

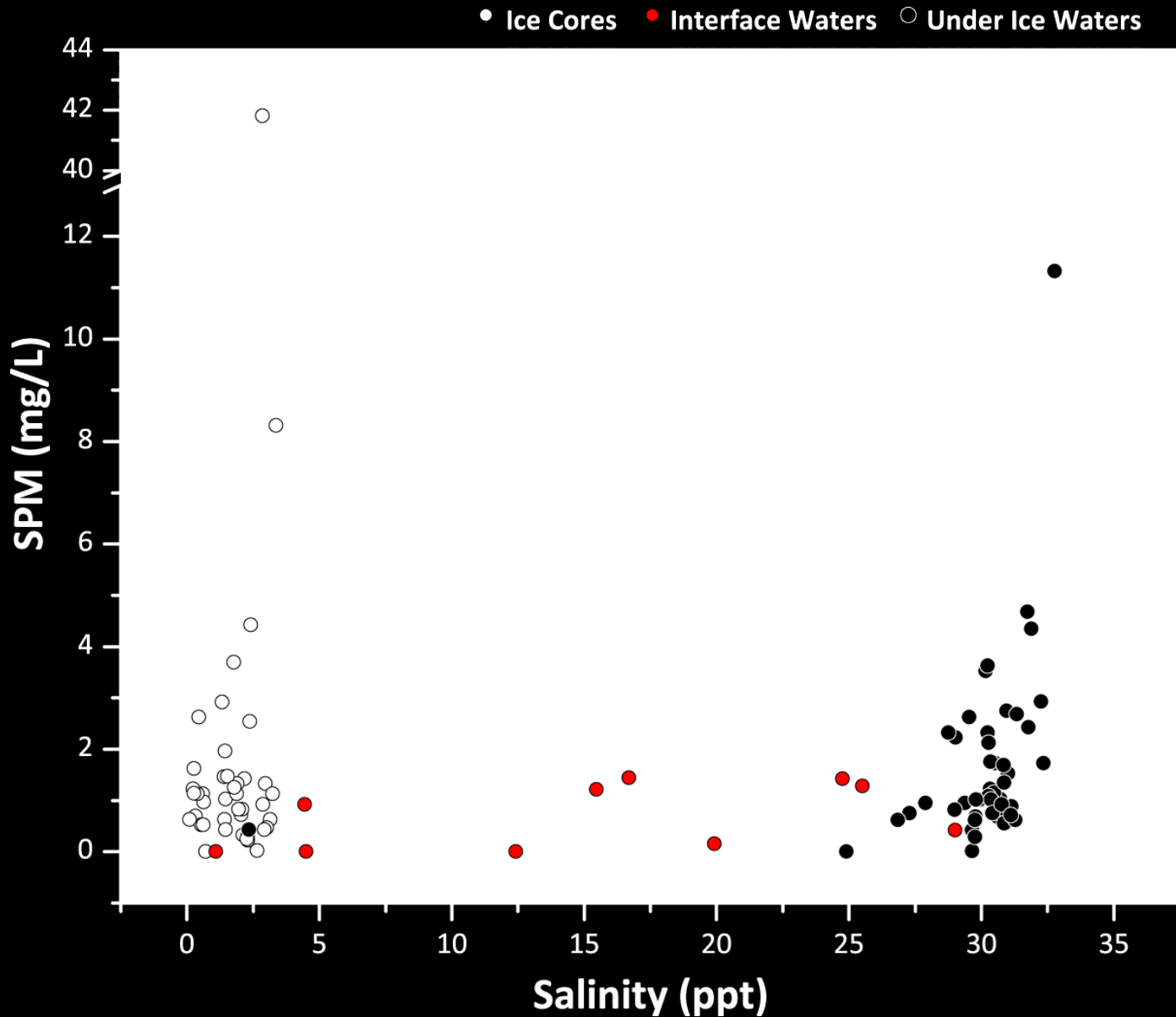


Data Contributions:

- 1) Point-Based *In Situ* Measurements:
 - a) Suspended Particulate Matter (SPM)
- 2) Matrix-Based *In Situ* Measurements:
 - a) CDOM Absorbance (and associated parameters)
 - b) Optical Profiles
- 3) Gridded Satellite Products:
 - a) Sea Ice Persistence, Timing of Breakup and Formation
 - b) Chlorophyll-*a* Concentrations/NPP
 - c) Sea surface temperature

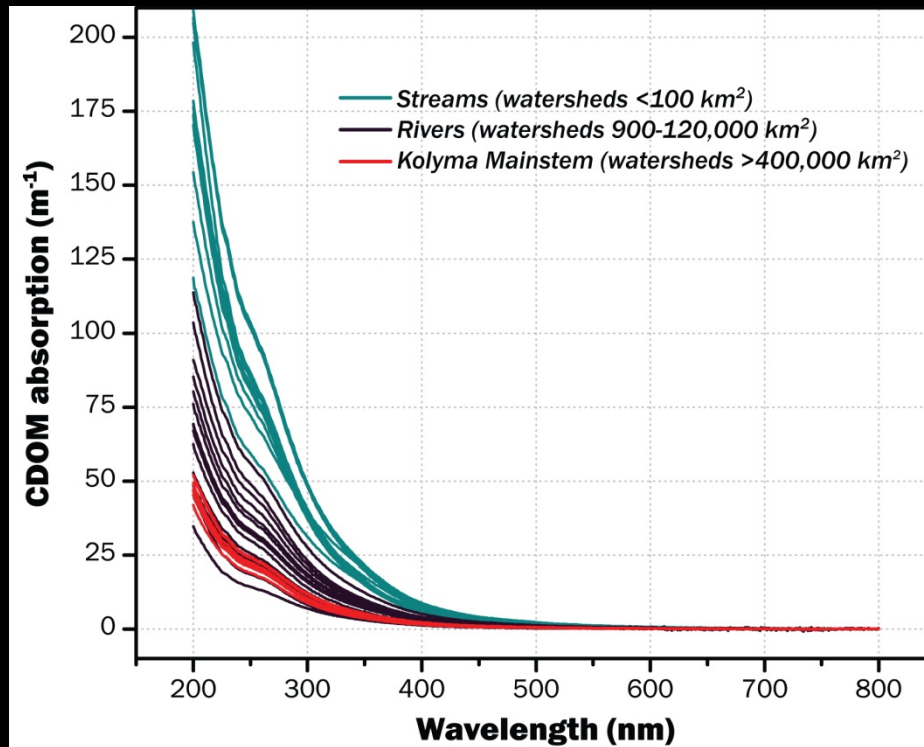
Karen Frey
 Graduate School of Geography
 Clark University

