

One size doesn't fit all: Tailoring eDNA methodologies for marine biosecurity in data-poor regions

Eva Aylagas

M. Couëdel, R. Cadiz, B. Alabdulaziz, A. Polisenno, D. Baker, C. Bocanegra, A. P. Chakkiath, D.M. Cottrell, J. Curdia, J. Sempere-Valverde, V. Syomin, S. Chebaane, Marcos A. L. Teixeira, Ashwag Asseri, August Santillan, Trad Albarakati, A. Alhosamai, A. Ardan, L.J. Rabaoui, M.A. Qurban, S. Carvalho

Red Sea and Arabian Gulf: recipients and donors of NIS

Use of eDNA: challenges and opportunities



1

Sample collection

- Replicate number
- Sample type
- Sample volume



2

Sample processing

- DNA extraction method
- Genetic markers
- PCR protocol



2

Data analysis

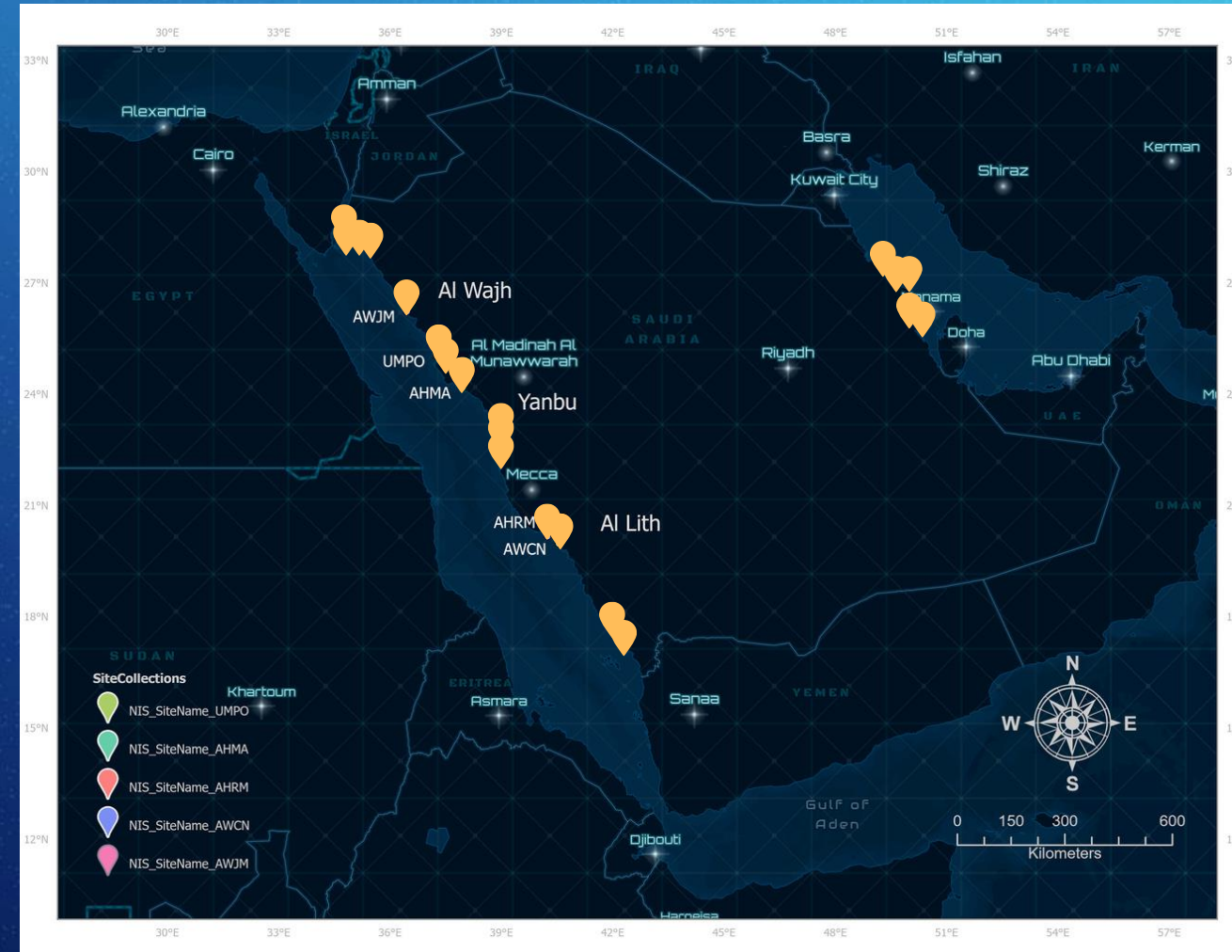
- Community level analysis
- NIS identification
- Detection probability



Large-scale monitoring program: 12-month period surveys collecting data from 34 ports and marinas

