## Algal-dominated to urchin-barren state

Ecological processes

Climate-driven changes

Over-exploitation of natural resources

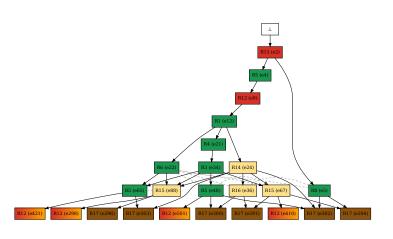
Management interventions

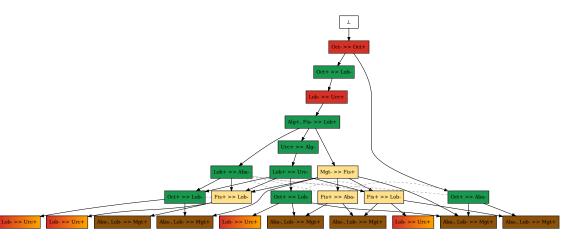
Final configuration event

Alg+, Urc-, Lob+, Aba+, Oct-, Fis-, Mgt- (algal-dominated)

to

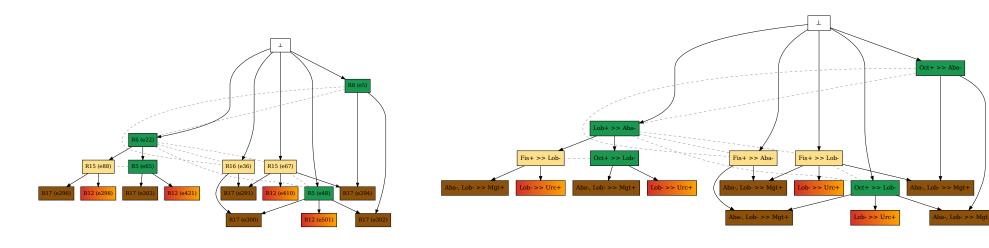
Alg-, Urc+, Lob-, Aba-, Oct+, Fis+, Mgt+ (urchin-barren)





(a) Event structure with ids.

(b) Event structure with labels.



(c) Pathway structure with ids.

(d) Pathway structure with labels.

Figure 1: First set of configurations (6) leading to Urchin barren state from Algal dominated state.

R13 (e2), R5 (e4), R12 (e9), R1 (e12), R4 (e21), R6 (e22), R14 (e24), R3 (e34), R15 (e88), R17 (e296), R12 (e298)

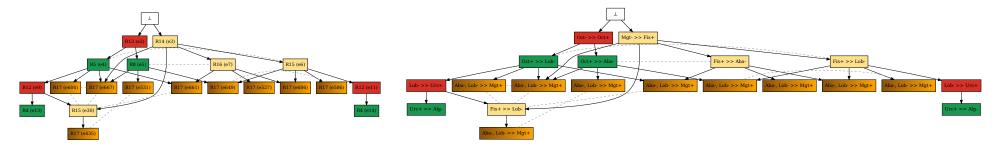
R13 (e2), R5 (e4), R12 (e9), R1 (e12), R4 (e21), R14 (e24), R3 (e34), R16 (e36), R15 (e67), R17 (e291), R12 (e410)

R13 (e2), R5 (e4), R12 (e9), R1 (e12), R4 (e21), R6 (e22), R14 (e24), R3 (e34), R5 (e65), R17 (e303), R12 (e421)

R13 (e2), R5 (e4), R12 (e9), R1 (e12), R4 (e21), R14 (e24), R3 (e34), R16 (e36), R5 (e48), R17 (e300), R12 (e501)

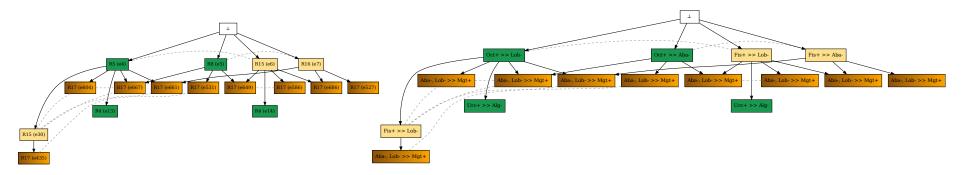
R13 (e2), R5 (e4), R8 (e5), R12 (e9), R1 (e12), R4 (e21), R14 (e24), R3 (e34), R15 (e67), R17 (e294), R12 (e410)

R13 (e2), R5 (e4), R8 (e5), R12 (e9), R1 (e12), R4 (e21), R14 (e24), R3 (e34), R5 (e48), R17 (e302), R12 (e501)



(a) Event structure with ids.

(b) Event structure with labels.



(c) Pathway structure with ids.

(d) Pathway structure with labels.

Figure 2: Second set of configurations (9) leading to Urchin barren state from Algal dominated state.

