APPENDIX A

FIELD SHEETS

Codes for Fish Tissue Sampling

Location codes

Location	Name	code
Muliwai 1	North Muliwai	M1
Muliwai 2	South Muliwai	M2
Muliwai 3	Nānākuli Muliwai	M3
Muliwai 4		M4
Muliwai 5		M5
Nearshore Waters 1	off south Muliwai	NW1
Nearshore Waters 2	Sandy Beach	NW2
Nearshore Waters 3		NW3
Seaweed 1	Limu kala	SW1
Seaweed 2	Limu 2	SW2
Seaweed 3		SW3
Seaweed 4		SW4
Fish 1	Striped Mullet	F1
Fish 2	Aholehole	F2
Fish 3	Medaka	F3
Fish 4	"Tilapia"	F4
Fish 5	Moana (Parupeneus multifasciatus)	F5
Fish 6	Hinalea (Thalassoma trilobatum)	F6 Christmas wrass
Fish 7	humuhumu hi ukole (Melichthys vidua)	F7 Brown trigger
Fish 8	a'awa (Bodianus bilunulatus)	F8 Haw. Hogfish
Fish 9	hinalea lau-wili (T. duperry)	F9 – Saddle wrasse
Fish 10	~~Taape (Lutjanus Kasmira)~~	F10 Lutjanus fulvus (to'au)
Fish 11	Moano 2 (P. pleurostigma)	F11
Fish 12	Fistularia commersonii	F12 Cornet fish
Fish 13	Sufflumen fraenatus	F13 Bridled triggerfish
Fish 14	Rhinecanthus rectangulus	F14 Picasso "
Fish 15	Reef lizzardfish	F15 Synodus variegatus
Fish 16	Hou (Surge wrasse)	F16 T. purpureum
Fish 17	Kupipi (A. sordidus)	F17 Blackspot sergeant
Fish 18	Nenue (K. bigibbus)	F18 gray chub
Fish 19	Po'opa'a (Cirrhitus pinnulatus)	F19 stocky hawkfish
Fish 20	Humuhumu lei Sufflamen bursa	F20

Urchin 1 Hā ukeuke = Ul (Colobocentrotus atratus)
kaupali

Example: M2F1-15S
second muliwai, first fish species on list, sequential composite number 15, S=standard sample.

Field Record for | Study of Chemical Residues in | Fish Tissue

Sampling Date: 2 Aug 2006
Collection Method: Beach Seine
Colector Name: Andy Jahn
Affiliation: Tetra Tech contractor Phone: 707-468-7432
Address: 1000 Riverside Dr. Ukiah, CA 95482

Site Location County: Hono

Sidt Name: North Mulivai
Description:
Mākua Beach

Composite Sample ID: MI FI FI-1 S
site matrix seq. S/D

Species: Striped Mullet
Specimen/Lot Number

	time	Lengths (mm TL)					Notes
1	0925	105mm					
2	1040	205	140	99	75	72	
3		74	65	75			
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: MI FI-2
site matrix seq. S/D

Species: Ahole hole
Specimen/Lot Number

	time	Lengths (mm TL)					Notes
1	0925	75mm	90	89	106	75	
2	↓	109	69	67	74	75	
3	↓	61	63	67	80	65	
4	0930	71	67	62	69		
5	0940	85	85	75	62	65	
6							
7							
8							

Number of fish in composite: Total Weight (g):

Notes/Diagrams:

Continuation sheet. Date: Location:

Composite Sample ID: M1 ___ F2 - 3 S
site matrix seq. S/D

Species: Aholehole

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1050	63	75	60	79	62	
2		60	64	72	65	60	
3		64	65	67	70	64	
4		63	63	65	75	65	
5	1100	86	110	87	65	64	
6	1	103	90	91	67		
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: M1 ___ F1 - 4 ___
site matrix seq. S/D

Species: Striped Mullet

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1060	72	74	69			
2	1310	93	60	77	74	71	
3		60	67	60	211		
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: M1 ___ F0 - 15 ___
site matrix seq. S/D

Species: Medaka

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1050	82	69	48	50	52	
2		78	78	69	55		
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Continuation sheet. Date: Location:

Composite Sample ID: M 1 F4 - 6 S
site matrix seq. S/D

Species: Tilapia

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1145	173	199	165	153	137	
2		193	200	176	155	190	
3		147					
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: M 1 F4 - 7
site matrix seq. S/D

Species: Tilapia

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1145	110	93	126	135	107	
2		110	112	112	101	117	
3		140	140	130	127	127	
4		134	105				
5	1245	129					
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: MT F2-8
site matrix seq. S/D

Species: Akekeke

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1200	100	95	95	89	104	
2		91	107	105	113	100	
3		101	91				
4	1310	72	108	109	102	106	
5		59	105				
6							
7							
8							

Number of fish in composite: Total Weight (g):

Field Record for | Study of Chemical Residues in | Fish Tissue

Sampling Date: August 5, 2010
Collection Method: Seine / hook + line
Colector Name: Andy Jahn
Affiliation: contractor - TetraTech Phone: 707-468-7432
Address: 1000 Riverside Dr. Ukiah, CA 95482

Site Location County: Hono.
Sidt Name: South Muliwai
Description: Mākua Beach

Composite Sample ID: M 2 (site) F1 - 1 (matrix seq.) ___ (S/D)
Species: Striped Mullet
Specimen/Lot Number

	time	Lengths (mm TL)					Notes
1	1130	145	164	145	147	157	RBT 530g
2		161	176	146	170	151	
3		185	169				
4							
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Composite Sample ID: M 2 (site) F4 - 2 (matrix seq.) ___ (S/D)
Species: Tilapia
Specimen/Lot Number

	time	Lengths (mm TL)					Notes
1	1130	144	121	124	119	124	BGadj. 900g
2		125	115	125	125	119	
3		109	123	115	115	112	
4		109	122	131	122	115	
5		109	120	114	111		
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Notes/Diagrams:

Continuation sheet. Date: Location:

Composite Sample ID: M 2 (site) F4-3 (matrix seq.) ____ (S/D)

Species: Tilapia

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	90	~~72~~	107	106	106	
2		96	105	94	96	97	
3		94	101	90	97	99	
4		100	~~105~~	95	97	111	
5		101	95	97	97	94	
6		84	92	89			
7							
8							

BG Adg 500

Number of fish in composite: Total Weight (g):

Composite Sample ID: M 2 (site) F3-4 (matrix seq.) ____ (S/D)

Species: Medaka

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	61	63	62	60	59	
2		70	70	70	71	64	
3		56	71	66	65	63	
4		65	59	55	59	55	
5		67	67	65	56	56	
6		60	63	62	60	67	
7		59	60	55	59	67	
8		55	57	64	57	55	

Number of fish in composite: Total Weight (g):

Composite Sample ID: M 2 (site) F3-4 (matrix seq.) ____ (S/D)

Species: Medaka (continued)

