

Assessing coastal waters of American Samoa: Territory-wide survey data provide a critical “big-picture view” for this tropical archipelago

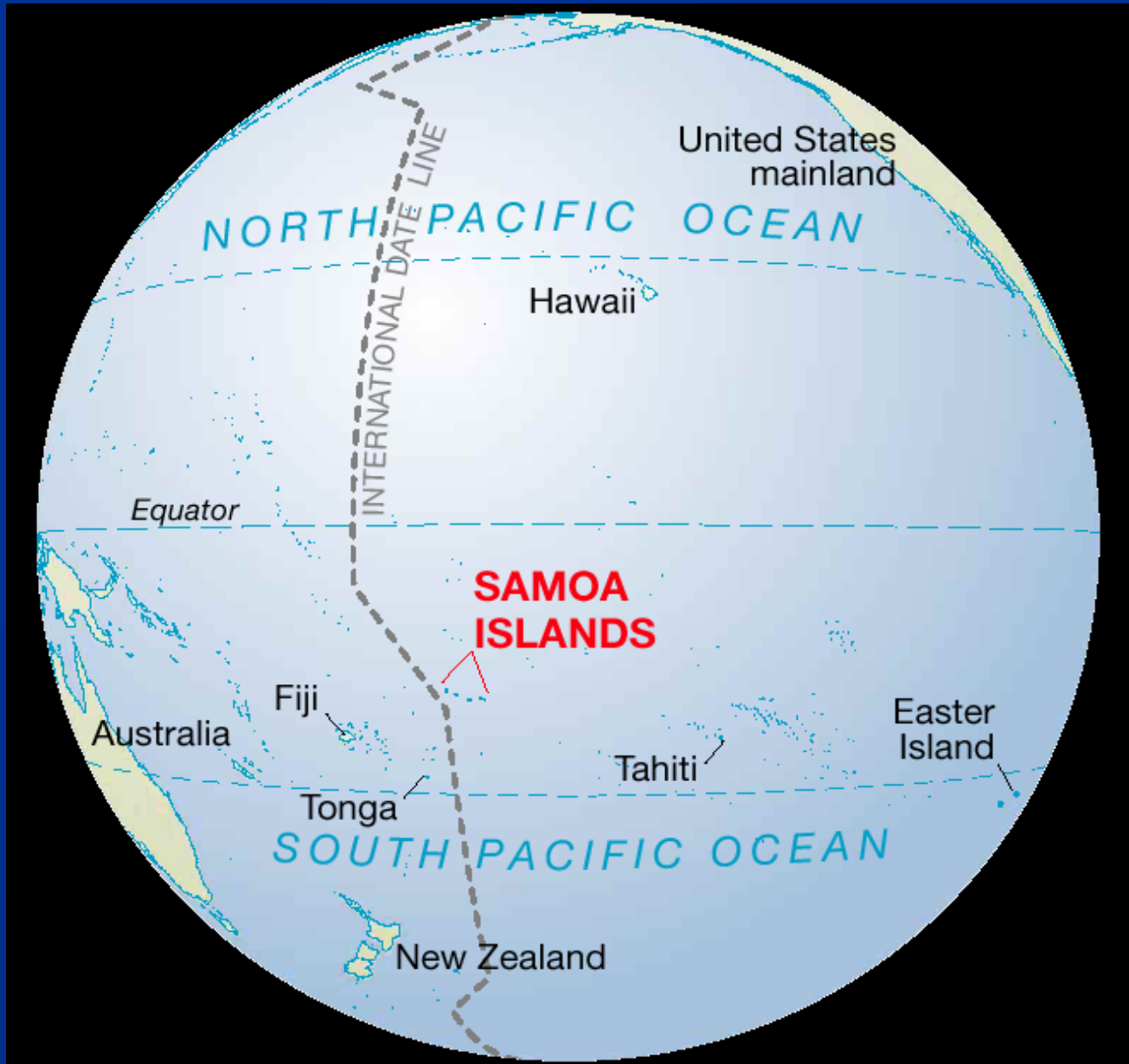
Guy T. DiDonato, Eva M. DiDonato
Lisa M. Smith, and Linda C. Harwell



