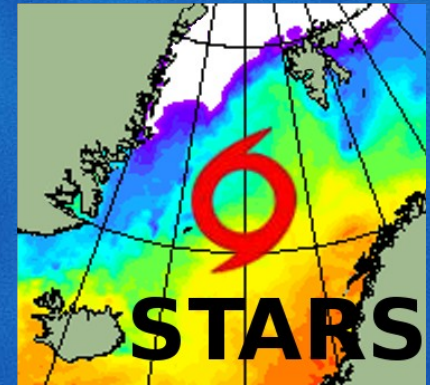




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Character of polar lows in the Nordic Seas using STARS-DAT

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STARS final meeting, ESTEC, 11-03-2013



History of polar low research

- Characteristics of polar lows
- Polar low tracks and statistical distribution
- Sea level anomaly response to polar lows
- Sea surface temperature response to polar lows
- Joint response of SLA and SST



Section through a polar low

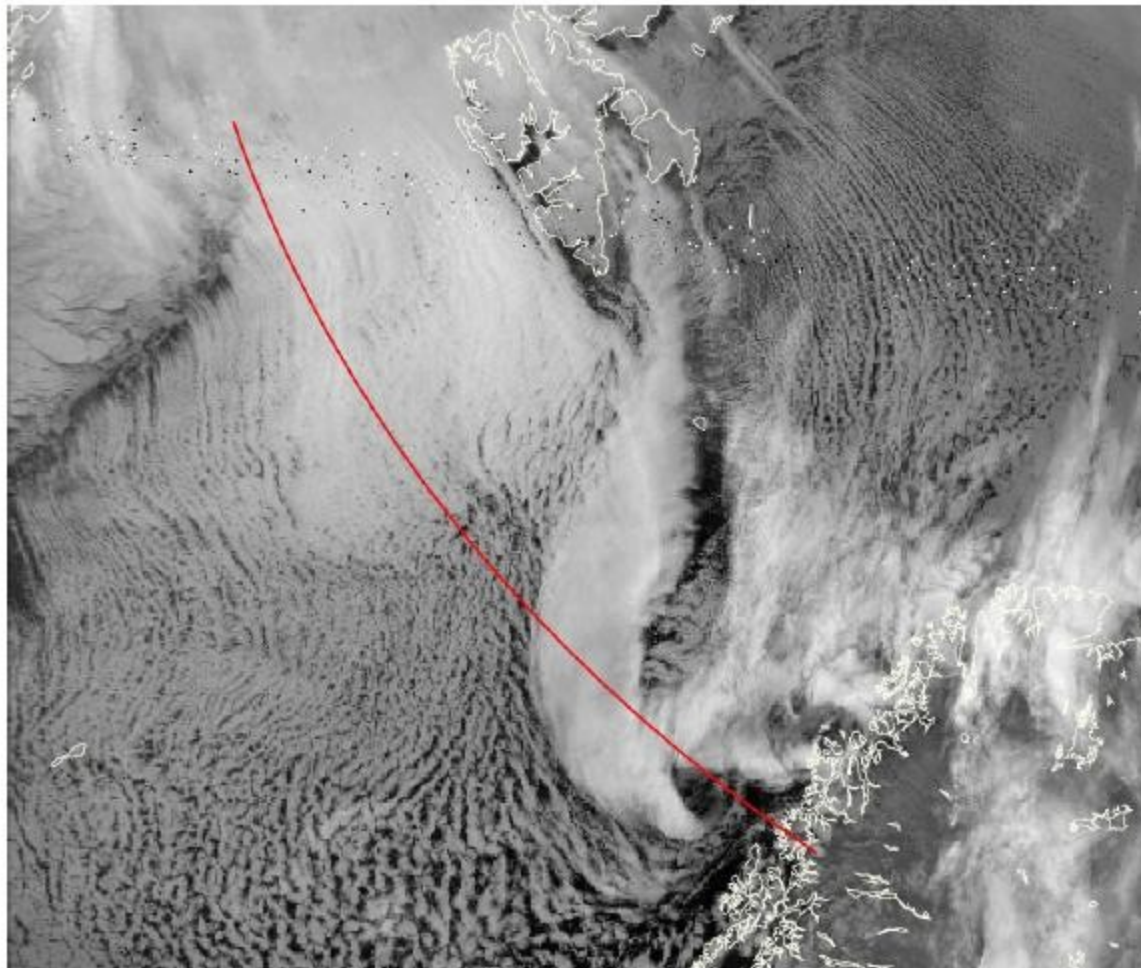


Figure 2.1: Polar low on 26 January 2007 off the coast of Northern Norway. The solid red line shows where the cross section presented in Figure 2.2 is taken.



