

## CONTENTS

<b>INTRODUCTION</b>	1
Indicators of Trace Metal Bio-availability	2
Spatial and Temporal Variation in Trace Metal Concentrations in Sediments and Biota	3
Trace Metals in Marine Biota and the Health of Torres Strait Islanders and Papuans	4
<b>MATERIALS AND METHODS</b>	6
Sample Collection	6
Sediments	6
Biota	8
Sample Preparation	14
Sediments	14
Biota	14
Chemical Analysis	15
Sediments	15
Biota	15
Quality Assurance	16
Statistical Analyses	16
Normalization procedures	17
Power analysis	17
<b>RESULTS</b>	19
Sediments	19
Physico-chemical characteristics	19
Summary	32
Trace metal concentrations	33
Methodologies	34
Seasonal patterns	35
Spatial patterns	36
Summary	42
Biota as Indicator Organisms	43
<i>Thalassia hemprichii</i> (seagrass)	43
Seasonal patterns	43
Spatial patterns	44
Regional variation	44
<i>Thalassodendron ciliatum</i> (seagrass)	44
Seasonal patterns	44
Spatial patterns	44
Regional variation	46
<i>Tridacna crocea</i> (boring clam)	46
Seasonal patterns	48
Spatial patterns	48
Regional variation	53
<i>Tridacna maxima</i> (rugose giant clam)	54
Seasonal patterns	55
Spatial patterns	55
Regional variation	59
<i>Pinctata margaritifera</i> (black-lip pearl oyster)	59
Seasonal patterns	60
Spatial patterns	60
Regional variation	61

<i>Hyotissa hyotis</i> (coxcombe or zig-zag oyster)	64
Seasonal patterns	64
Spatial patterns	65
Regional variation	65
<i>Chama plinthota</i> (jewel-box oyster)	65
Seasonal patterns	68
Spatial patterns	68
Regional variation	68
<i>Trochus niloticus</i> (trochus)	68
Seasonal patterns	69
Spatial patterns	71
Regional variation	71
<i>Strombus luhanus</i> (red-lipped stromb)	71
Seasonal patterns	72
Spatial patterns	72
Regional variation	72
<i>Stichopus chloronotus</i> (sea cucumber)	75
Seasonal patterns	76
Spatial patterns	76
Regional variation	76
<i>Lutjanus carponotatus</i> (stripey - reef fish)	79
Seasonal patterns	80
Spatial patterns	80
Regional variation	80
<i>Polymesoda erosa</i> (mangrove cockle)	82
Seasonal patterns	83
Spatial patterns	84
Regional variation	88
Summary	88
Sampling Design	91
Community Fishery	94
 <b>DISCUSSION</b>	 112
Seasonal and Spatial Patterns	112
Sediments	113
Biota	115
Regional Variation in Trace Metal Concentrations	120
Sampling Strategies	122
Community Fishery	123
 <b>SUMMARY AND CONCLUSIONS</b>	 125
Recommendations	127
 <b>ACKNOWLEDGEMENTS</b>	 131
 <b>REFERENCES</b>	 131
 <b>APPENDIX</b>	 137
Appendix Figures	138
Appendix Tables	153