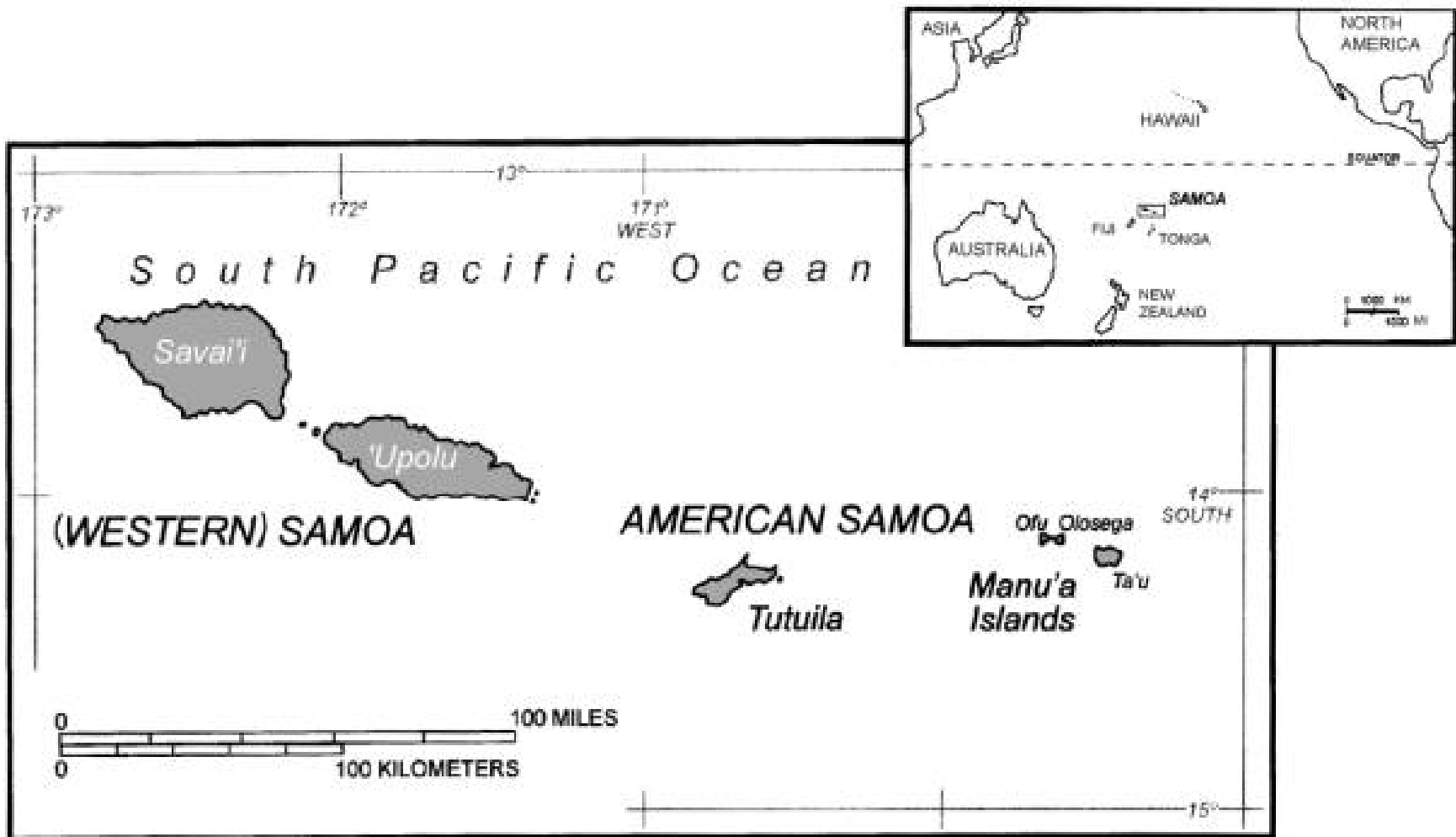
Presentation Outline

- **American Samoa—some perspective**
- **2004 coastal water quality survey**
- **Survey results—what we learned, and why it's valuable**
- **NCA monitoring—pluses and pitfalls**

American where?



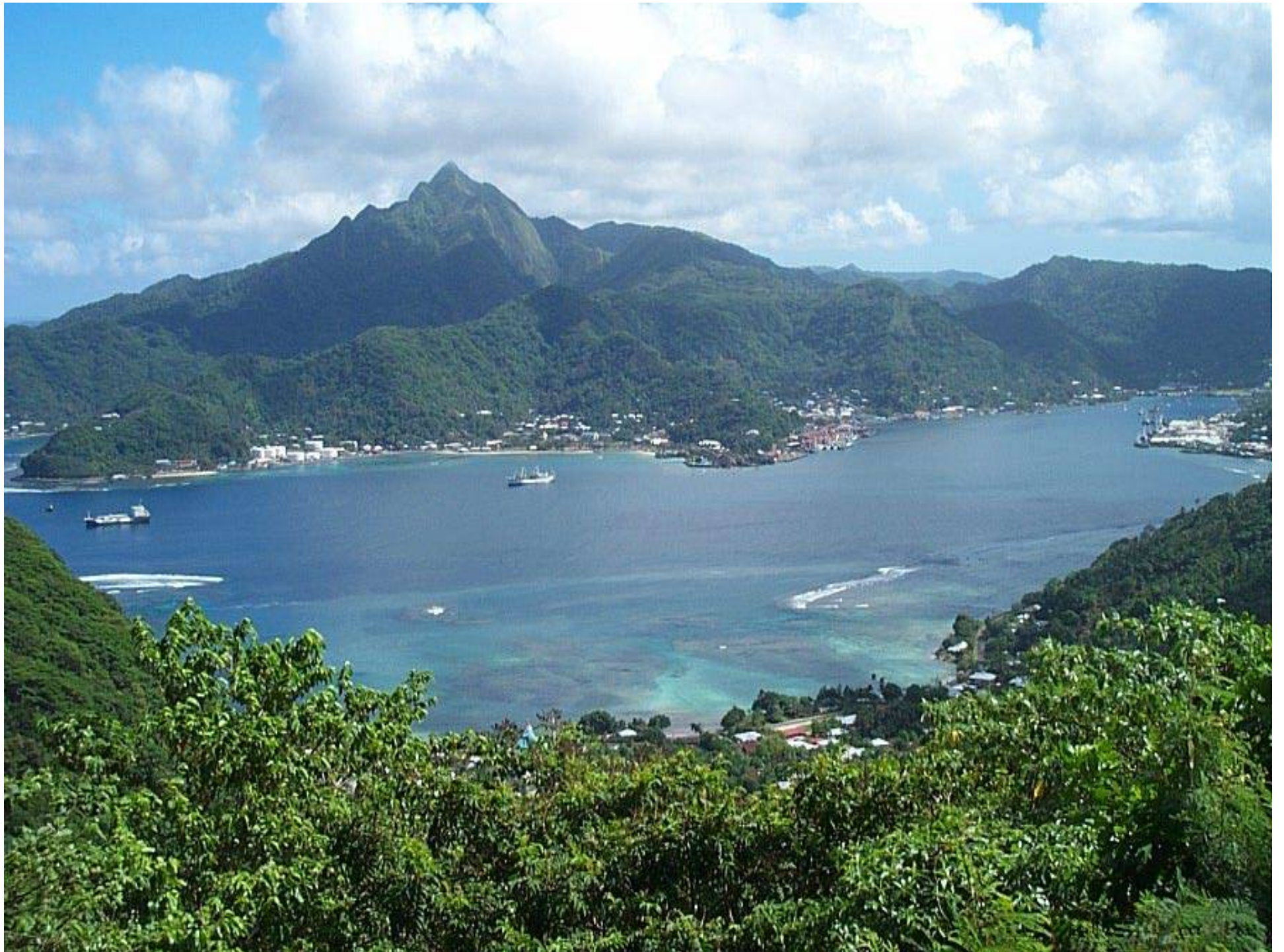
The Samoan Archipelago





Island Vistas

Photo credits: C. Hawkins, E. DiDonato



When it rains. . .

