



Pteropod molluscs

Toward an understanding of population
connectivity
and species delimitations

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DENSE POPULATIONS

Hyalocylis striata



CRITICAL FOOD WEB COMPONENTS



ACIDIFICATION



WARMING

Increase in metabolic rates



Increase demand for food

Increase in oxygen requirements

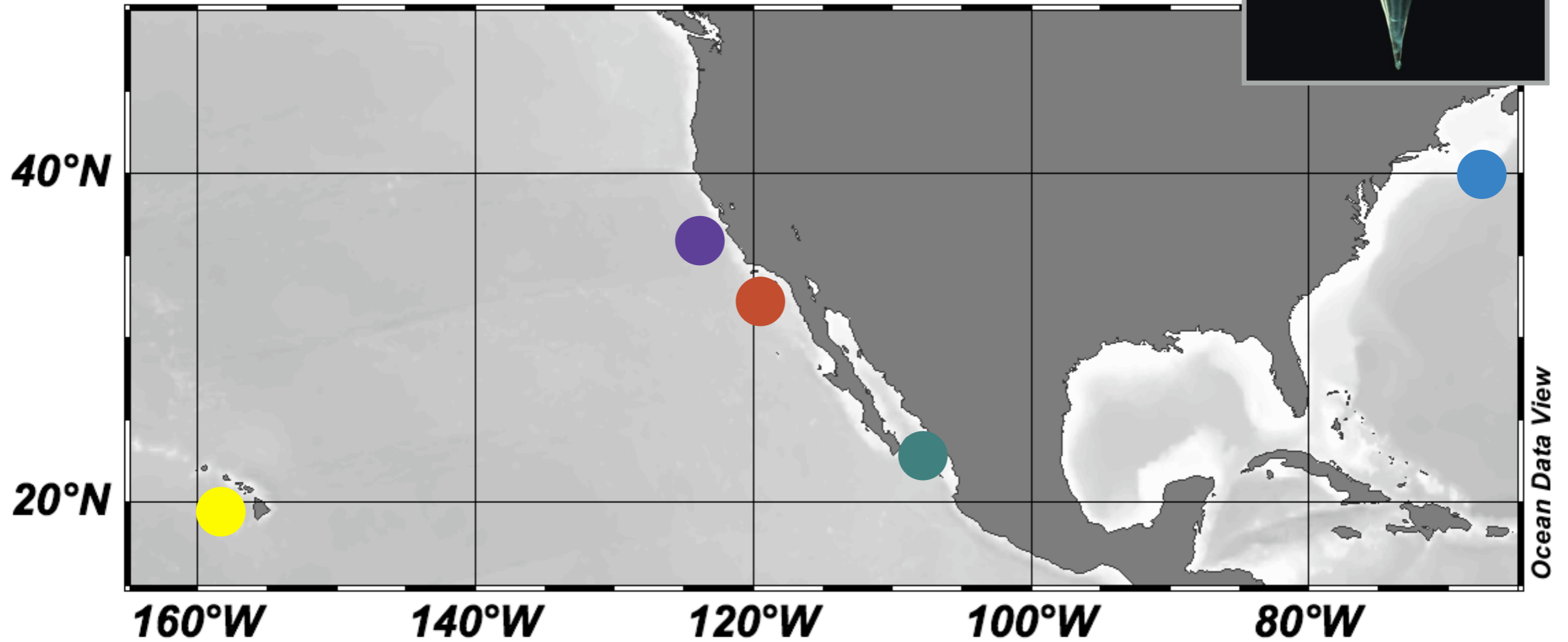
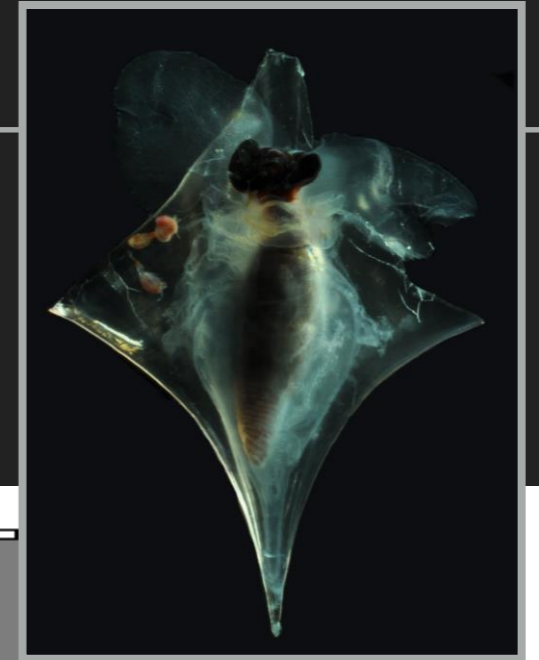
DEOXYGENATION

