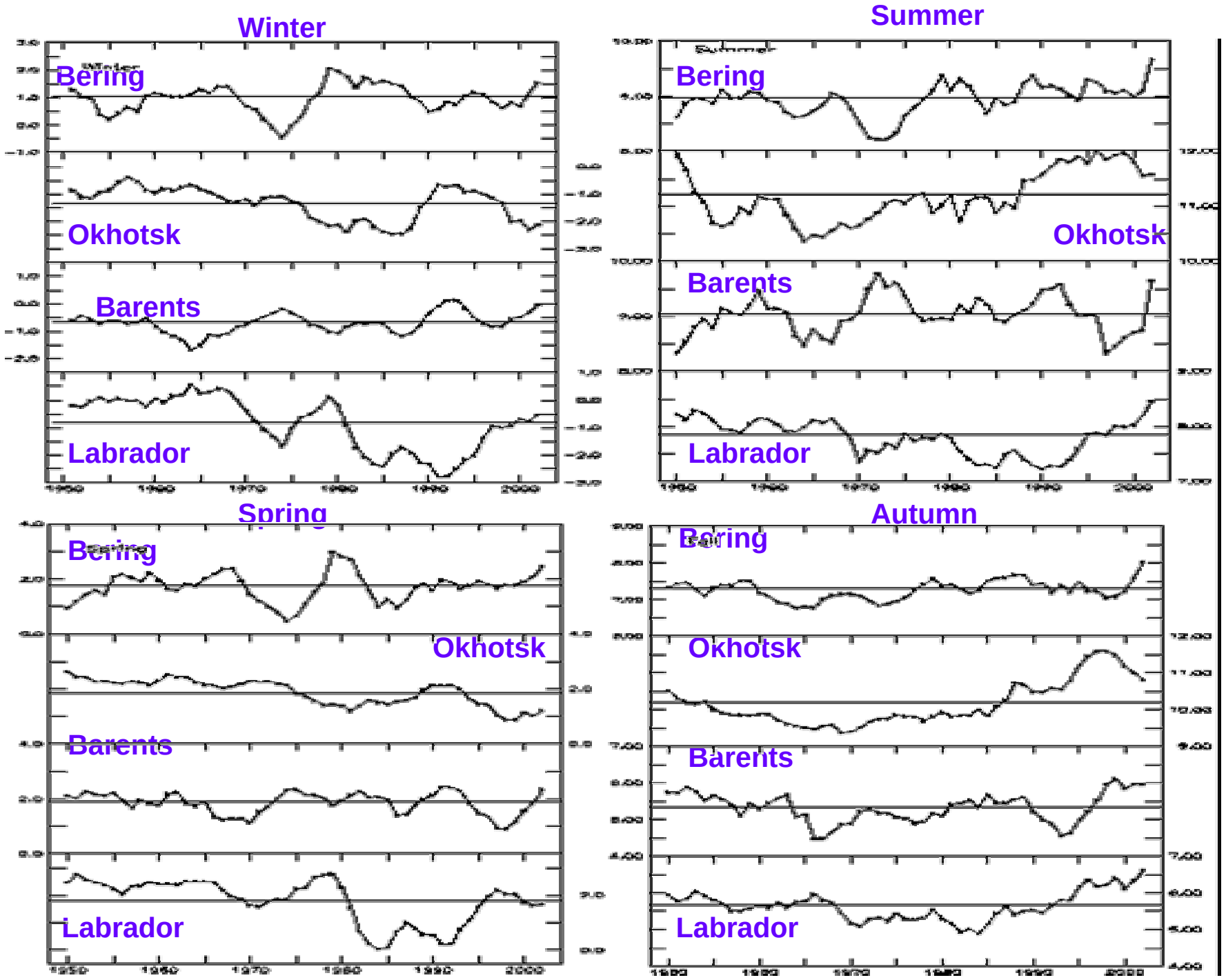
Climatology of Surface Air Temperature



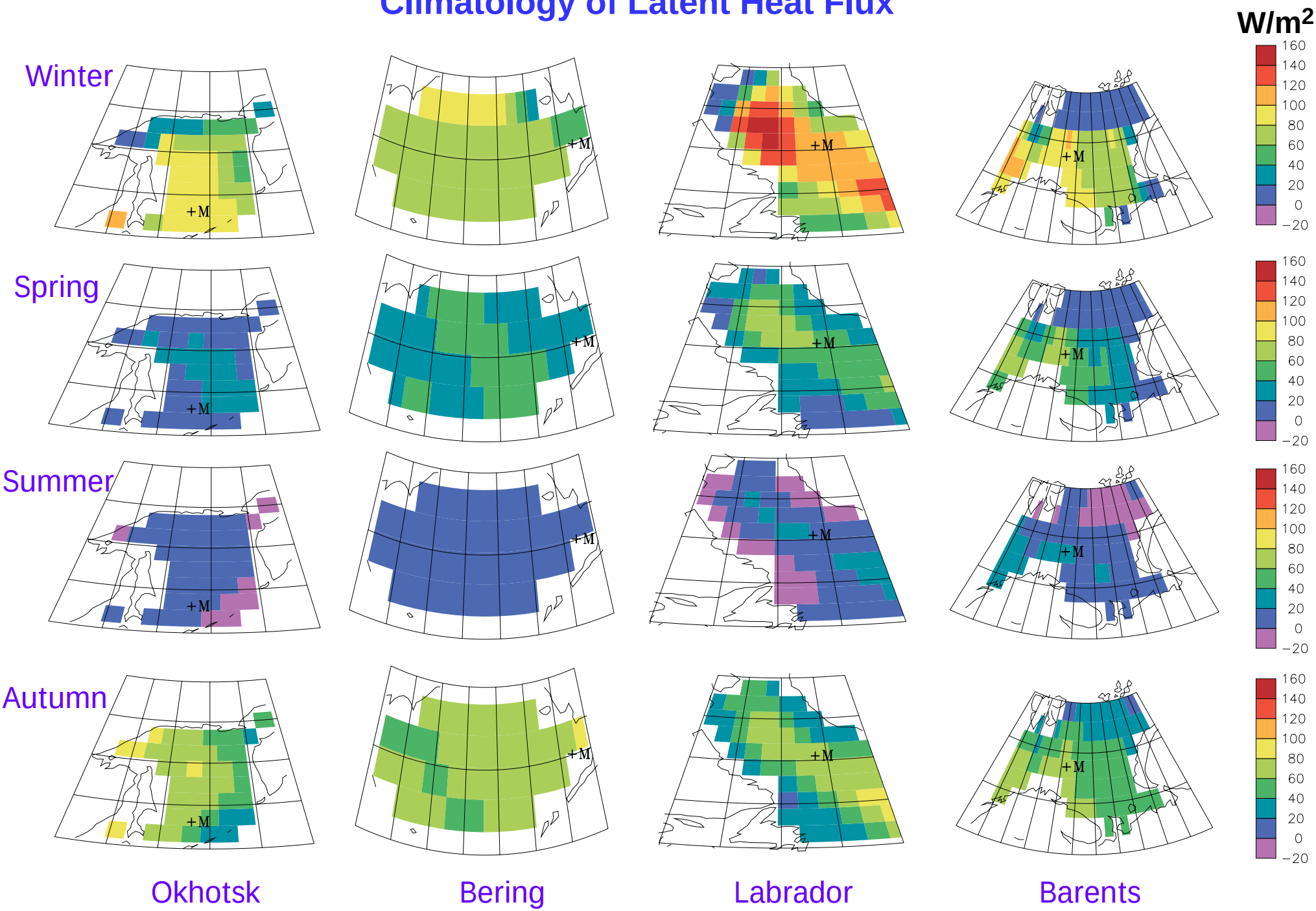
Monthly Surface Air Temperature (2m) Anomalies



