# New high-resolution Southwest North Atlantic Regional Climatology

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**Abstract**

Ocean processes in the Southwest North Atlantic (SWNA) play an important role in long-term earth and ocean climate change. This region is also a resource-rich coastal zone with abundant fisheries and other material assets. Combined, the previously released NCEI Northwest Atlantic (NWA) regional climatology (RC) and newly developed SWNA RC provide complete coverage of the Gulf Stream system, which is the critical element of northward heat transport and the Atlantic Meridional Overturning Circulation. The SWNA RC is a collection of high-resolution quality-controlled temperature and salinity fields on standard depth levels from the sea surface to 4,900 m depth. This RC is based on temperature and salinity observations from the 2018 release of the World Ocean Database. The coverage includes the years 1955 to 2017 by annual, seasonal, and monthly fields for the entire period, as well as for each of the six decades. All fields computed on three horizontal grids: 1°x1°, 1/4°x1/4°, and 1/10°x1/10° degree. The SWNA RC is instrumental for assessing ocean climate changes in this region of the North Atlantic Ocean over the 1955-2017 time period and can be used in various climate studies, environmental research projects, and related applications.

# New high-resolution Southwest North Atlantic Regional Climatology

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Newly developed Regional Climatology (RC) for Southwest North Atlantic [1] (Figure 1) is based on temperature and salinity observations from the 2018 release of the World Ocean Database [2]. The coverage includes the years 1955 to 2017 of annual, seasonal, and monthly fields for the entire period, as well as for each of the six decades: 1955-1964, 1965-1974, 1975-1984, 1985-1994, 1995-2004, and 2005-2017 (the last "decade" is three year longer than others to include all available data). All fields were computed on three horizontal grids: 1°x1°, 1/4°x1/4°, and 1/10°x1/10° degree.

High-resolution quality-controlled temperature and salinity fields on World Ocean Atlas [3, 4] were computed at standard depth levels from the sea surface to 4,900 m depth. Additional parameters included in SWNA RC are simple statistical means, data distributions, standard deviations, standard errors of the mean, observed minus analyzed, and seasonal minus annual.

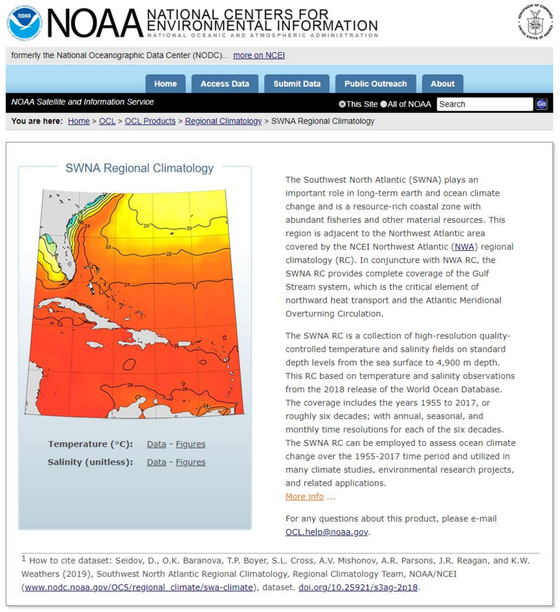


**Figure 1.** Southwest North Atlantic Regional Climatology main web page

All fields are available as a maps (an example is shown in Figure 2) and gridded data files in CSV, ArcGIS shape, and NetCDF formats (Figure 3).

The SWNA RC can be used for assessing ocean climate changes in this region of the North Atlantic Ocean over the 1955 - 2017 time period in various climate studies, environmental research projects, and related applications. For example, Figure 4 shows the decadal sequences of temperature and salinity maps revealing long-term change of these essential ocean climate parameters that may provide a clue to slow systematic ocean and climate change.

Combined with the previously released NCEI Northwest Atlantic Regional Climatology [5], the new NCEI Southwest North Atlantic Regional Climatology provide complete coverage of the Gulf Stream system—the critical element of northward heat transport and the Atlantic Meridional Overturning Circulation.