1

Effect of water volume on biodiversity metrics



2

Efficiency of eDNA to detect NIS

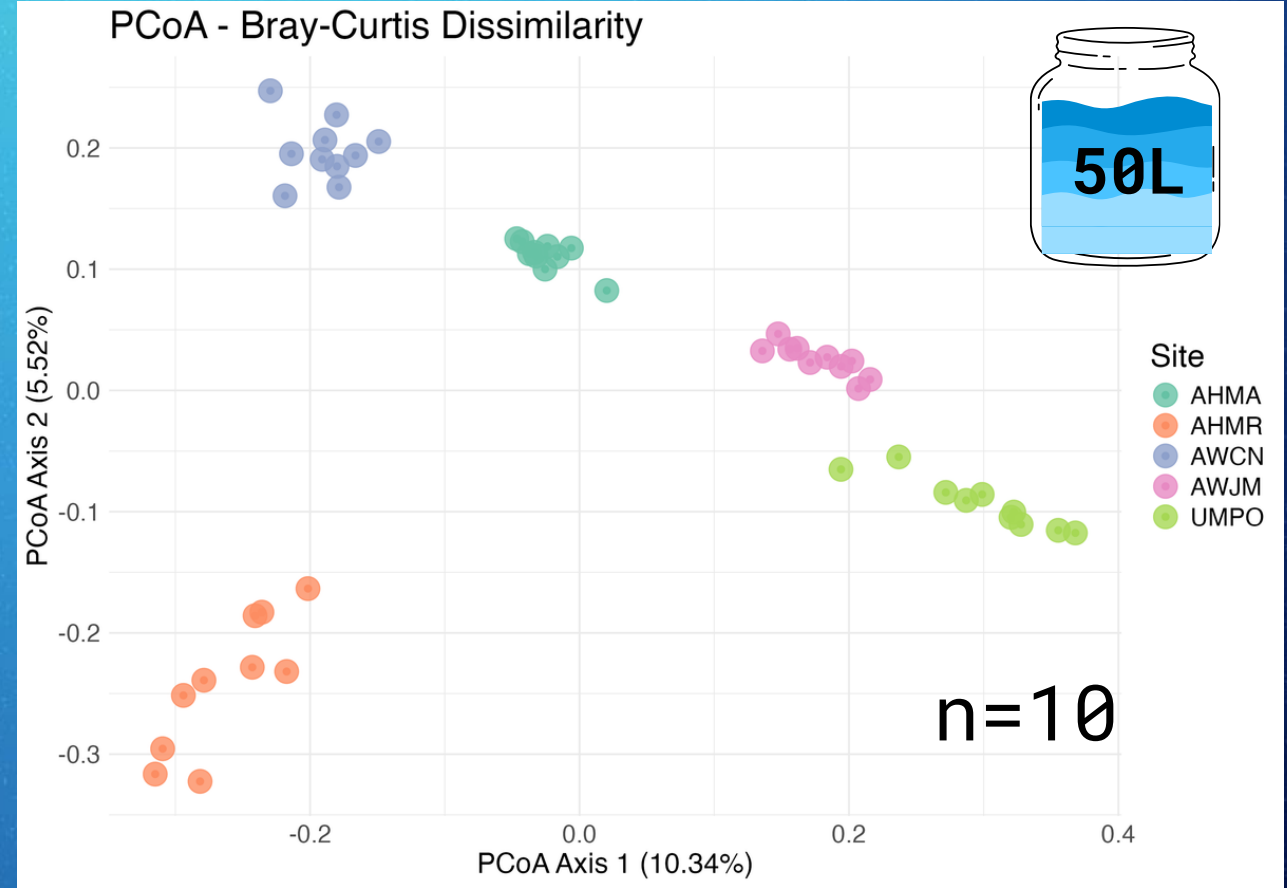
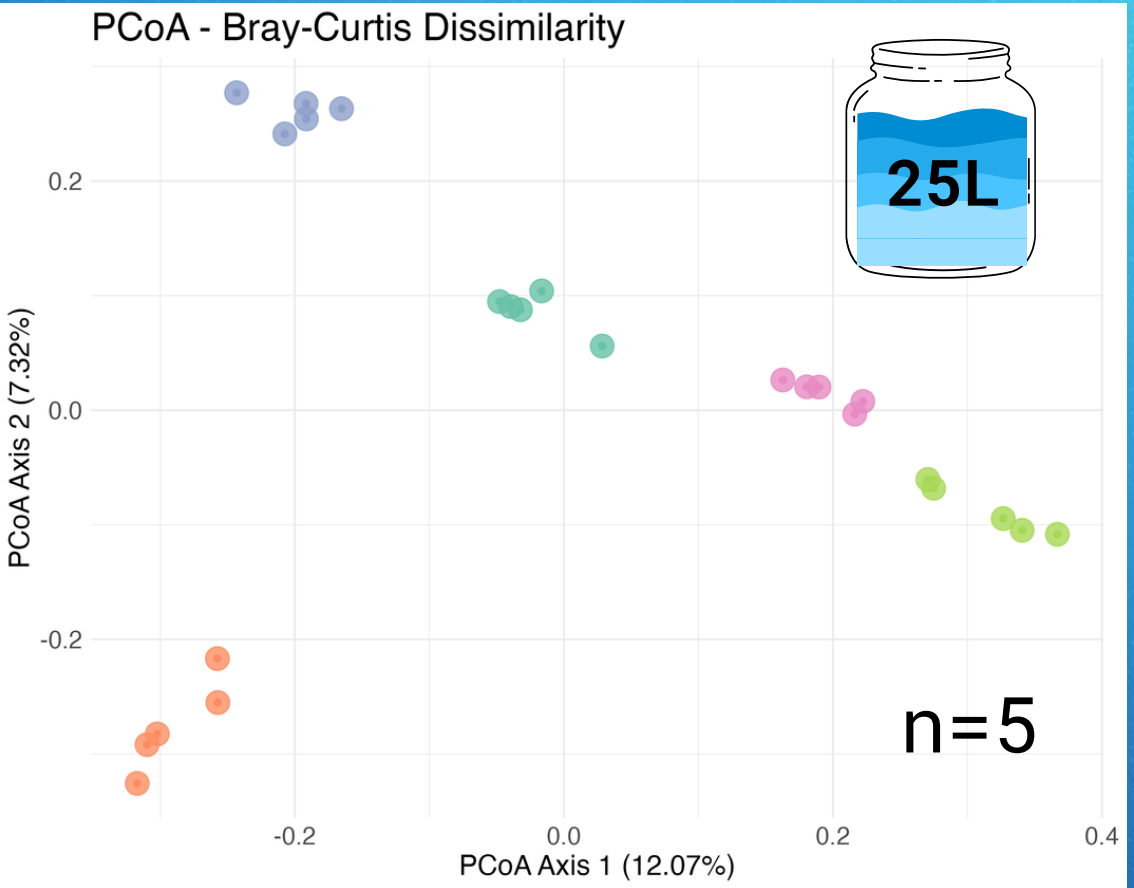
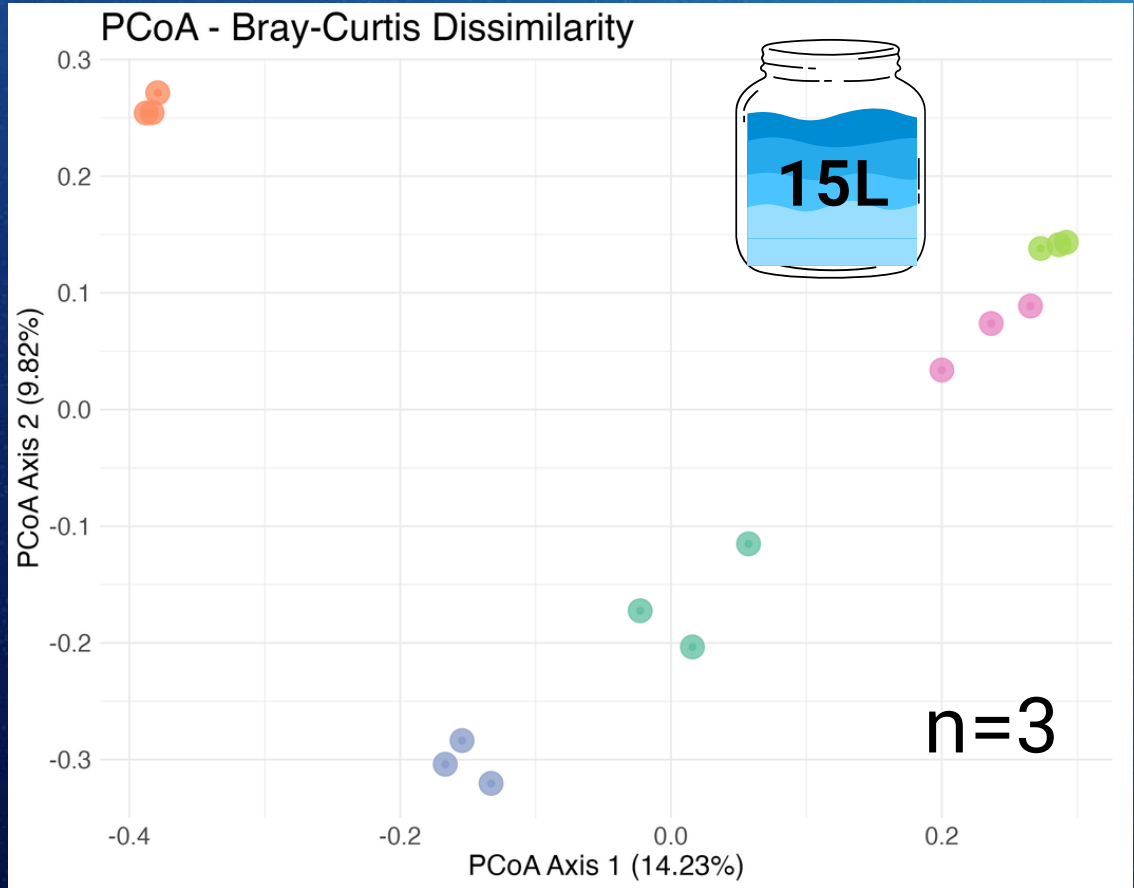