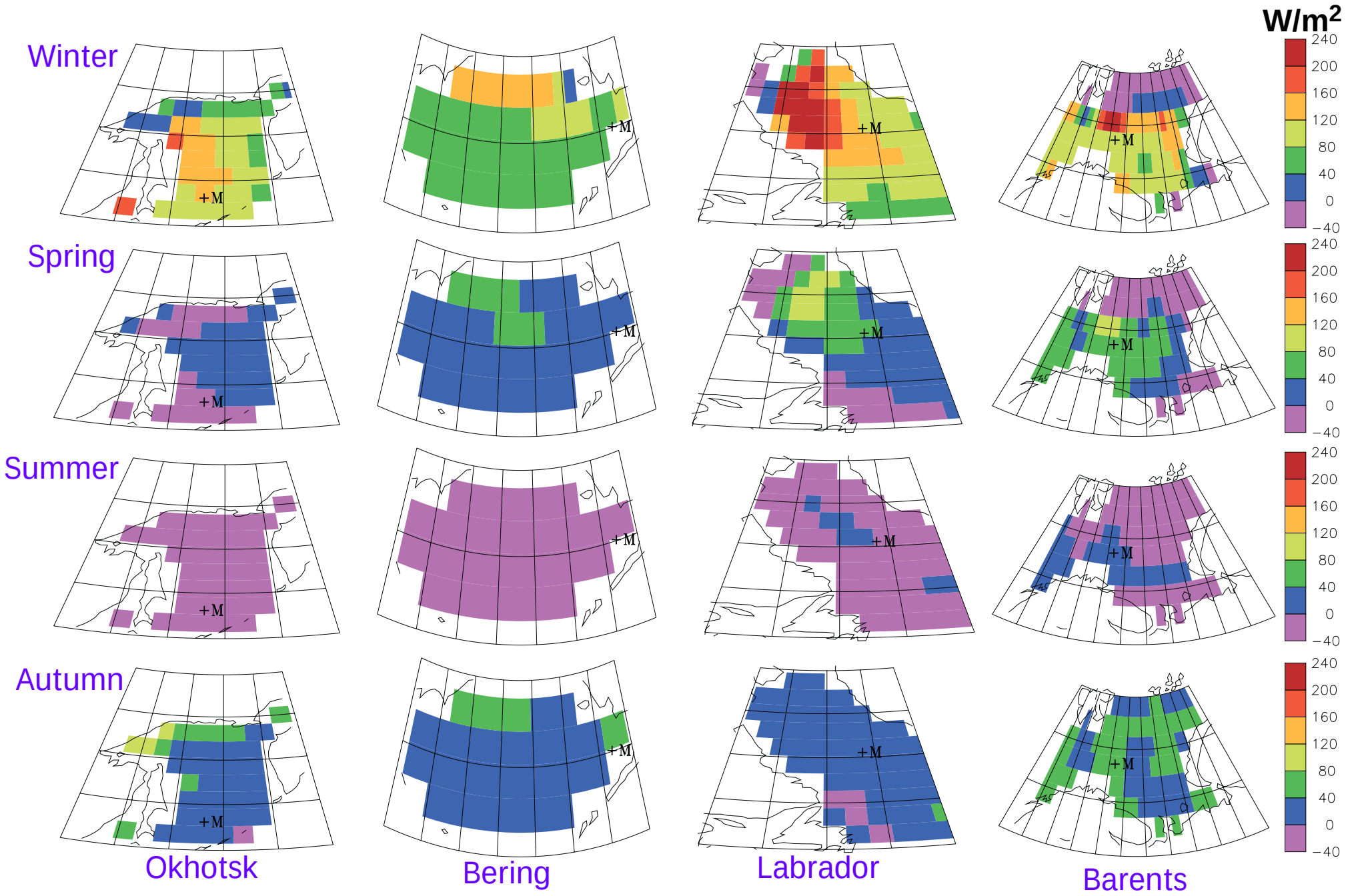
Seasonal Mean Surface Air Temperature



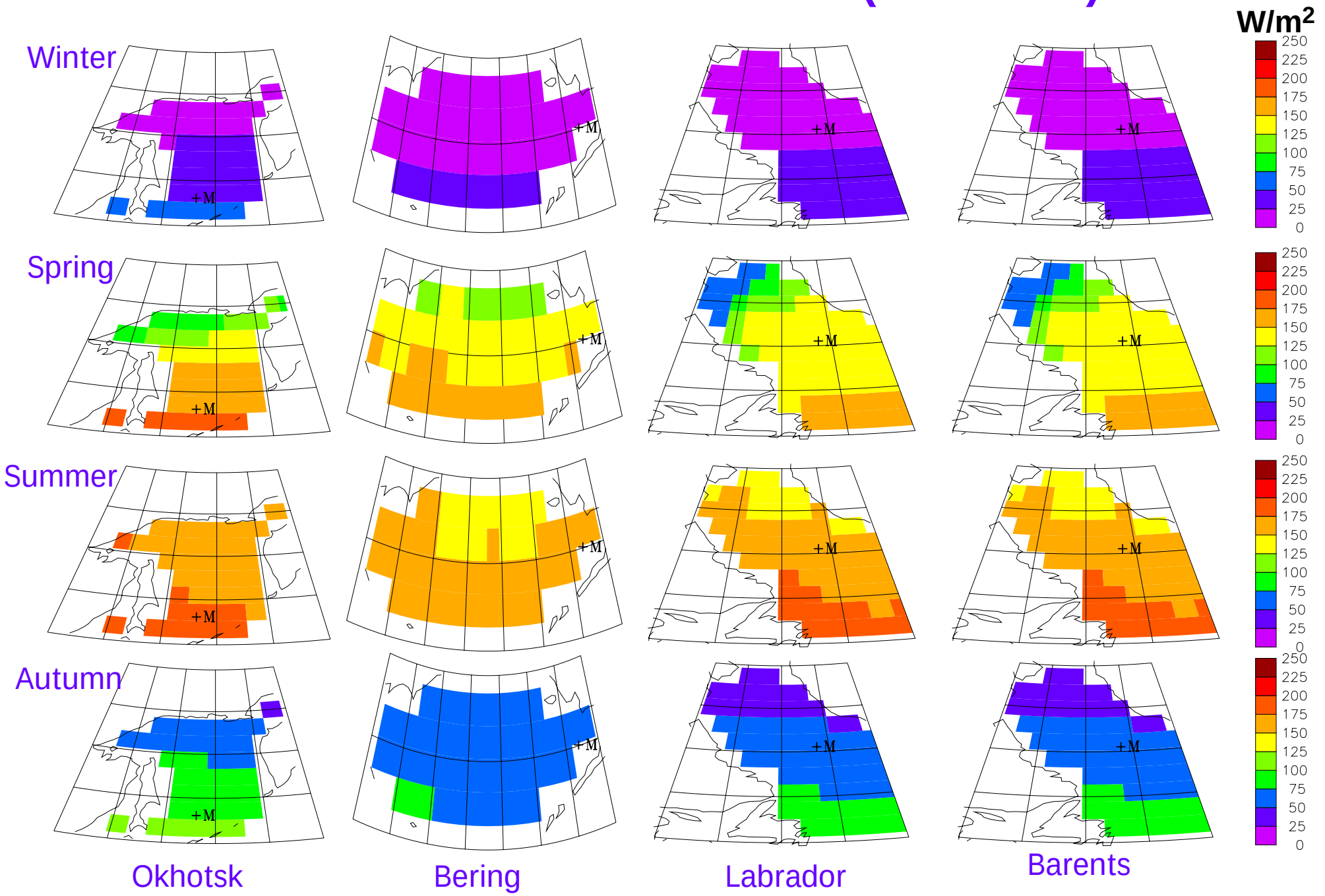
Climatology of Latent Heat Flux