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	57	55	59	70	59	
2		59	63	58	56	64	
3		60					
4							
5							
6							
7							
8							

RBT 119g

51 fish
55-77 mm

Number of fish in composite: Total Weight (g):

Field Record for Study of Chemical Residues in Fish Tissue

Sampling Date August 3, 2006
Collection Method Hand
Colector Name Landin Johnson
Affiliation: Tetra Tech Phone: (808) 535-3366
Address: 820 Mililani St Suite 700 Honolulu 96813

Site Location Mākua Beach County: _____

Sidt Name: _____
Description:

Composite Sample ID: NW1 WI-1 ___
site matrix seq. S/D

Species: _____

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1330						
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species: _____

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Notes/Diagrams:

Field Record for Study of Chemical Residues in Fish Tissue

Sampling Date: 4 August 2006
Collection Method: hook + line
Colector Name: Andy Jahn
Affiliation: Tetra Tech contractor Phone: 707-468-7452
Address: 1000 Riverside Dr. Ukiah, CA 95482

Site Location County: Hono
Sidt Name: South Maliwai
Description: Mākua Beach

Composite Sample ID: M2 F4-5 D
site matrix seq. S/D

Species: Tilapia

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1030	102	121	119	120	136	BG 1117g
2		104	100	115	141	130	
3		120	132	114	119	130	
4		109	106	106	105		
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species:

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Notes/Diagrams:

Field Record for Study of Chemical Residues in Fish Tissue

Sampling Date 4 August 2006
Collection Method Hook & line
Colector Name Dawn A. Lieces
Affiliation: Tetra Tech Phone: (808) 533 0 3366
Address: 820 Mililani St. Suite 700 Honolulu Hi 96813

Site Location County: _____

Sidt Name: Nānākuli Muliwai
Description:
Nānākuli Beach Park

Composite Sample ID: M 3 F4-1 ___
site matrix seq. S/D

Species: tilapia

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1500	125	115	130	115	119	1290-2099
2		120	120	117	115	136	
3		139	117	119	128	118	
4		110	114	113	116	119	
5		130	122	119	120	111	
6		121	120	113	115	135	
7		120	121	131	111		
8							

Number of fish in composite: _____ Total Weight (g): _____

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species: _____

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Notes/Diagrams:

(Seq 2 is Aug 6)

Field Record for Study of Chemical Residues in Fish Tissue

Sampling Date 5 + 10 Aug '06
Collection Method Seine
Colector Name A Jahn
Affiliation: Tetra tech contractor Phone: 707-468-7432
Address: 1000 Riverside Dr. Ukiah, CA 95482

Site Location County: Hono
Sidt Name: South Muliwai
Description:
Makua Beach

Composite Sample ID: M 2 F1 5 ___
site matrix seq. S/D
Species: Striped mullet

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1000	102	1105	200	107	203	
2		153					
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW 1 UI 7 ___
site matrix seq. S/D
Species: Urchin - Hāuke'uke

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1000						43 urchin
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Notes/Diagrams:

Continuation sheet. Date: Location:

Composite Sample ID: NW 1 FS - 1 ___
site matrix seq. S/D

Species: Mpana (Parapeneus

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1300	191	~~202~~ 210	290	209	217	
2		190	177	176	177		
3							
4							
5							
6							
7							
8							

~ 2.5 lb

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW 1 FD - 1 ___
site matrix seq. S/D

Species: Hinalea

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1300	213					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW 1 ~~FD~~ FT - 1 ___
site matrix seq. S/D

Species: Humuhumu hi'ukole - Brown humu

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1		99	182				
2							
3							
4							
5							
6							
7							
8							

~ $\frac{3}{4}$ lb

Number of fish in composite: Total Weight (g):

Continuation sheet. Date: Location:

Composite Sample ID: NW1 FB 1 ___
site matrix seq. S/D

Species: _____

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1300	175					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW1 F9-1 ___
site matrix seq. S/D

Species: Hinalea lau-wili (Saddle wrasse)

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1		165					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW1 F10 1 ___
site matrix seq. S/D

Species: ~~Iaape~~ To'au

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1300	176					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

+6 (seq. 2 = 6 kg)

Continuation sheet. Date: 5 Aug 06 Location: Makua Beach

Composite Sample ID: NW1 F9 - 1 ____
site matrix seq. S/D

Species: moana 2 (P. pleurostigma)

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1300	179					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Composite Sample ID: NW1 F11 - 2 ____
site matrix seq. S/D

Species: moana 2

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	0900	199	190				
2	1000	205					
3	1230	212					
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Composite Sample ID: NW1 F5 - 2 ____
site matrix seq. S/D

Species: moana

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	0900	231	212	190	260		
2	1000	190	195				
3	1230	211					
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Continuation sheet. Date: Location:

Composite Sample ID: NW1 F12-2
site matrix seq. S/D

Species: Fistularia commersonii (cornetfish)

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1000	415					Measurement does not include tail filament.
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW1 F14-2
site matrix seq. S/D

Species: Rhinecan ~~Humuhumu~~ Humuhumunukunuku apua'a

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1000	172					
2	1230	212					
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW1 F13-2
site matrix seq. S/D

Species: ~~Fistularia commersoan~~ Bridled triggerfish

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1000	199	147	130			
2	1230	235					
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Continuation sheet. Date: Location:

Composite Sample ID: NW1 F15 -2 ____
site matrix seq. S/D

Species: Lizzard Fish

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1000	240					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW1 F16- 2 ____
site matrix seq. S/D

Species: Surge) Wrasse)

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	202	209	163	151		
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: FNW1 F6-2 ____
site matrix seq. S/D

Species: Hinalea

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	166	175				
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Continuation sheet. Date: Location:

Composite Sample ID: NW1 site F17-2 matrix seq. S/D

Species: Blackspot Sergeant

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	180	171				
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW1 site F20-2 matrix seq. S/D

Species: Humuhumu ke

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	177					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: NW1 site F19-2 matrix seq. S/D

Species: Nenue

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	174					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Continuation sheet. Date: Location:

Composite Sample ID: NW1 FG-2
site matrix seq. S/D

Species: Stocky Hawkfish

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	159					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species:

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species:

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Field Record for Study of Chemical Residues in Fish Tissue

Sampling Date 8 Aug 2006
Collection Method Seine
Colector Name Dawn Lieces
Affiliation: Tetra Tech Phone:
Address:

Site Location County:

Sidt Name: Nanakuli mauiwai
Description:
S. end Nanakuli Beach Park

Composite Sample ID: M3 F2 - 1 (site / matrix seq. / S/D)

Species: Aholehole

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1000	89	89	99	95	87	
2		84	86	88			
3	1300	99					
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Composite Sample ID: M3 F2 - 2 (site / matrix seq. / S/D)

Species: Aholehole

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	128					
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Notes/Diagrams:

