

OCEAN MAPPING

of



The Black Sea

PRODUCED BY
LUCY HUGHES

THE BLACK SEA



Satellite imagery taken by NASA May 25th 2004

Black Sea Characteristics

Surface area: 436,400 km²
Maximum depth: 2,206 m
Length: 1,175 km

Climate around the Black Sea is characterized by cold winters often punctuated by severe gale force north easterlies that sweep in from Siberia. Summers are hot and humid similar to the rest of the Mediterranean. Winds, however, are strongest in the winter months. The sea is divided into an upper and lower layer due to the influx of fresh water that runs into the basin. This upper layer in winter averages at -0.5-10 degrees Celcius during the winter, in the summer it is warmed to temperatures between 23 and 26 degrees. In the lower depths, 50 metres and below, temperatures remain unchanged from their winter norms.

Salinity in the sea range in average between 17 and 18 parts per thousand – this is essentially half that of oceans. A rapid increase in salinity occurs at depths 50 metres and below where it averages 21 parts per thousand.

Life in the Black Sea only exists in the upper water layer where oxygen dissolves. 180 species of fish inhabit these waters and consequently are the most valuable biological resource. At 70 metres down there is no oxygen at all. At these depths the water is heavy with hydrogen sulphide making it habitable only to certain kinds of bacteria.



