Modelling of Transport and Mixing across Gulf Stream  TATYANA KRASNOPOLSKAYA, VLADIMIR IL’CHENKO, Institute of Hydromechanics NASU, VYACHESLAV MELESHKO, OLENA STETSENKO, Kiev National Taras Shevchenko University — The new mathematical model for a stream function of a meandering jet of Gulf Stream is suggested based upon a modification of the von Kármán vortex street stream function. This stream function allows to approximate experimentally found by Bower main coherent structure elements of Gulf Stream in a coordinate frame moving with a speed of the meander: i) an eastward-propagating meandering jet; ii) regions of fluid recirculation below and above meander crests and troughs; iii) regions of westward-propagating fluid below and above the jet and recirculation regions. The inclusion of eddies above the recirculation regions and the jet enhance transport and mixing across the jet. Calculations show that more than one third of the circular area above hyperbolic points may contain warm fluid from a central area of the jet. To study mixing across the jet we examine deformation of this circular area back in time, so we can determine from which part of the jet that area is composed. Contour line tracking method conserving all topological properties in 2-D flows is used for this procedure.