Continuation sheet. Date: 8 Aug 06 Location: South Muliwai

Composite Sample ID: M2 F3-80 ___
site matrix seq. S/D

Species: Mefaka

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1600						59 fish, 53-71 mm measured in range 53-71
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Composite Sample ID: M2 F1-81 ___
site matrix seq. S/D

Species: mullet

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1		172	171	155	159	170	
2		155	152	150	175	175	
3							
4							
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Composite Sample ID: M2 F1-82 ___
site matrix seq. S/D

Species: Mullet

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1600	195	190	205	190	~~190~~	
2		193					
3							
4							
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Continuation sheet. Date: 8 Aug 08 Location: South Muliwai - Makua Beach

Composite Sample ID: ML 0 FI-02 ___
site matrix seq. S/D

Species: Mullet

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1300	160	142	146	135	155	
2		144	153	165	125	140	
3		144	151	153	157	139	
4		140	142	153			
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species: ___

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species: ___

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Field Record for | Study of Chemical Residues in | Fish Tissue

Sampling Date: 9 August 06
Collection Method: Hand U
Colector Name: Dawn A. Lieces
Affiliation: Tetra Tech, Inc Phone: (808) 533-3566
Address: 820 Mililani St, Honolulu, Hawaii 96813

Site Location: Near shoreWaters of South Muliwai County: Honolulu
Sidt Name: Mākua Beach
Description:

Composite Sample ID: NW1 (site) SWI-1 (matrix, seq.) ___ (S/D)
Species: Limu kala
Specimen/Lot Number

	time	Lengths (mm TL)					Notes
1	1400						
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Composite Sample ID: NW1 (site) SWI-1 (matrix, seq.) ___ (S/D)
Species: Limu 2
Specimen/Lot Number

	time	Lengths (mm TL)					Notes
1	1400						
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: ___ Total Weight (g): ___

Notes/Diagrams:

Field Record for | Study of Chemical Residues in | Fish Tissue

Sampling Date: 8-19-06
Collection Method: Hook and line
Colector Name: Landin
Affiliation: Tetra Tech, Inc. Phone: (808) 533-3366
Address: 737 Bishop St, Ste 2340, Honolulu, HI 96813

Site Location: Sandy Beach County: Honolulu, Hawaii
Sidt Name:
Description: Rocks east of Sandy Beach.

Composite Sample ID: NW 2 (site) FI7-1 (matrix seq.) S (S/D)
Species: Blackspot sergeant

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1100	145	136				weights: 190, 150 (g)
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: 2 Total Weight (g): 340

Composite Sample ID: NW 2 (site) FI7-2 (matrix seq.) D (S/D)
Species: Blackspot sergeant

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1130	153	146				weights: 160, 150 (g)
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: 2 Total Weight (g): 310

Notes/Diagrams:

Continuation sheet. Date: 8-19-06 Location: Sandy Beach (Cranks)

Composite Sample ID: NW2 F9-1 S
site matrix seq. S/D

Species: Saddle wrasse

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1200	146	144	153	119	130	Weights (g): 50, 45, 75, 30, 30, 30
2	1700	130					
3							
4							
5							
6							
7							
8							

Number of fish in composite: 6 Total Weight (g): 260

Composite Sample ID: NW2 F6-1 S
site matrix seq. S/D

Species: Christmas wrasse

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1230	192	151	158	165		Weights (g): 115, 55, 65, 75
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: 4 Total Weight (g): 310

Composite Sample ID: NW2 F18-1 S
site matrix seq. S/D

Species: Gray chub

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1400	178					Weight (g): 130
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: 1 Total Weight (g): 130

Continuation sheet. Date: 8-19-06 Location: Sandy Beach (Cracks)

Composite Sample ID: NW2 FL4-1 S
site matrix seq. S/D

Species: Picasso triggerfish

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1700	276					weight (g): 320
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: 1 Total Weight (g): 320

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species: _____

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species: _____

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Field Record for | Study of Chemical Residues in | Fish Tissue

Sampling Date: 8-30-06
Collection Method: Hook & Line
Colector Name: London
Affiliation: Tetra Tech, Inc Phone: 808-533-3566
Address:

Site Location: Sandy Beach County: Honolulu
Sidt Name: Rainbow Ridge
Description: West of Sandy Beach

Composite Sample ID: NW2 FS FB-1 S
site matrix seq. S/D
Species: Many bar goatfish
Specimen/Lot Number | time | Lengths (mm TL) | Notes

1	1200	252	160				Weights (g) 280, 125
2	weight	280	125				grams
3							
4							
5							
6							
7							
8							

Number of fish in composite: 2 Total Weight (g): 405

Composite Sample ID: NW2 FB-1 S
site matrix seq. S/D
Species: Bridled Triggerfish
Specimen/Lot Number | time | Lengths (mm TL) | Notes

1		176					Weight (g) 150
2	weight	150					
3							
4							
5							
6							
7							
8							

Number of fish in composite: 1 Total Weight (g): 150

Notes/Diagrams:

Field Record for | Study of Chemical Residues in | Fish Tissue

Sampling Date: 09/07/06
Collection Method: Hook and line
Colector Name: L. Johnson, G. Flegel
Affiliation: Tetra Tech, Inc. Phone: (808) 533-3566
Address: 841 Bishop St, Suite 700, Honolulu, HI 96813

Site Location: Makua (NW) County: Honolulu
Sidt Name: Makua reef
Description:

Composite Sample ID: NW 1 FG-2 S
site matrix seq. S/D

Species: Saddle wrasse

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1300	156	126	105	114	96	Weights (g): 60, 20, 15, 15, 10
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: 5 Total Weight (g): 120

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species:

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: Total Weight (g):

Notes/Diagrams:

Field Record for Study of Chemical Residues in Fish Tissue

Sampling Date 09-07-06
Collection Method Gill net, minnow trap, throw net
Colector Name L. Johnson + G. Floyd
Affiliation: Tetra Tech, Inc. Phone: (808) 533-3366
Address: 820 Mililani St, Suite 700, Honolulu, HI 96813

Site Location NANAKULI MULIWAI (M3) County: Honolulu

Sidt Name:
Description:

Composite Sample ID: M3 F3-1 S
site matrix seq. S/D

Species: MEDAKA

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1500	57	65	60	70	61	Continued below
2	1500	51	54	57	52	75	
3	↓	45	45	59	60	62	
4		62	43	67	48	65	
5		57	47	43	47	56	
6		56	65	57	60	55	
7		58	42	46	60	55	
8	↓	46	62	55	57	56	

Number of fish in composite: See next Total Weight (g): See next

Composite Sample ID: — — — —
site matrix seq. S/D

Species: — (See above)

Continued from above.

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1500	59	46	47	55	58	
2	↓	52	65	48	44	55	
3	↓	44	40	40			
4							
5							
6							
7							
8							

Number of fish in composite: 53 Total Weight (g): 150.