Section through a polar low

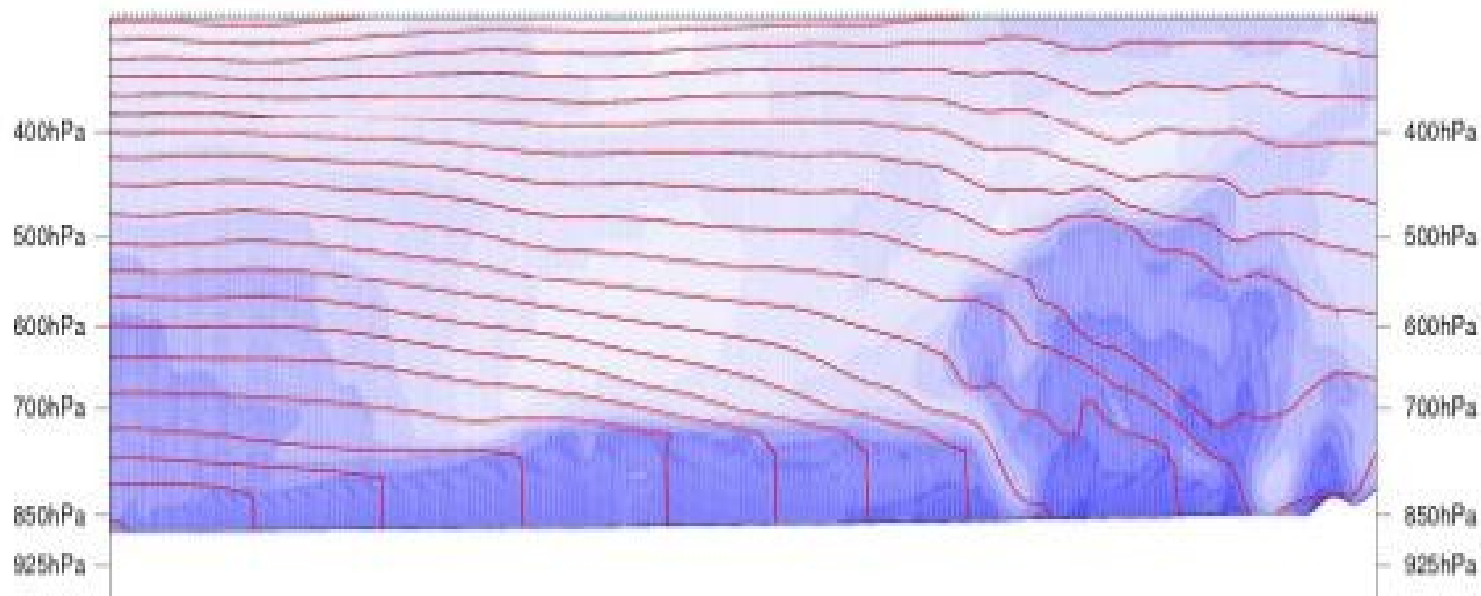


Figure 2.2: Cross section along the red solid line in Figure 2.1. The left part of the graph corresponds to the north-western end of the cross section. Red solid lines are potential temperature and the relative humidity is presented as blue shading.