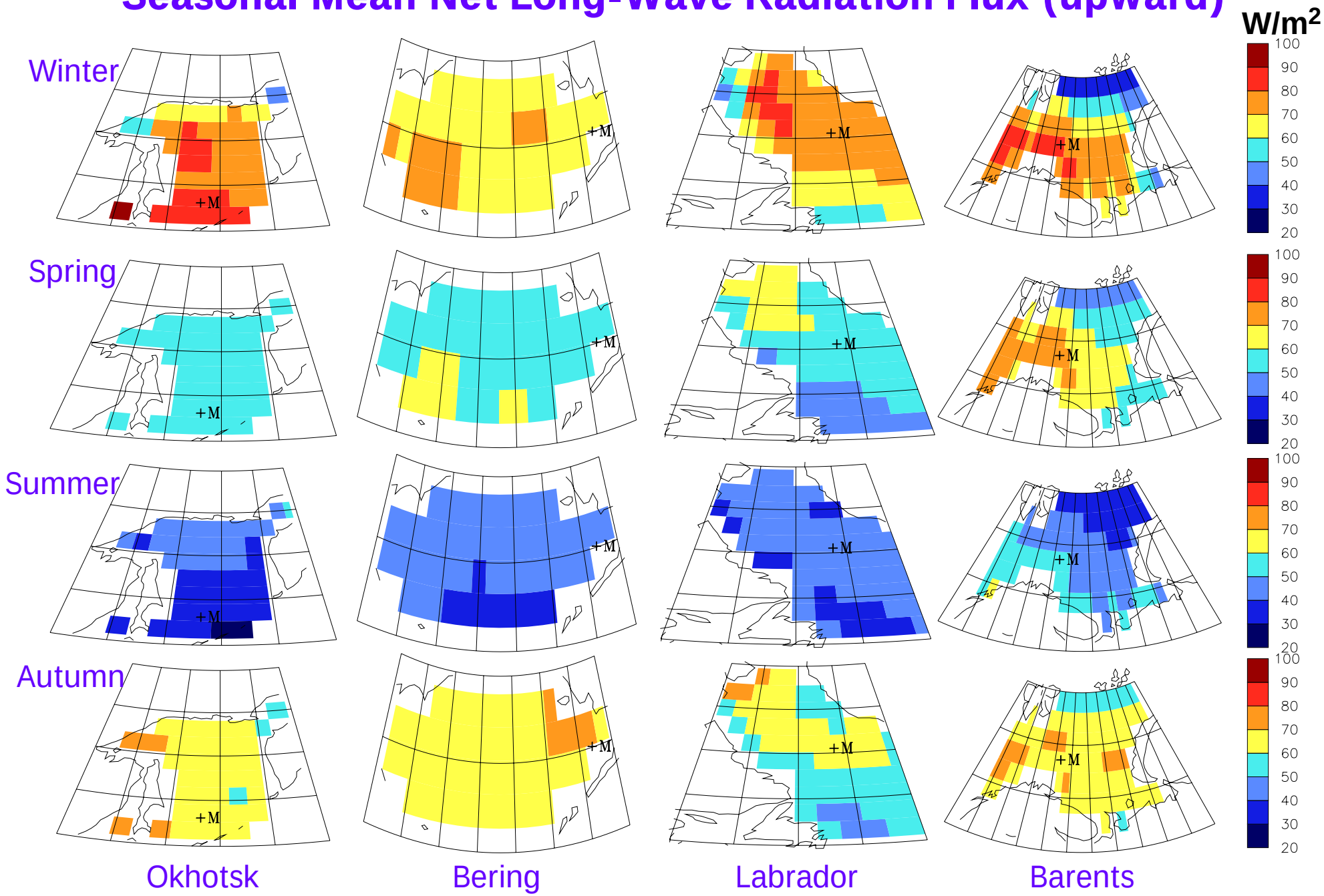
Climatology of Sensible Heat Flux



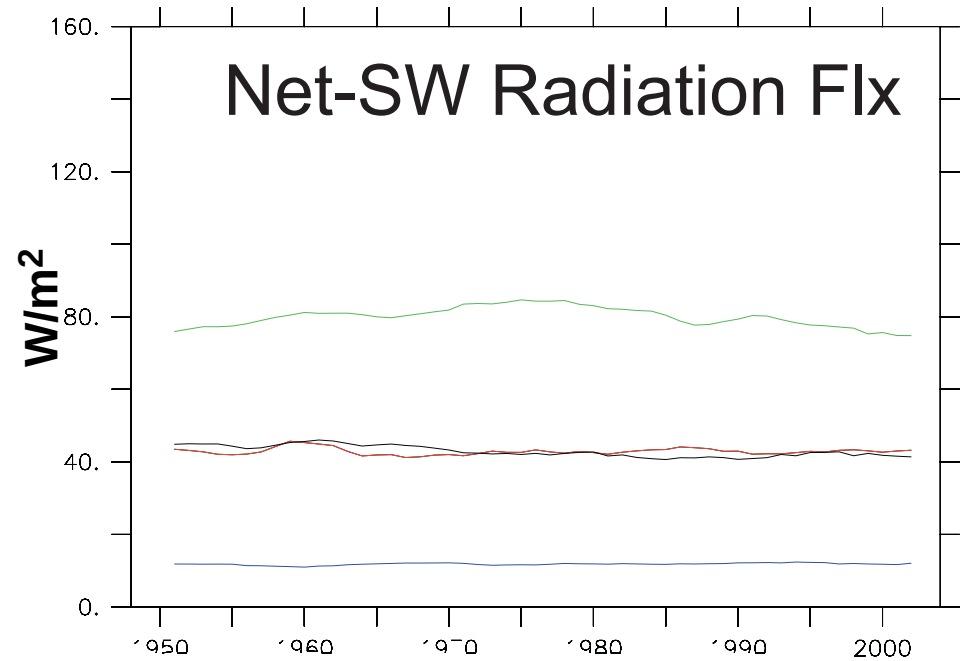
Net Short Wave Radiation Flux (downward)