(1) Point-Based *In Situ* Measurements: Suspended Particulate Matter (SPM)



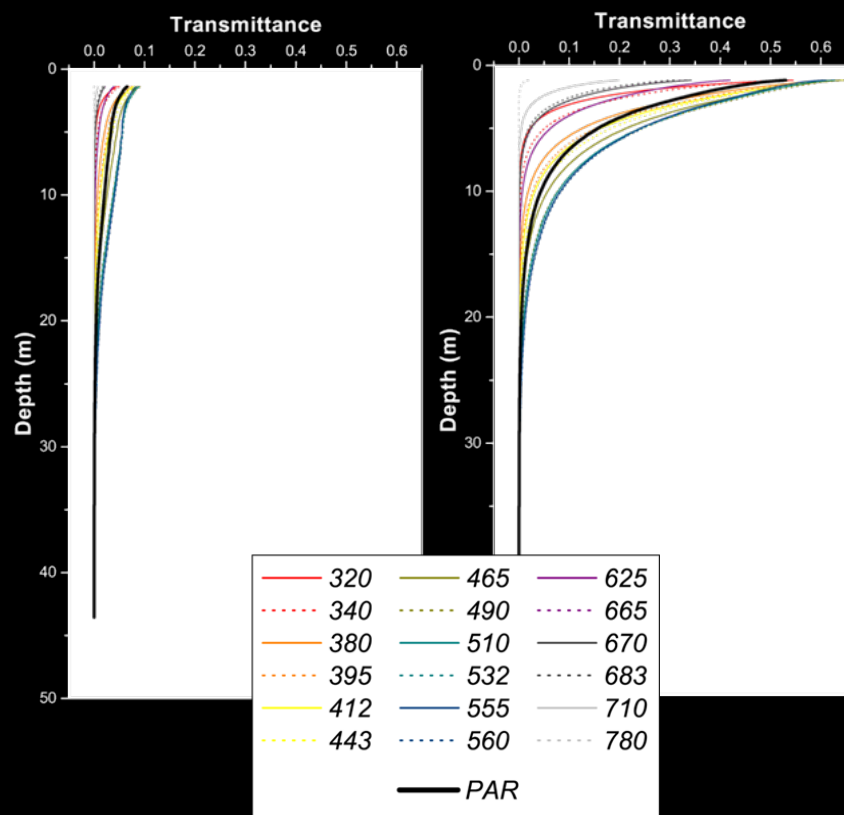
(2) Spreadsheet/Matrix-Based *In Situ* Measurements: CDOM Absorbance (and associated parameters)

a_{250} , a_{254} , a_{350} , a_{365} , a_{375} , a_{412} , a_{440} , $a_{250}:a_{365}$, $S_{290-350}$, $S_{275-295}$, $S_{350-400}$, $S_{275-295}:S_{350-400}$



Wavelength (nm)	Site 1/Depth A	Site 1/Depth B	Site 1/Depth C
200	62.3932	204.8180	85.3103
201	60.7811	201.8241	83.6982
202	59.6296	198.5999	82.3164
203	58.9387	196.2969	81.1649
204	57.5569	193.3030	80.0134
205	56.6357	191.0000	79.0922
206	56.1751	189.1576	77.9407
207	54.7933	185.0122	76.0983
208	53.6418	182.0183	74.7165
209	53.1812	180.1759	73.7953
210	51.7994	176.2608	72.1832
211	50.8782	173.2669	70.5711
212	50.1873	170.9639	69.6499
213	49.2661	168.2003	68.4984
214	48.3449	164.9761	67.1166
215	47.8843	162.9034	66.1954
216	46.7328	159.9095	64.8136
217	46.0419	157.1459	63.8924
218	45.3510	154.8429	62.5106
219	44.4298	152.0793	61.5894
220	43.7389	149.7763	60.8985
221	42.8177	147.2430	59.7470
222	42.1268	145.1703	58.8258
223	41.2056	142.4067	57.6743
224	40.7450	139.8734	56.5228
225	39.8238	137.3401	55.6016
226	39.3632	135.4977	54.9107
227	38.9026	134.3462	54.2198
228	38.4420	133.1947	53.7592
229	38.2117	132.0432	53.2986
230	37.9814	130.8917	52.8380
231	37.2905	128.5887	51.9168
232	36.5996	126.5160	50.9956
233	36.1390	124.6736	50.3047
234	35.4481	122.6009	49.3835