Notes/Diagrams:

Continuation sheet. Date: _____ Location: NANAKULI MAUKA

Composite Sample ID: M3 - FL - 2 2
site matrix seq. S/D

Species: Hawaiian Flagtail ("Ahole kole")

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	1500	123	78				
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: 2 Total Weight (g): 40g

Composite Sample ID: M3 FL-1 2
site matrix seq. S/D

Species: Striped mullet

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1	0730	250					weight 170(g)
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: 1 Total Weight (g): 170

Composite Sample ID: ___ ___ ___ ___ ___
site matrix seq. S/D

Species: _____

Specimen/Lot Number	time	Lengths (mm TL)					Notes
1							
2							
3							
4							
5							
6							
7							
8							

Number of fish in composite: _____ Total Weight (g): _____

Field Record: Makua Shellfish Study	
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON
Data Recorder	YVONNE PARRY
Additional Personnel and Duties	DAWN LLECES
Environmental Conditions	see field notes

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
9/29/2008	11:45	M1	COLATR	6.9	35	MNS-03	
				7.4	45		
				6.4	32		
				7.1	45		
				6.0	32		
				5.4	20		
				6.0	27		
				6.1	25		
				6.3	31		
				6.8	34		
				6.9	35		↑ 1 jar
9/29/2008	11:45	M1	COLATR	6.3	26		
				5.8	22		
				6.3	29		
				5.7	21		
				6.2	25		
				6.3	31		
				~~7.2~~ 6.5 YKP	26		
				5.6	19		
				6.3	32		
				6.6	37		
				6.5	43		
				6.0	29		
				5.9	27		
				5.2	21		↑ 2 jar

Field Record: Makua Shellfish Study	
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON
Data Recorder	YVONNE PARRY
Additional Personnel and Duties	DAWN LECES - FIELD NOTES
Environmental Conditions	

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	11:45	M1	COLATR	6.1	21	MNS-03
				6.3	26	
				4.8	29	
				6.2	31	
				5.4	19	
				5.5	28	
				6.0	22	
				6.9	37	
				5.9	28	
				6.0	27	
				5.4	24	
				6.4	28	
9/29/2008	11:45	M1	COLATR	6.4	32	MNS-03
				7.3	52	
				5.8	25	
				6.3	24	
				5.7	29	
				4.9	23	
				5.1	17	
				5.2	16	
				5.4	19	
				5.7	29	
				5.7	24	
				5.5	32	
				5.5	24	

3rd jar
4th
4th

3/8

Field Record: Makua Shellfish Study						
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LLECES - FIELD NOTES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	1145	M1	COLATR	5.3	18	MNS-03
				6.2	22	
				4.5	11	
				5.6	19	
				5.7	24	
				5.4	18	4th jar
9/29/2008	1145	M1	COLATR	5.1	18	MNS-03
				6.6	35	
				6.2	26	
				4.6	17	
				4.7	15	
				5.4	21	
				4.6	16	
				6.0	28	
				5.4	20	
				5.3	21	
				5.5	29	
				5.0	17	
				5.2	17	
				5.6	19	
				4.2	11	
				6.0	23	
				5.1	22	
				5.6	19	
				5.2	15	5th jar

Field Record: Makua Shellfish Study	
Sample Processor	SUSAN CARLSTENN, MAREN ANDERSON
Data Recorder	YVONNE PARRY
Additional Personnel and Duties	DAWN LLECES - FIELD NOTES
Environmental Conditions	

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	1145	M1	COLATR	6.0	24	MNS-03
↓	↓	↓	↓	5.4	18	↓
↓	↓	↓	↓	5.0	15	↓
9/29/2008	11:45	M1	COLATR	5.3	18	MNS-03
↓	↓	↓	↓	4.8	15	↓
↓	↓	↓	↓	3.4	7	↓
↓	↓	↓	↓	5.7	22	↓
↓	↓	↓	↓	4.5	11	↓
↓	↓	↓	↓	5.2	22	↓
↓	↓	↓	↓	4.0	10	↓
↓	↓	↓	↓	5.0	13	↓
↓	↓	↓	↓	5.7	27	↓
↓	↓	↓	↓	4.9	15	↓
↓	↓	↓	↓	4.9	19	↓
↓	↓	↓	↓	4.5	13	↓
↓	↓	↓	↓	4.0	16	↓
↓	↓	↓	↓	4.4	12	↓
↓	↓	↓	↓	4.6	14	↓
↓	↓	↓	↓	4.5	13	↓
↓	↓	↓	↓	4.0	16	↓
↓	↓	↓	↓	5.2	15	↓
↓	↓	↓	↓	4.5	9	↓
↓	↓	↓	↓	4.8	10	↓
↓	↓	↓	↓	3.6	8	↓
↓	↓	↓	↓	5.2	15	↓

↑ 5th
6th ↓

↕

5/8

Field Record: Makua Shellfish Study						
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LLECES - FIELDNOTES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	1145	M1	COLATR	4.4	14	MNS-03
			COLATR	5.5	31	
				5.0	14	
				4.5	10	
				5.1	18	
				4.3	10	
				3.6	7	
				4.9	16	
				4.0	8	
				4.5	10	
				4.3	8	
				5.0	16	
				5.6	22	6th
9/29/2008	1145	M1	COLATR	5.0	15	MNS-03 7th
				5.0	19	
				5.2	18	
				4.8	9	
				5.2	18	
				4.6	14	
				4.8	14	
				4.6	11	
				4.9	19	
				5.0	15	
				4.8	13	
				5.1	18	

~~795~~ ~~972~~
~~1389~~ 1716
501
2217
6.66
2883
7.88
3671

6/8

Field Record: Makua Shellfish Study							
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON						
Data Recorder	YVONNE PARRY						
Additional Personnel and Duties	DAWN LLECES - FIELD NOTES						
Environmental Conditions							
Date	Time	Location	Species	Length/Width (cm) ~~(g)~~	cm ~~Mass (g)~~	Composite ID	
9/29/2008	1145	M1	COLATR	4.5/10	4.6/16	MNS-Ø3	
				6.1/28	4.2/11		
				4.5/14	5.1/20		
				5.4/24	4.9/10		
				4.8/14	5.5/18		
				4.9/18	4.6/19		
				4.2/10	4.5/14		
				4.7/15	6.2/20		
				4.4/9	4.3/11		7th
9/29/2008	1145	M1	COLATR	4.8/18	4.5/16	MNS-Ø3	8th
				5.0/18	4.9/10		
				5.9/23	4.2/16		
				5.0/25	4.0/8		
				4.9/17	4.5/13		
				4.6/13	5.1/16		
				4.8/15	4.3/12		
				4.0/15	4.0/6		
				4.0/13	4.6/20		
				4.9/15	4.3/11		
				4.4/10	5.0/20		
				4.7/19	5.8/27		
				4.9/15	5.2/18		
				5.0/19	5.1/16		8th
9/29/2008	1145	M1	COLATR	5.8/26	4.9/15	MNS-Ø3	9th
				4.8/17	4.1/10		