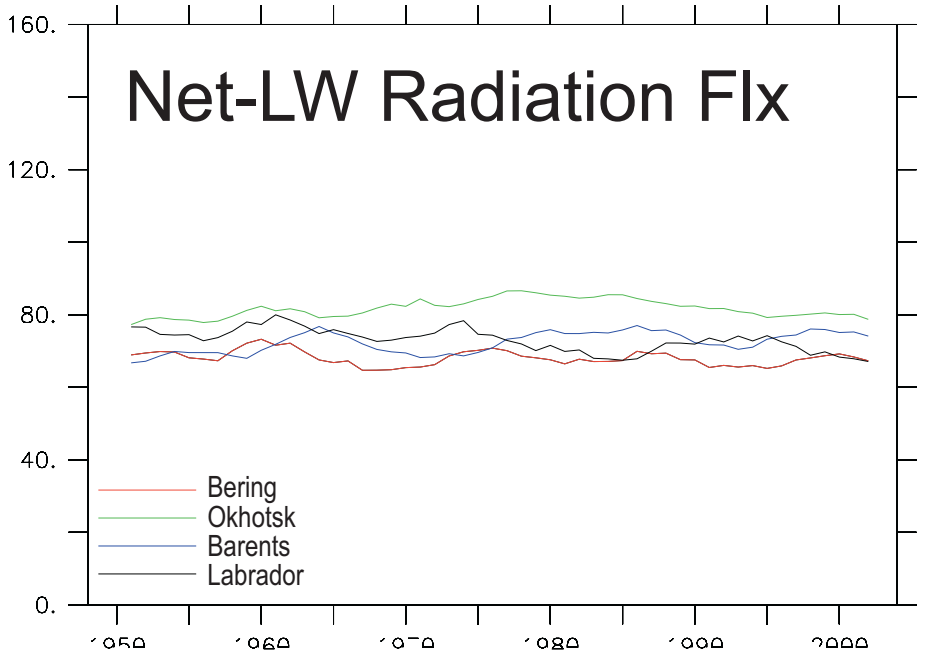


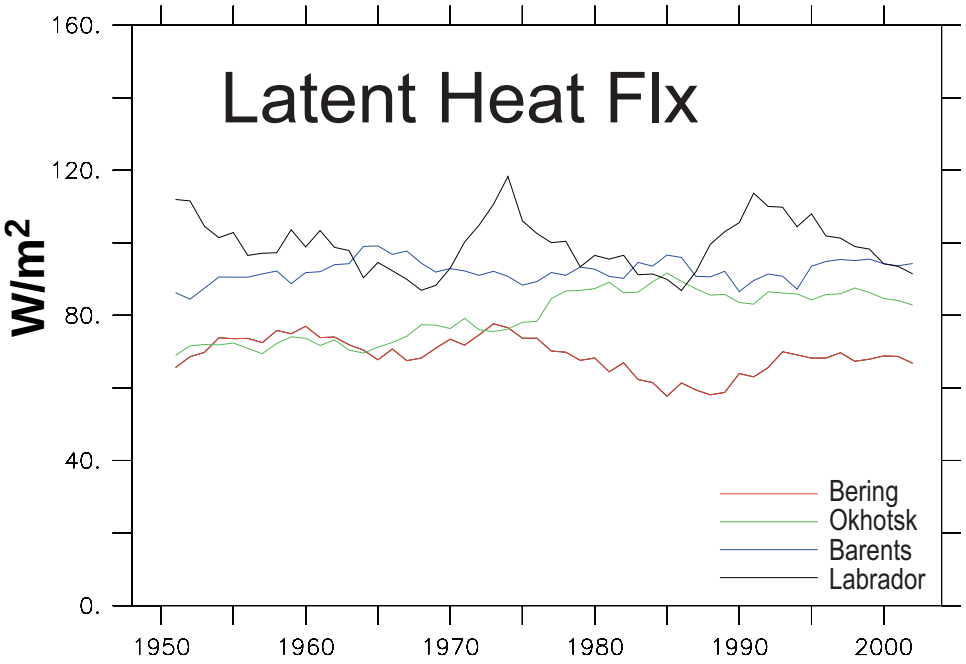
Seasonal Mean Net Long-Wave Radiation Flux (upward)

