

# Roles of Mesoscale Eddies in the Kuroshio Paths

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## ABSTRACT

A high-resolution ocean general circulation model is developed to simulate connections between the Kuroshio path variations and mesoscale eddy activities as realistically as possible. The climatological mean of the modeled Kuroshio takes a nearshore nonlarge meander path. It is found that the model is capable of simulating two types of nonlarge meander state and a possible version of the large meander state. The offshore nonlarge meander is generated through interaction between the Kuroshio and an anticyclonic eddy. The large meander occurs just after significant intensification of the anticyclonic Kuroshio recirculation; successive intrusion of anticyclonic eddies from the upstream region is responsible for this process. Those anticyclonic eddies are advected by the Kuroshio from the region northeast of Luzon Island and increase the upstream Kuroshio volume transport on an interannual time scale. The cyclonic eddies propagating from the Kuroshio Extension region, on the other hand, weaken the Kuroshio meander after the merger. The Kuroshio path variations south of Japan thus seem to be closely related to eddy activities in the subtropical gyre system.