Plasticity in frustule silica content allows diatoms to evade silicon limited growth in an upwelling environment

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Diatoms bloom in turbulent environments using a complex mix of r-selected strategies that prioritize rapid growth (Margalef, 1978)



One strategy: decoupling division rate and silica production rate when Si becomes scarce (Paasche, 1973) to maximize abundance for a given pulse of Si



Si stress

Implied from culture studies, cells are able to decrease silicification to maintain division rates

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Is decreasing silicification (Si μ m⁻²) to maintain division rate a common adaptive strategy within diverse natural diatom assemblages?



- Treatments: ambient, +19µM Si
- - Silicification (Z)
 - New frustule S.A. (SA_{new})
 - Division rate (μ)

Among diatom taxa, there was a conserved trend to decrease silicification with increasing silicon stress with little change to division rate





Longitude (°E)

Changes in V and μ from Si stress did not significantly alter community composition nor contribution to total silica production















