Abstract: Subthermocline circulation in the tropical North Pacific Ocean is investigated using profiling float temperature-salinity data from the International Argo and the Origins of the Kuroshio and Mindanao Current (OKMC) projects. Three well-defined eastward jets along 9N, 13N, and 18N are detected beneath the wind-driven, westward-flowing North Equatorial Current. Formation processes responsible for these North Equatorial Undercurrent (NEUC) jets that appear across the tropical North Pacific Ocean are explored both theoretically and using numerical models with different complexities. Analyses of an eddy-resolving global ocean general circulation model output reveal that the NEUC jets have a mode-1 baroclinic vertical structure and are spatially persistent on the interannual and longer time scales. This OGCM-simulated vertical structure prompts us to adopt the simpler, nonlinear 1.5-layer reduced-gravity model, as well as the baroclinic Rossby wave triad interaction theory, to unravel the essential processes underlying the NEUC jets. Research activities relating to the OKMC project in the Philippine Sea will be presented.