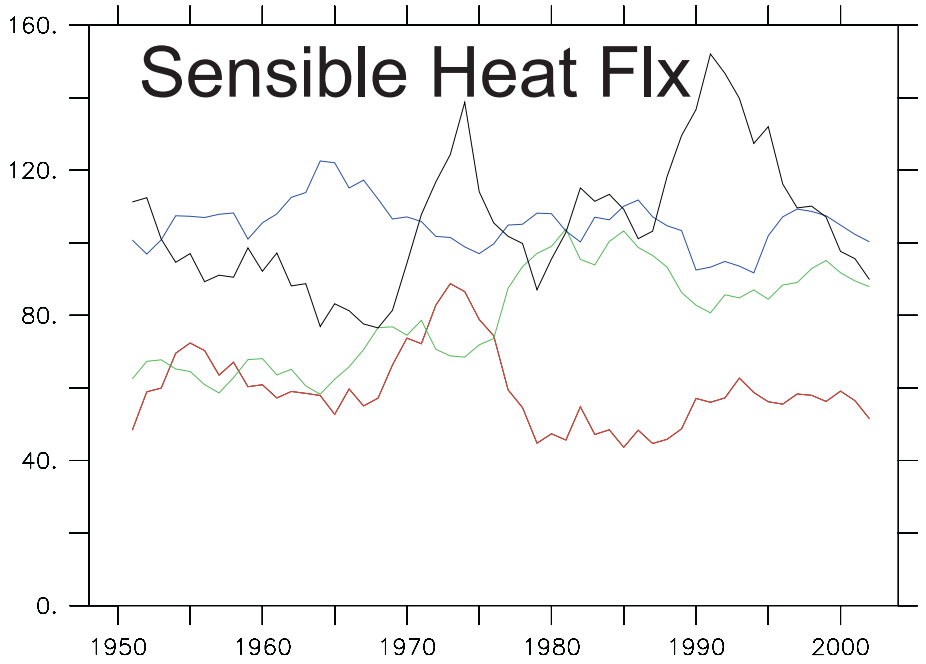


WINTER

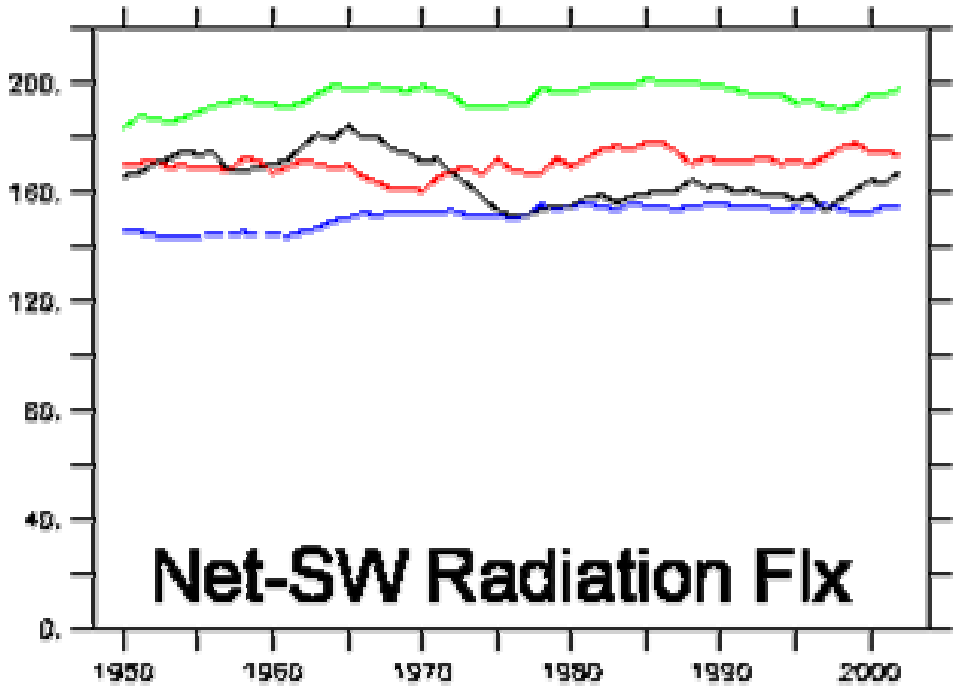

Net-SW Radiation Flx
W/m2
160.
120.
80.
40.
0.
1950
1960
1970
1980
1990
2000

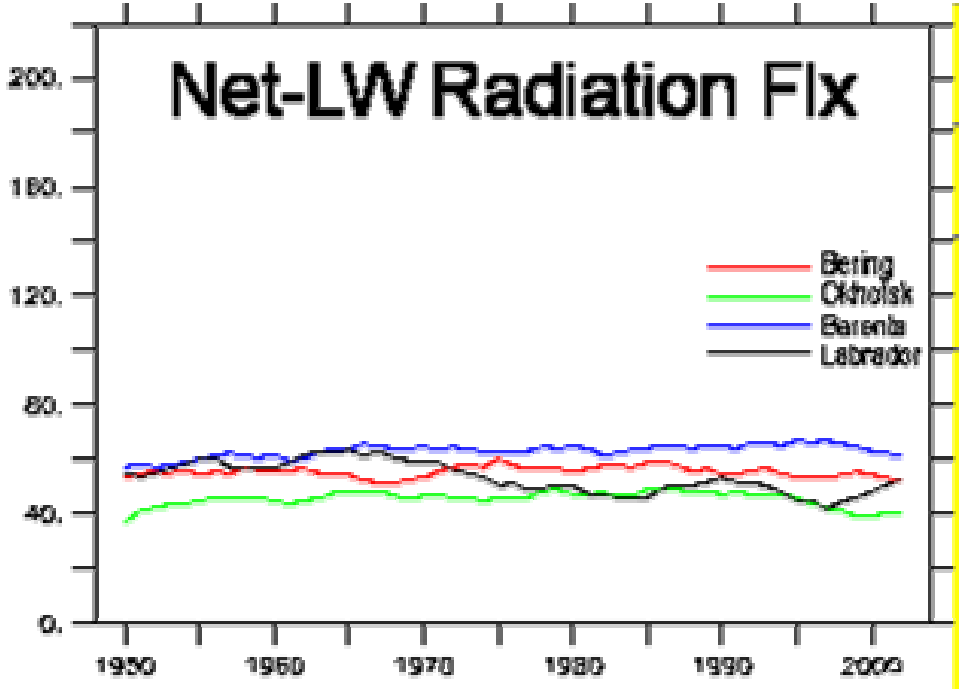

Net-LW Radiation Flx
160.
120.
80.
40.
0.
Bering
Okhotsk
Barents
Labrador

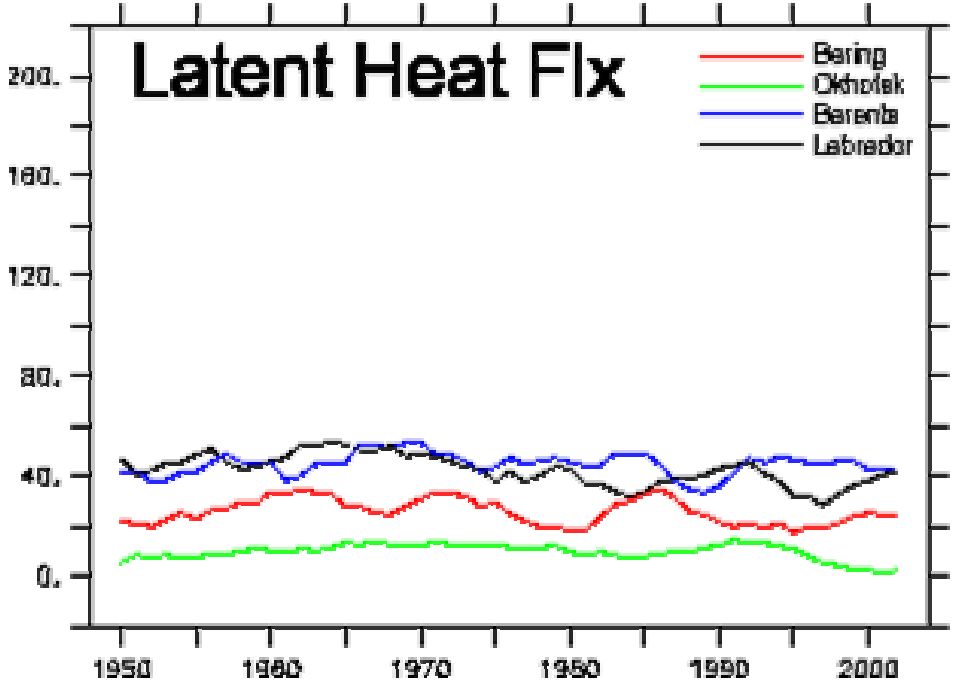

Latent Heat Flx
W/m2
160.
120.
80.
40.
0.
1950
1960
1970
1980
1990
2000
Bering
Okhotsk
Barents
Labrador