Polar low tracks

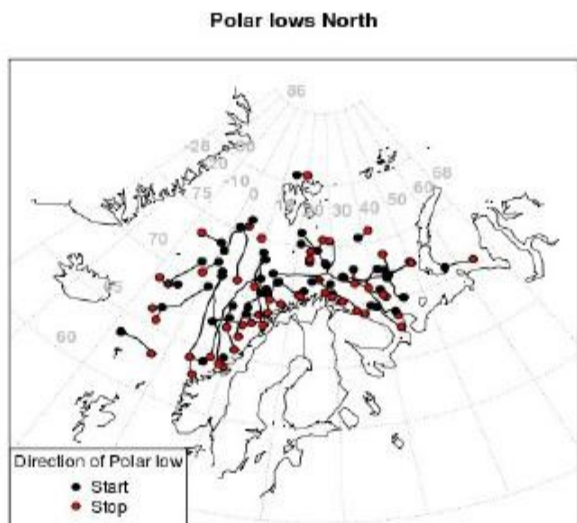


Figure 3.2: All polar lows in the northern area.

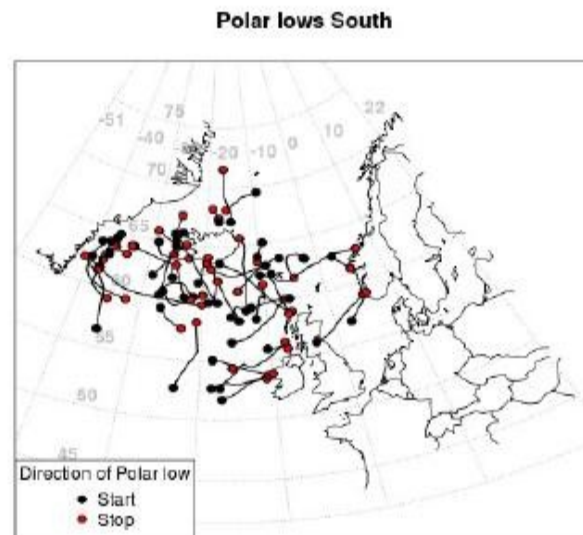
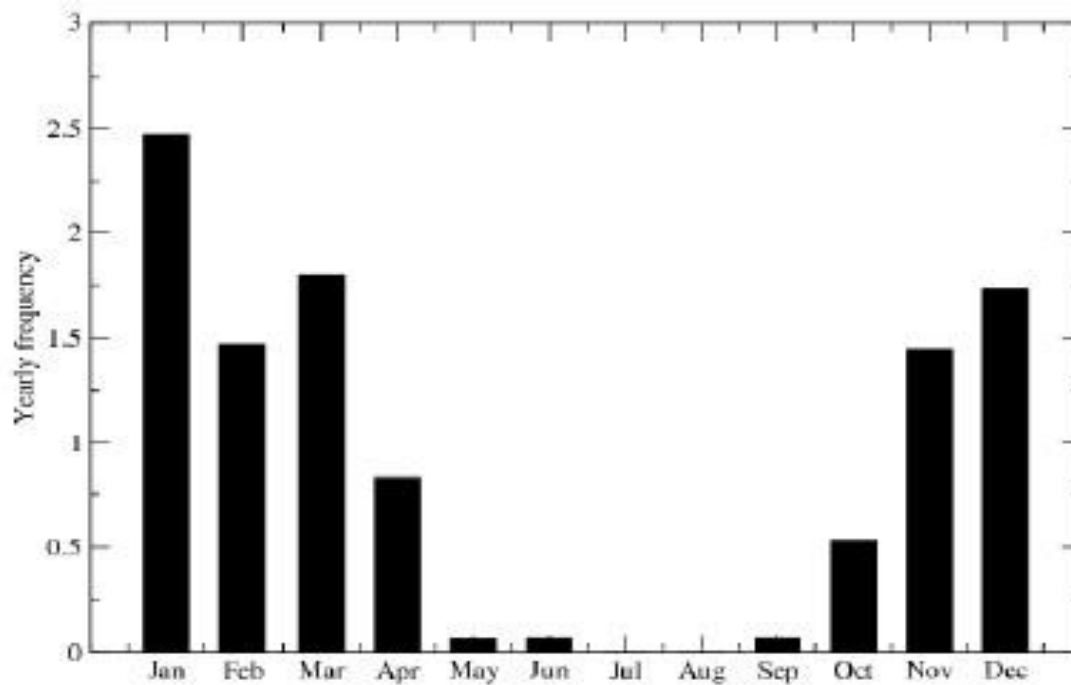


Figure 3.3: All polar lows in the southern area.