May, 2003

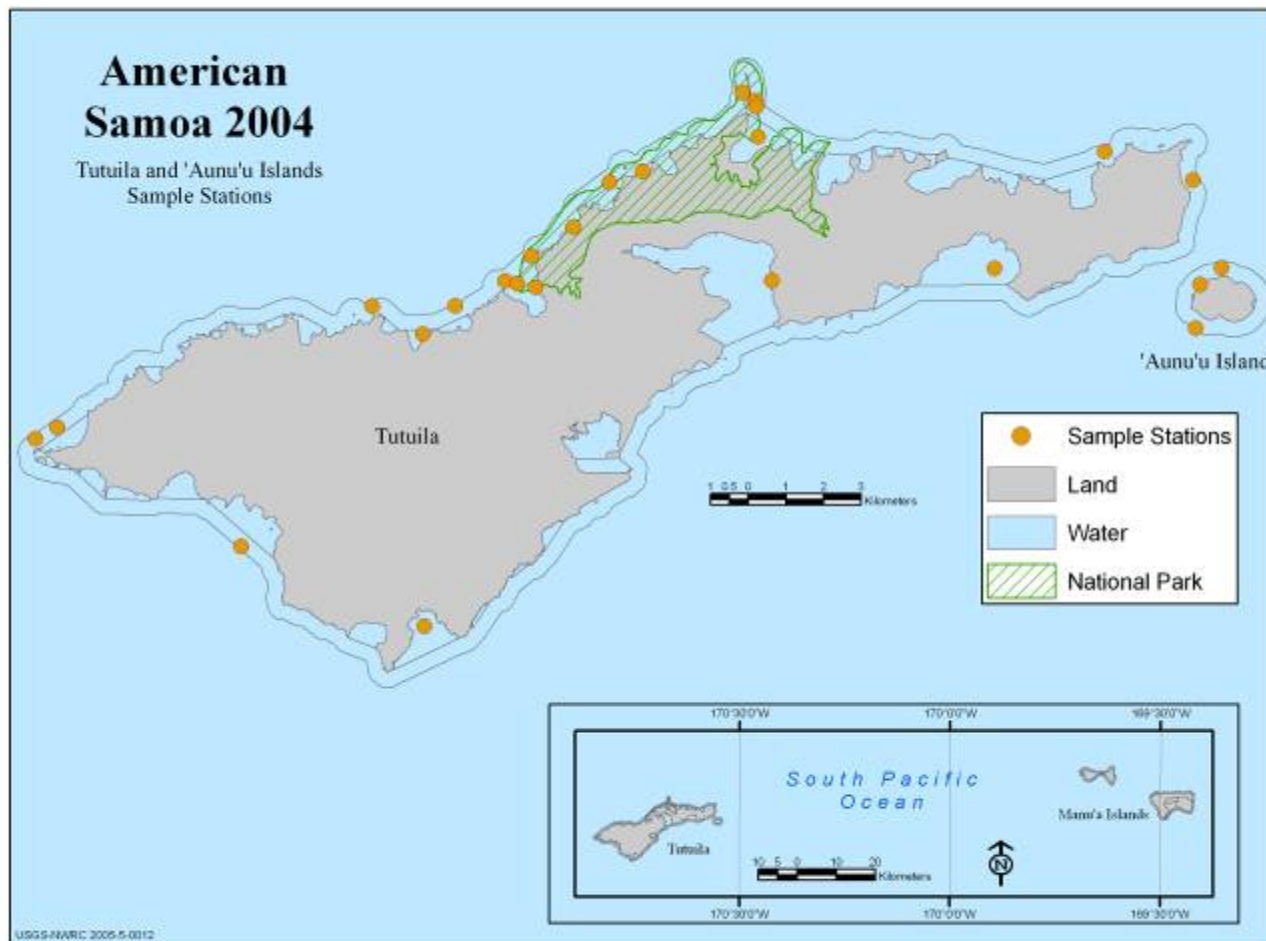
Photo credit: C. Hawkins



Study Objectives

- **Using NCA methods, comprehensive water quality survey for Territory's near-coastal habitats**
 - Focus on 5 main high islands
 - Near-coastal=major embayments+ $\frac{1}{4}$ mile out
- **Provide robust data set for baseline**
- **Compare NPS with Territorial waters**

Random Sampling Sites



Data Collected

- **Water Quality Parameters**
 - Hydrography, Nutrients, Chl *a*, TSS, Clarity, *Enterococcus*
- **Sediment Contaminants**
 - TOC, PAHs, PCBs, Pesticides, Metals
- **Fish Whole-body Contaminants**
 - PAHs, PCBs, Pesticides, Metals

