A global review of the ecosystem services of bivalve aquaculture

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Aims

Review provisioning, regulating and cultural services

Synthesis of the data available from around the world

Provide values for upscaling

Highlight knowledge gaps

Ecosystem services of bivalve aquaculture

Provisioning Services

Food production
Poultry grit
Fertilisers and lime
Shell for construction
Pearls

Regulating Services

Nutrient remediation
Biological accumulation
Carbon sequestration
Shoreline protection

Cultural Services

Wildlife watching
Education
Research
Heritage
Seafood festivals
Spiritual significance

Overall value of shellfish aquaculture

Supporting services

Increasing seabed roughness

Providing habitats

Indirect benefits
to other services

Provisioning services

20.8 % of global aquaculture is bivalves

14.6 million tonnes produced (2015)

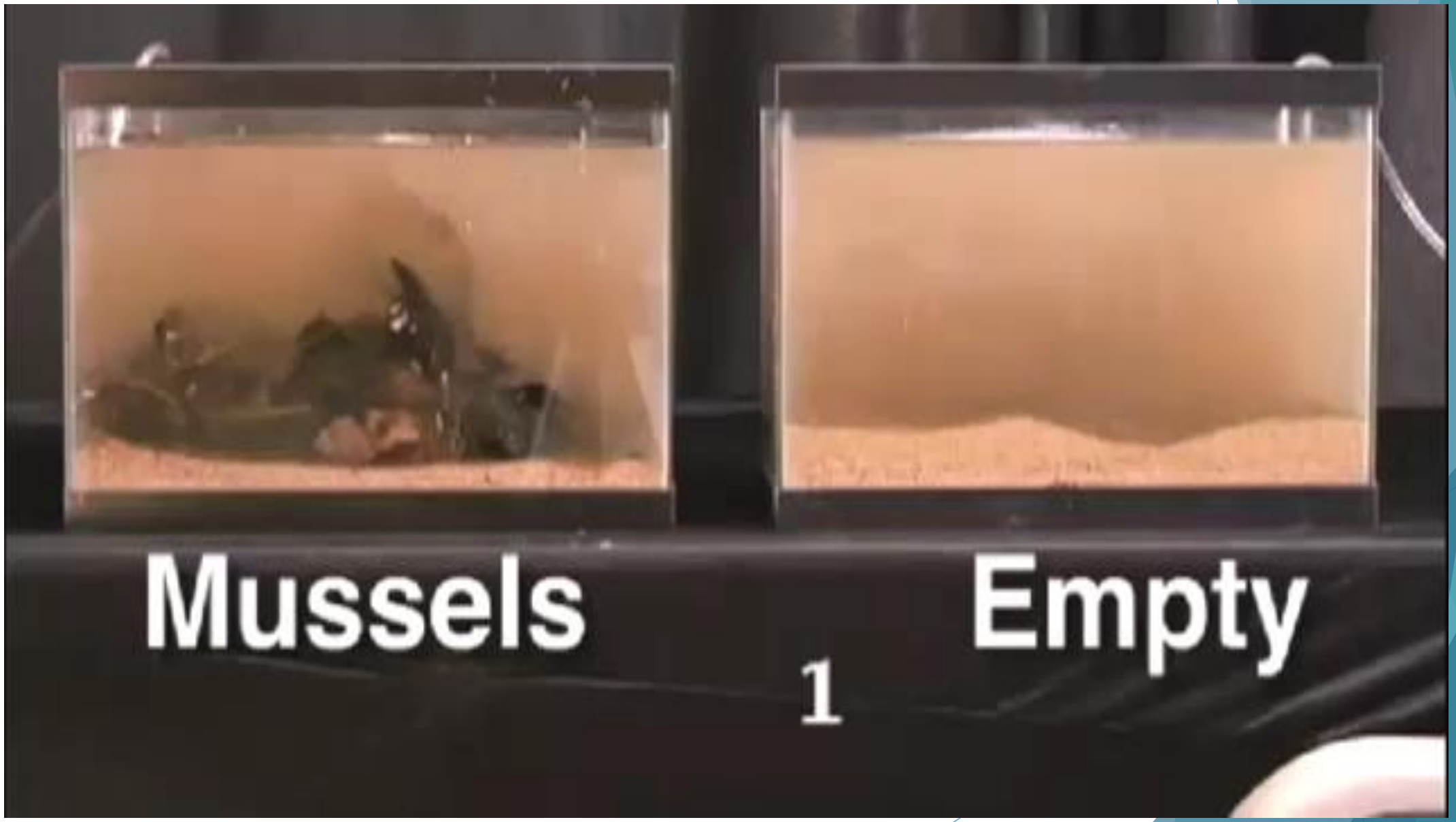

QUALITY
JONDO
PRODUCTS
MIXED POULTRY
GRIT

Shell as aggregate

$240 – 2,400 per tonne

Potential value of $5.2 billion

Regulating services



Nutrient removal

Nitrogen

Shell 0.32% ± 0.09 Tissue 9.28% ± 0.40

Phosphorus

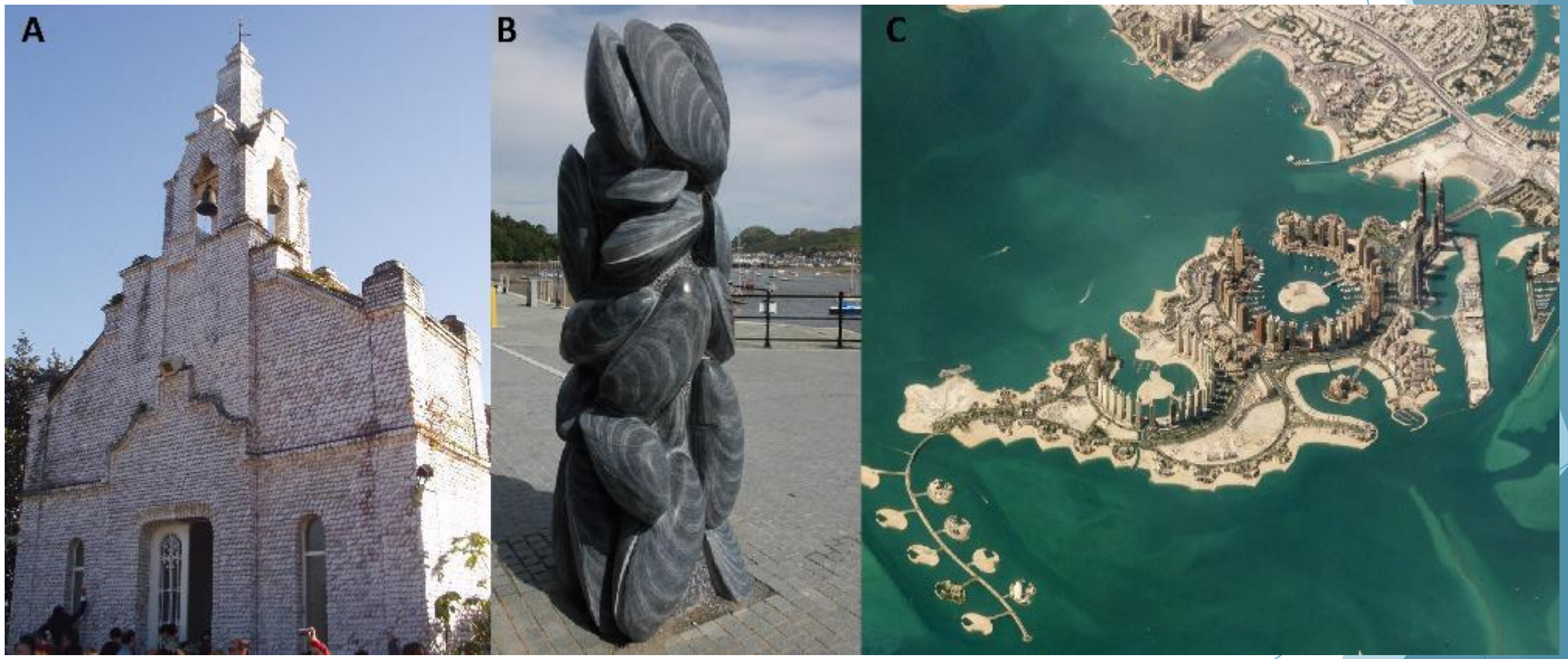
Shell 0.04% ± 0.01 Tissue 0.88% ± 0.07

Nitrogen removal \$8,996 – 31,050 t^{-1}
Phosphorus removal \$13,118 – 58,561 t^{-1}