7/8

Field Record: Makua Shellfish Study						
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LEECES- FIELD NOTES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm) / mass	Length/width Mass (g)	Composite ID
9/29/2008	1145	M1	COLATR	4.4 / 15	4.3 / 11	MNS-03
				4.4 / 11	5.4 / 26	-
				4.2 / 8	4.9 / 20	-
				3.8 / 9	5.5 / 22	-
				4.8 / 18	4.9 / 15	
				4.9 / 13	4.5 / 11	
				3.4 / 21	4.0 / 32	
				3.3 / 22	4.9 / 30	
				3.5 / 15	3.4 / 15	
				3.4 / 17	4.7 / 29	
				3.4 / 16	3.4 / 19	
				3.5 / 15	9/29/2008 YKP	
9/29/2008	1145	M1	COLATR	3.4 / 19	3.1 / 14	MNS-03
				3.5 / 21	3.4 / 11	
				2.9 / 10	3.6 / 16	
				4.0 / 21	3.3 / 13	
				3.1 / 11	3.5 / 15	
				4.0 / 23	4.0 / 19	
				3.7 / 17	3.3 / 17	
				4.0 / 15	4.0 / 18	
				2.6 / 13	3.5 / 19	
				4.3 / 24	3.5 / 15	
				3.5 / 20	2.5 / 13	
				3.6 / 13	2.9 / 9	
				3.1 / 11	YKP 3.9 / 16	

9th

9th jar

10th jar

10th jar

/	/
/	/
/	/
/	/

YKP see back of page

Date	Time	Location	Species	Length/width	Mass [g]	composite ID
9/29/2008	1145	M1	COLATR	3.4	16	MNS#3
				3.5	17	
				4.0	15	
				3.7	17	
				3.4	14	
				2.7	10	
				2.5	9	
				2.5	7	
				2.6	12	
				3.2	14	
				3.4	21	
				2.2	15	
				3.0	10	
				3.7	15	
				3.6	18	
				4.0	20	
				3.2	14	
				4.1	21	
				4.2	26	

↓ 11th ja

Field Record: Makua Shellfish Study

Sample Processor	SUSAN CARSTENN / MAREN ANDERSON
Data Recorder	YVONNE PARRY
Additional Personnel and Duties	DAWN LLECES - FIELD NOTES
Environmental Conditions	

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	11:55	M1	GRATEN	1.0	7	~~MNS~~ MNS-Ø2

Field Record: Makua Shellfish Study						
Sample Processor	MAREN ANDERSON, SUSAN CARSTENN					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LLECES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	11:45	Mi MNS inner tidal	PACPL/MP	3.3	19	MNS-01
9/29/2008	12:57	North Huliwai	PLADEP SCYSER	7.1	163	MNM-04 jar 1
9/29/2008	12:57	North Huliwai	SCYSER	9.0	224	MNM-04 ziplock 1

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Jason A. Lieces					
Additional Personnel and Duties						
Environmental Conditions	See field notes					
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**
10/1/09	1200	SBNS/ Habitat	COLATR	7.1	62	SBNS-01
↓	↓	↓	↓	6.2	43	↓
↓	↓	↓	↓	6.6	45	↓
↓	↓	↓	↓	5.4	38	↓
↓	↓	↓	↓	6.9	67	↓
↓	↓	↓	↓	4.9	20	↓
↓	↓	↓	↓	5.4	22	↓
↓	↓	↓	↓	6.2	47	↓
↓	↓	↓	↓	6.2	40	↓
↓	↓	↓	↓	5.8	44	↓
↓	↓	↓	↓	6.5	42	↓
↓	↓	↓	↓	6.0	51	↓
↓	↓	↓	↓	5.1	24	↓
↓	↓	↓	↓	5.2	23	↓
↓	↓	↓	↓	7.5	55	↓
↓	↓	↓	↓	6.9	54	↓
↓	↓	↓	↓	5.6	47	↓
↓	↓	↓	↓	6.5	30	↓
↓	↓	↑	↑	6.0	43	↓
↓	↓	↑	↑	6.2	25	↓
↓	↓	↑	↑	6.9	60	↓
↓	↓	↑	↑	7.4	39	↓
↓	↓	↑	↑	6.5	36	↓
↓	↓	↑	↑	5.9	30	↓
↓	↓	↓	↓	5.4	25	↓

Jar 1 3pp

Jar 2 410

Jar 3

1012

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Dawn A. Lleces					
Additional Personnel and Duties						
Environmental Conditions	See field notes					
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**
10/11/09	1200	SBNS/Habitat	COLATR	6.7	50	SBNS-01
↓	↓	↓	↓	6.7	30	↓
				6.9	50	
				6.5	36	
↓	↓	↓	↓	4.9	19	↓
				7.0	39	
				4.5	10	
				3.7	5	
				4.6	11	
				3.6	9	
				5.1	22	
				5.5	22	
				4.5	12	
				5.1	15	
				6.2	29	
				5.0	15	
				4.1	11	
				4.5	19	
				4.1	10	
				4.9	14	
				3.7	9	
				5.0	14	
				5.2	34	
				4.0	7	
↓	↓	↓	↓	4.6	13	↓

Jar 3 (cont) 451

Jar 4

513

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/1/09	1200	SBNS/Habitat	COLATR	3.7	10	SBNS-01	Jar 4
↓	↓	↓	↓	5.8	26	↓	(cont.)
↓	↓	↓	↓	5.2	15	↓	371
				3.9	6		Jar 5
				5.5	21		
				5.4	17		
				5.0	15		
				3.7	10		
				5.4	28		
				3.6	6		
				4.7	14		
				4.0	9		
				5.3	17		
				4.7	12		
				4.4	8		
				4.5	10		
				5.5	19		
				4.0	9		
				4.9	19		
				5.0	24		
				4.0	8		
				4.3	12		
				4.9	19		
				5.9	24		
↓	↓	↓	↓	4.7	14	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn Lieces						
Additional Personnel and Duties							
Environmental Conditions	See Field notes						
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**	
10/01/08	12:00	SBNS/Habitat	COLATR	5.6	25	SBNS-01	Jar 5 (cont.)
↓	↓	↓	↓	4.1	10	↓	
				4.8	15		
				4.3	9		453
				4.2	9		
				4.3	15		
				4.2	14		
				4.3	8		
↓	↓	↓	↓	5.6	29	↓	sample
				5.2	15		Jar 6
				3.6	7		
				4.0	16		
				4.5	16		
				5.3	17		
				3.8	10		
				6.9	46		
				5.6	25		
				4.8	15		
				4.9	13		
				4.7	15		
				5.3	21		
				5.5	16		
				5.5	20		
				3.4	8		
↓	↓	↓	↓	5.1	19	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See field notes						
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**	
10-01-08	1200	SBNS/Habitat	COLATR	4.7	10	SBNS-01	Jar 6 (cont.)
↓	↓	↓	↓	4.7	19	↓	
				3.8	10		
				4.3	13		398
				4.4	15		
				5.3	24		
↓	↓	↓	↓	6.0	20	↓	
				4.7	14		Jar 7
				4.0	8		
				4.2	11		
				5.7	30		
				3.5	6		
				4.1	10		
				3.4	9		
				5.2	17		
				5.5	23		
				5.5	26		
				4.9	15		
				4.8	15		
				4.7	14		
				4.9	17		
				4.7	17		
				3.9	5		
				4.7	16		
↓	↓	↓	↓	4.1	15	↓	

