The Climate Ocean Sea Ice Model team (COSIM) at Los Alamos National Laboratory develops marine components for the U.S earth system simulator (the CESM or Community Earth System Model). The team has begun building biogeochemistry modules into its sea ice routines and is also coupling them with ecodynamics in marginal waters, in collaboration with the International Arctic Research Center (IARC). We will overview major aspects of this effort from a Pan-Arctic perspective. They include the simulation of nutrient cycling and primary production in bottom layers of the pack, release of cloud brightening organics and trace gases into leads, and interaction with open ocean biogeochemistry of the high latitude Pacific and Atlantic. We have also improved vertical ice column tracer transport algorithms associated with gravity drainage and flushing. Moreover, the team is now testing trace element prioritization schemes in toy global systems codes. Arctic ice and margin geocycles will be surveyed in this context. From among the list of projects, emphasis will be placed on a few which have been the most productive recently and are not covered by other presentations.