10 replicates (5L)

Effect of water volume on biodiversity metrics



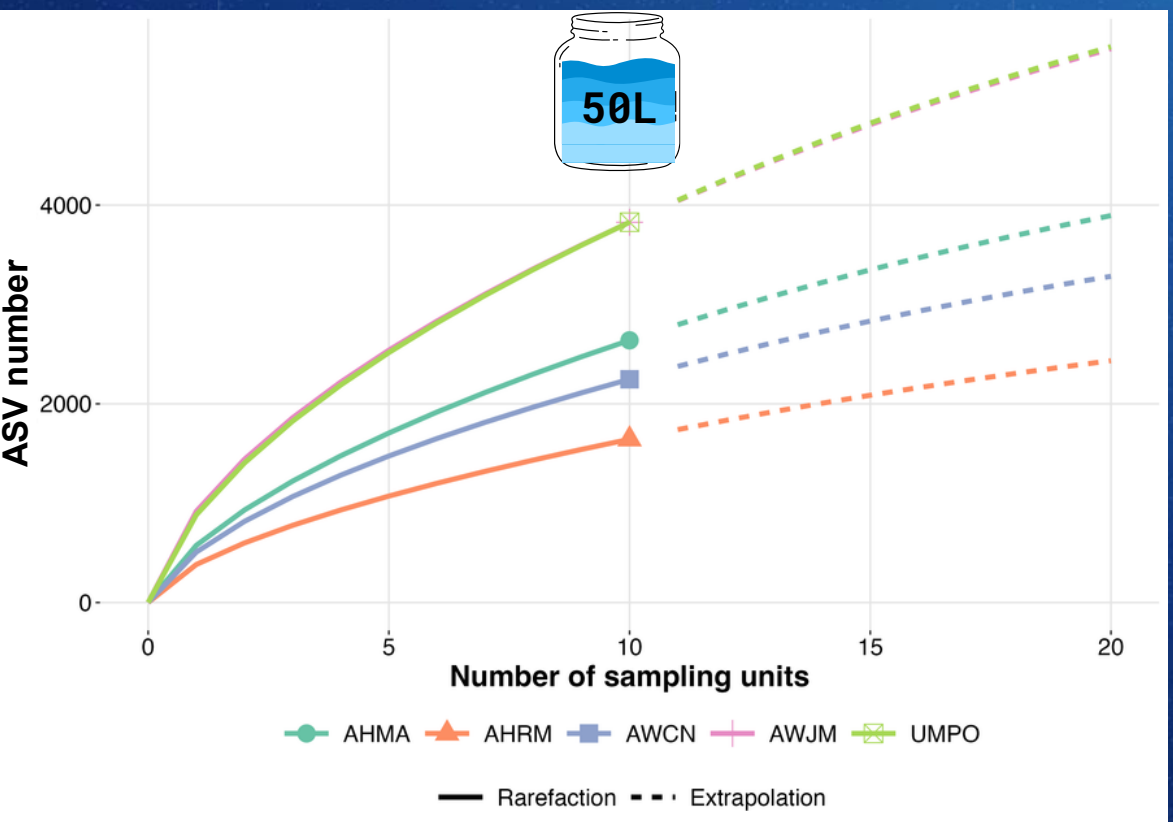
COI gene (m1COIint/jgHC02198)