Field Record: Makua Shellfish Study	
Sample Processor	Maren Anderson
Data Recorder	Dawn Lleces
Additional Personnel and Duties	
Environmental Conditions	See field notes

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10-01-00	12:00	SBNS/Habitat	COLATR	4.4	9	SBNS-01	Jar 7
↓	↓	↓	↓	5.1	27	↓	(cont.)
				5.4	17		
				4.9	13		
				4.6	14		409
				5.1	15		
				6.6	30		
↓	↓	↓	↓	5.3	16	↓	
				5.0	17		Jar 8
				4.3	10		
				4.6	14		
				4.3	11		
				4.5	12		
				4.5	10		
				4.5	14		
				5.0	17		
				4.7	12		
				5.7	24		
				5.7	22		
				5.3	19		
				5.7	29		
				5.1	19		
				3.9	8		
				4.2	11		
↓	↓	↓	↓	4.7	15	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/01/08	12:00	SBNS/Habitat	COLATR	5.9	29	SBNS-01	Jar 8
				3.4	9		(cont.)
				4.1	14		
				4.7	17		
				4.9	19		
				5.1	16		417
				4.2	11		
				4.9	13		
				3.7	9		
				4.4	12		
↓	↓	↓	↓	4.7	12	↓	
				6.0	35		Jar 9
				5.7	20		
				5.7	26		
				4.2	14		
				4.9	12		
				4.3	14		
				4.9	13		
				6.3	37		
				5.5	24		
				6.6	34		
				5.2	17		
				6.4	29		
				5.2	12		
↓	↓	↓	↓	4.9	14	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/01/09	1200	SBNS/Habitat	COLATR	4.3	7	SBNS-01	Jar 9
↓	↓	↓	↓	4.4	10	-	
				6.7	35		
				5.0	10		
				3.7	7		448
				4.2	19		
				3.5	9		
				5.6	28		
				~~5~~ 4.7	14	↓	
				5.0	15		Jar 10
				4.6	16		
				7.2	53		
				5.9	25		
				6.6	43		
				5.9	23		
				4.3	15		
				4.3	12		
				6.1	25		
				4.2	9		
				4.9	15		
				4.1	13		
				4.6	11		
				4.6	15		
				4.8	11		
↓	↓	↓	↓	4.5	13	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See on field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/01/00	12:00	SPNS/Habitat	COLATR	4.0	11	SPNS-01	Jar 10
↓	↓	↓	↓	4.6	10	↓	(cont)
				3.0	9		
				3.9	8		
				4.3	13		
				3.5	5		467
				5.4	18		
				4.2	13		
				5.2	13		
				6.0	30		
				4.6	10		
				3.8	7		
↓	↓	↓	↓	4.1	6	↓	
				4.5	10		Jar 11
				6.2	20		
				4.7	15		
				4.5	15		
				4.6	19		
				5.0	15		
				4.4	12		
				3.9	9		
				6.9	43		
				5.3	16		
				4.9	15		
↓	↓	↓	↓	4.1	9	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See a field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10-01-08	1200	SBNS/Habitat	COLATR	4.3	14	SBNS-01	Jar 11
				3.7	7		(cont.)
				5.4	20		
				4.8	14		
				4.0	10		
				3.9	7		
				4.0	12		
				4.4	10		491
				~~5.4~~ 5.5	25		
				5.4	19		
				4.0	14		
				4.6	11		
				5.4	24		
				3.7	~~4~~ 7		
				4.9	14		
				5.1	16		
				4.7	19		
↓	↓	↓	↓	6.3	45	↓	
				6.2	30		Jar 12
				5.5	24		
				6.2	32		
				5.2	30		
				7.3	63		
				5.7	40		
↓	↓	↓	↓	5.7	26	↓	

11 05 12

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Yvonne Parry / Dawn A. Lieces						
Additional Personnel and Duties							
Environmental Conditions	See Field Notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/01/08	1200	SBNS / ~~Habitat~~ DAL	COLATR	6.2	47	SBNS-Ø1	Jar 12 (cont.)
				6.2	43		
				6.3	45		
				6.2	45		511
				6.4	33		
				6.0	26		
				6.0	27		
10/02/08	1115	SBNS	COLATR	6.5	37	SBNS-Ø1	517.0g Jar 13
				6.0	32		
				6.6	38		
				7.9	62		
				6.6	45		
				7.3	58		
				7.5	55		
				6.1	27		
				6.0	26		
				6.2	40		
				6.8	41		
				6.7	42		503
	1115	SBNS	COLATR	6.0	30	SBNS-Ø1	Jar 14
				6.4	33		
				6.0	26		
				7.1	42		
				5.8	25		
				6.0	20		

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Yvonne Parry					
Additional Personnel and Duties						
Environmental Conditions	see Field notes					
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**
10/2/08	1115	SBNS	COLATR	6.2	30	SBNS-01
↓	↓	↓	↓	6.5	39	↓
↓	↓	↓	↓	6.7	21	↓
↓	↓	↓	↓	6.5	26	↓
↓	↓	↓	↓	5.5	25	↓
↓	↓	↓	↓	6.0	30	↓
↓	↓	↓	↓	6.7	50	↓
↓	↓	↓	↓	6.6	40	↓
↓	↓	↓	↓	6.5	28	↓
↓	↓	↓	↓	5.8	31	↓
↓	↓	↓	↓	5.0	16	↓
↓	↓	↓	↓	5.6	40	↓
↓	↓	↓	↓	6.2	44	↓
↓	↓	↓	↓	5.2	21	↓

↑ 617
↓

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Dawn A. Lleces					
Additional Personnel and Duties						
Environmental Conditions	See field notes					
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
10/01/08	1200	SBNS/Habitat	PLADEP	3.0	32	SBNS-02

Field Record: Makua Shellfish Study

Sample Processor	Maren Anderson
Data Recorder	Dawn Lleces
Additional Personnel and Duties	
Environmental Conditions	see Field Notes

