

Modeling of California's June Wind, Wind Stress and Curl of the Wind Stress

Dr. Darko R. Koracin, Ph.D.

Research Professor
Desert Research Institute, University of Nevada Reno
darko@dri.edu 775-674-7091

Travis McCord

Desert Research Institute, University of Nevada Reno
mccord@dri.edu 775-674-7091

Domagoj Podnar

Desert Research Institute, University of Nevada Reno
domagojp@dri.edu 775-674-7091

Abstract: Atmospheric mesoscale modeling of a typical June California and Northern Baja California marine atmosphere reveals details important to coastal ocean processes. The southbound wind speed increases from distant offshore to up to a few kilometers of the Northern and Central California Coast. Fast winds extend southward of Point Conception, leaving the eastern portion Southern California Bight with weak and cross shore winds. The southbound, coast parallel winds are re-established south of San Diego, and extend along Northern Baja California. The fastest winds are close to the coast in the immediate lees of every cape. Wind

stress patterns match the surface wind patterns with the greatest wind stress close to the coast in the lees of capes. Contrary to previously held views, the curl of the wind stress is strong and positive only within 10-20 km of the northern California Coast and in the greater Santa Barbara Channel area. Thus, the positive wind stress curl that is associated with coastal upwelling occurs only in limited areas close to the coast. The remainder of the coastal waters of California and Northern Baja California have weak, negative curl of the wind stress which generates ocean downwelling.