R13 (e2), R14 (e3), R15 (e6), R16 (e7), R12 (e11), R4 (e14), R17 (e686)

R13 (e2), R14 (e3), R8 (e5), R15 (e6), R12 (e11), R4 (e14), R17 (e586)

R13 (e2), R14 (e3), R8 (e5), R15 (e6), R12 (e11), R4 (e14), R17 (e649)

R13 (e2), R14 (e3), R5 (e4), R16 (e7), R12 (e9), R4 (e13), R17 (e527)

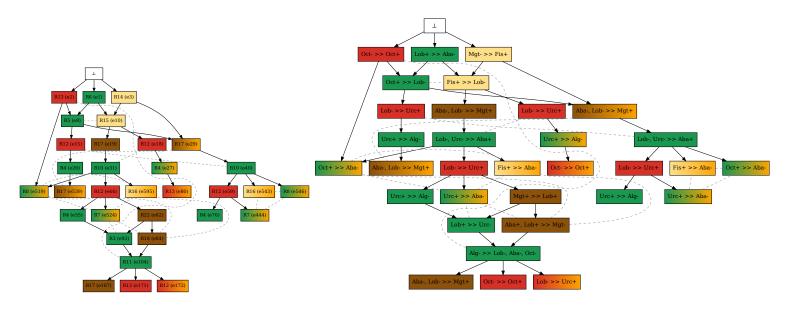
R13 (e2), R14 (e3), R5 (e4), R16 (e7), R12 (e9), R4 (e13), R17 (e661)

R13 (e2), R14 (e3), R5 (e4), R8 (e5), R12 (e9), R4 (e13), R15 (e30), R17 (e435)

R13 (e2), R14 (e3), R5 (e4), R8 (e5), R12 (e9), R4 (e13), R17 (e667)

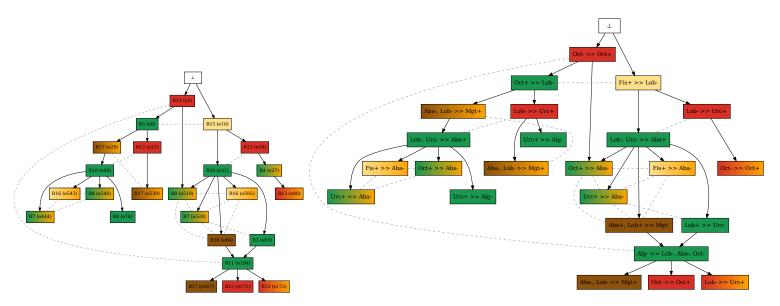
R13 (e2), R14 (e3), R5 (e4), R8 (e5), R12 (e9), R4 (e13), R17 (e531)

R13 (e2), R14 (e3), R5 (e4), R8 (e5), R12 (e9), R4 (e13), R17 (e604)



(a) Event structure with ids.

(b) Event structure with labels.



(c) Pathway structure with ids.

(d) Pathway structure with labels.

Figure 3: Third set of configurations (11) leading to Urchin barren state from Algal dominated state. R6 (e1), R13 (e2), R14 (e3), R5 (e8), R12 (e15), R4 (e26), R17 (e29)

R6 (e1), R13 (e2), R14 (e3), R5 (e8), R17 (e29), R10 (e40), R12 (e59), R4 (e76), R7 (e444)

R6 (e1), R13 (e2), R14 (e3), R5 (e8), R17 (e29), R10 (e40), R12 (e59), R4 (e76), R16 (e543)

R6 (e1), R13 (e2), R14 (e3), R5 (e8), R17 (e29), R10 (e40), R12 (e59), R4 (e76), R8 (e546)

R6 (e1), R13 (e2), R14 (e3), R5 (e8), R12 (e15), R4 (e26), R17 (e539)

R6 (e1), R13 (e2), R14 (e3), R15 (e10), R17 (e19), R10 (e31), R12 (e44), R4 (e55), R7 (e524)

R6 (e1), R13 (e2), R14 (e3), R15 (e10), R17 (e19), R10 (e31), R12 (e44), R4 (e55), R16 (e595)

R6 (e1), R13 (e2), R14 (e3), R15 (e10), R17 (e19), R10 (e31), R12 (e44), R4 (e55), R8 (e519)

R6 (e1), R13 (e2), R14 (e3), R15 (e10), R12 (e18), R17 (e19), R4 (e27)

R6 (e1), R14 (e3), R15 (e10), R12 (e18), R17 (e19), R4 (e27), R13 (e80)

R6 (e1), R14 (e3), R15 (e10), R17 (e19), R10 (e31), R12 (e44), R4 (e55), R22 (e62), R18 (e84), R3 (e93), R11 (e104), R17 (e167), R13 (e171), R12 (e172)