(a)

Uptake

ML

Depth (m)

50

N : Si
2 : 1

N : Si
15 : 1

Deep thermocline

100

$\delta^{30}Si_{BSi}$
0.5–1 ‰

$\delta^{15}NO_3^- =$ **6–7.5‰**

$\delta^{30}Si(OH)_4 =$ **1.5‰**

150

$\delta^{15}N_{Bulk}$
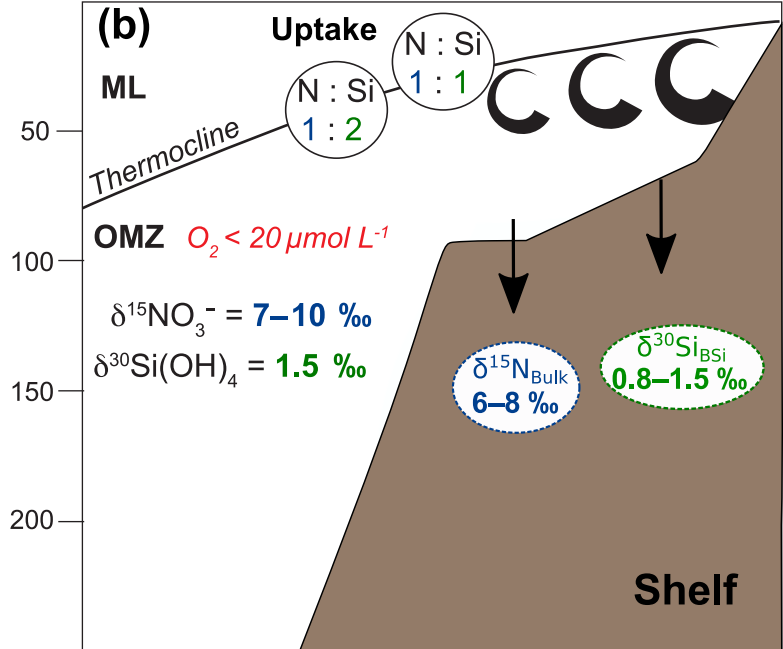**5–7 ‰**

200

Shelf

	NO_3^-	$Si(OH)_4$
Utilization	70–100 %	< 50 %

LIA (humid): El Niño-like conditions, deep thermocline, low productivity

non-siliceous phytoplankton

no nutrient-rich upwelling

suboxic subsurface waters → reduced N-loss

(b)

Uptake

ML

50

N : Si
1 : 1

N : Si
1 : 2

Thermocline

OMZ *$O_2 < 20\,\mu mol\,L^{-1}$*

100

$\delta^{15}NO_3^- =$ **7–10 ‰**

$\delta^{30}Si(OH)_4 =$ **1.5 ‰**

$\delta^{30}Si_{BSi}$
0.8–1.5 ‰

150

$\delta^{15}N_{Bulk}$
6–8 ‰

200

Shelf

	NO_3^-	$Si(OH)_4$
Utilization	30–90 %	30–90 %

Today, CWP and LIA (arid) : La Niña-like conditions, strong upwelling, high productivity

siliceous phytoplankton (diatoms)

anoxic subsurface condition

N-loss (denitrification + anammox)