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
10/3/00	~~1300~~ 1400	MNS	RANRAN	7.8 / 6.2	156	MNS-05
				9.0 / 6.8	236	-
				9.0 / 7.0	223	
				7.4 / 6.0	132	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lieces						
Additional Personnel and Duties	Susan Carstenn						
Environmental Conditions	See ~~onsite data~~ Field notes						
Date	**Time**	**Location**	**Species**	**Length/Width (cm)** (Full length / carapace length)	**Mass (g)**	**Composite ID**	
10-6-09	1225	NM	MACGRA	7.3/3.4	9	NM-01	Jar 1
10-7-09	1442	NM	MACGRA	7.2/3.4	9	NM-01	
				7.5/3.6	9		
				6.9/3.3	8		
				7.2/3.4	9		
				7.1/3.5	5		
				7.4/3.5	5		
				7.5/3.6	8		
				7.2/3.5	6		
				7.3/3.6	6		
				7.1/3.4	5		
				7.6/3.7	6		
				6.5/3.1	4		
				7/3.3	3		
↓	↓	↓	↓	7.5/3.6	6	↓	
10-6-09	1555	NNS	RENREN	6.75/5.3	94	NNS-01	
10-7-09	1442	NM	MACGRA	7.1/3.5	9	NM-01	Jar 1 (cont)
				6.2/2.7	4		
				7.0/3.3	6		
				6.4/3.0	3		
				4.9/2.2	0.5		
				5.3/2.4	1		
				5.7/2.5	2		
				6.9/3.4	5		
				5.4/2.6	1		

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Dawn A. Lees					
Additional Personnel and Duties						
Environmental Conditions	See field notes					
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
10-7-09	1442	NM	MACGRA	5.4 / 2.5	1	NM-01
				5.0 / 2.4	1	
				5.3 / 2.5	1	
				5.4 / 2.5	3	
				4.9 / 2.2	2	
				6.0 / 2.6	3	
				5.0 / 2.3	0.5	
				3.6 / 1.7	0.25	
				4.3 / 2.0	0.25	
				3.9 / 1.6	0.25	
				5.6 / 2.5	2	
				5.7 / 2.5	3	
				5.7 / 2.4	3	
				4.5 / 1.9	2	
				6.0 / 2.7	3	
				5.4 / 2.5	2	
				4.5 / 2.0	0.5	
				5.6 / 2.6	2	
				4.0 / 1.9	1.5	
				4.9 / 2.0	0.5	
				5.0 / 2.3	1	
				4.7 / 2.1	1	
				5.2 / 2.4	2	
				3.4 / 1.7	~~0.25~~ 1	
↓	↓	↓	↓	3.2 / 1.5	~~0.25~~ 1	↓

Jar 1 (cont.)

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	see Field Notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10-07-08	1442	NM	MACGRA	7.1 / 3.5	8	NM-01	Jar 1 (cont.)
↓	↓	↓	↓	6.5 / 2.9	7	↓	
				7.8 / 3.6	6		
				6.7 / 3.2	6		
↓	↓	↓	↓	7.3 / 3.7	7	↓	
10-07-08	1442	NM	MACGRA	6.9 / 3.6	8	NM-01	Jar 2
				6.9 / 3.1	5		
				5.6 / 2.5	2		
				7.3 / 3.5	7		
				4.9 / 2.3	1		
				7.0 / 3.3	5		
				5.5 / 2.5	2		
				5.3 / 2.5	2		
				5.2 / 2.5	1		
				5.2 / 2.4	1		
				5.7 / 2.6	3		
				5.0 / 2.7	2		
				6.7 / 3.3	5		
				5.5 / 2.5	2		
				5.9 / 2.6	3		
				4.6 / 2.2	1		
				7.0 / 3.5	5		
				4.7 / 2.3	1		
				5.2 / 2.5	2		
				5.1 / 2.4	1		

Field Record: Makua Shellfish Study						
Sample Processor	Marin Anderson					
Data Recorder	Dawn A. Lecos					
Additional Personnel and Duties						
Environmental Conditions	See field notes.					
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**
10.07.08	1442	NM	MACGRA	4.4/2.2	2	NM-01
↓	↓	↓		5.2/2.5	1	↓
10.08.08	1000	NM	MACGRA	7.5/3.8	6	
				7.0/3.3	5	
				7.4/3.6	10	
				7.5/3.7	7	
				7.8/3.8	9	
				7.4/3.6	9	
				7.8/3.7	7	
				7.2/3.3	8	
				8.3/4.0	9	
				7.0/3.4	5	
				5.4/2.5	3	
				5.8/2.8	2	
				5.2/2.4	3	
				4.7/2.4	2	
				6.4/3.2	4	
				5.4/2.4	1	
				5.8/2.8	3	
				5.2/2.3	2	
				3.7/1.8	0.5	
				5.7/2.8	3	
				5.4/2.3	3	
				5.6/2.5	3	
				4.8/2.2	2	

Jar 2 (cont.)

170.5

Field Record: Makua Shellfish Study

Sample Processor	Maren Anderson
Data Recorder	Dawn A. Lleces
Additional Personnel and Duties	
Environmental Conditions	See field notes

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
10-07-06	1625	NM	PACMIN	3.1	27	NM-02
				2.4	12	-
				1.5	3	
				2.3	10	

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Tom Ogawa / Susan Carstenn					
Additional Personnel and Duties						
Environmental Conditions	see Field Notes					
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
10.08.08						

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Dawn A. Lucas					
Additional Personnel and Duties						
Environmental Conditions	See field notes					
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
10-9-09	11:34	MSM	PACMIN	3.3	29	MSM-01
				3.2	27	-
				3.0	19	
10-9-09	11:45	MSM		8.4/4.0	14	MSM-02
				6.9/3.2	5	

Makua Shellfish Study - Sample Codes and Species List
September 26, 2008

Location	Habitat	Composite ID
Makua	North Muliwai	MNM
Makua	South Muliwai	MSM
~~Makua~~	~~Intertidal~~	~~MI~~
Makua	Nearshore	MNS
Nanakuli	Muliwai	NM
Sandy Beach	Intertidal - Bamboo Ridge	SBBRI
Sandy Beach	Intertidal	SBI
Sandy Beach	Nearshore	SBNS

Species	Common Name	Species Code
Muliwai		
Thiaridae	Malaysian snail	THI
Nearshore		
Parribacus antarcticus	slipper lobster	PARANT
Ranina ranina	kona crab	RANRAN
Intertidal		
Colobocentrotus atratus	helmet urchin	COLATR
Echinometra oblonga	oblong urchin	ECHOBL
Grapsus tenuicrustas	thin-shelled rock crab	GRATEN
Isognomon californicum	black purse shell, nahawele, papaua	ISOCAL
Littoraria pintado	dotted periwinkle, pipipi kolea	LITPIN
Nerita picea	black nerite, pipipi	NERPIC
Echinometra mathaei (MI only)	rock-boring urchin	ECHMAT
Siphonaria normalis (MI only)	false `opihi, opihi-awa	SIPNOR
Nesochthamalus interextus (MI only)	purple rock barnacle	NESINT
Pachygrapsus plicatus (MI only)	pleated rock crab	PACPLI
Cypraea caputserpentis (MI only)	snakehead cowry	CYPCAP
Echinothrix diadema (MI only)	blue-black urchin	ECHDIA
Cellana exarata (SBBR only)	black-foot opihi	CELEXA
Plagusia depressa tuberculata		PLADEP, - Ø1
Scylla Serrata - Samoan Crab		SCYSER

Sept. 29, 2008

9:43 Tetra Tech team arrives at Mākua Military Reservation Range Control to sign in and check out Mākua Beach keys and Range Control

10:05 Tetra Tech and Oceanic Institute enter Malama ~~Mak~~ Beach State Park and secure gates behind cars.