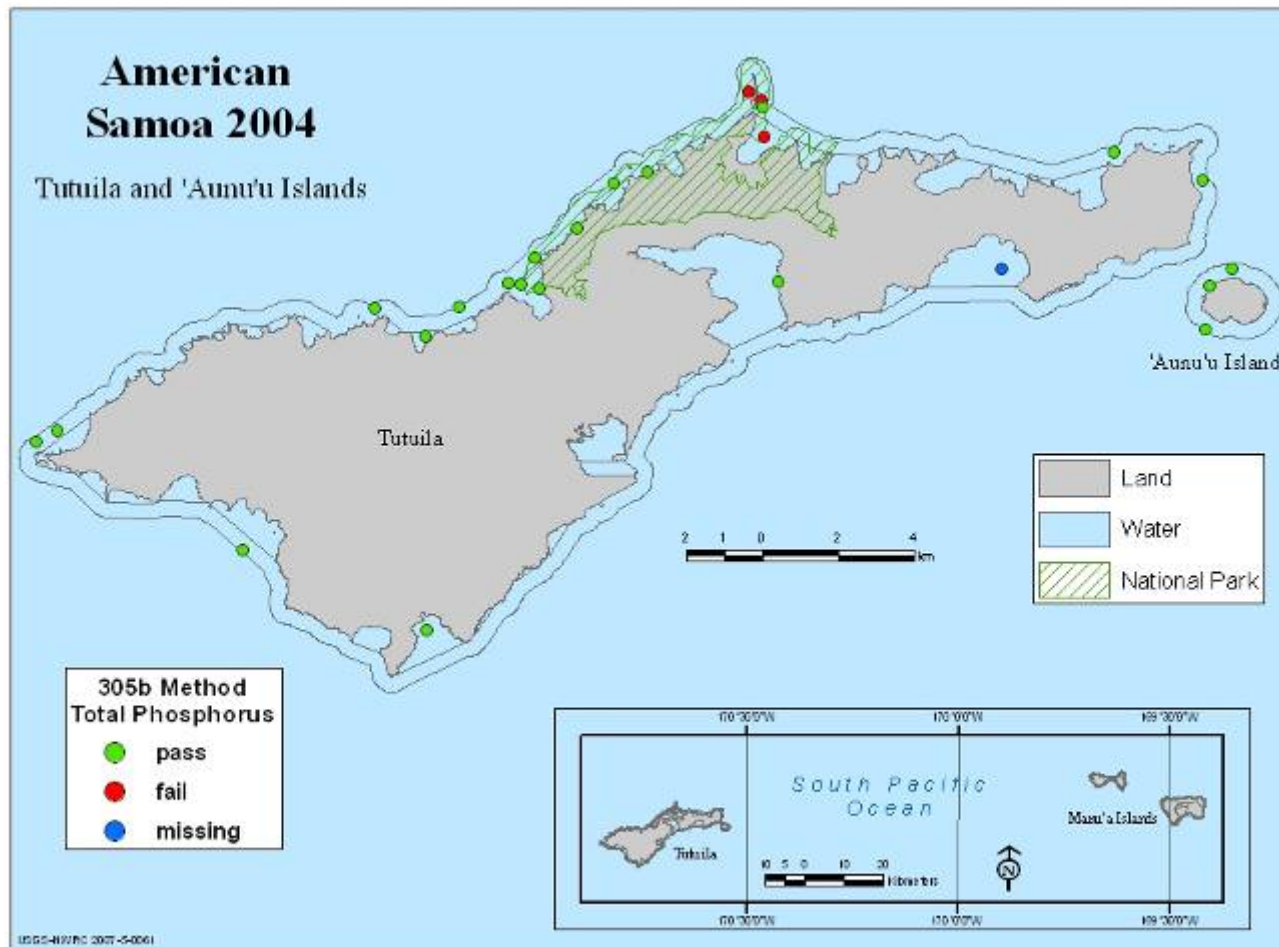
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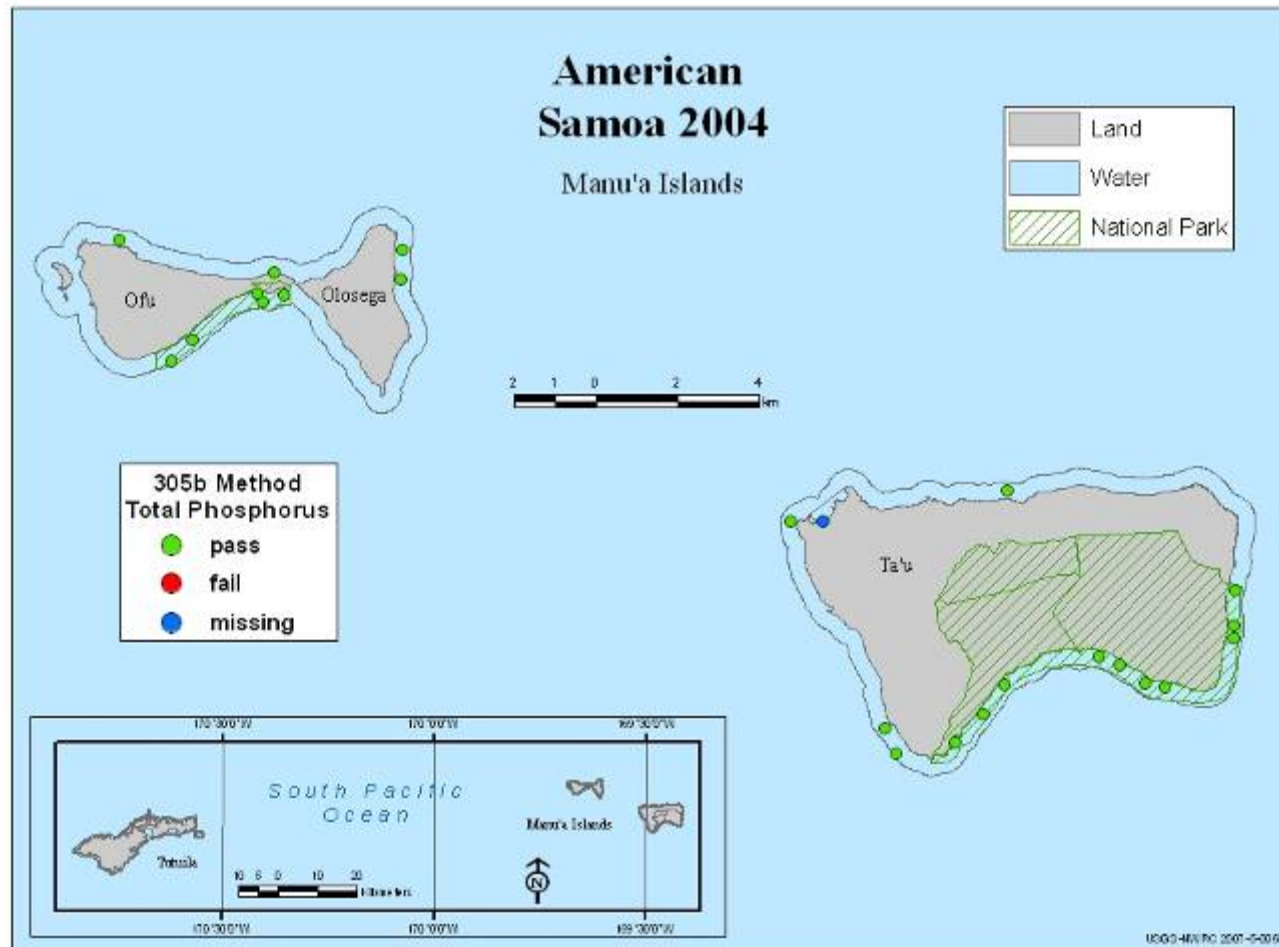
AS Water Quality Standards

Parameter	Pago Pago Harbor	Open Coastal
Total P (mg/L)	0.03	0.015
Total N (mg/L)	0.2	0.13
Chlorophyll ($\mu\text{g/L}$)	1	0.25
Light Penetration (ft)	65	130
DO (% sat, mg/L)	>70%, 5.0	>80%, 5.5
pH	6.5 – 8.6	6.5 – 8.6
<i>Enterococcus</i> (CFU/100 mL)	104	124