1,000 500 0 Kilometers

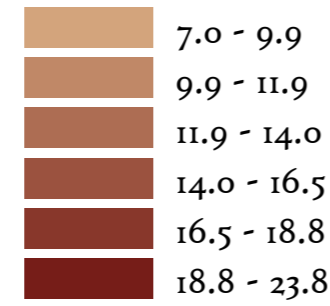
1:15 000 000

TEMPERATURE 1989 & 1990

Mean Temperature 1989



In ° Celcius



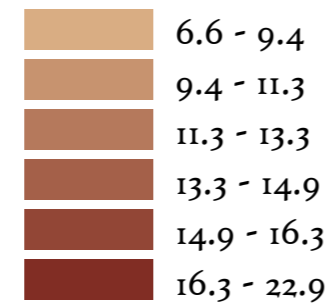
100 50 0 100 Kilometers

1:7 000 000

Mean Temperature 1990



In ° Celcius



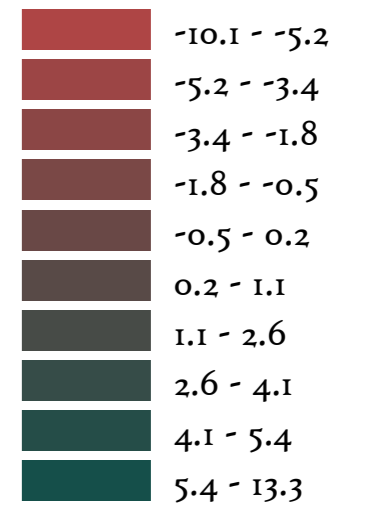
100 50 0 100 Kilometers

1:7 000 000

Mean Difference in Temperature between 1989 and 1990



Comparison of cells between 1989 and 1990



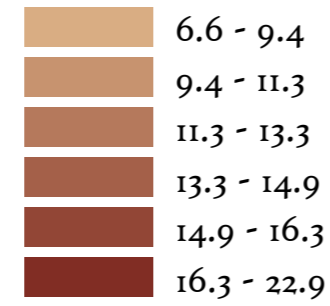
100 50 0 100 Kilometers

1:4 000 000

Mean Temperature 1990



In ° Celcius



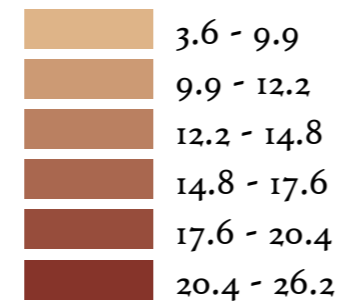
100 50 0 100 Kilometers

1:7 000 000

Mean Temperature 1991



In ° Celcius



100 50 0 100 Kilometers

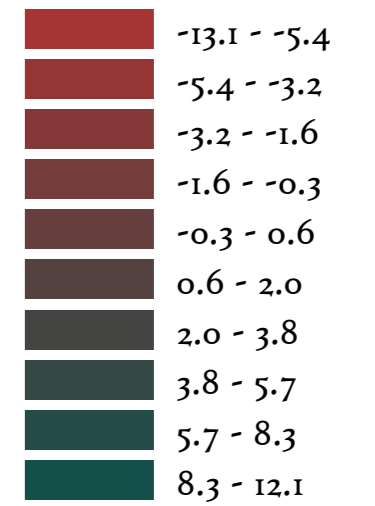
1:7 000 000

TEMPERATURE 1990 & 1991

Mean Difference in Temperature between 1990 and 1991



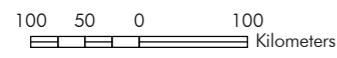
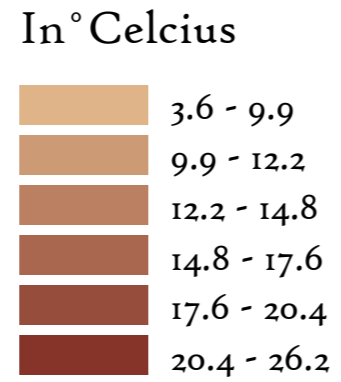
Comparison of cells between 1990 and 1991



100 50 0 100 Kilometers

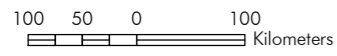
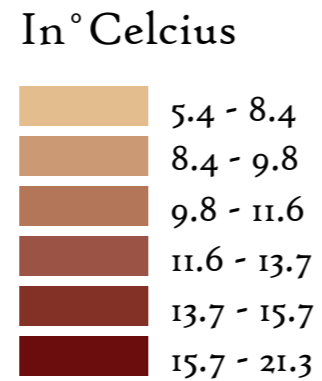
1:4 000 000

Mean Temperature 1991



1:7 000 000

Mean Temperature 1992



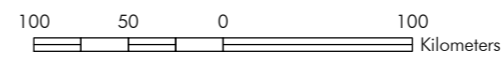
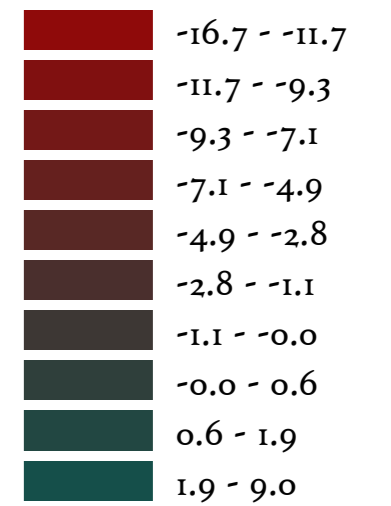
1:7 000 000