Metabolic suppression



May not be achievable in warmer water

Clio pyramidata



● Northern California

● Gulf of California

● Hawaii

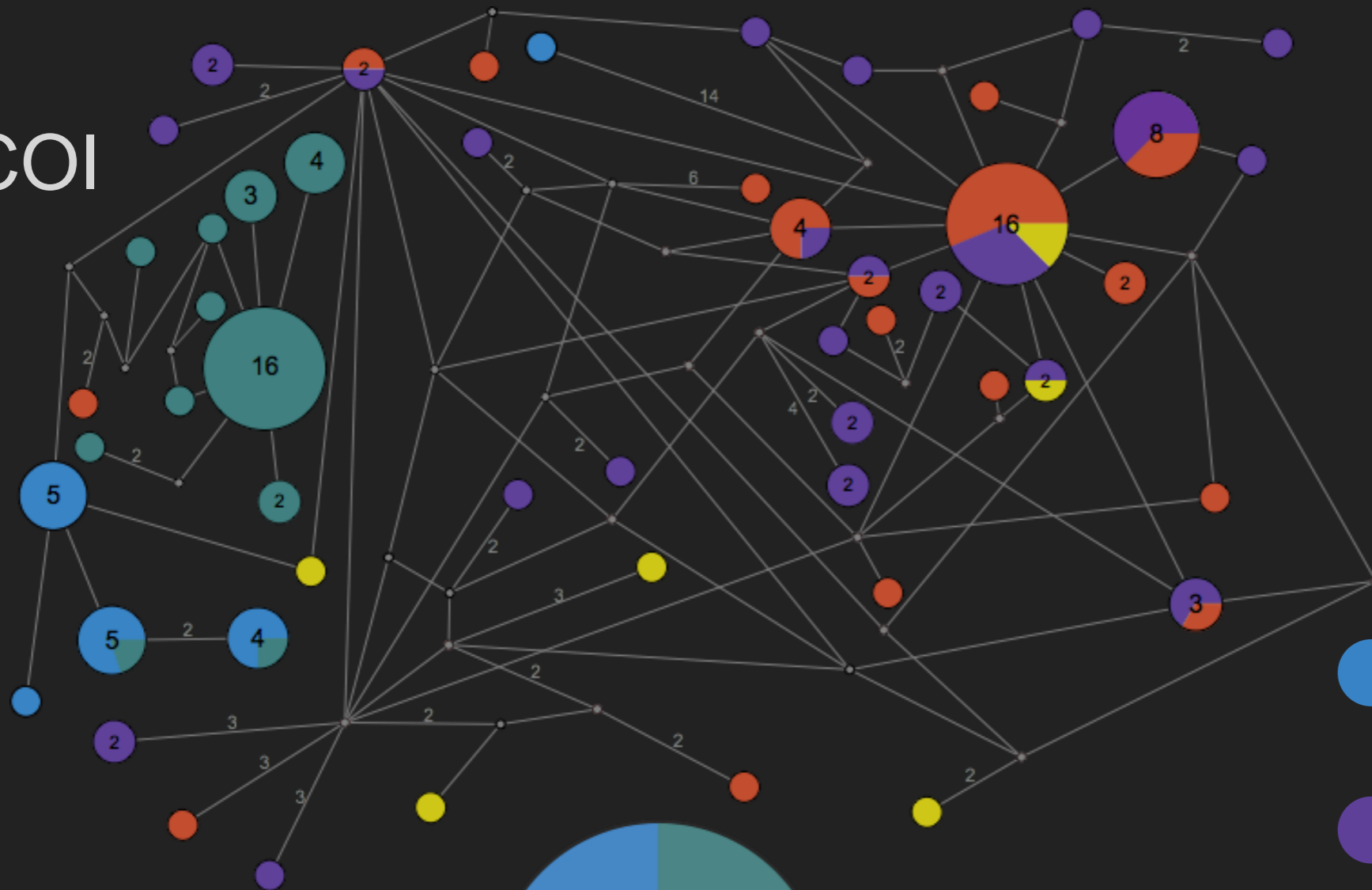
● Southern California

● Northwest Atlantic
(Bear Seamount)

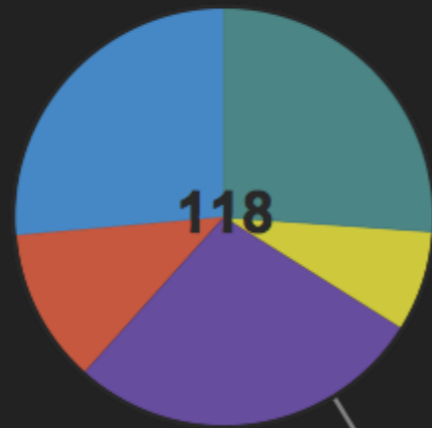
Clio pyramidata



COI

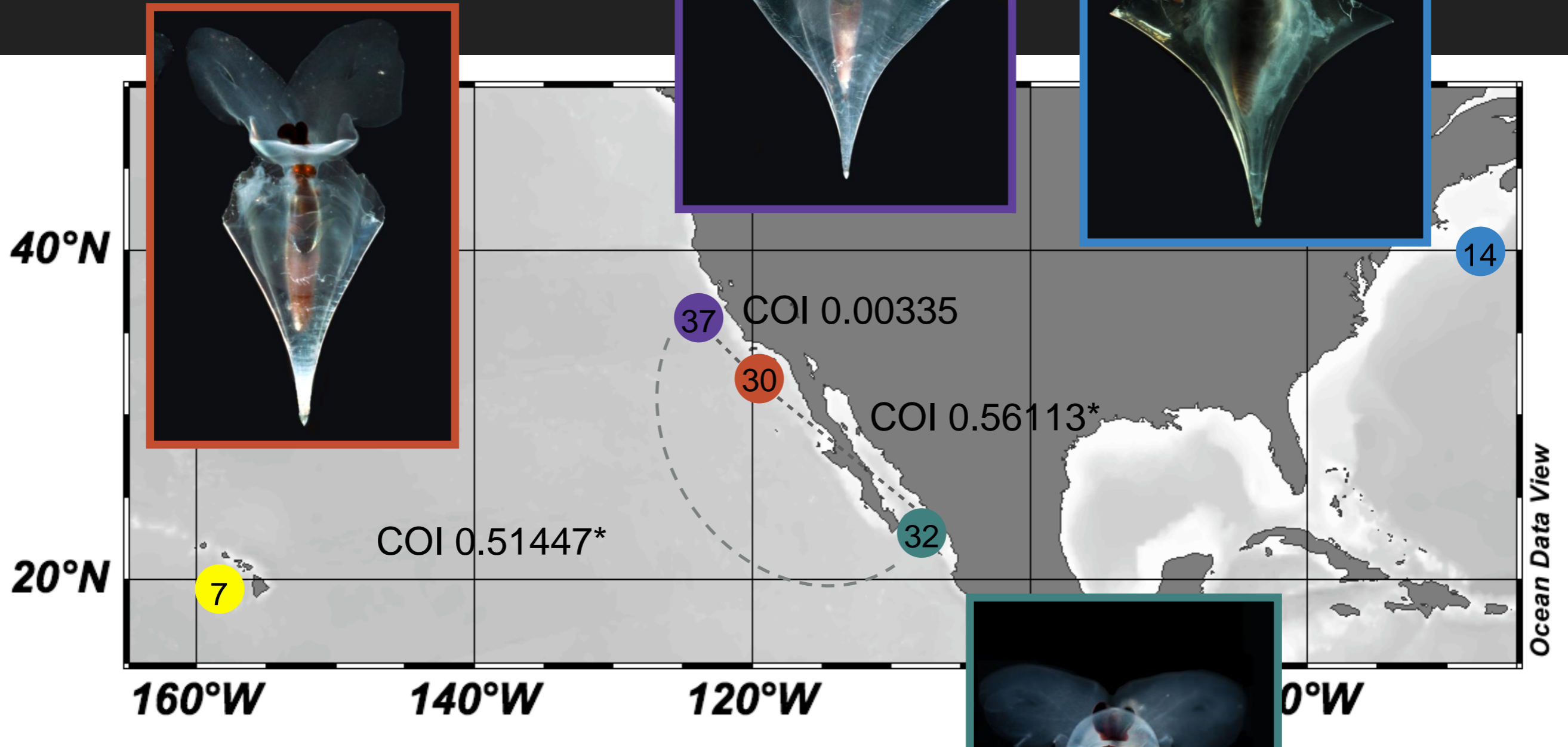


H3



- Northwest Atlantic (Bear Seamount)
- Northern California
- Southern California
- Gulf of California
- Hawaii