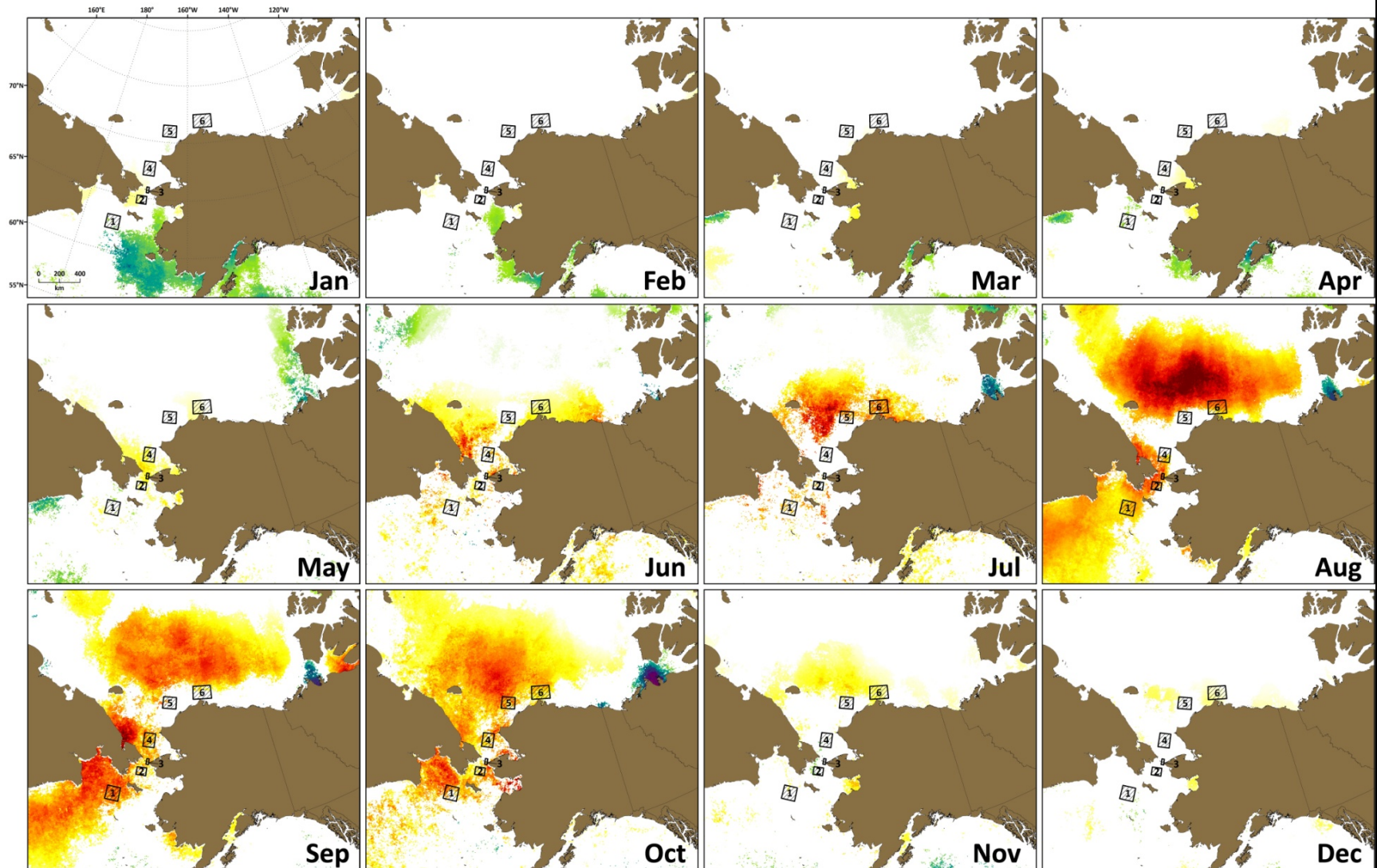
(2) Spreadsheet/Matrix-Based *In Situ* Measurements: Optical Profiles



[DateTime]	[LuZDepth]	[LuZ320]	[LuZ340]	[LuZ380]	[LuZ395]	[LuZ412]	[LuZ443]	[LuZ465]	[LuZ490]	[LuZ510]	[LuZ532]
7/17/2011 13:40	0.172738537	0.188854292	0.371679872	0.55418396	0.567236304	0.889064014	0.964381695	0.958402634	1.026483059	0.839922726	0.667323709
7/17/2011 13:40	0.179819927	0.190493137	0.373980105	0.554851174	0.572311163	0.900178373	0.963311732	0.954907835	1.026125789	0.837171555	0.665008485
7/17/2011 13:40	0.186877266	0.18836315	0.371330559	0.551779151	0.568012655	0.897099853	0.955203474	0.949035287	1.010520339	0.825666964	0.655491412
7/17/2011 13:40	0.192244112	0.193369702	0.380420327	0.562356889	0.583315194	0.918993652	0.971678734	0.966067672	1.029810429	0.844179809	0.669670165
7/17/2011 13:40	0.200224236	0.201773211	0.396901429	0.580683947	0.608889401	0.955936849	1.005111337	0.994438052	1.067600608	0.876700997	0.700840116
7/17/2011 13:40	0.207083136	0.209945798	0.413542956	0.597953141	0.63152343	0.985774279	1.036640882	1.022269249	1.104102373	0.906558633	0.726635754
7/17/2011 13:40	0.213784978	0.214353189	0.421003163	0.605352581	0.637316823	0.989000976	1.049473524	1.035681725	1.1159271	0.915628552	0.739727736
7/17/2011 13:40	0.221424967	0.211567521	0.410047203	0.593181729	0.616154194	0.949650645	1.026308179	1.015281796	1.081933022	0.885222852	0.72484982
7/17/2011 13:40	0.229833409	0.196218684	0.381607592	0.558847427	0.57751894	0.880252719	0.966495812	0.96234256	1.003696561	0.813948154	0.671659589
7/17/2011 13:40	0.237358496	0.172709838	0.344485492	0.514732659	0.51620084	0.799929559	0.885647118	0.893673003	0.909194946	0.733183742	0.60155201