Community level analysis: site-specific biodiversity was distinguishable from 3 replicates

Species Accumulation Curves

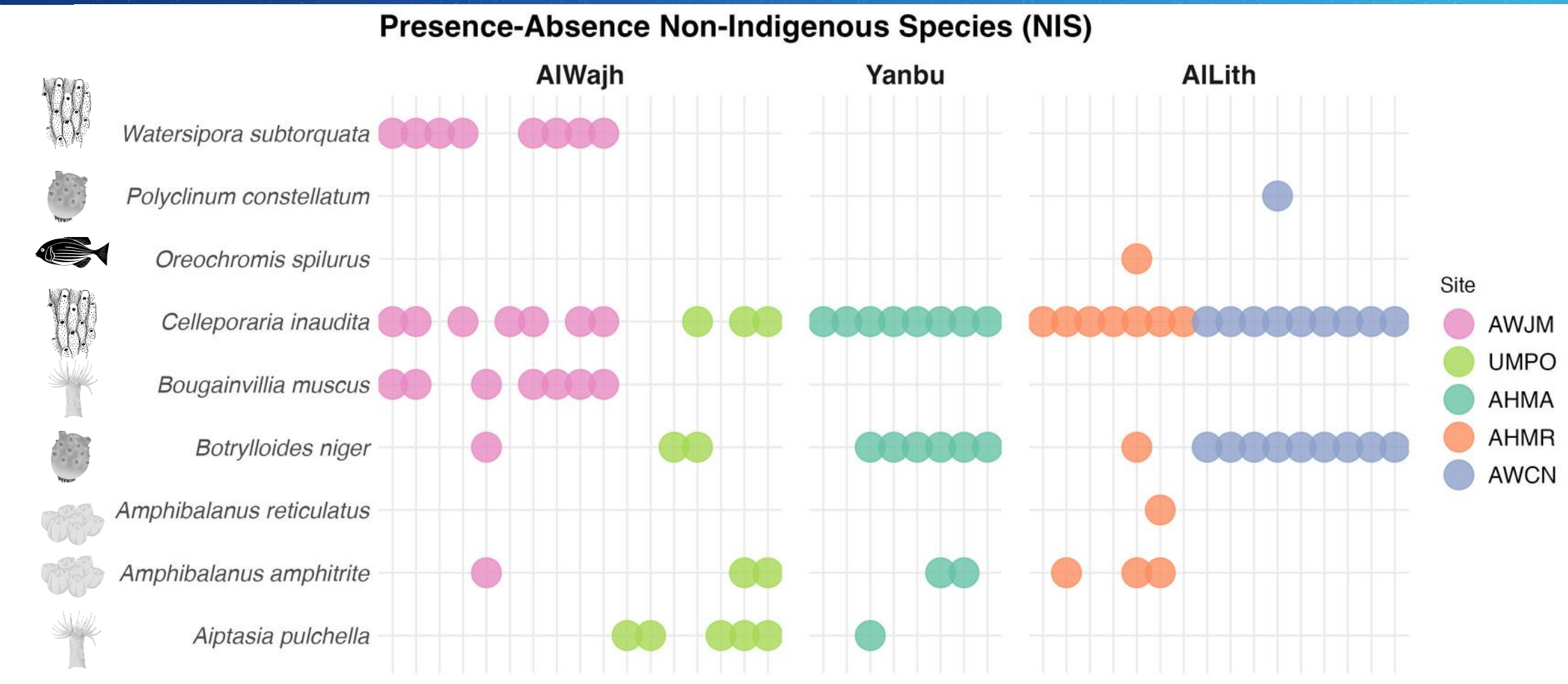
Species richness undersampled at each site based on the present sampling effort