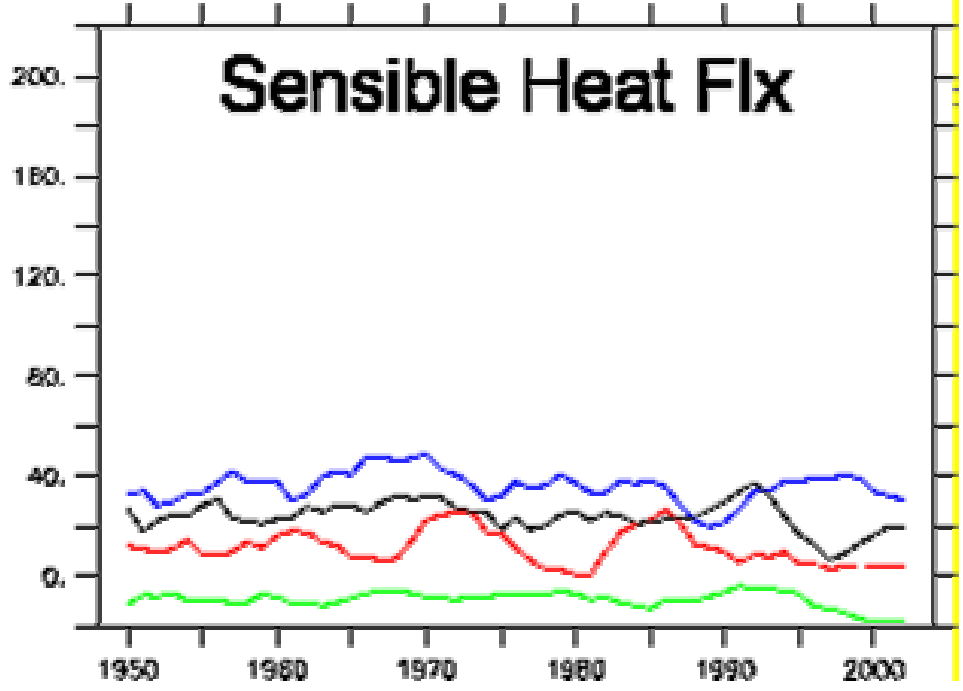

Sensible Heat Flx
160.
120.
80.
40.
0.
1950
1960
1970
1980
1990
2000

SPRING

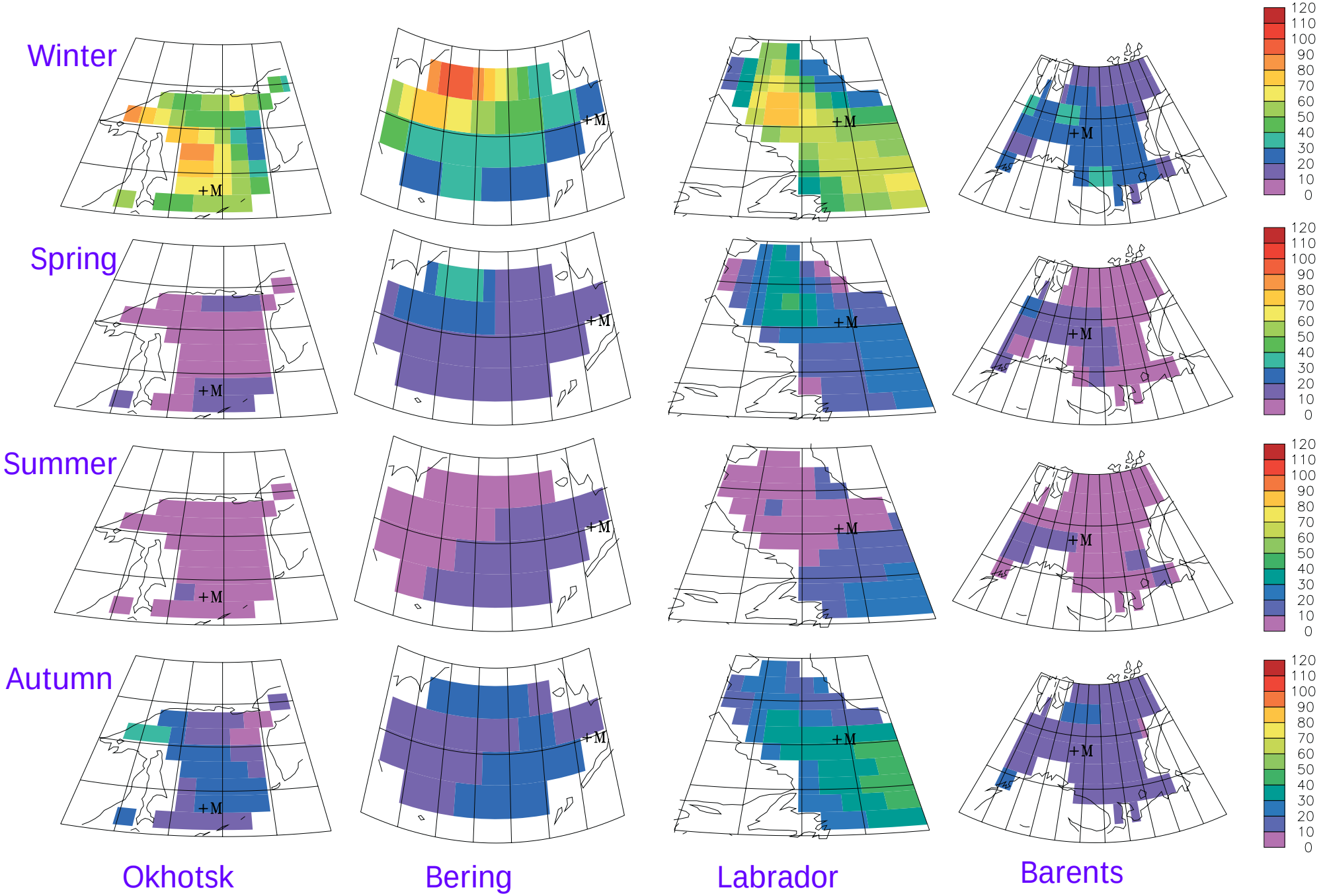

Net-SW Radiation Flx
200.
160.
120.
80.
40.
0.
1950
1960
1970
1980
1990
2000


Net-LW Radiation Flx
Bering
Okhotsk
Barents
Labrador
200.
160.
120.
80.
40.
0.
1950
1960
1970
1980
1990
2000


Latent Heat Flx
Bering
Okhotsk
Barents
Labrador
200.
160.
120.
80.
40.
0.
1950
1960
1970
1980
1990
2000