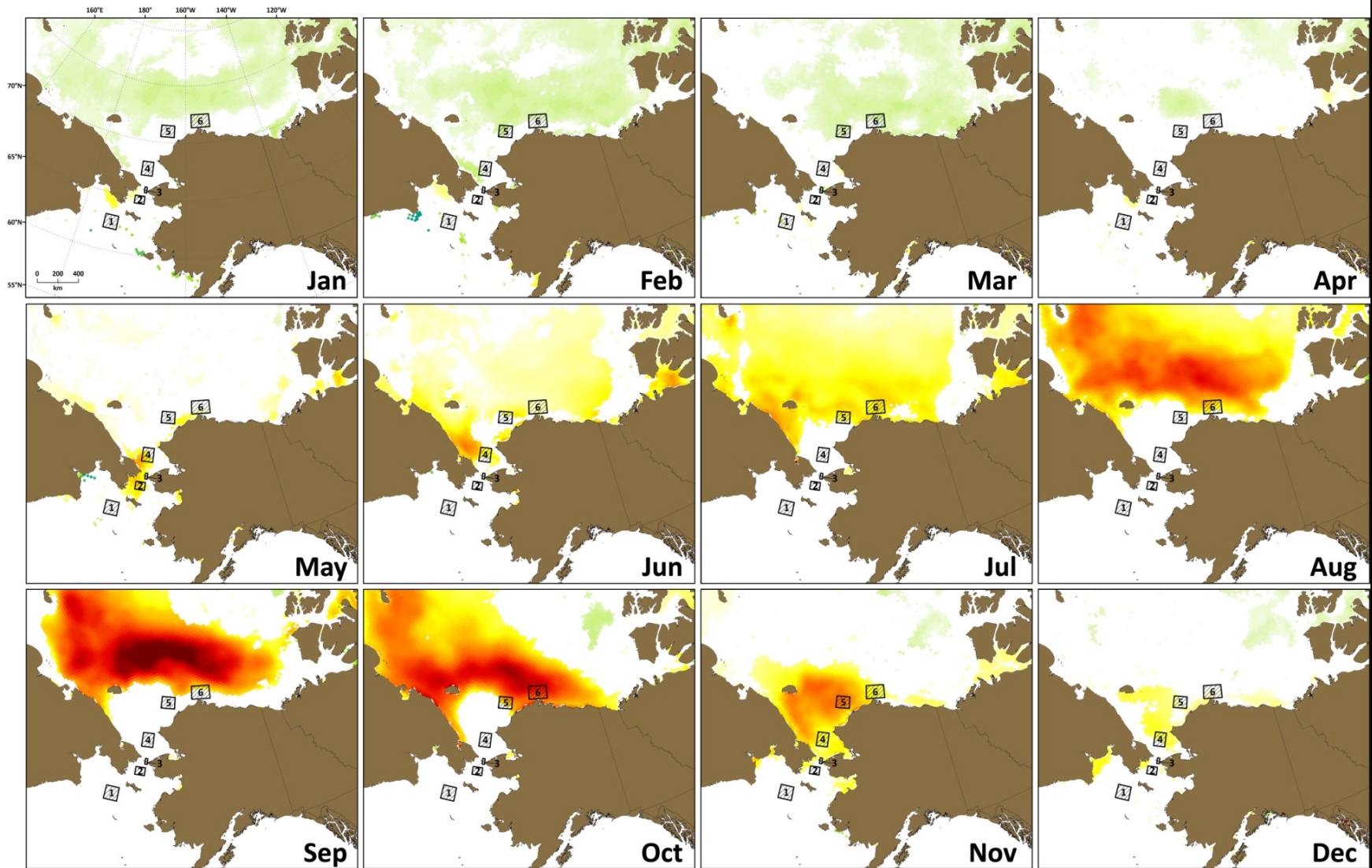
(3) Gridded Satellite Products

Trends in Sea Surface Temperatures

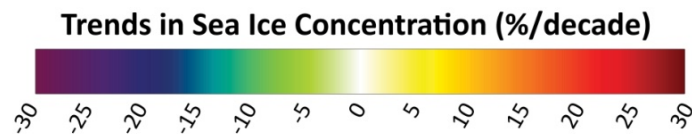


(3) Gridded Satellite Products

Trends in Sea Ice Concentration



Based on SMMR and SSM/I
(1979-2008)



(Mann-Kendall, $p < 0.1$)