TEMPERATURE 1991 & 1992

Mean Difference in Temperature between 1991 and 1992



Comparison of cells between 1991 and 1992



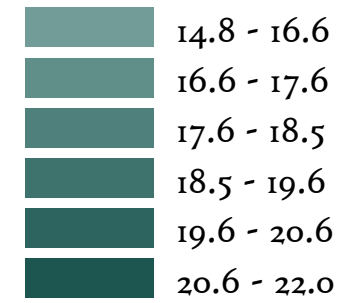
1:4 000 000

SALINITY 1989 & 1990

Mean Salinity 1989



Mean Salinity in PSU



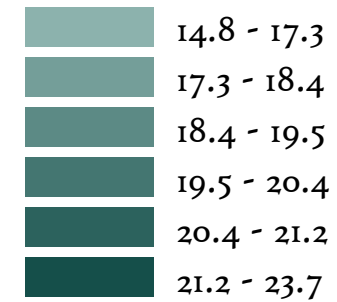
100 50 0 100 Kilometers

1:7 000 000

Mean Salinity 1990



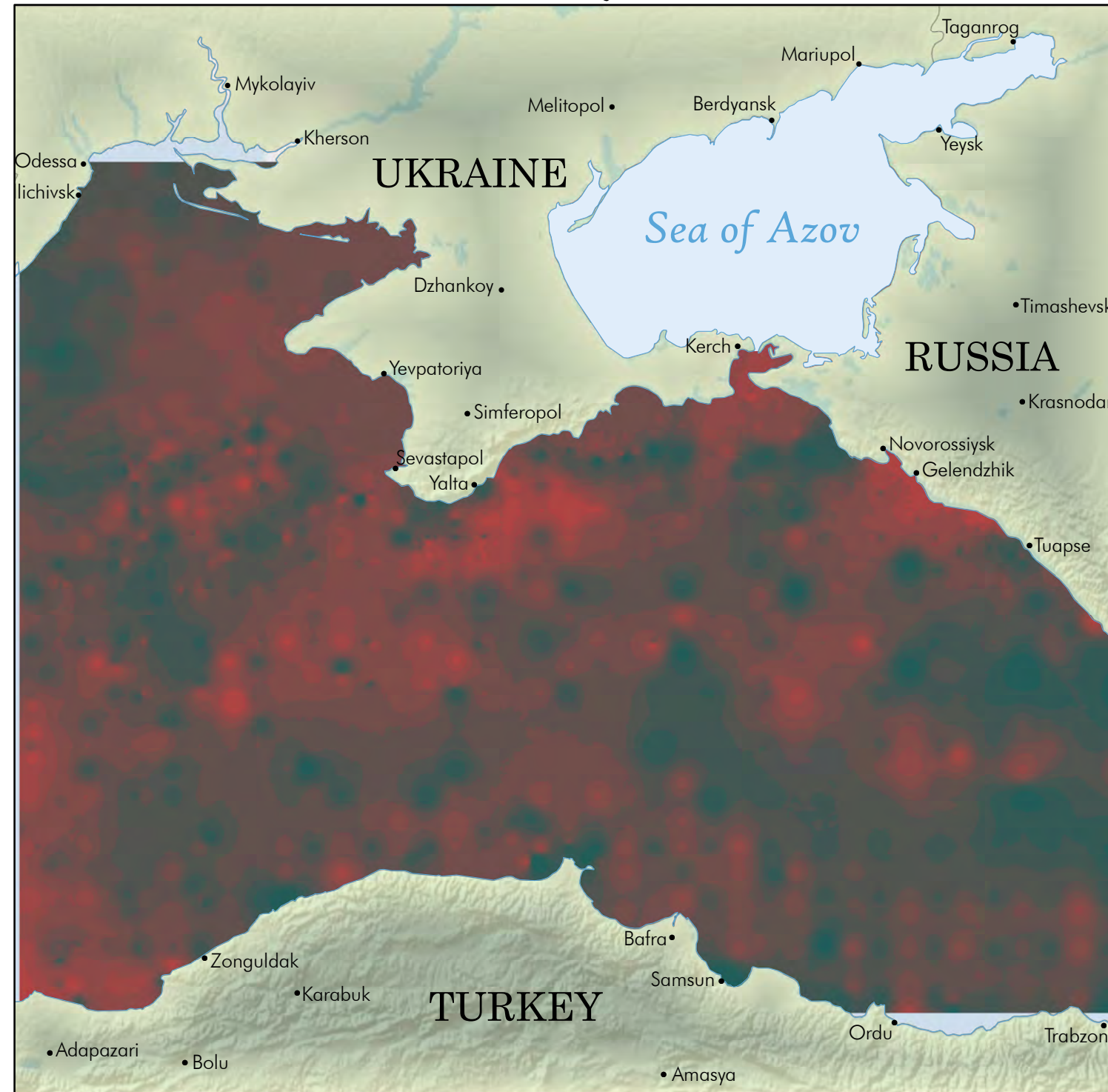
Mean Salinity in PSU



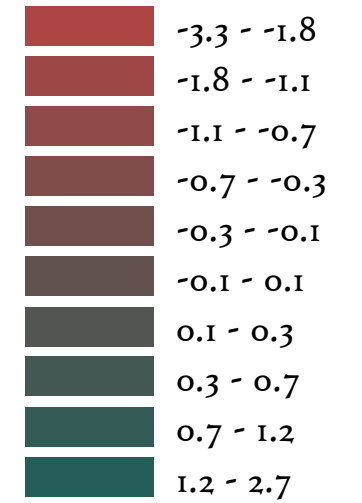
100 50 0 100 Kilometers

1:7 000 000

Mean Difference in Salinity between 1989 and 1990



Comparison of cells between 1989 and 1990



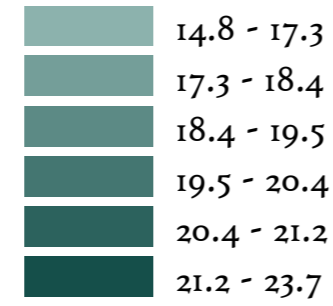
100 50 0 100 Kilometers

1:4 000 000

Mean Salinity 1990



Mean Salinity in PSU



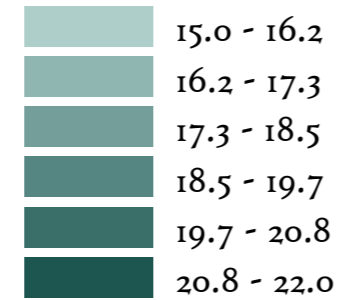
100 50 0 100 Kilometers

1:7 000 000

Mean Salinity 1991



Mean Salinity in PSU



100 50 0 100 Kilometers

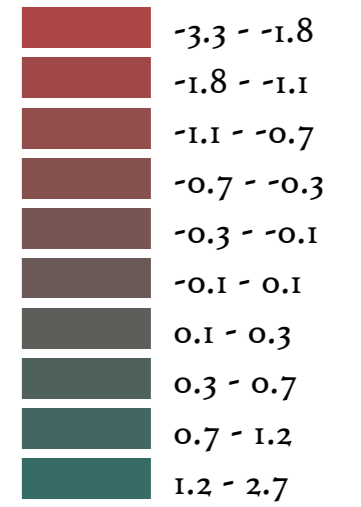