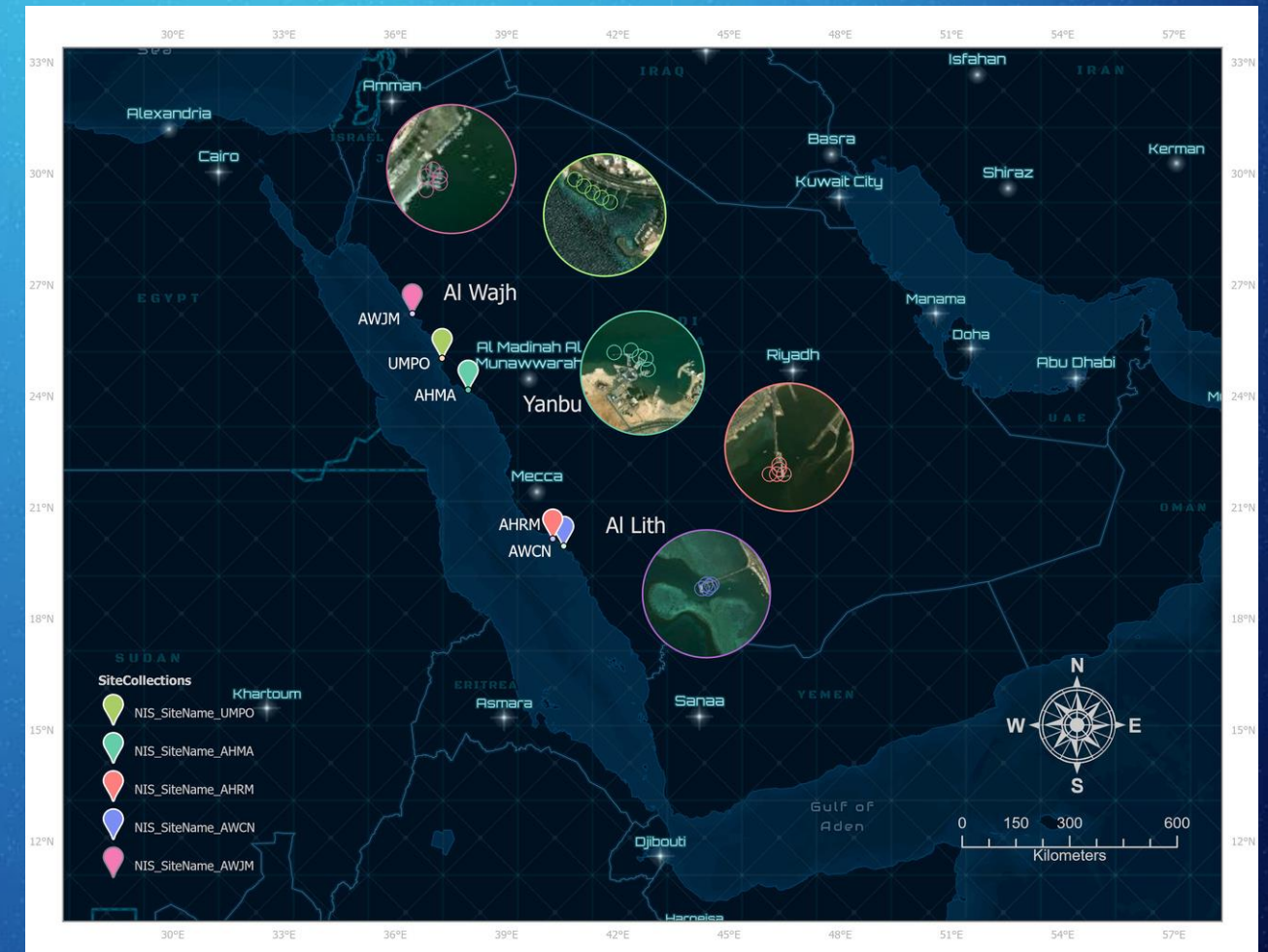
Efficiency of eDNA to detect NIS



WORK IN PROGRESS



Tax Assignment: 97% identity COI



Aquaculture introduced



Cryptogenic



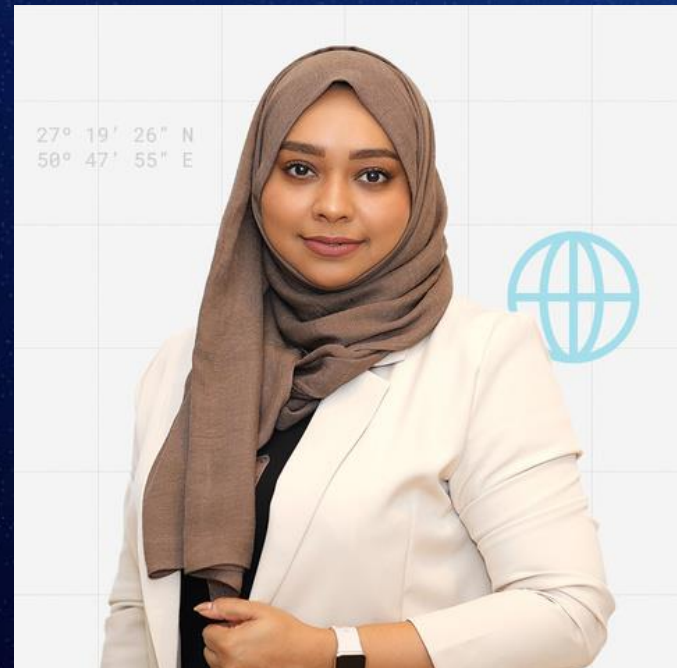
المركز الوطني
لتنمية الحياة الفطرية
National Center for Wildlife
المملكة العربية السعودية