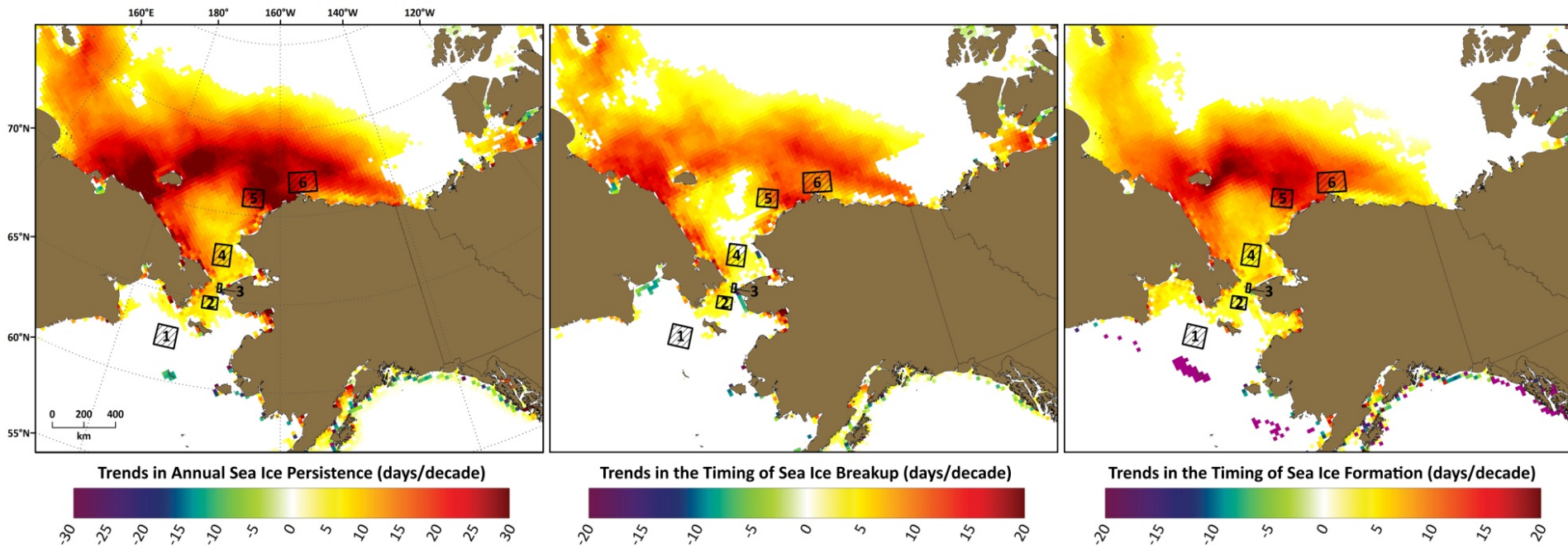
(3) Gridded Satellite Products

Trends in Sea Ice Cover/Timing of Events

Annual Persistence

Sea Ice Breakup

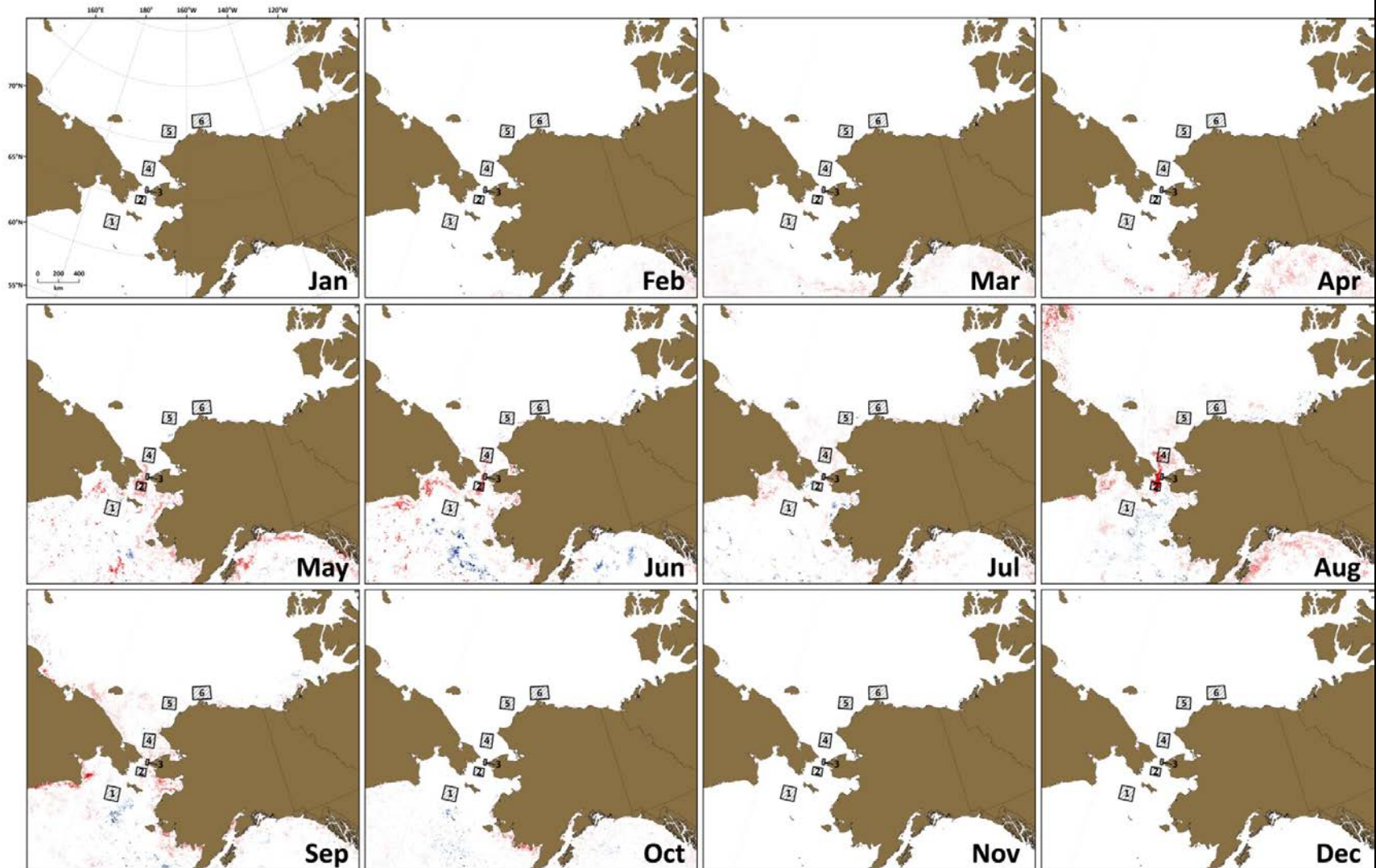
Sea Ice Formation



(Mann-Kendall, $p < 0.1$)

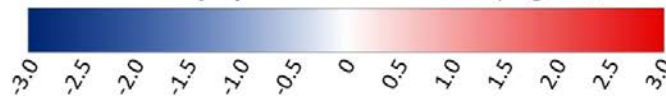
Based on SMMR and SSM/I Satellite-Derived Sea Ice Concentrations (1979-2008)