1:7 000 000

SALINITY 1990 & 1991

Mean Difference in Salinity between 1990 and 1991



Comparison of cells between 1990 and 1991



100 50 0 100 Kilometers

1:4 000 000

Mean Salinity 1991



100 50 0 100 Kilometers

1:7 000 000

Mean Salinity 1992

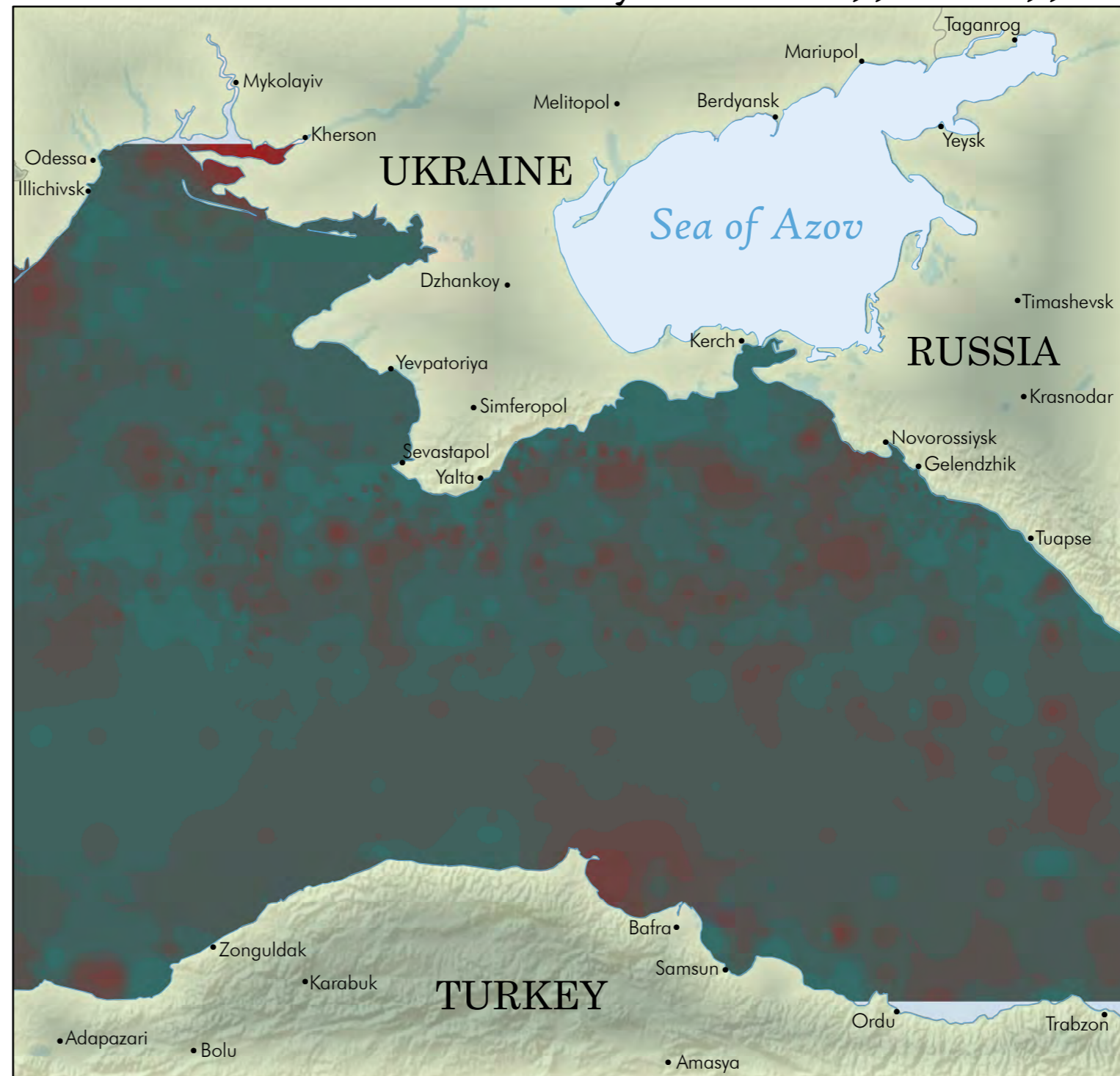


100 50 0 100 Kilometers

1:7 000 000

SALINITY 1991 & 1992

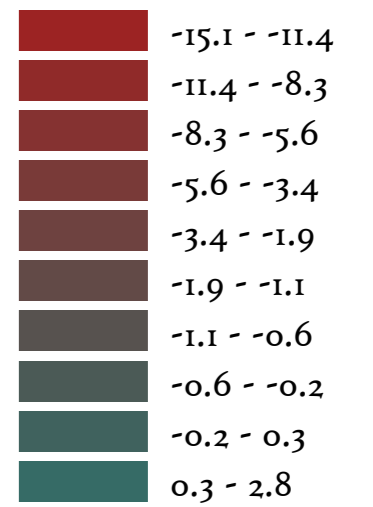
Mean Difference in Salinity between 1991 and 1992



100 50 0 100 Kilometers

1:4 000 000

Comparison of cells between 1991 and 1992



BASEMAP DATA: NATURAL EARTH DATA 1:10 000 000

www.naturalearthdata.com



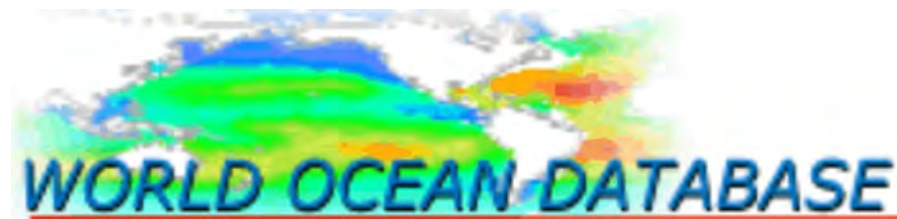
TERRAIN: ESRI WORLD SHADED RELIEF

<http://resources.esri.com/arcgisonlineservices/>



OCEANIC DATA: WORLD OCEAN DATABASE 2009

http://www.nodc.noaa.gov/OC5/WOD09/pr_wod09.html



DATA EXTRACTION FACILITATED BY OCEAN DATA VIEW

<http://odv.awi.de/>



http://en.wikipedia.org/wiki/File:The_Swallow%27s_Nest_castle_on_the_Aurora_cliffs_of_cape_Ai-Todor_%282005-09-22%29.jpg

The Swallows Nest a castle built near Yalta in 1912

COVER MAP:

MAP OF THE BLACK SEA FROM THE PORTOLAN ATLAS, 1544 BY BATTISTA AGNESE

http://commons.wikimedia.org/wiki/File:1544_Battista_Agnese_map_of_the_Black_Sea.jpg

SATELLITE IMAGERY:

BLACK SEA NASA MAY 25 2004

http://en.wikipedia.org/wiki/File:Black_Sea_Nasa_May_25_2004.jpg

Encyclopedia Britannica Online: Academic Edition. *The Black Sea*.

Accessed April 19th 2010 from <http://search.eb.com/eb/article?tocId=9109729>

This project is a portion of the requirements for *Cartographic Techniques II CART 4023*

While this project has been prepared carefully it may still contain inaccuracies. As such it remains for representation purposes only.



Centre of Geographic Sciences
COGS | NSCC

Produced by Lucy Hughes, April 20 2010

SOURCES