Clio pyramidata F_{ST} s



F_{ST} - fixation index

1 no genetic mixing

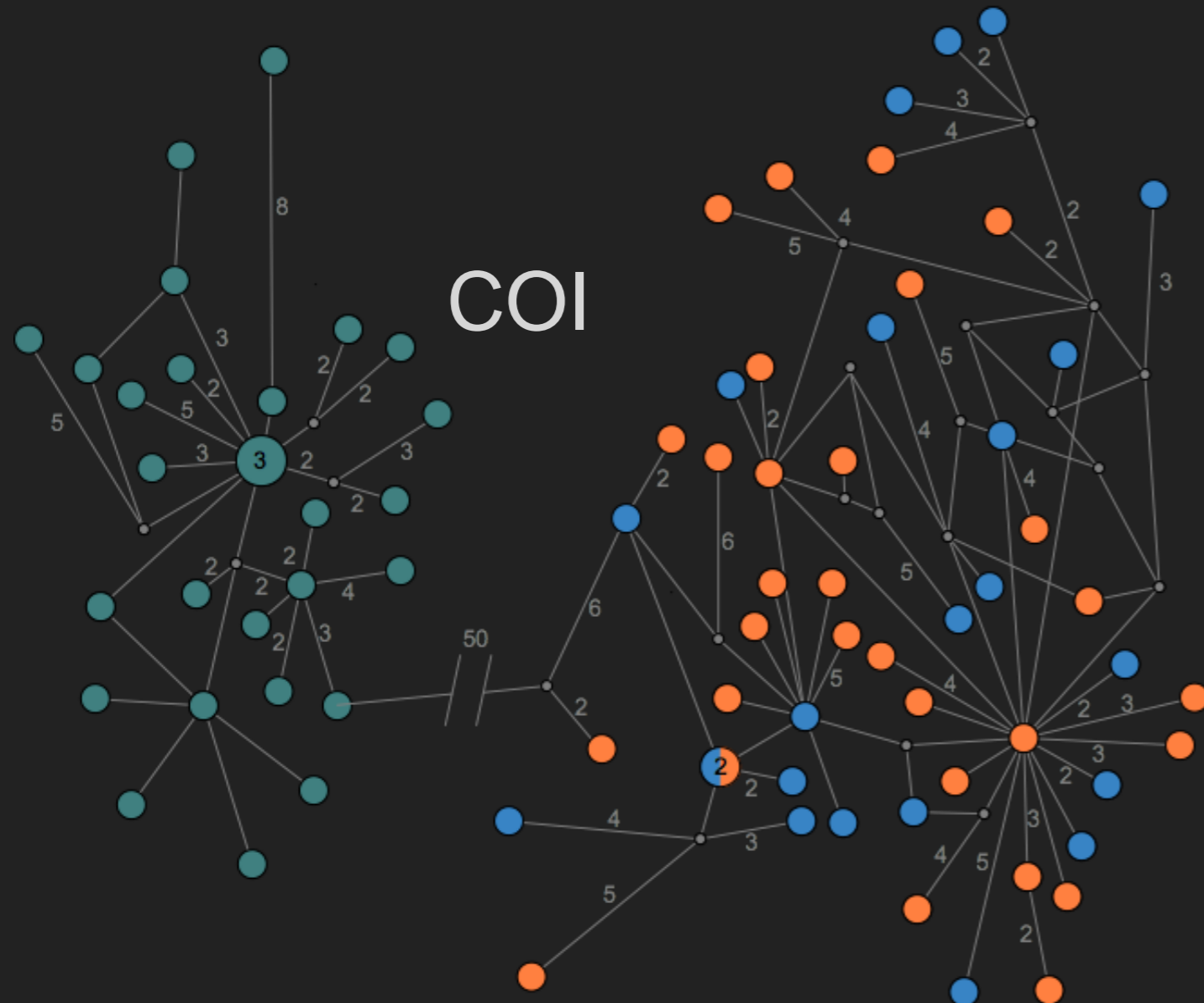
0 full genetic mixing



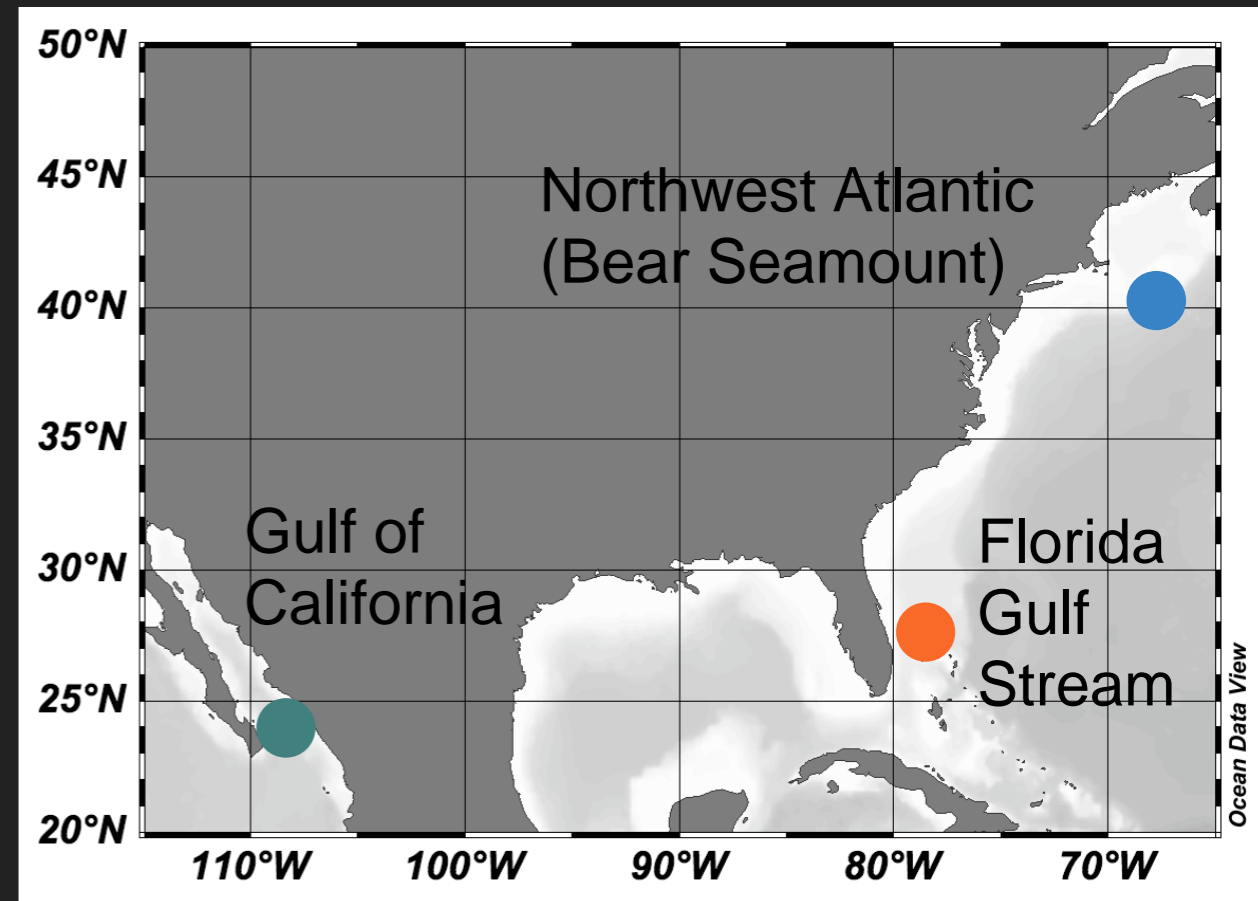