(3) Gridded Satellite Products Trends in Chl-a Concentrations



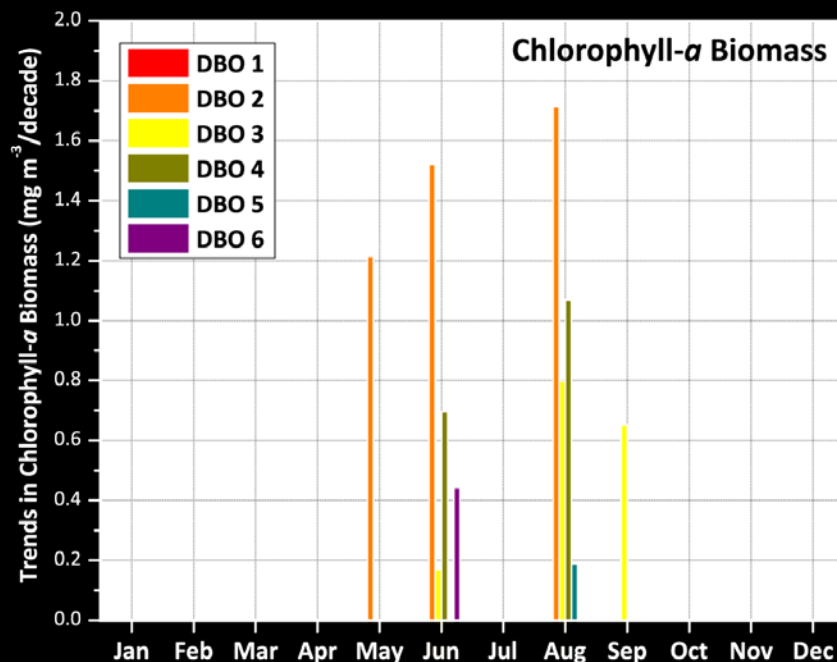
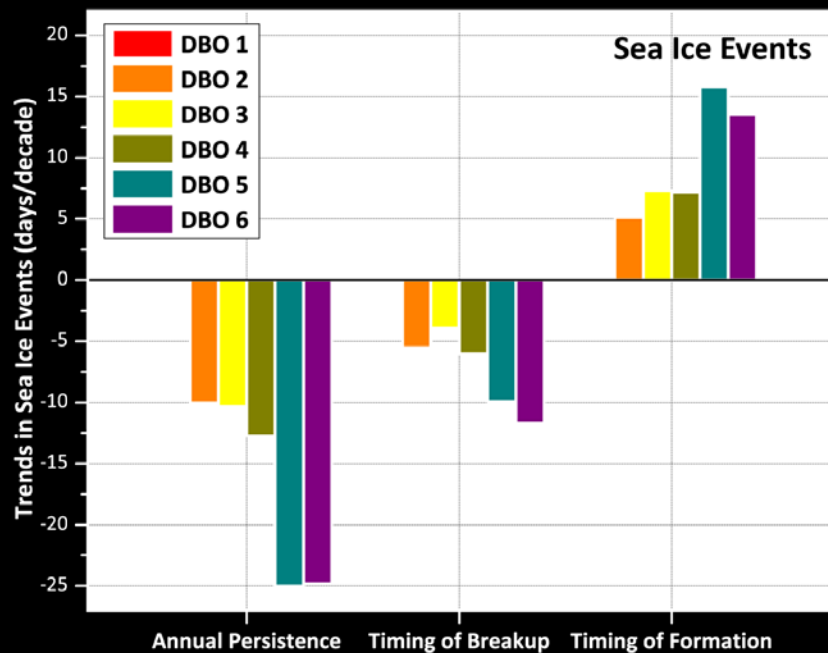
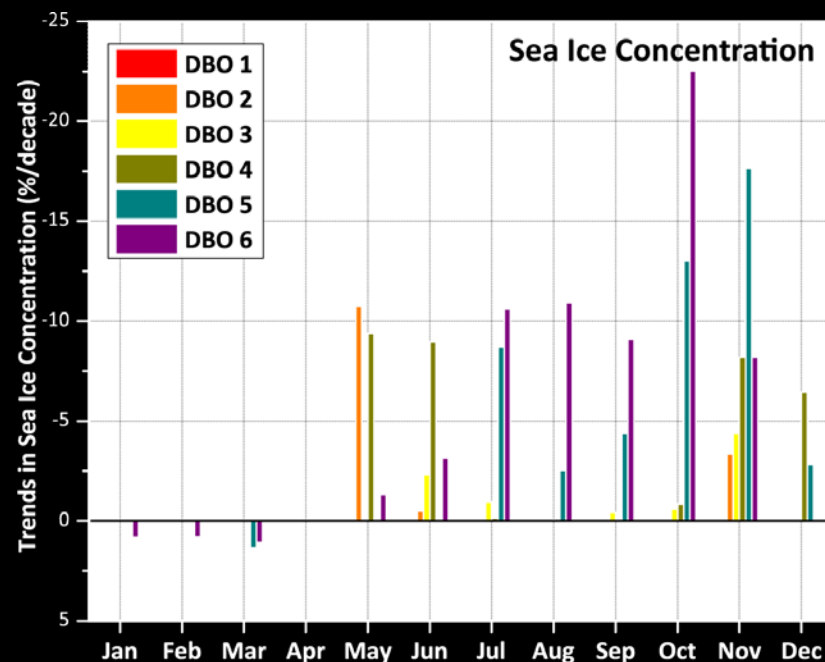
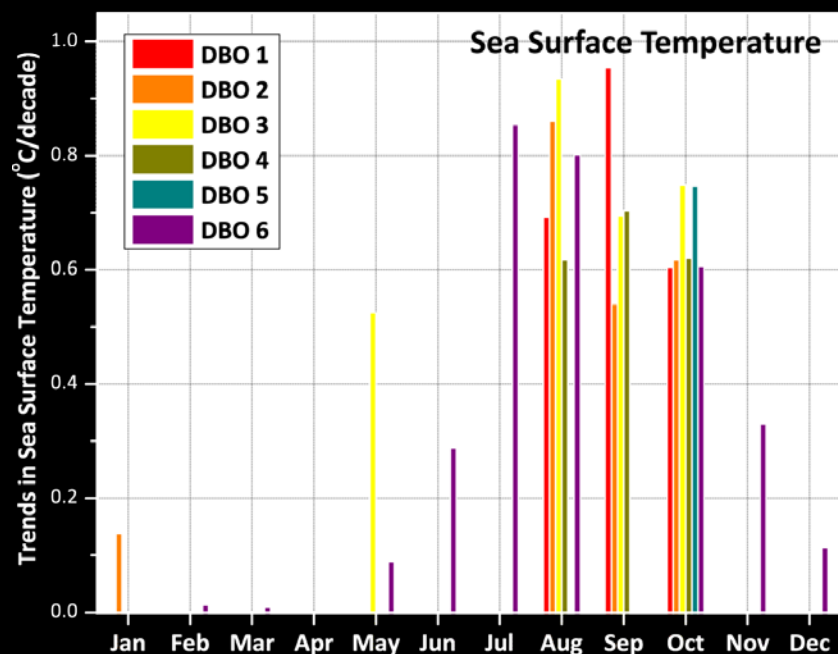
*Based on Globcolour Chl-a
Concentrations (1998-2009)*