Statistical distribution





SLA observations along PL track

SLA measurements for case 25, North.
2008-03-04 01:00 - 2008-03-04 20:00

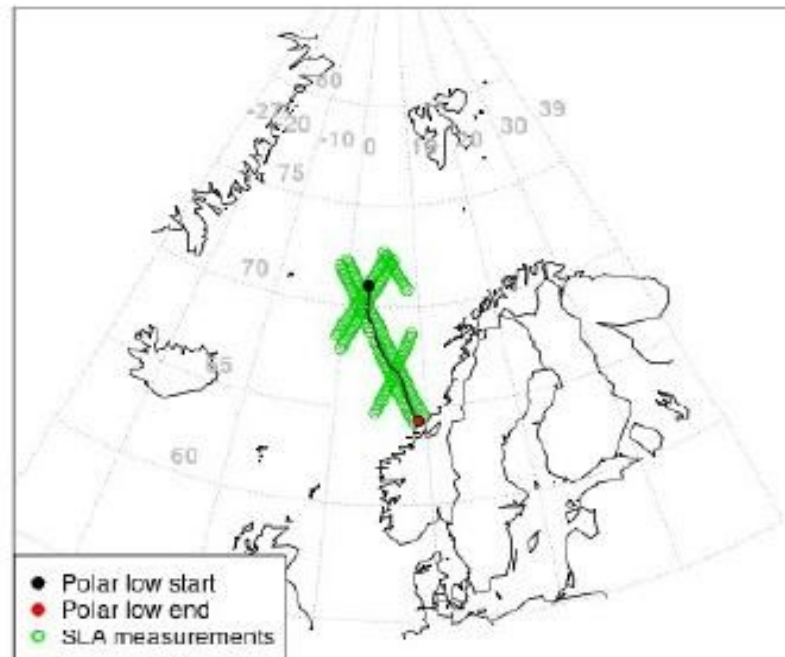


Figure 4.1: Polar low track and position of SLA observations for case 25 N. In this case the storm was on the 04.03.2008, and the SLA measurements shown here are from 02.03.2008 – 06.03.2008.



SLA observations along PL track

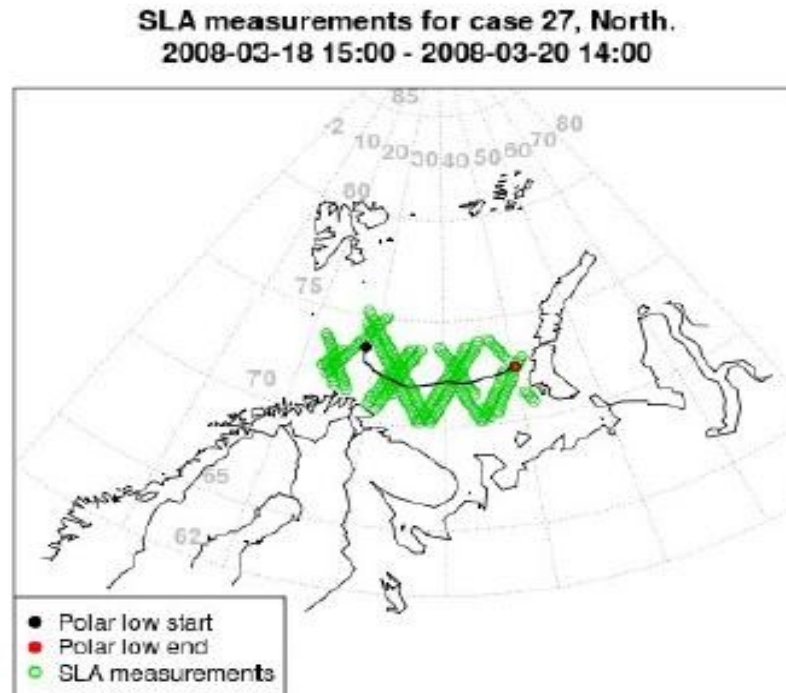


Figure 4.2: Polar low track and SLA observations for case 27 N. This polar low started on 18.03.2008 and lasted until 20.03.2008 (Appendix A). The SLA measurements are from 16.03.2008 – 22.03.2008.