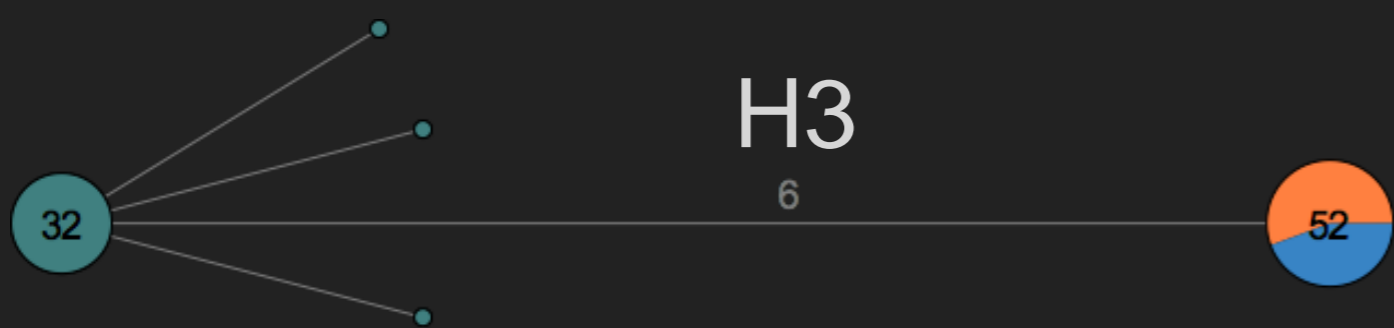
Cavolinia uncinata



COI



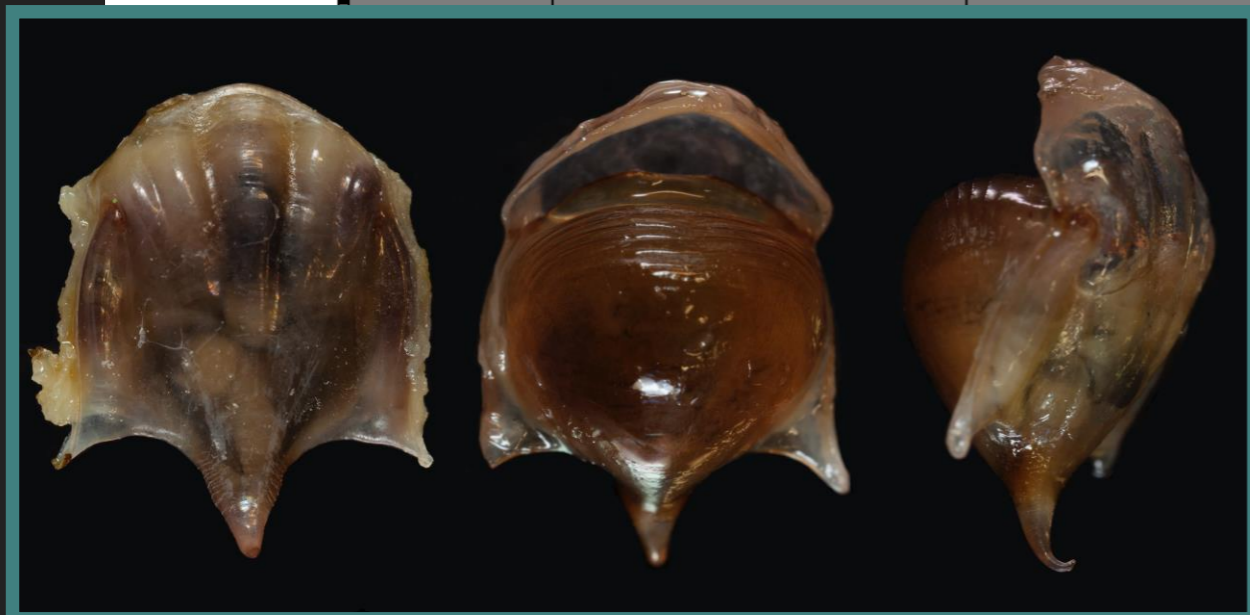
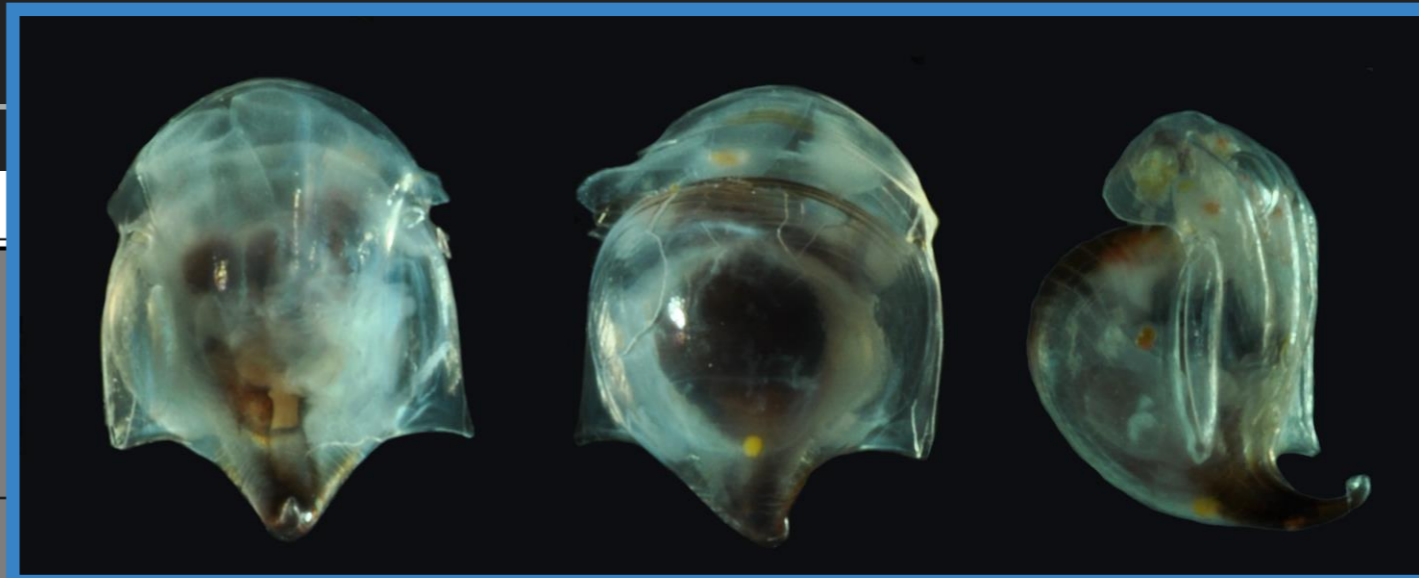
H3