Trends in Chlorophyll-a Concentration ($\text{mg m}^{-3}/\text{decade}$)

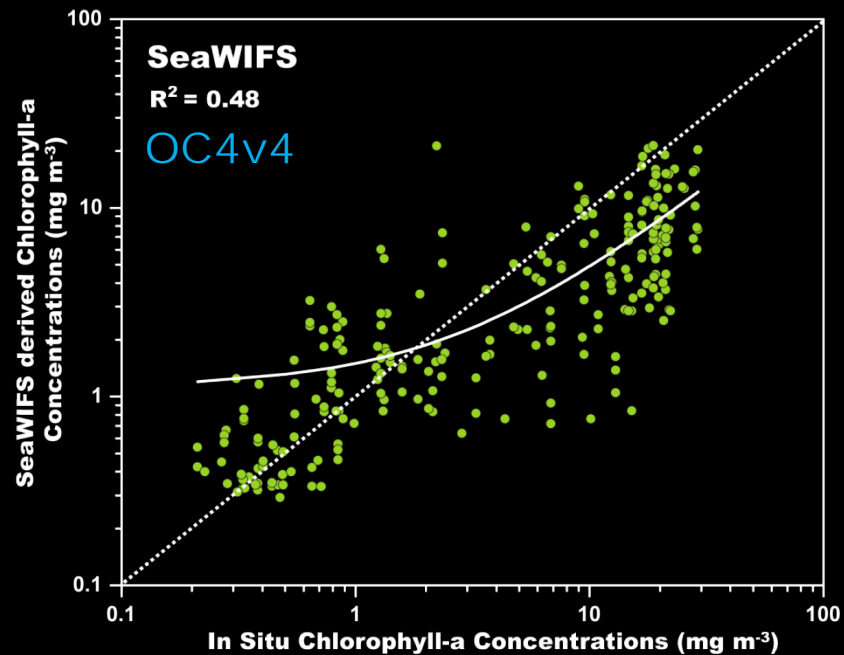
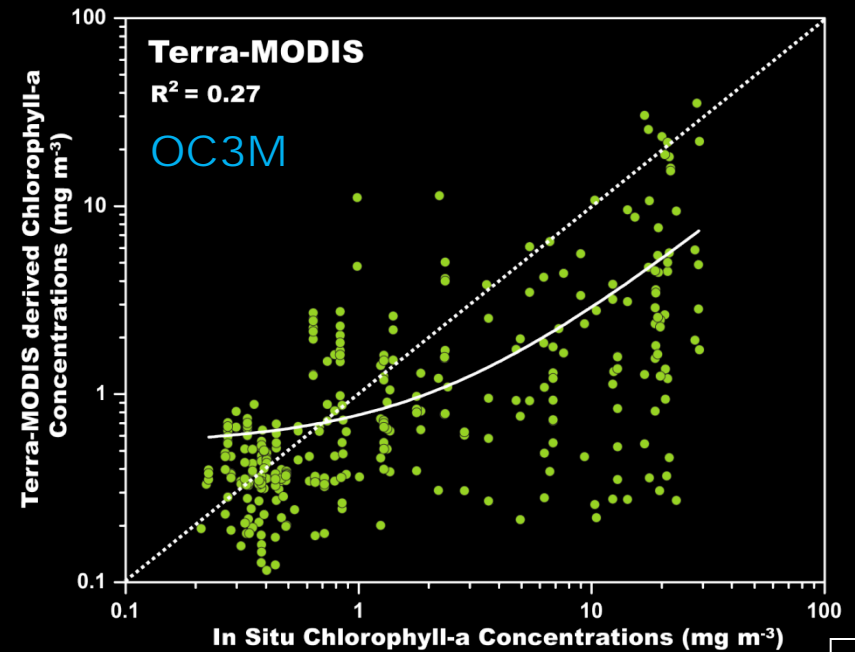
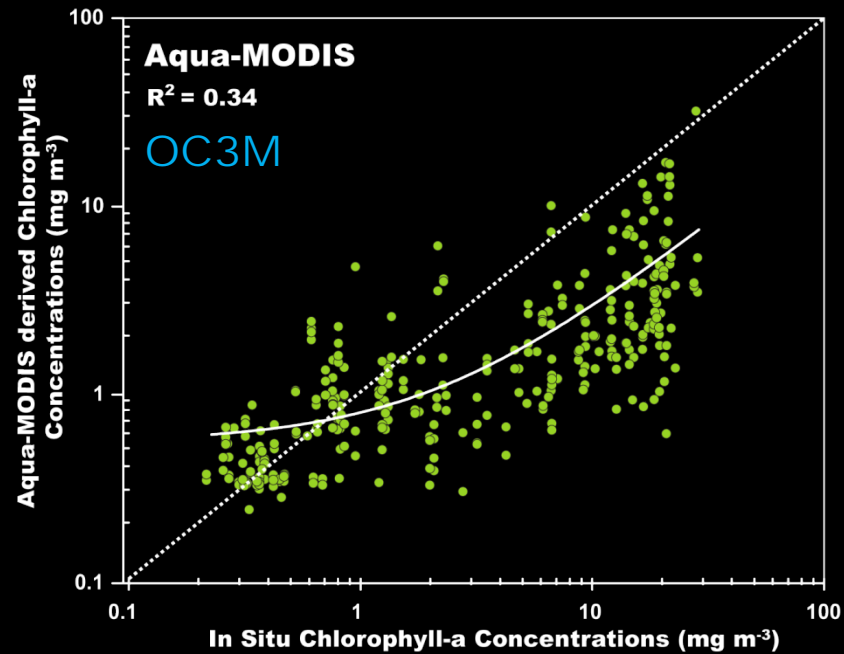