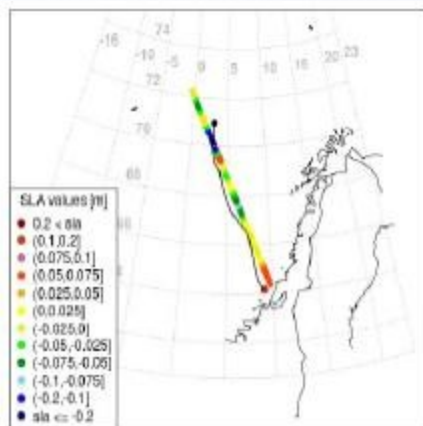


Figure 4.3: Case 25 North. SLA two days before.

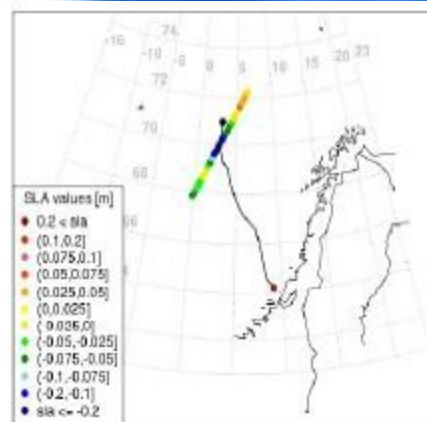


Figure 4.4: Case 25 North. SLA one day before.

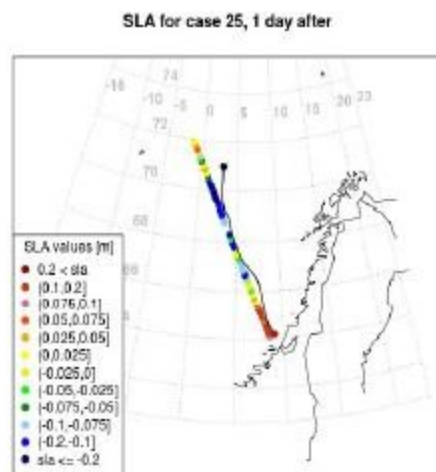


Figure 4.5: Case 25 North. SLA 1 day after.

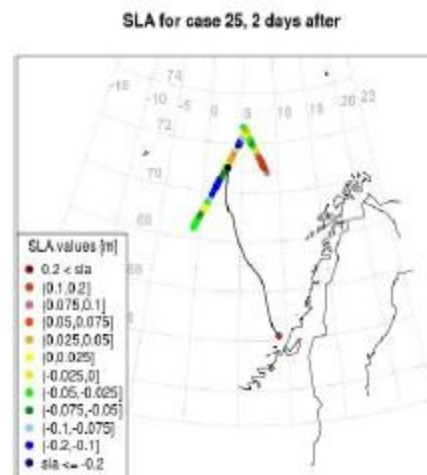


Figure 4.6: Case 25 North. SLA two days after.



SLA distribution before and after

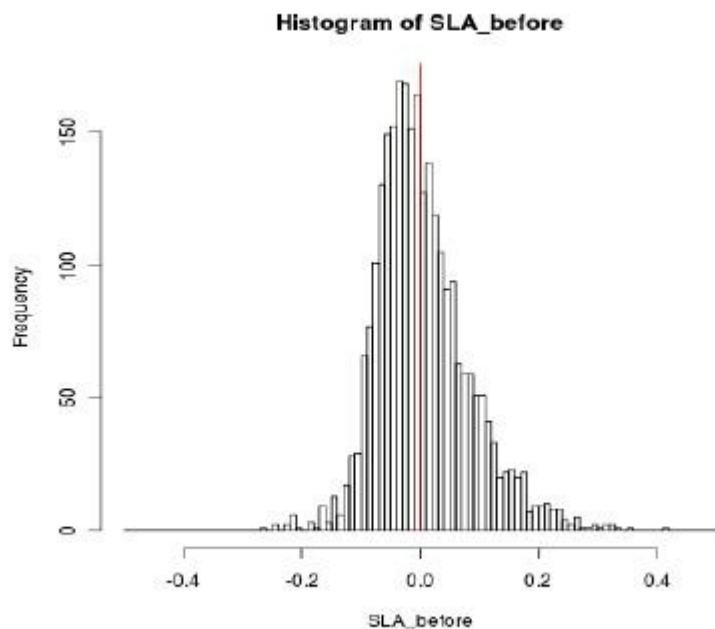


Figure 4.11: Distribution of SLA before polar lows North.

