1   A numerical Study of the Interannual variability of the Adriatic Sea (2000-2002).

P. Oddo(1), N. Pinardi (2), M.Zavatarelli(2)

1. Istituto Nazionale di Geofisica e Vulcanologia, Bologna, Italy, (2) Bologna University, Centro Interdipartimentale per la Ricerca sulle Scienze Ambientali, Ravenna, Italy (oddo@bo.ingv.it/ Fax +39 051 4151499)

A free surface, three dimensional finite difference numerical model based on the Princeton Ocean Model (POM) has been implemented in order to simulate the interannual variability of the Adriatic Sea circulation. The implementation makes use of an interactive surface momentum and heat flux computation that utilizes the European Centre for Medium-Range Weather Forecasts (ECMWF) 6 hours analyses and the model predicted sea surface temperatures. The model is also nested at its open boundary with a coarse resolution Mediterranean general circulation model, utilizing the same surface forcing functions. The simulation and analysis period spans 3 years (1-Jan-2000 to 31-Dec-2002) coinciding with the "Mucilage in the Adriatic and the Tyrrhenian" (MAT) Project monitoring activities. Model results for the simulated years show a strong interannual variability of the basin averaged proprieties and circulation patterns, linked to the atmospheric forcing variability and the Po river runoff. In particular, years 2000 and 2002 are characterized by a weak surface cooling (with respect to the climatological value) and well marked river runoff maxima. Conversely, year 2001 is characterized by a stronger wind and heat (autumn cooling) forcings but no river runoff autumn peak, even if the total amount of water inflow during winter and spring is sustained. The circulation is characterized by similar patterns in 2000 and 2002 but very different structures in 2001. During the latter, deep water is not formed either in the Northern or Middle Adriatic. A comparison with the observed data shows that the major model deficiencies are connected to the low salinity of the waters, prob-

ably connected to the missed inflow of salty Ionian waters of Aegean origin and to the numerical overestimation of the vertical mixing processes.