

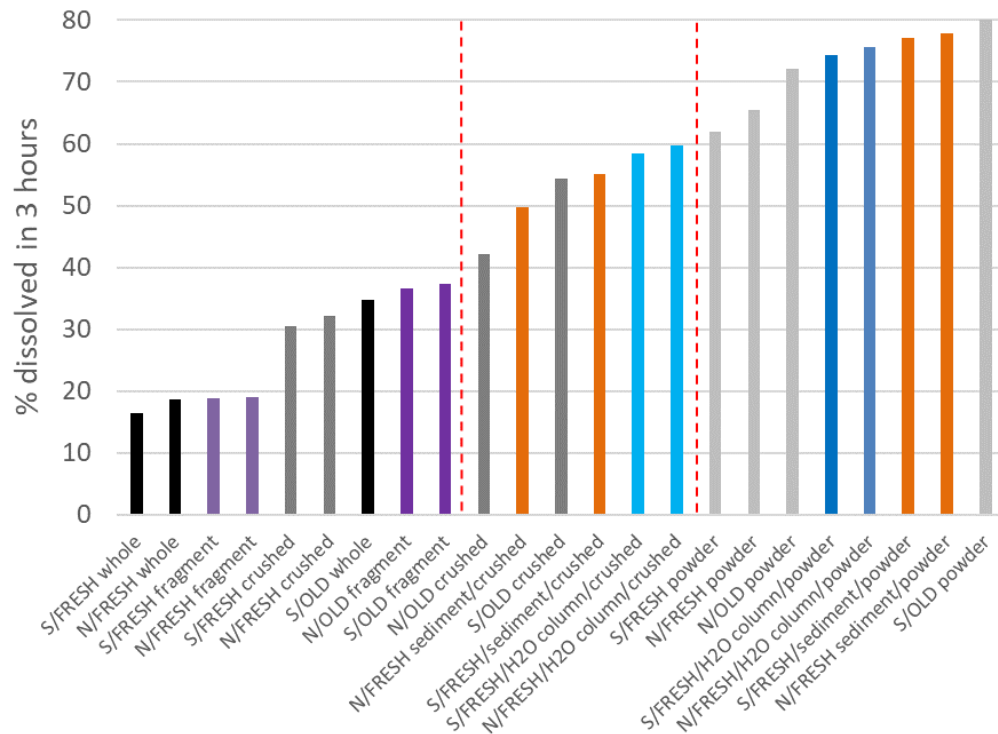
A feasibility study of coastal acidification mitigation strategies for the mussel industry

Cliff Law, NIWA/University of Otago



Shell dissolution

Screening for optimal dissolution rate



- Smaller size: faster dissolution
- No effect of shell from different locations
- No effect of shell age
- Pre-treatment increases dissolution