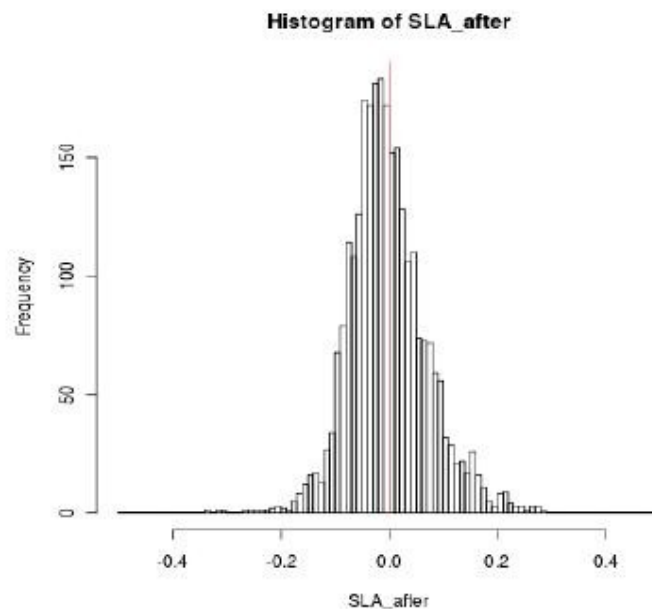


Figure 4.12: Distribution of SLA after the polar lows North.

Student t-test North:

Mean before [cm]	Mean after [cm]	t-value	p-value
0.48	-0.17	3.16	1.60E-003



SLA distribution before and after

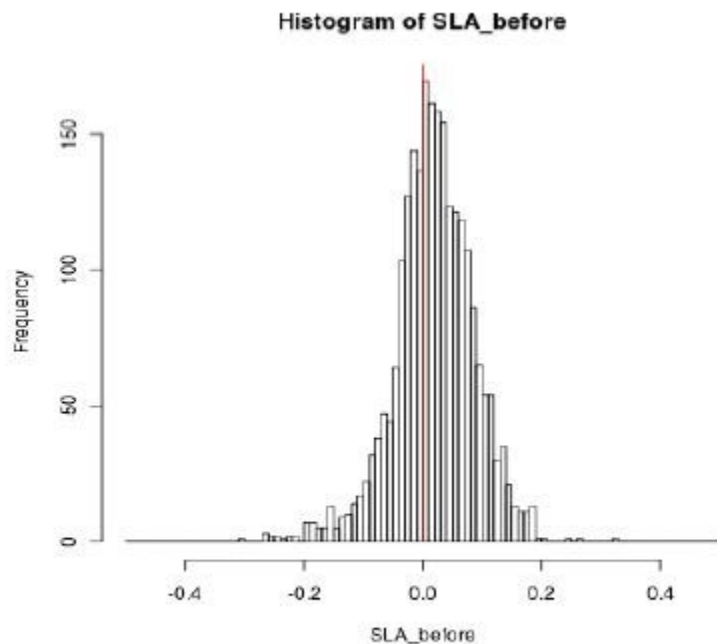


Figure 4.13: Distribution of SLA before polar lows South.