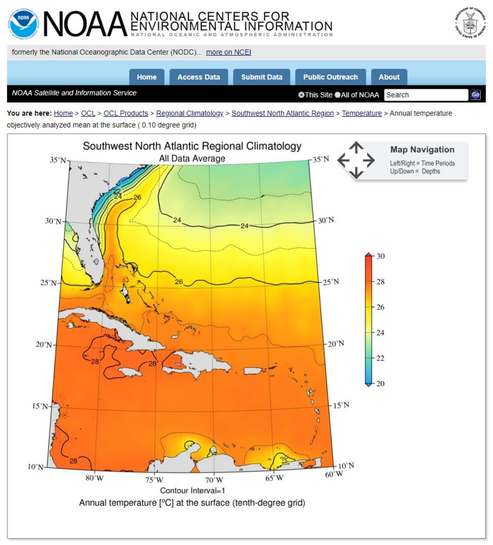


**Figure 2.** SWNA RC Map access page

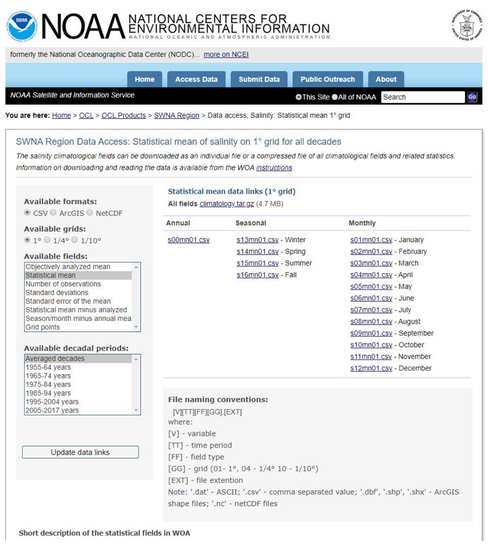


**Figure 3.** SWNA RC Data access page

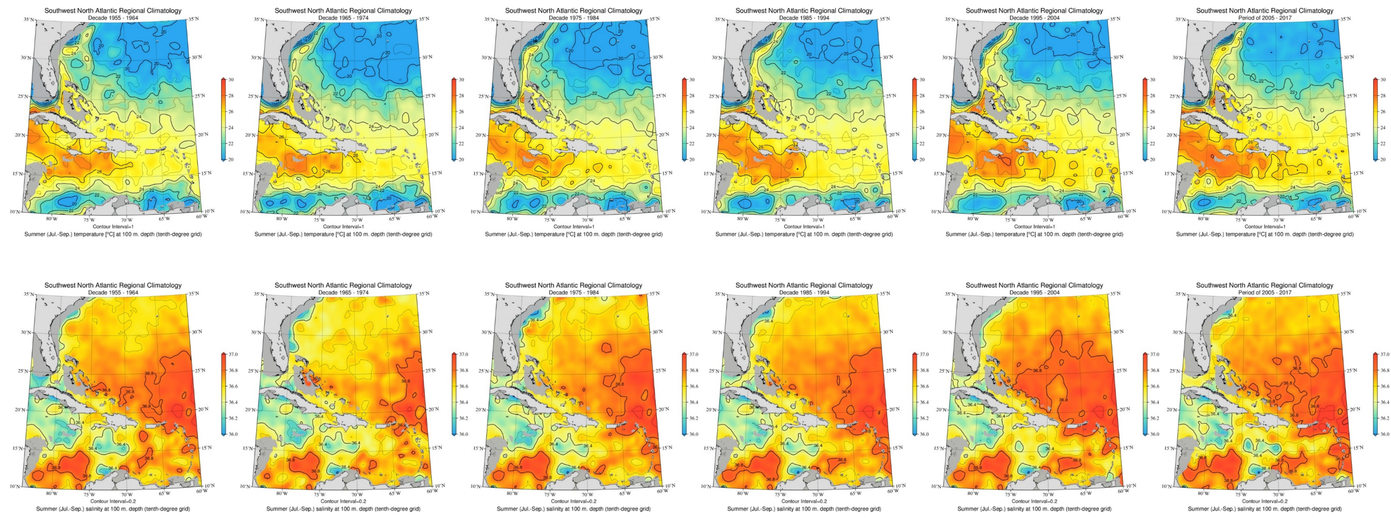


**Figure 4.** SWNA RC Decadal Temperature (top) and Salinity (bottom) fields on 1/10° grid @ 100m depth for Summer

**References**

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