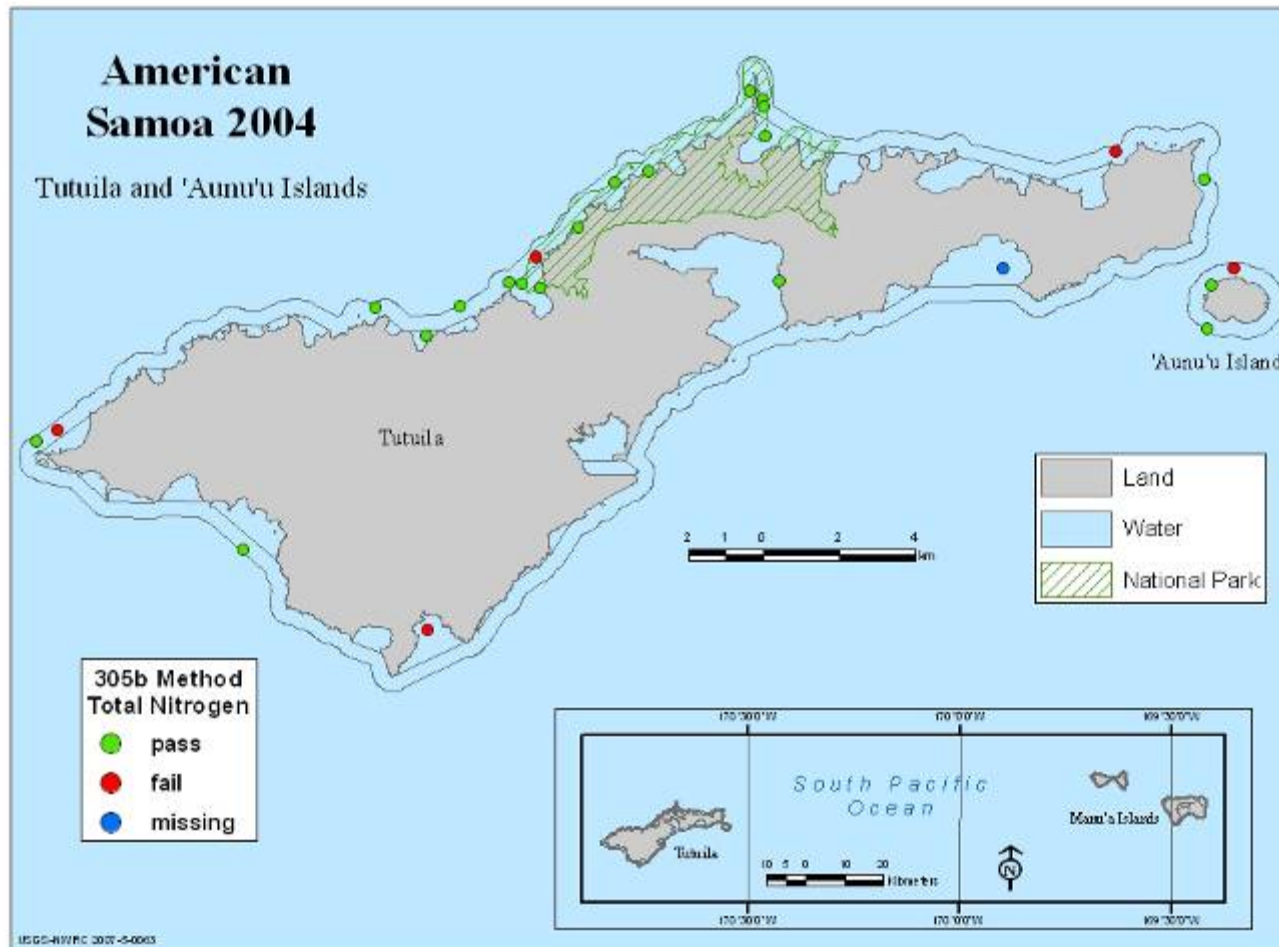
Total Phosphorus



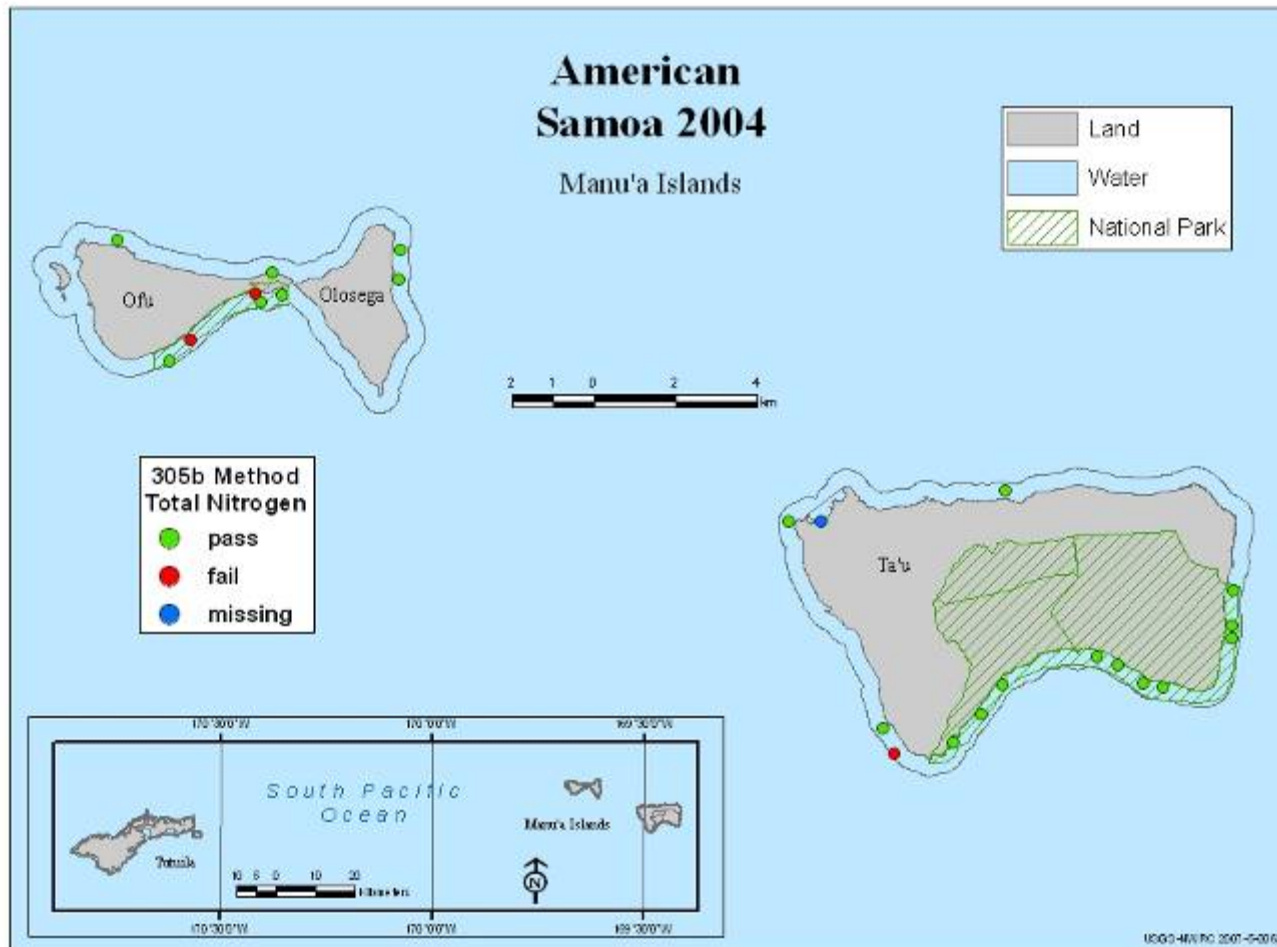
Total Phosphorus



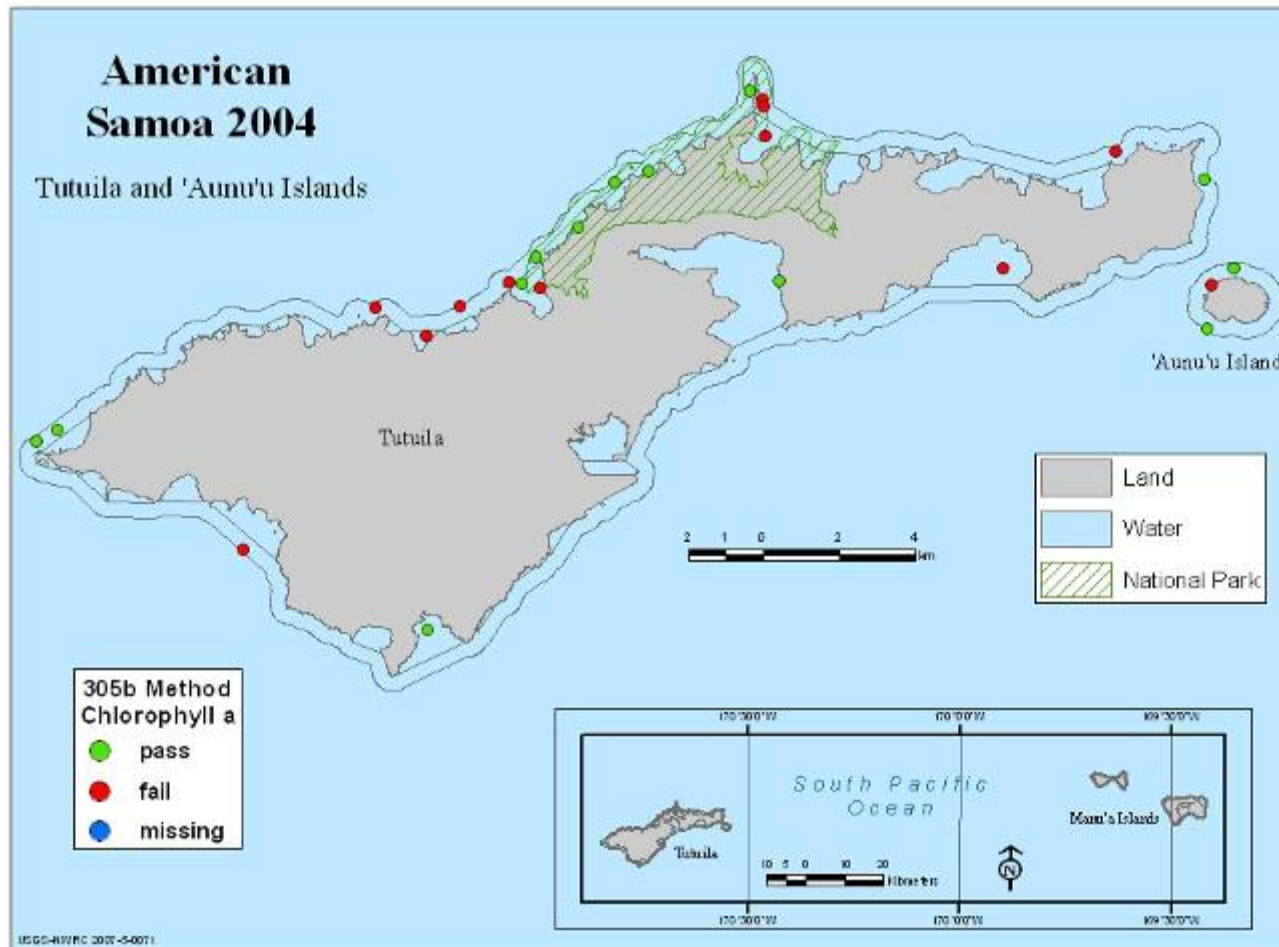
Total Nitrogen



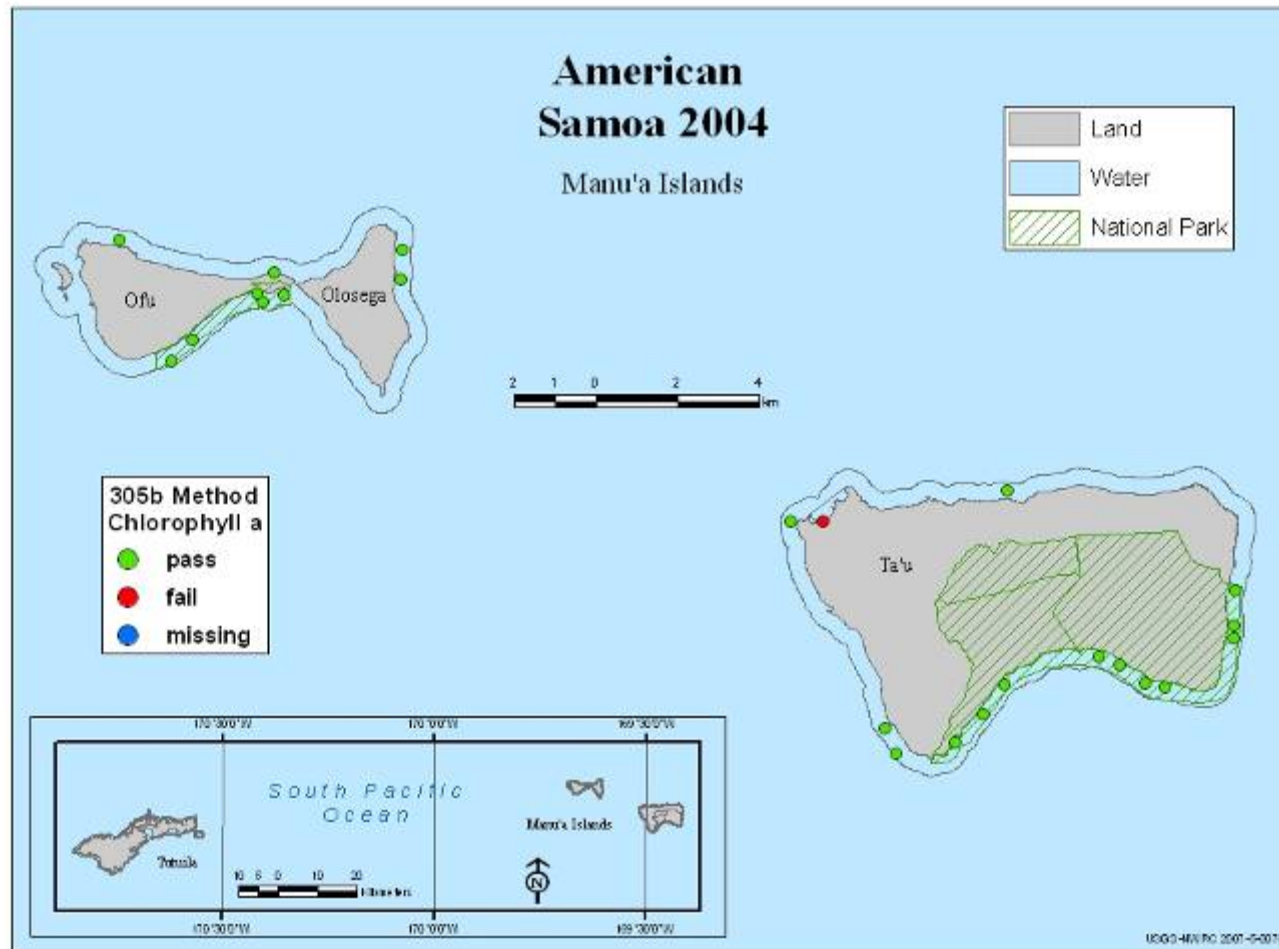
Total Nitrogen



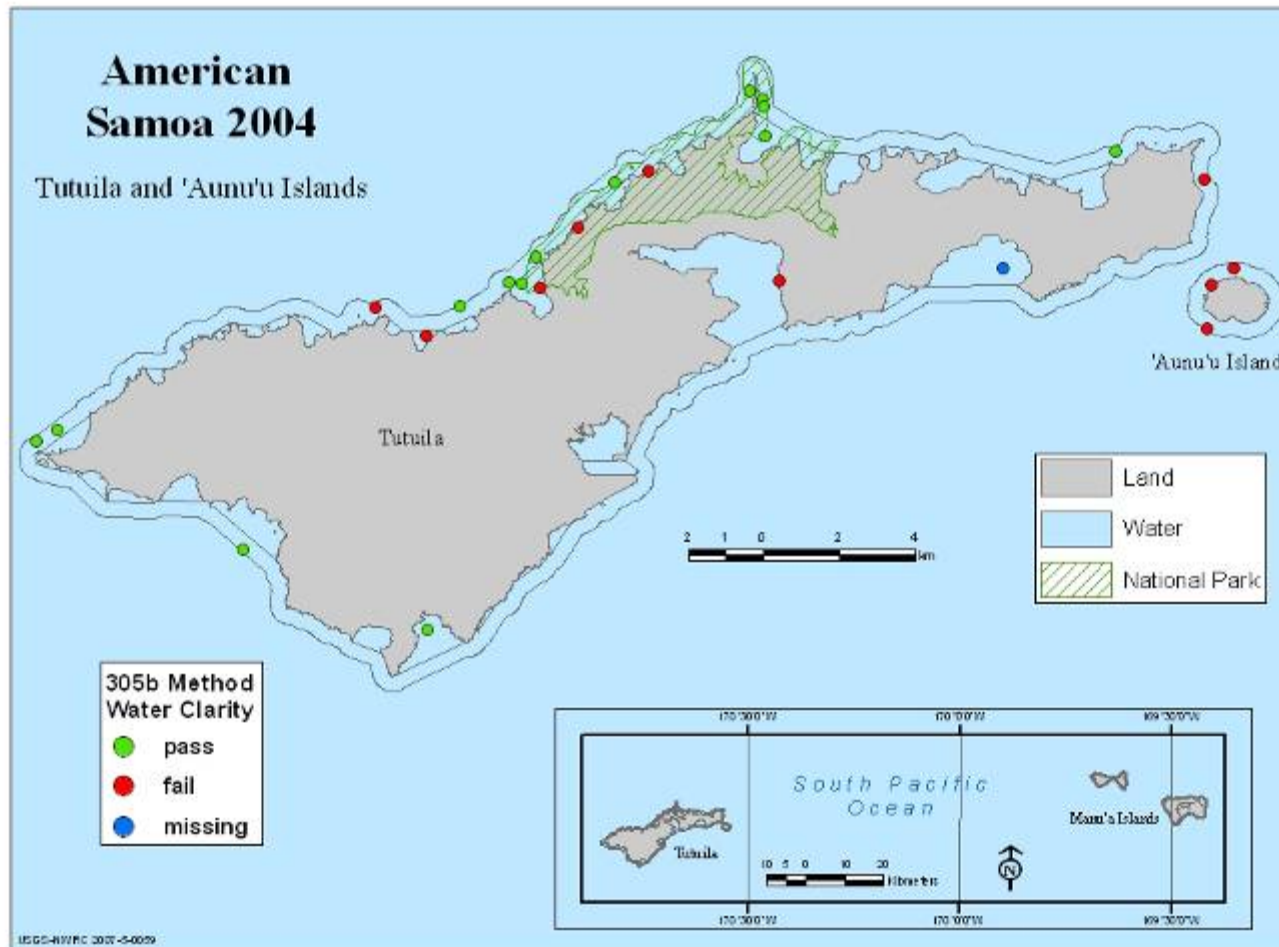
Chlorophyll a



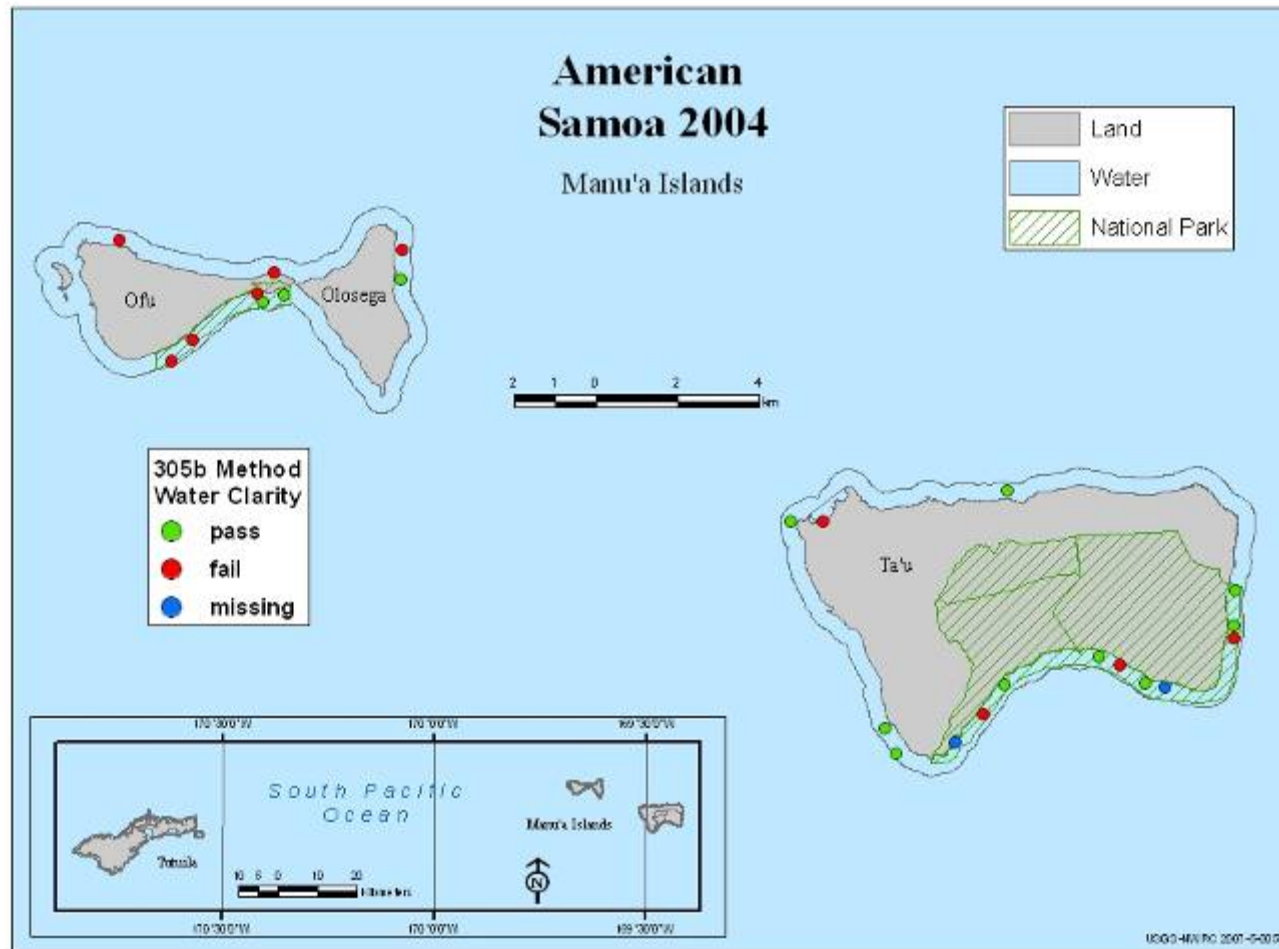
Chlorophyll a



Water Clarity



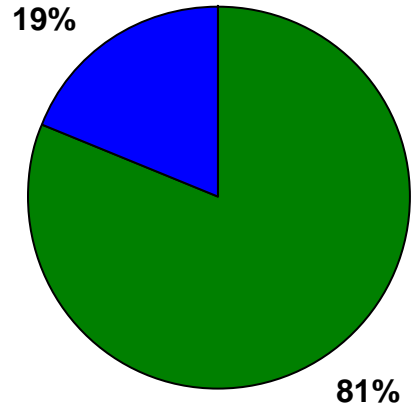