Thank you



Ronald Cadiz



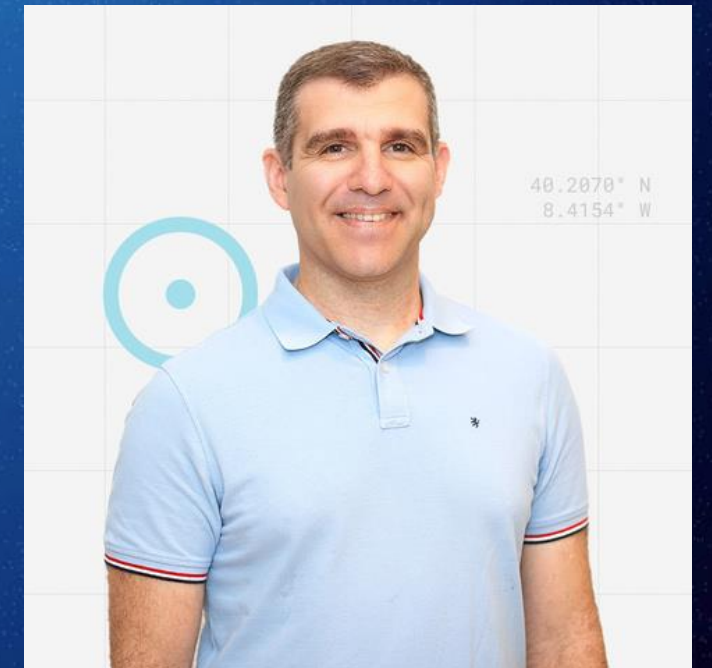
Doaa Baker



Dr Angelo Poliseno



Dr Marion Couedel