2. Shell dissolution

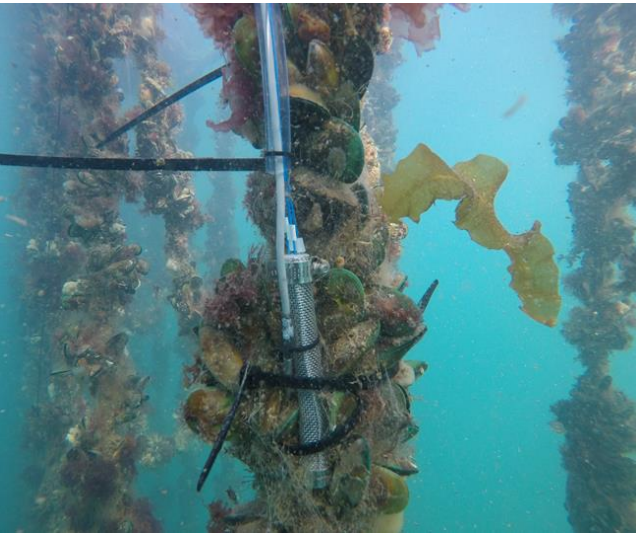
Placement is critical

If $\Omega > 1$ carbonate is stable, but < 1 carbonate dissolves

Shell dissolution

Placement is critical

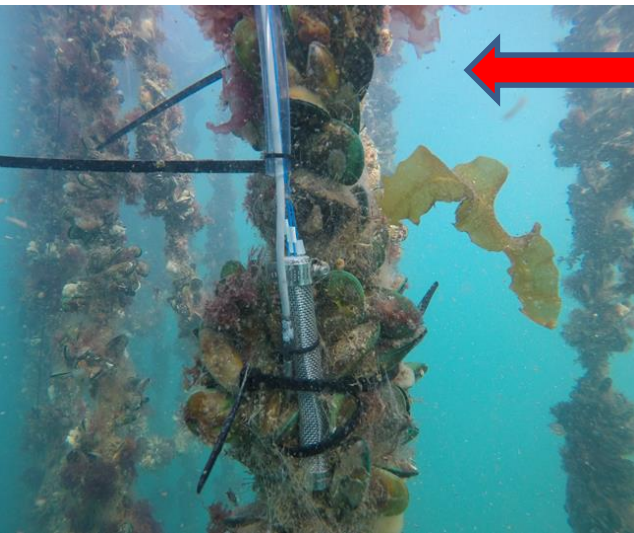
If $\Omega > 1$ carbonate is stable, but < 1 carbonate dissolves



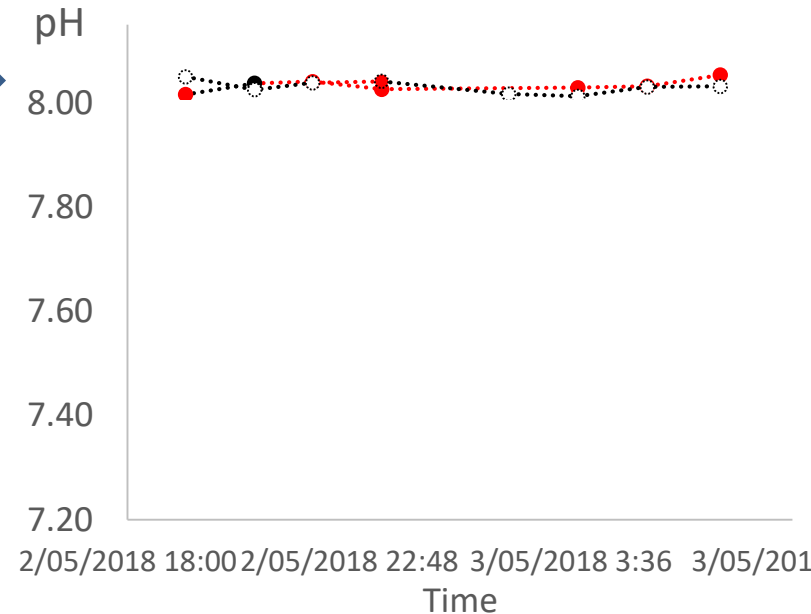
Shell dissolution

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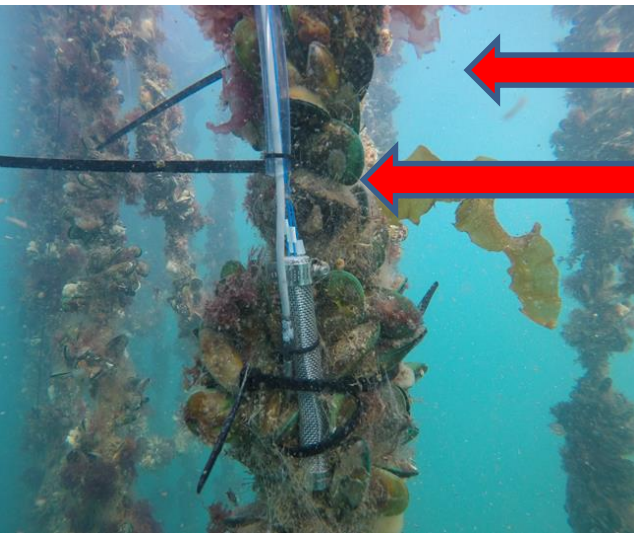
Ambient
pH 8.03
 Ω 2.3