Sensible Heat Flx
200.
160.
120.
80.
40.
0.
1950
1960
1970
1980
1990
2000

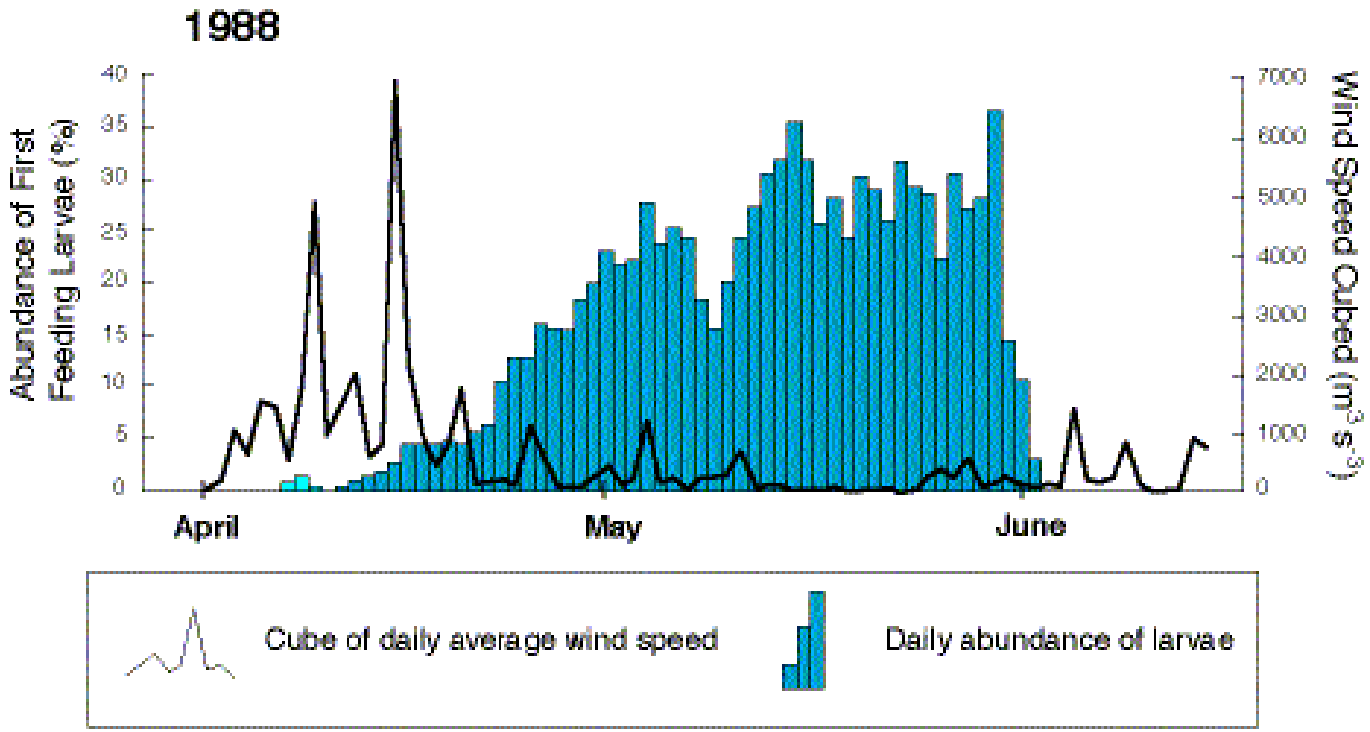
Climatology of WIND MIXING



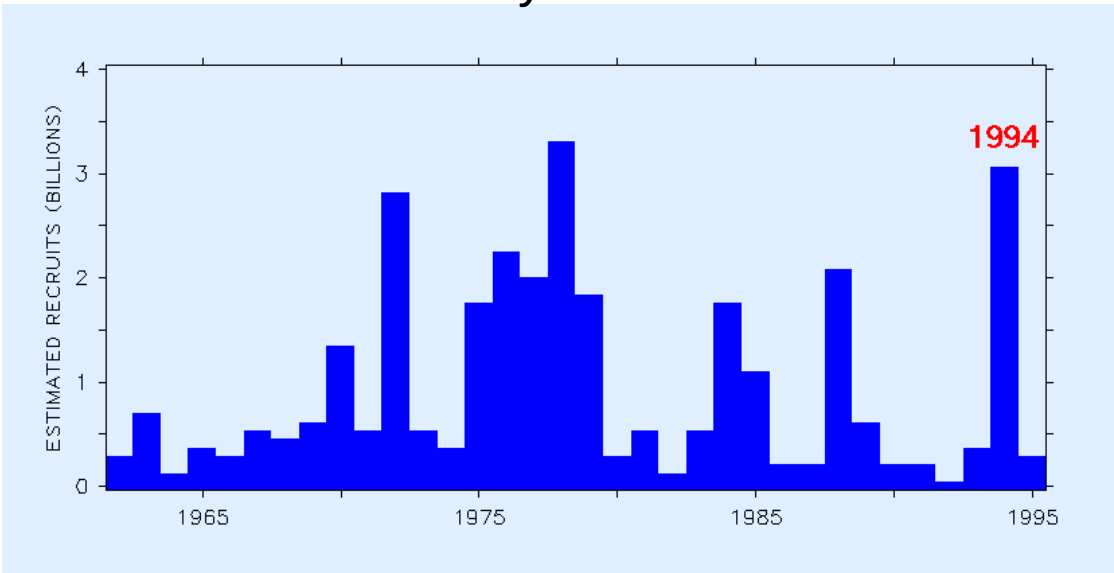
SUMMARY

Similarities	Differences
• No trend in the seasonal SLP (except winter) at all 4 sub-Arctic Seas. Downward trend in winter SLP at Bering, Labrador, and Barents seas (except Sea of Okhotsk). • Prominent interannual variability of the winds in Spring and Fall. • Similar seasonal cycle of individual components of surface heat flux • The decadal variations of Tair are similar among the seasons, especially between winter and spring. The interannual variations in winter tend to be anti-correlated between Labrador and Barents, and between Okhotsk and Bering.	• There is little coherence in the fluctuations between the Pacific (Bering) and Atlantic (Barents, Labrador) sector in the winter downward SLP trend. • Winter wind variability is more pronounced in the Bering and Barents than in Okhotsk and Labrador. • The Labrador Sea displays greater mean and variability in latent and sensible heat fluxes in winter. • The decadal variations in summer and fall Tair are much different from winter and spring at Sea of Okhotsk. The anti-correlation of Tair is stronger in N. Atlantic sector than in N. Pacific sector.