(Mann-Kendall, $p < 0.1$)

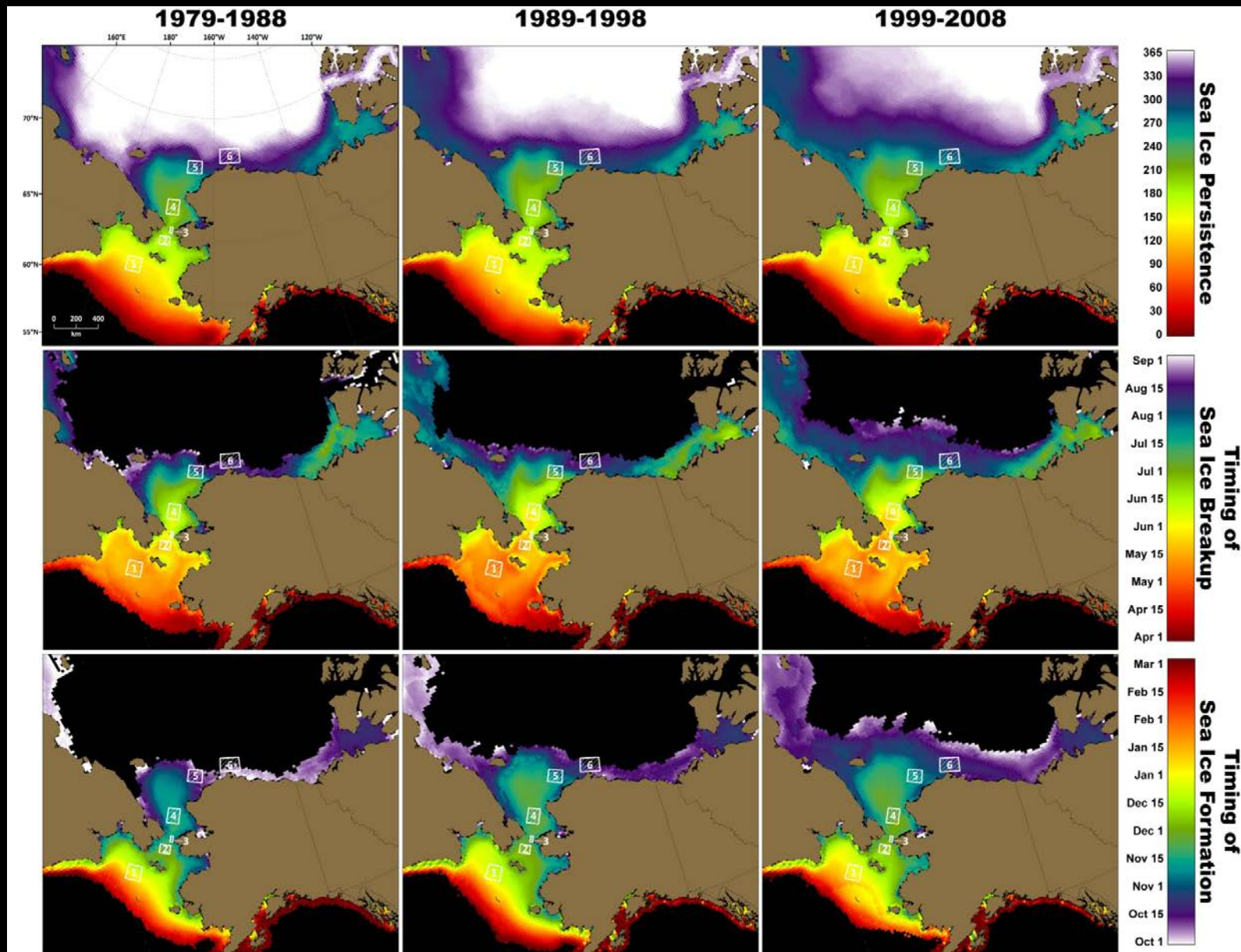
Trends in SST, Sea Ice Cover, Chl-*a* Biomass (Mann-Kendall, $p < 0.1$)



Satellite vs. *In Situ* Chl-*a* Concentrations



(3) Gridded Satellite Products: Sea Ice Persistence, Breakup, Formation



(3) Gridded Satellite Products: Chlorophyll-*a* Concentrations

