

Factors	Temperate estuaries	Tropical estuaries
Climate ^(a)	<ul style="list-style-type: none"> • Season: 4 seasons • Light: Variable • Temperature: Variable 	<ul style="list-style-type: none"> • Two seasons: dry and rainy season • Light: Higher and relative constant • Temperature: Higher and relative constant
Hydrology ^(a)	<ul style="list-style-type: none"> • Discharge: More stable • Flushing capacity: More stable • Less mangrove system in temperate estuaries 	<ul style="list-style-type: none"> • Discharge: Large seasonal variation • Flushing capacity: High variation • The strong impact of mangroves in downstream
Nutrient loads ^(a)	<ul style="list-style-type: none"> • Stable or decrease in recent years 	<ul style="list-style-type: none"> • Increase by urbanization
Variables in water column ^(a)	<ul style="list-style-type: none"> • Silica: Can be limiting for production • Turbidity: more stable 	<ul style="list-style-type: none"> • Silica: Less likely to limit primary production • Turbidity: high seasonal variation
Variables in bottom sediments ^(a)	<ul style="list-style-type: none"> • High organic carbon content 	<ul style="list-style-type: none"> • Higher organic carbon and carbonate • High concentration of PO_4^{3-}
Seawater ^(a)	<ul style="list-style-type: none"> • Variable concentrations because of seasonal biological activities 	<ul style="list-style-type: none"> • Seawater concentrations are more stable due to constant input of insolation (light, temperature) than temperate
Phytoplankton ^(a)	<ul style="list-style-type: none"> • Easier shift to non-silicious phytoplankton 	<ul style="list-style-type: none"> • The dominant phytoplankton group is diatom
Biogeochemical process	<ul style="list-style-type: none"> • 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 NH_4 ^(d) 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • Act as a sink for OC, NH_4^+, PO_4^{3-} but a source for NO_3^- ^(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)	<ul style="list-style-type: none"> • Four seasons may become dry and wet seasons 	<ul style="list-style-type: none"> • 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