Larval Survival vs. Wind Mixing

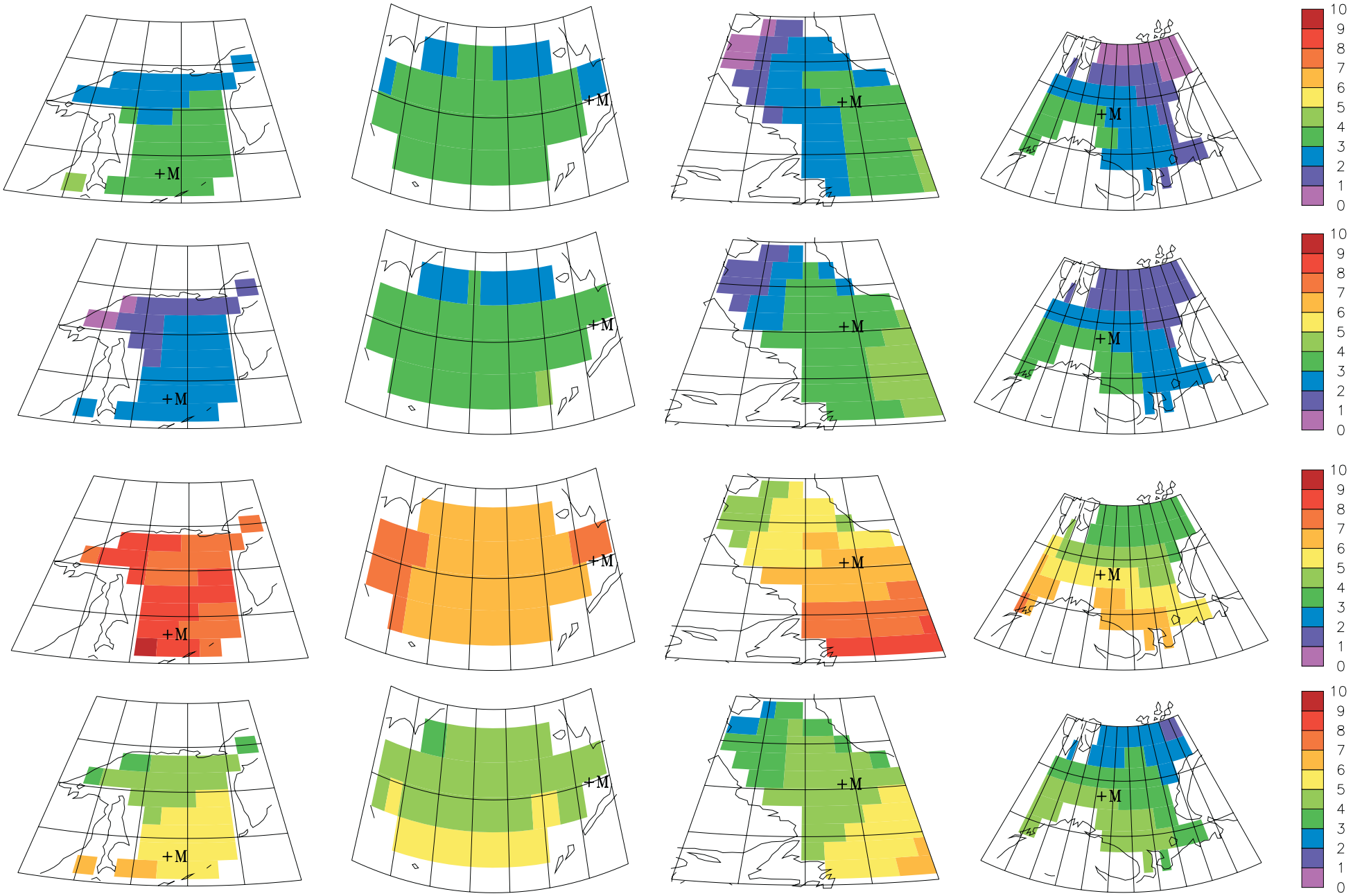


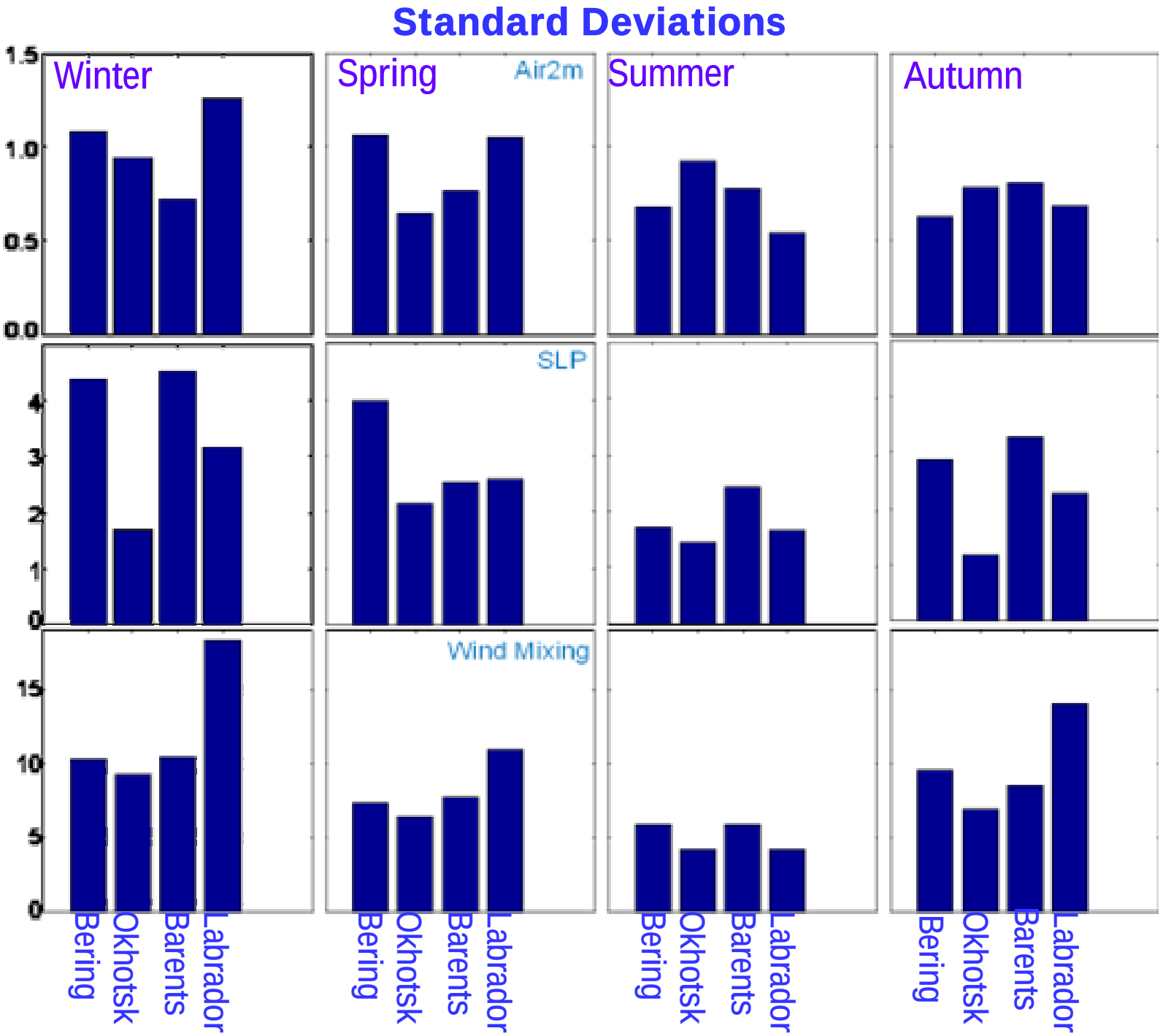
Gulf of Alaska Walleye Pollock Recruitment



http://www.pmel.noaa.gov/~miletta/web/foci_p2.html

Seasonal Mean Specific Humidity




Standard Deviations
Winter
Spring
Air2m
Summer
Autumn
SLP
Wind Mixing
1.5
1.0
0.5
0.0
4
3
2
1
0
15
10
5
0
Bering
Okhotsk
Barents
Labrador

Standard Deviations