Cavolinia uncinata F_{ST}s

50°N

45°N



30°N

25°N

20°N

110°W

100°W

90°W

80°W

70°W

COI 0.89584*
H3 0.98314*

COI -0.00582
H3 0.0000

COI 0.89085*
H3 0.98475*

23

29

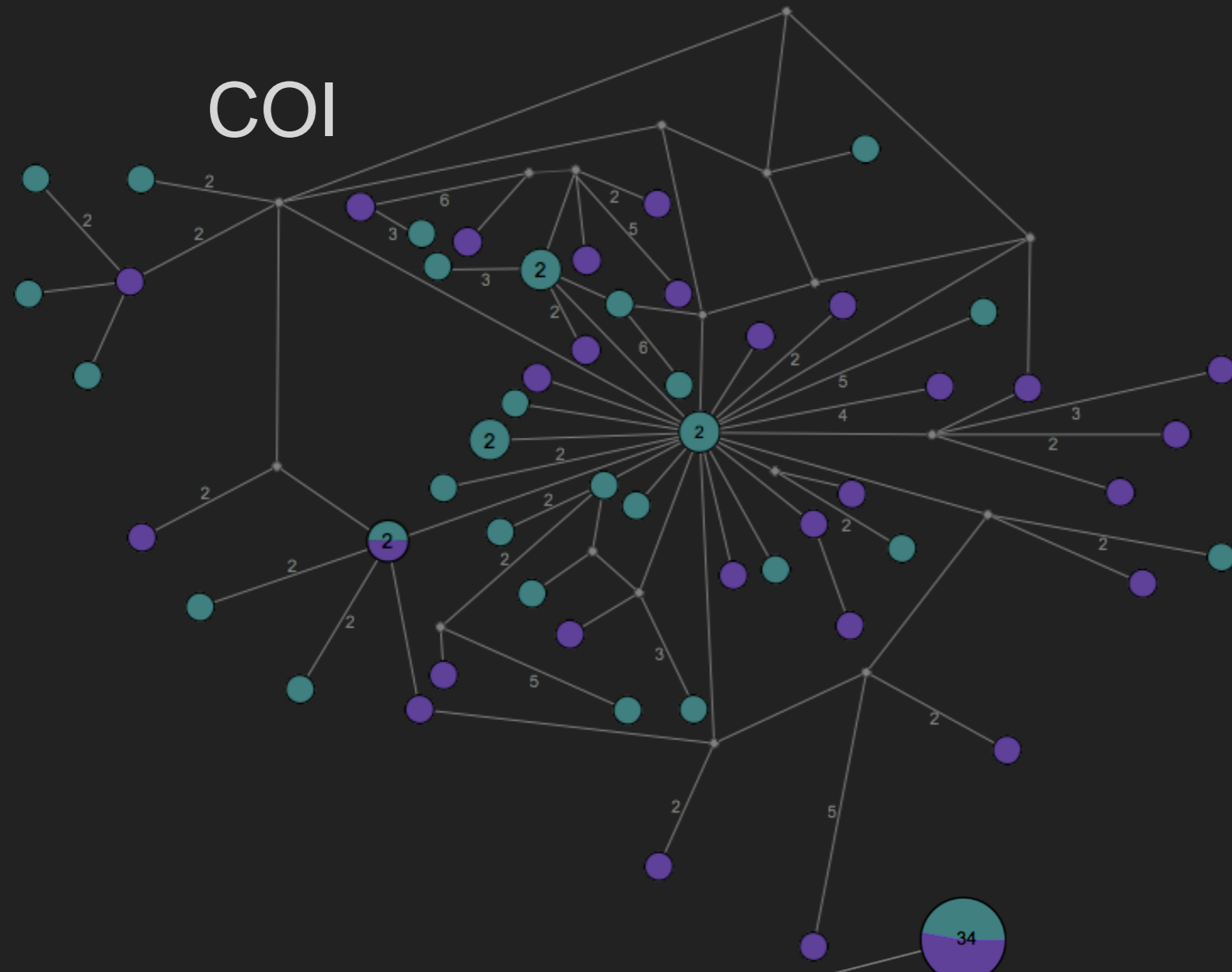
29

Ocean Data View

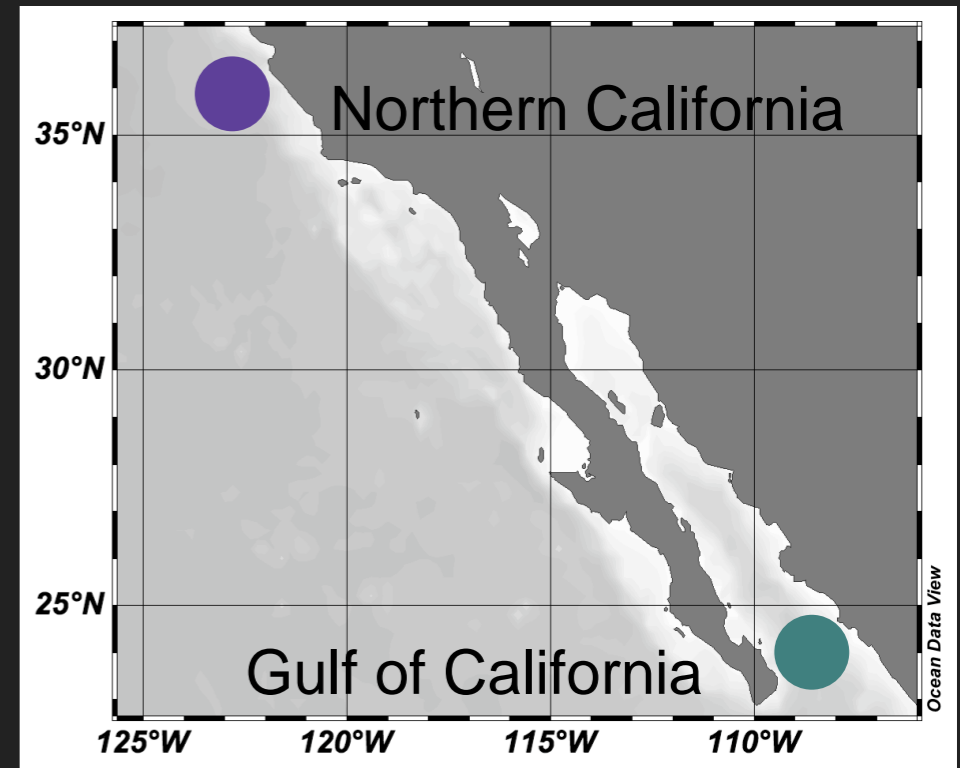
Hyalocylis striata



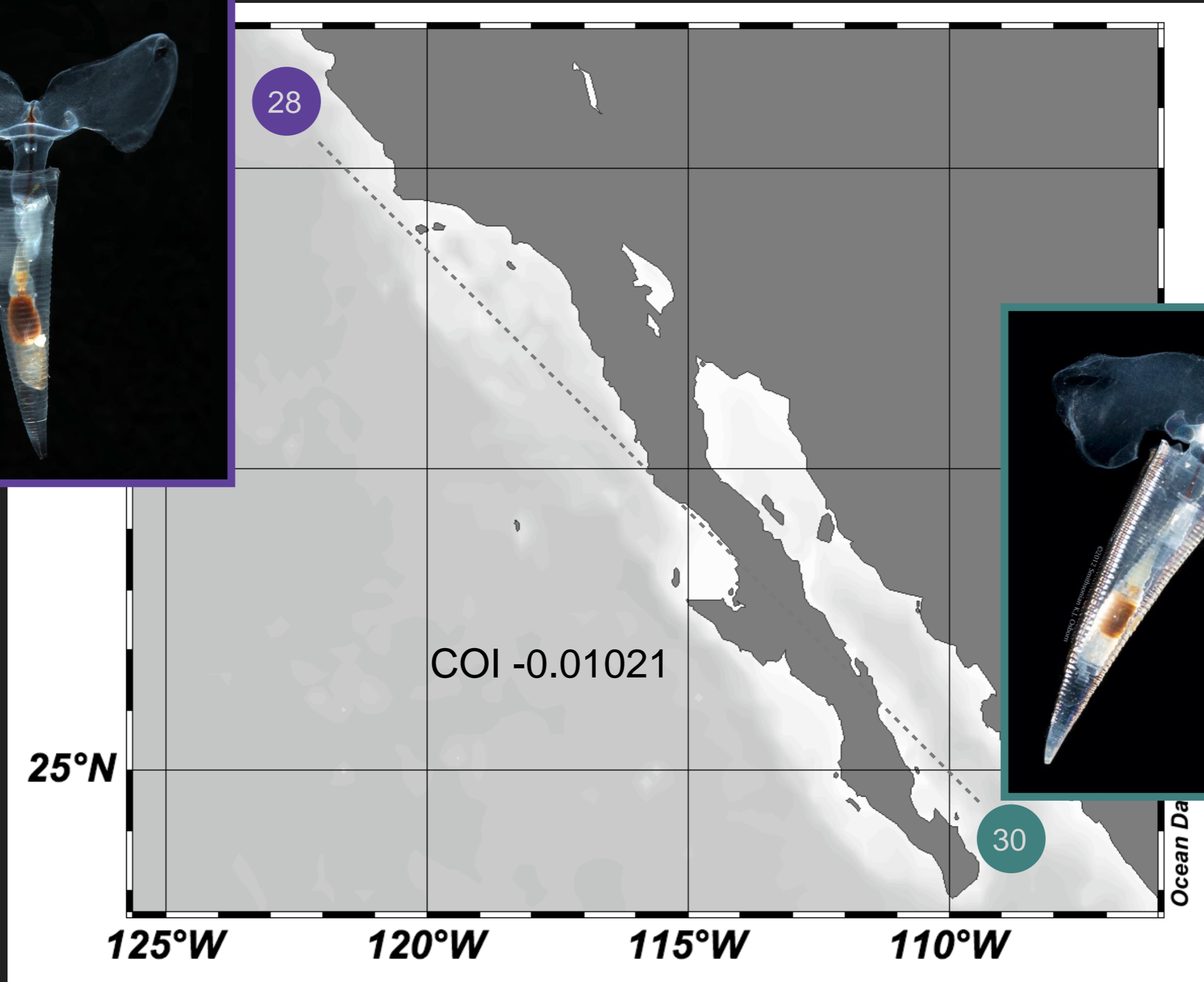