Shell dissolution

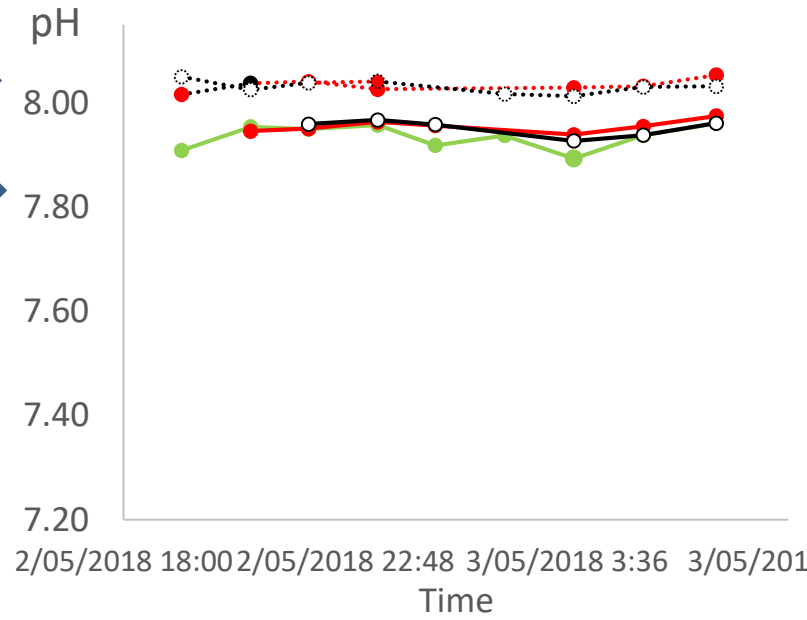
Placement is critical

If $\Omega > 1$ carbonate is stable, but < 1 carbonate dissolves



Ambient
pH 8.03
 Ω 2.3

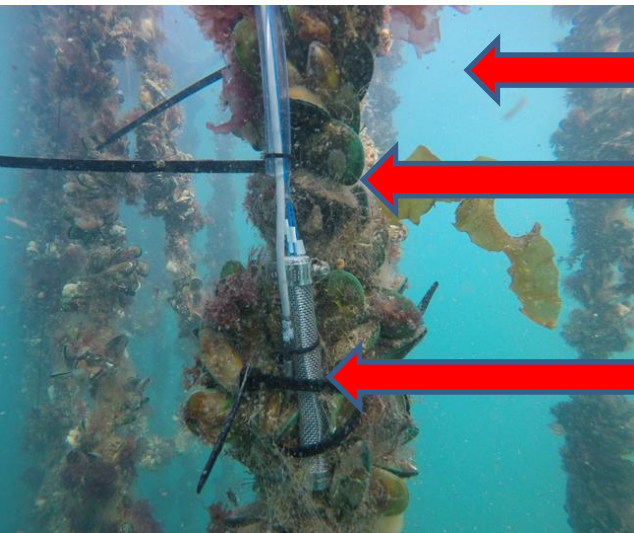
Boundary Layer
pH 7.9
 Ω 1.9



Shell dissolution

Placement is critical

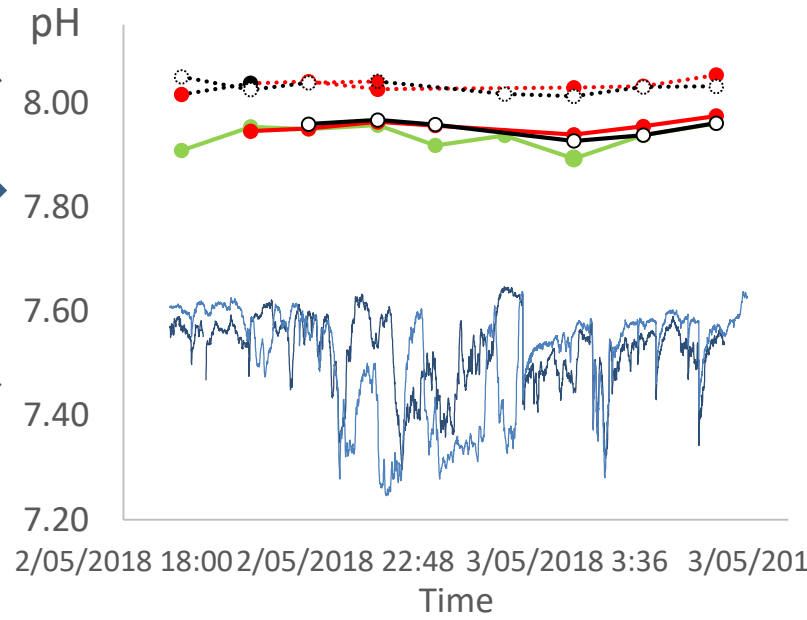
If $\Omega > 1$ carbonate is stable, but < 1 carbonate dissolves



Ambient
pH 8.03
 Ω 2.3

Boundary Layer
pH 7.9
 Ω 1.9

Boundary Layer
electrode
pH 7.5
 Ω 0.8



Shell dissolution

Field trials at Sanford Ecofarm in November 2018



Incorporate waste shell with mussel seed in spat socks

Monitor pH & determine impact on mussel seed

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National
Science
Challenges

SUSTAINABLE
SEAS

Ko ngā moana
whakauka