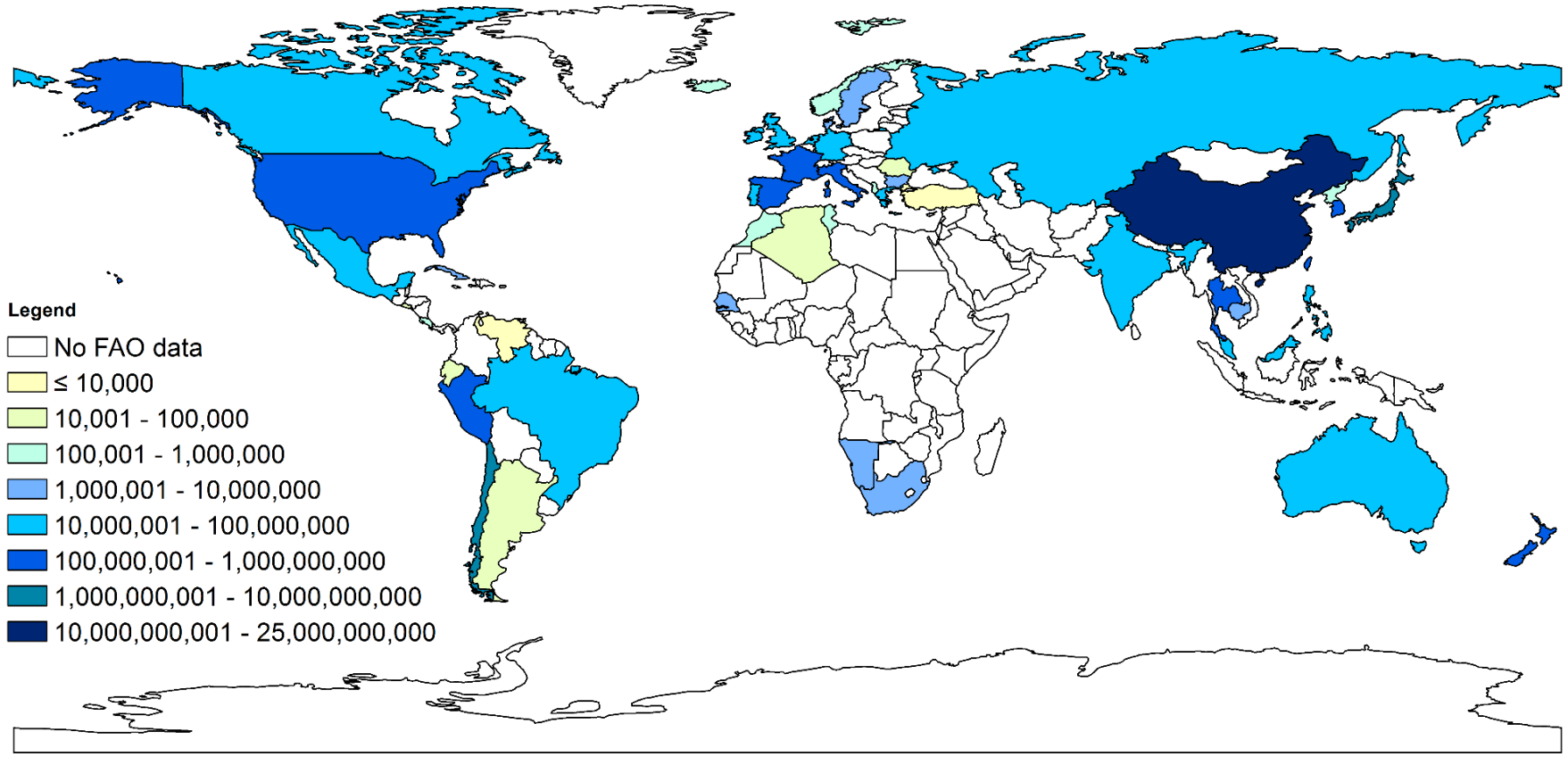
We estimate this has a global value of \$1.2 billion

Carbon sequestration

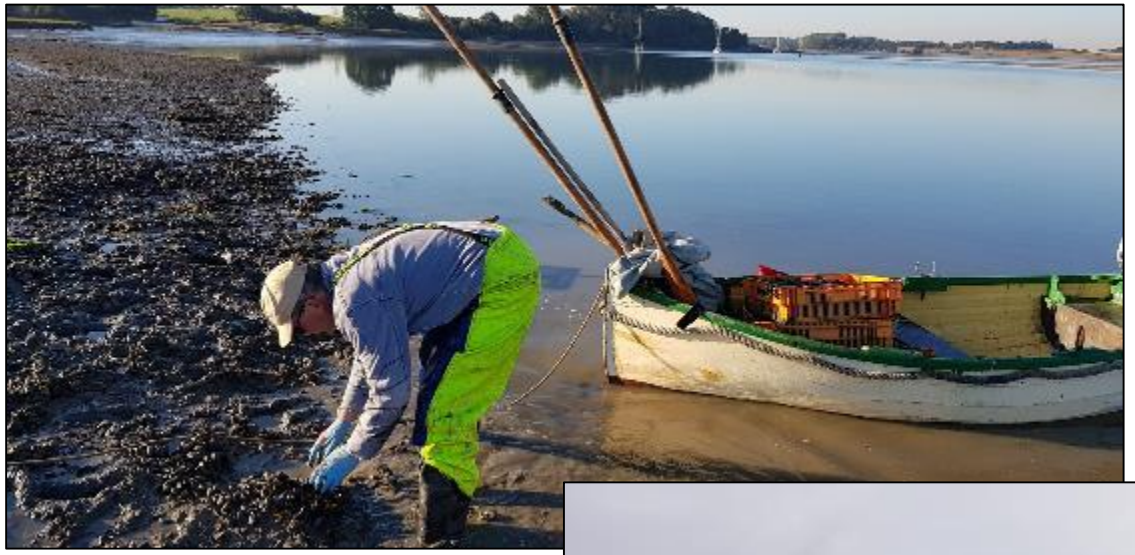
Cultural services



Seafood festivals



Non-food value of $6.47 billion



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A global review of the ecosystem services provided by bivalve aquaculture

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Abstract

Bivalve shellfish aquaculture provides many benefits to society, beyond their traditional market value. This study collates the evidence available on the provisioning, regulating and cultural ecosystem services provided by the bivalve species commonly used in aquaculture. For the first time, it synthesises this evidence to provide a global assessment of the potential market and non-market economic value of bivalve aquaculture. Bivalves are filter feeders, filtering water and particulates, creat-

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