



Arrival of iron-rich Saharan dust on the outer west Florida shelf each summer interrupts the normal seasonal succession of phytoplankton on temperate and subtropical shelves. Instead, iron-starved diazotrophs fix the ubiquitous nitrogen gas of seawater, passing this 'new nitrogen' in the form of dissolved organic matter of *Trichodesmium* origin to co-occurring toxic dinoflagellates for initial formation of red tides of *Karenia brevis*.