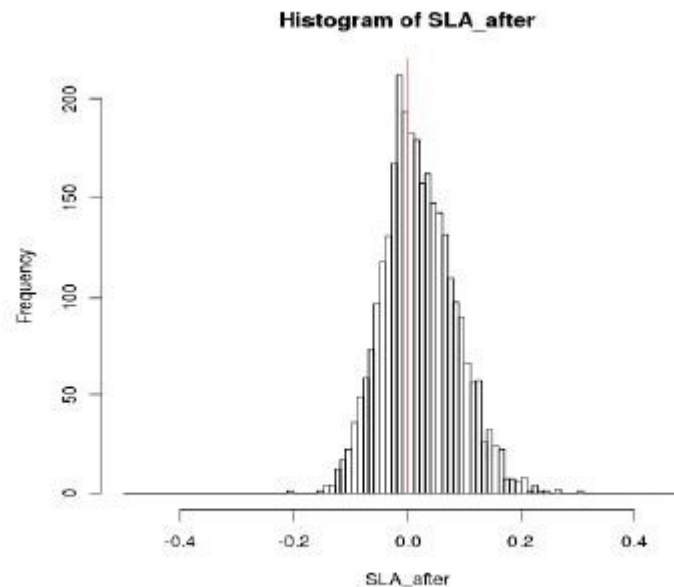


Figure 4.14: Distribution of SLA after polar lows South.

Student t-test South:

Mean before [cm]	Mean after [cm]	t-value	p-value
1.95	2.01	-0.35	0.73



SST distribution before and after

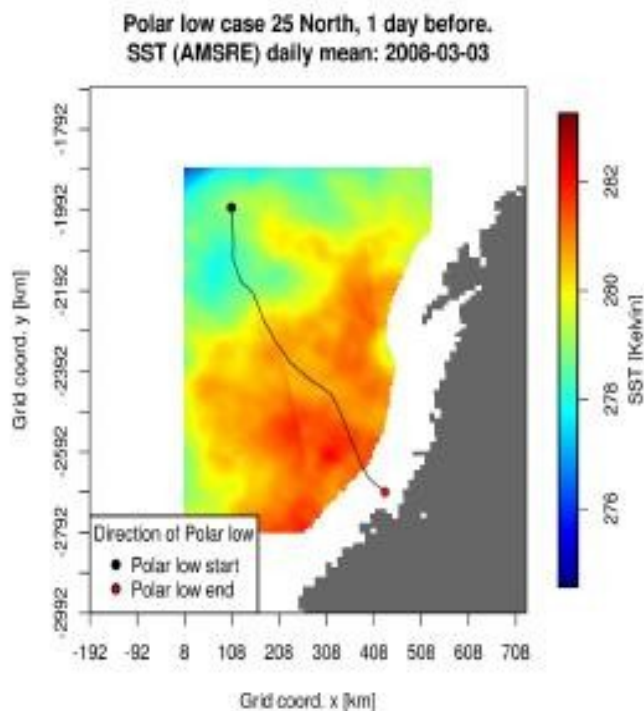


Figure 5.1: SST one day before polar low 25 N.

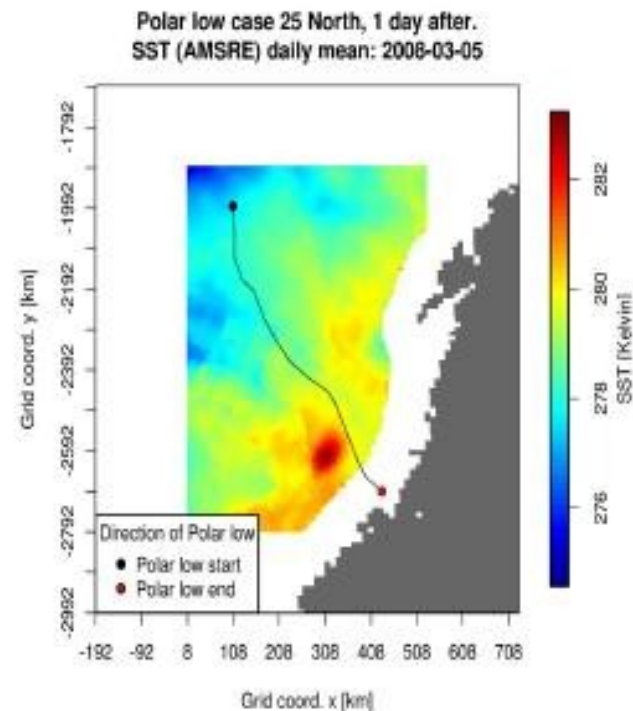


Figure 5.2: SST one day after polar low 25 N.