COI



H3

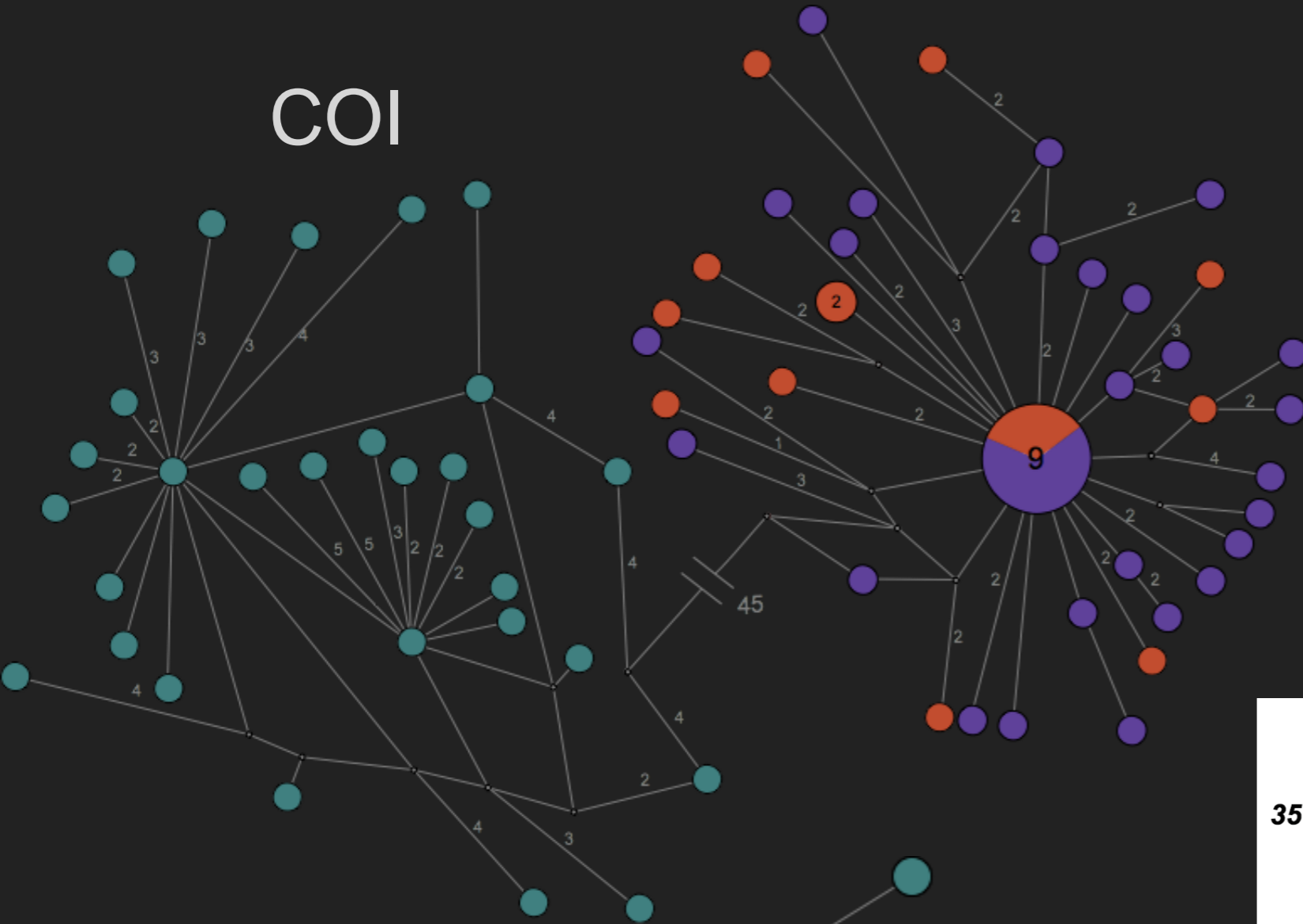


Hyalocylis striata F_{ST} s

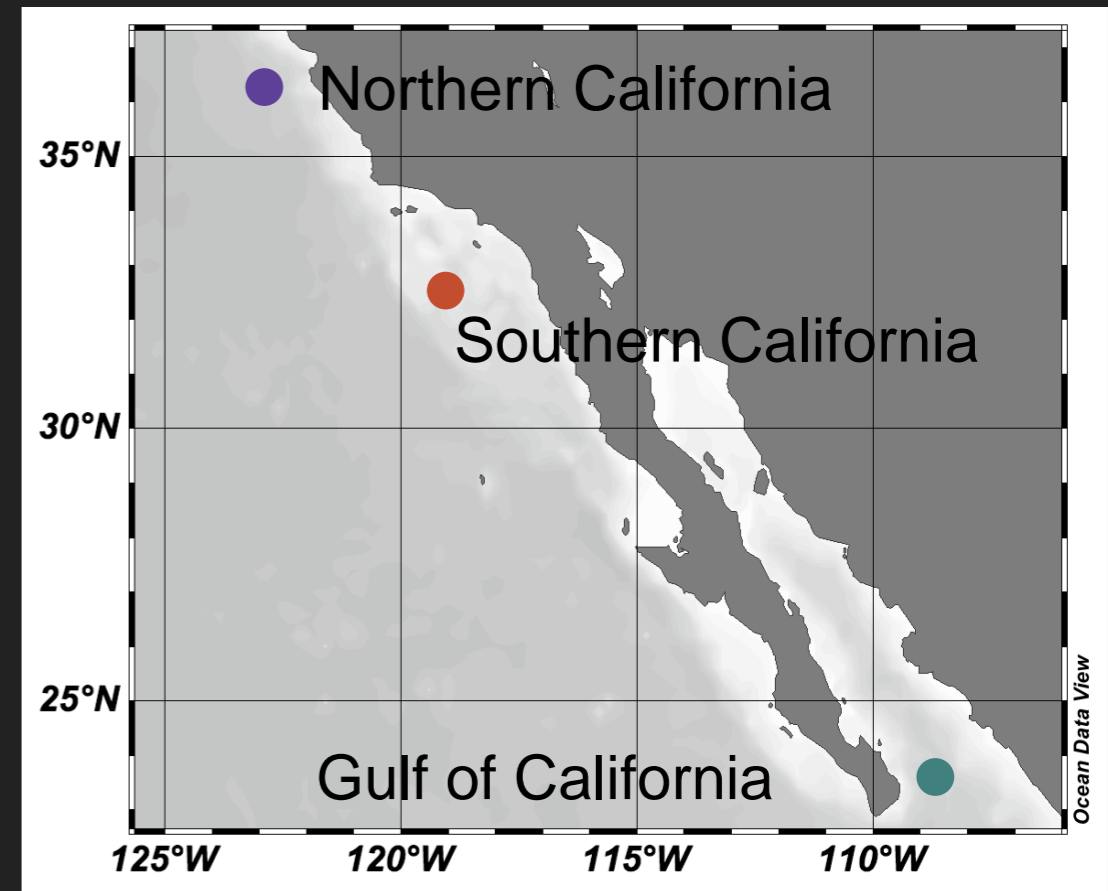
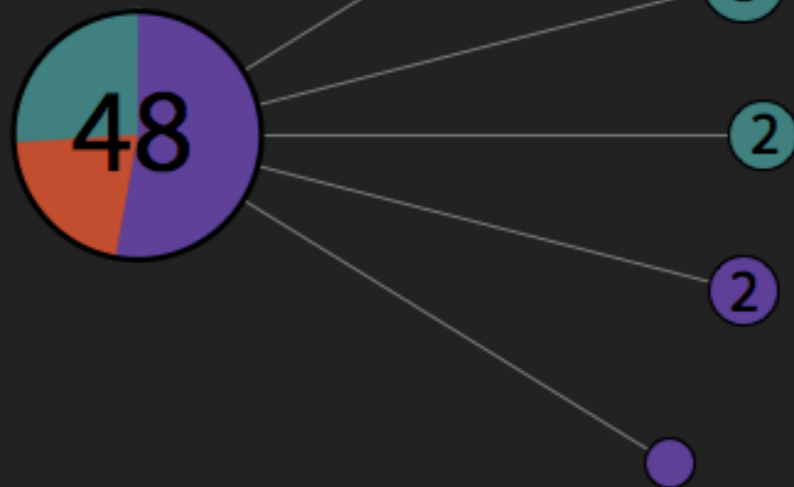