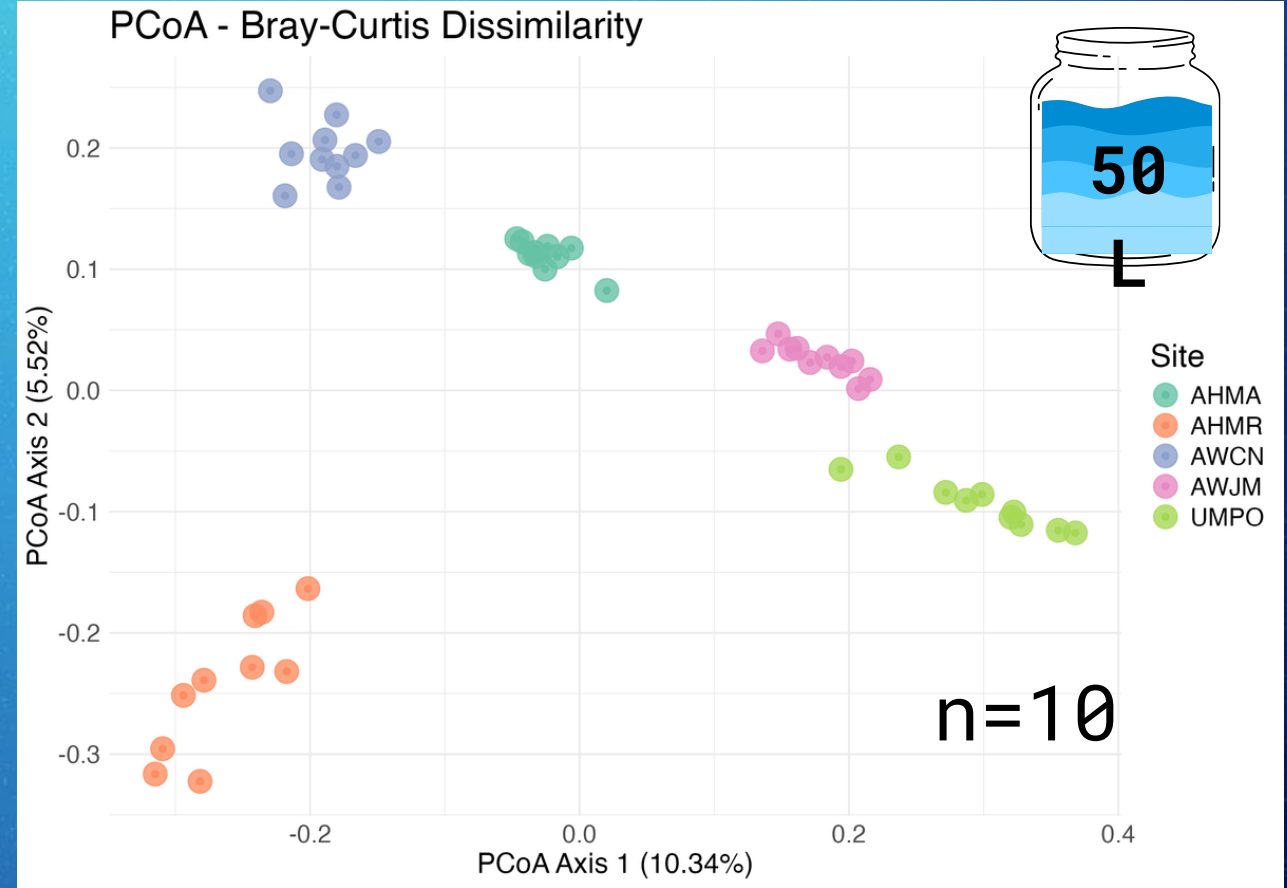
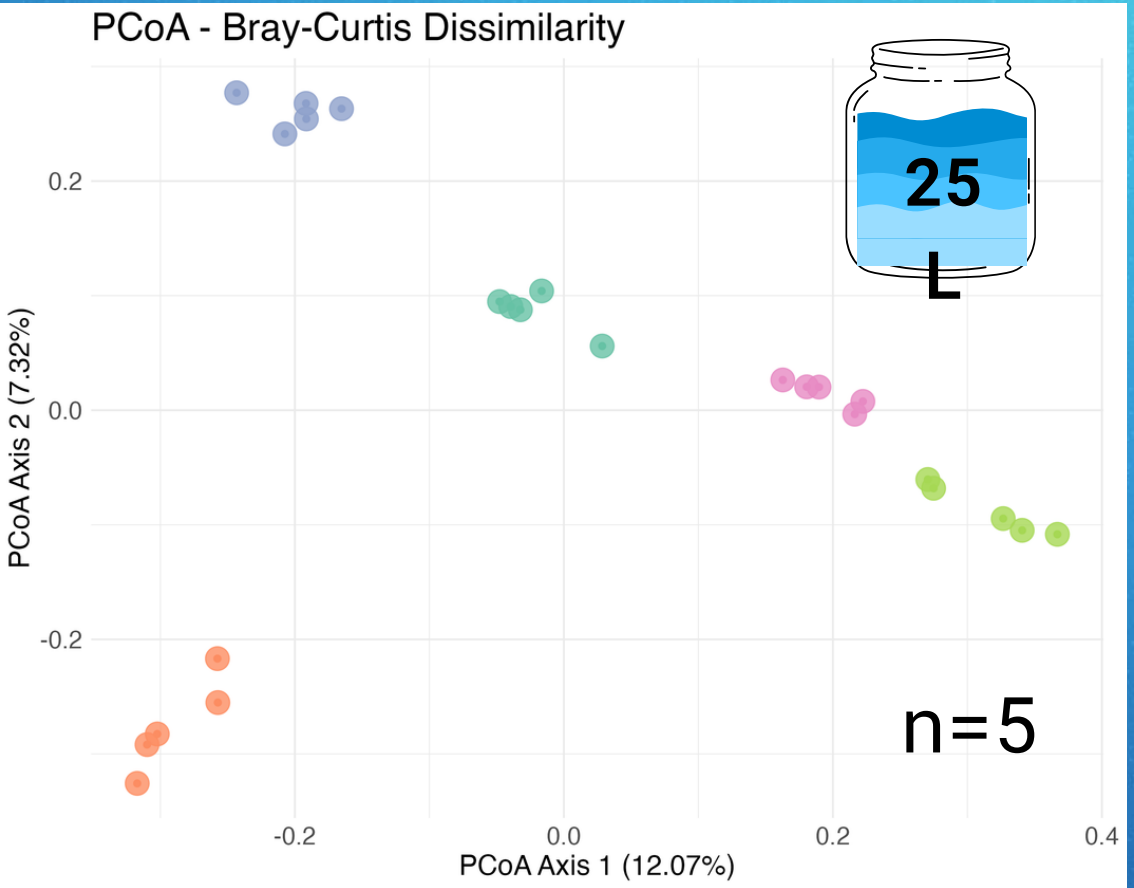
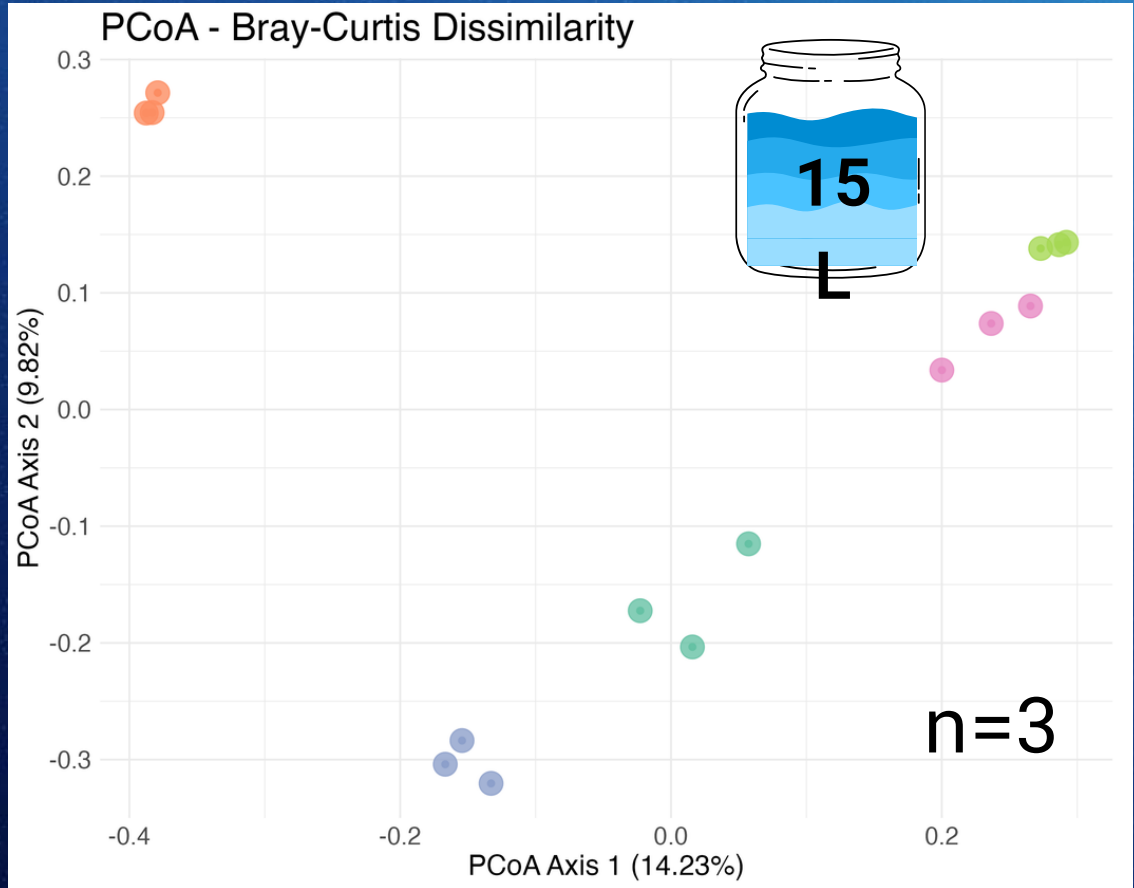


