|  |  |  |
| --- | --- | --- |
| **Factors** | **Temperate estuaries** | **Tropical estuaries** |
| Climate (a) | * Season: 4 seasons * Light: Variable * Temperature: Variable | * Two seasons: dry and rainy season * Light: Higher and relative constant * Temperature: Higher and relative constant |
| Hydrology (a) | * Discharge: More stable * Flushing capacity: More stable * Less mangrove system in temperate estuaries | * Discharge: Large seasonal variation * Flushing capacity: High variation * The strong impact of mangroves in downstream |
| Nutrient loads (a) | * Stable or decrease in recent years | * Increase by urbanization |
| Variables in water column (a) | * Silica: Can be limiting for production * Turbidity: more stable | * Silica: Less likely to limit primary production * Turbidity: high seasonal variation |
| Variables in bottom sediments (a) | * High organic carbon content | * Higher organic carbon and carbonate * High concentration of PO43- |
| Seawater (a) | * Variable concentrations because of seasonal biological activities | * Seawater concentrations are more stable due to constant input of insolation (light, temperature) than temperate |
| Phytoplankton (a) | * Easier shift to non-silicious phytoplankton | * The dominant phytoplankton group is diatom |
| Biogeochemical process | * Reaction rates are lower (a, b) * There is a limitation of production in the cold period (b) * Nitrification is no longer a major factor because of the decrease of NH4 (d) | * Reaction rates: Higher biological uptake and excretion (a) * No temperature limitation for production (b) * Dominated by OM oxidation, nitrification, deposition (f, g, h) |
| Nutrient export to coastal zone, ocean | * Low nutrient retention rate. 75% of nutrients can be exported to the ocean. Less seasonal variation (c) * Less than 10% of nutrients were retained/buried in sediment (b) | * Similarly, retention of nutrients is low in the rainy season but much higher in the dry season, thus less nutrient export (f) * Higher phosphate retention (higher sorption), but small nitrogen burial (around 2.5%) in sediment (b) |
| Assimilation capacity | * Net removal of N and Si, but a source of P because of P desorption (c) * 30–65% N can be removed by physical, biological processes in estuaries (d) | * Act as a sink for OC, NH4+, PO43- but a source for NO3- (g) * Higher N removal because of higher denitrification rate (b) * E.g., 50%, 37% and 11% C, N, P of external sources were removed by Pearl River in 1999 (g) |
| Climate change (b) | * Four seasons may become dry and wet seasons | * Greater contrasting seasonal behavior |
| a: Eyre et al., 1999  b: Tappin 2002 | c: Romero et al., 2019  d: Nixon et al. 1996 | e: McKee et al., 1999  f: Le et al., 2010, Trinh et al., 2010  g: Hu et al., 2009, h: Yu et al. 2019 |