Corolla spectabilis

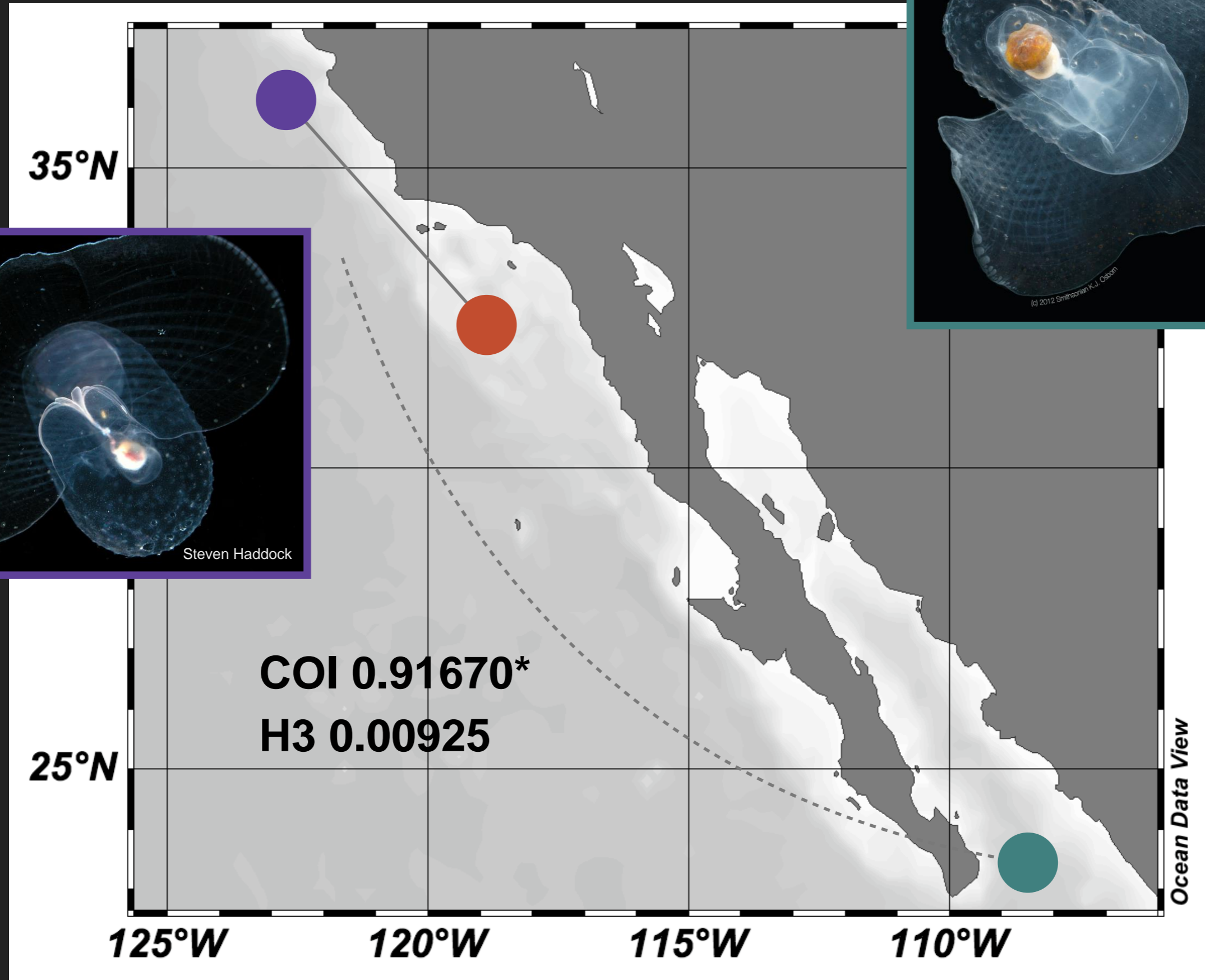
COI



H3



Corolla spectabilis F_{ST} s



CONCLUSIONS

- ▶ Species delimitations depend on taxon
 - ▶ Behavioral, physiological, ecological, selection differences
- ▶ *Cavolinia uncinata* likely two species
 - ▶ Previously considered formae by van der Spoel
- ▶ *Clio pyramidata* cosmopolitan
 - ▶ Despite morphological differences and large geographical distances



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Training Cruise