Dr João Curdia

Effect of water volume on biodiversity metrics



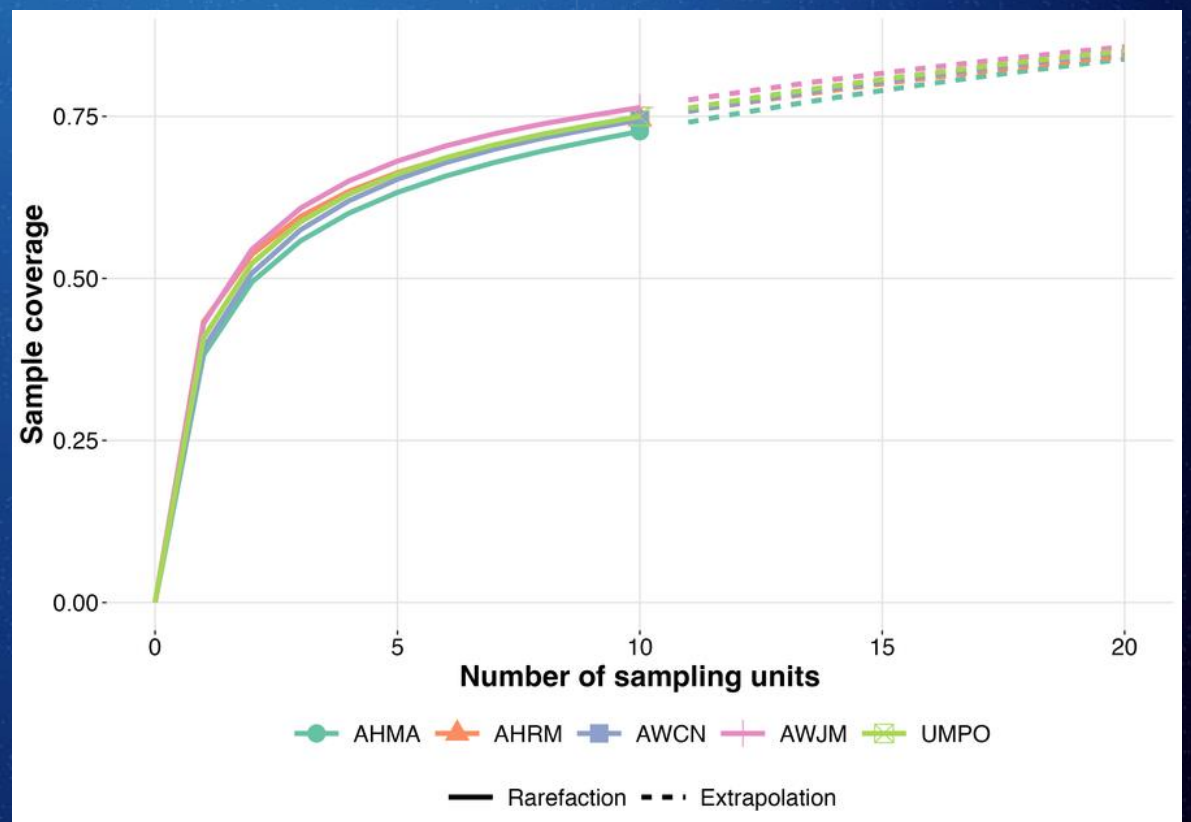
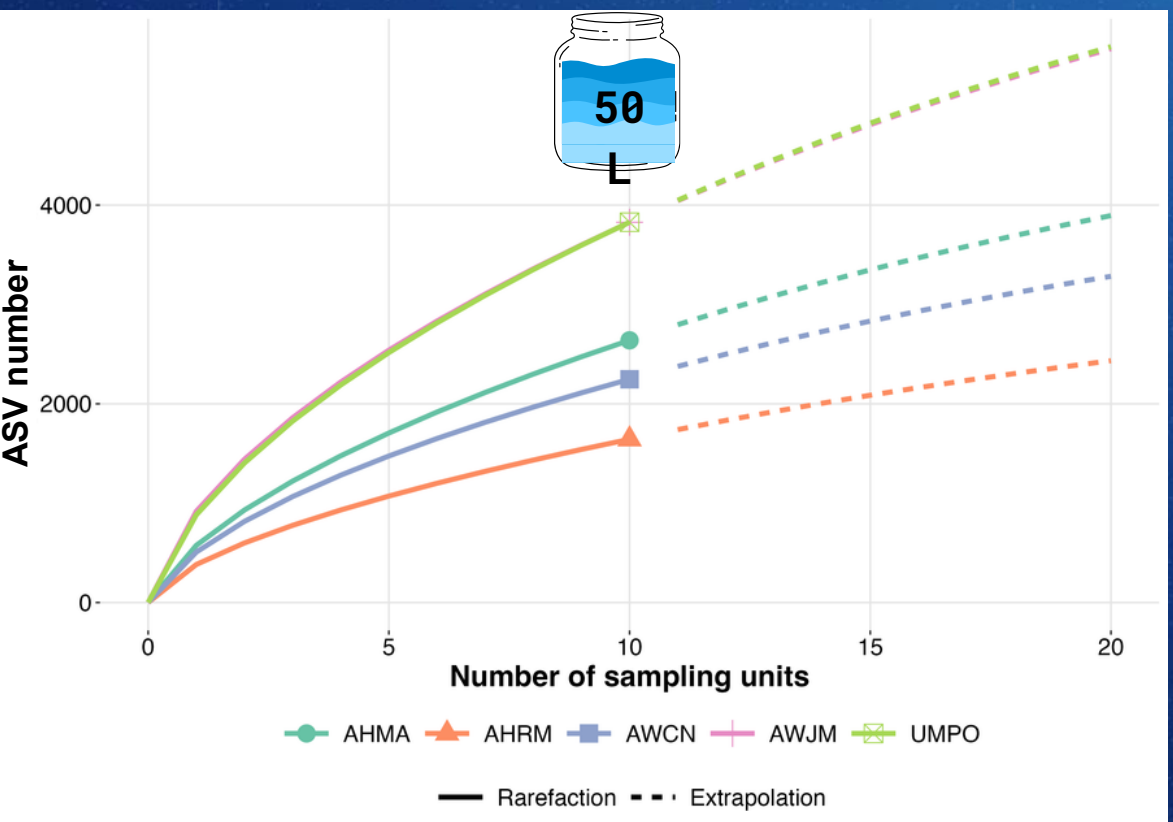
COI gene (m1COIint/jgHC02198)



Community level analysis: site-specific biodiversity was distinguishable from 3 replicates

Species Accumulation Curves

Species richness undersampled at each site based on the present sampling effort in terms of the number of sampling units





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