Water Clarity



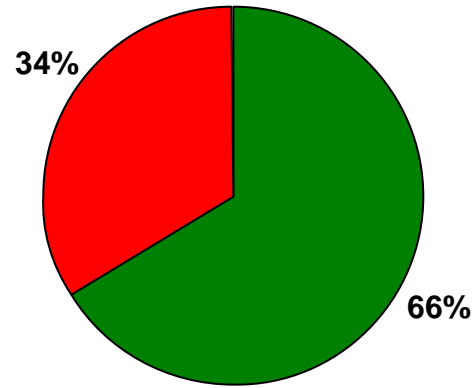
All Parameters



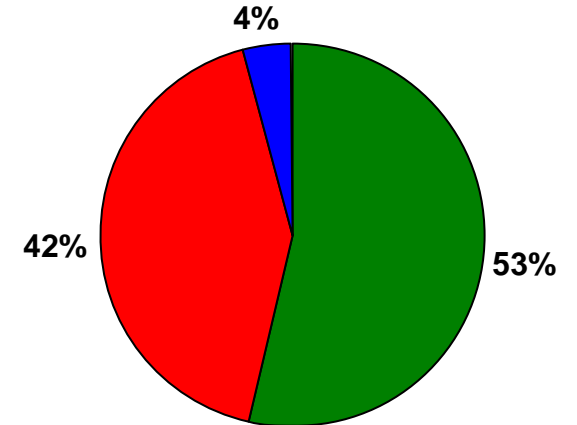
DO



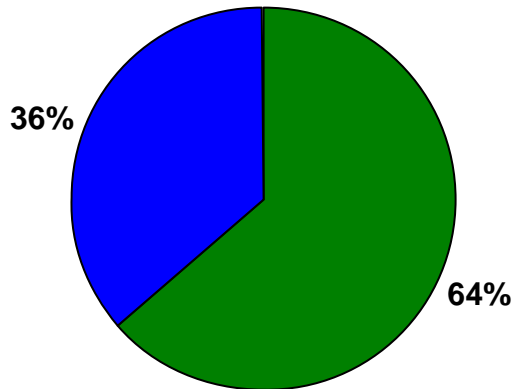
Chl a



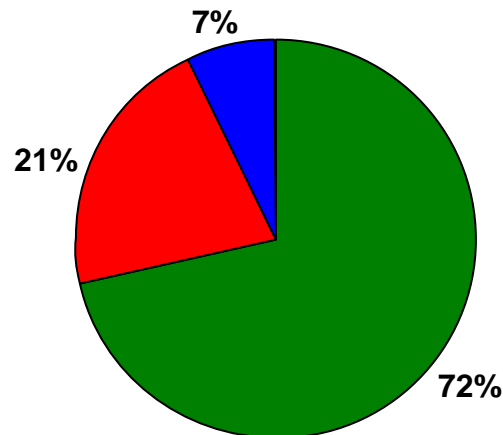
Water Clarity



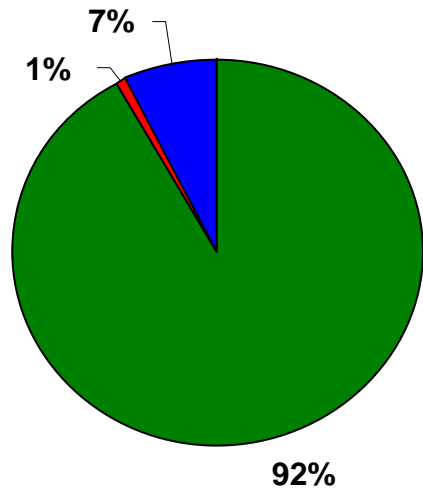
Enterococcus



TN



TP



Territory Wide WQ

- **These data provide the first Territory-wide assessment of coastal water quality**
- **Stations that failed for 2 or more parameters:
~23% of the Territory's coastal waters**
 - **Water clarity, Chl a, TN--most common offenders**
- **Valuable for 305(b) reporting requirements**

Benefits of NCA design

- **Robust estimate at the Territory-level**
 - NCA design is ideal for territory-wide resource
 - Provides “baseline” for future work
- **Standard indicators/field methods**
- **Comparability**
 - ASEPA standards used here, but NCA criteria for tropical estuaries could be applied as well

Challenges and Pitfalls

- **Remote location**
 - **NEVER underestimate the challenges of a remote location!!**
- **Inappropriate indicators and/or field methods**
 - **Sediment contaminants in a hardbottom envt**
 - **Benthos???**
 - **Hook and line fishing**
- **Cost**



Acknowledgements

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Thank you