Tetra Tech	Oceanic Institute
Susan Carstenn	Tom Ogawa
Dawn A. Lieces	Don De Lepena
Yvonne Barry	
Maren Anderson	
(2 vehicles)	

10:00 Tail gate safety brief for field team and sample station set up near south muliwai and sample gear preparation

10:30 Gear for sampling. 1 minnow traps (square), 2 cirular/cylindricle minnow traps, 4 crab nets. Nets and traps deployed at south muliwai.

10:51 Tetratech team arrives at north muliwai.

11:20 Tetra Tech at reef area, rocky near shore area, to deploy 5 gallon bucket crab traps and to start harvesting urchins

11:41 Field team starting to process samples

11:55 Crab species

MNS-01 – Plagusia depressa tuberculata

MNS-02 – Grapsus tenuicrustas

12:30 Crab net brought up empty. Minnow trap contained mosquito fish only. Net and trap redeployed

12:36 2nd crab net brought up empty. 2nd minnow trap contained akupa.

12:45 Team arrives at north muliwai to check crab nets and minnow traps. The first attempt at retrieving the first crab net ended up with no crabs, However the line for the net was pulled taut so Don decided to redeploy the net and check before mobilizing to rocky area. Minnow traps were pulled up with akupa and mosquito fish. Crab nets were checked before leaving. Both crab nets contained one samoan crab each.

13:10 Field crew mobilizes to rocky near shore area and rig up fishing poles with sugi line to catch crabs

13:20 Field conditions. Sunny with light trade winds, temperature at approximately 85° F. waters are flat.

14:40 Crab net from south muliwai pulled, empty. Minnow traps contained mosquito fish. Mosquito fish were emptied from minnow traps, traps were re-baited and redeployed

14:55 North muliwai. Crab traps were pulled up as empty. Minnow traps contained juvenile akupa. Minnow traps were re-baited and redeployed.

15:05 Tetra Tech team break down sample station and load equipment into vehicles

"Rite in the Rain" ALL-WEATHER WRITING PAPER

Sept 29, 2009

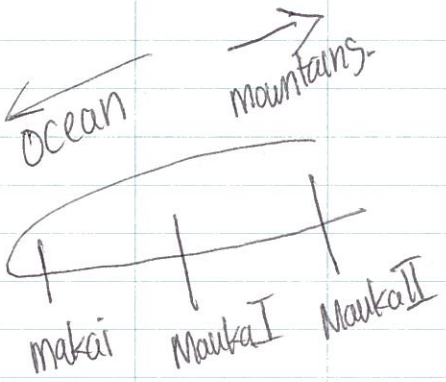
Salinity

South Muliwai (Makai) 10:45

DO 3.91 mg/L
% Sat 52
Salinity 3.5 ppt
Temperature 29.1°C
Cond. 6.45 mS/cm

South Muliwai (Mauka) I)

DO 2.91 mg/L
% Sat 39.8
Salinity 3.4 ppt
Temperature 28.1°C
Cond. 6.7 mS/cm



South Muliwai Mauka II 10:53am

DO 2.30 mg/L
% Sat 31
Salinity 3.4 ppt
Temperature 28.1°C
Cond 6.6 mS/cm

1535 Tetra Tech team leaves south muliwai area
1545 Tetra Tech team returns to Range Control to return gate keys and radio.
15:46 Team leaves site.

Sept 29, 2008

Photo Log

100-3263	Salinity monitor being deployed. Facing NW	Time 10:35
100-3264	Crab trap being deployed at south muliwai. Facing NW	Time 10:36
100-3265	10:36 Same. Crab trap being deployed with Kahala as bait. Facing NW	
100-3266	10:36 Minnow trap being deployed in ~~fort~~ south muliwai. Facing NW	
100-3267	10:39 Second set of crab traps and minnow traps being deployed in South muliwai. This location is NW of the first set of traps deployed.	
100-3268	10:51 Minnow trap being deployed at north muliwai. Facing south	
100-3269	10:5803 North muliwai. Facing east	
100-3270	10:53 Crab trap being deployed. Facing east.	
100-3271	10:54 Second minnow trap being deployed east end of north muliwai. Facing east	
100-3272	10:59 Second crab trap being deployed at north east end of north muliwai. Facing east.	
100-3273	11:13 Crab traps. 5 gallon bucket with bait. Passive method.	
100-3274	11:21 Harvesting Helmet urchins at, near shore rocky area. Facing East	
100-3275	11:24 Picture of the helmet urchins	
100-3276	11:27 Picture of 5 gallon bucket passive crab trap, rocky near shore area	
100-3277	11:34 Picture of 'a'ama crab, caught by hand. in rocky near shore area.	
100-3278	11:49 Field crew processing samples.	
100-3279	1206 Net being used to catch rock crab in rocky near shore area. Facing SE.	
100-3280	1208 Net being used to catch rock crab in rocky near shore area. Facing NE.	
100-3281	1233 1st minnow trap at south muliwai contained mosquito fish	
100-3282	12:30 Akupa at south muliwai in second minnow trap.	
100-3283	12:30 Akupa from minnow trap	
100-3284	12:46 1st minnow trap at north muliwai contained akupa only	
100-3285	12:46 Non fused pectoral fins of akupa from North muliwai.	
100-3286	12:50 Second crab trap at north muliwai. Bait is missing	
100-3287	12:51 Second minnow trap at north muliwai with mosquito fish. Facing north	
100-3288	12:57 Samoan crab from 1st crab net at north muliwai	
100-3289	12:57 Samoan crab in bucket. 1st crab trap in north muli	
100-3290	13:01 Second samoan crab caught from north muliwai.	
100-3291	1326 Rocky near shore area for crab catching. Equipment being used include hook and line on a pole with a scoop net.	
100-3292	14:13 Pipi wai located at rocky near shore area	
100-3293	14:42 First minnow trap from south muliwai being emptied of mosquito fish Facing South	
100-3294	1443 Second crab trap from south muliwai pulled up empty. Facing South	
100-3295	1444 Second minnow trap from south muliwai pulled up with mosquito fish	
100-3296	1445 Minnow traps rebaited and redeployed	
100-3297	1456 First crab net in north muliwai pulled up empty. Facing south.	
100-3298	1459 Second crab net in north muliwai pulled up empty. Facing south east	
100-3299	1500 Second minnow trap pulled up with single juvenile akupa Facing south	

"Rite in the Rain" ALL-WEATHER WRITING PAPER

Field Record: Makua Shellfish Study	
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON
Data Recorder	YVONNE PARRY
Additional Personnel and Duties	DAWN LLECES
Environmental Conditions	see field notes

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
9/29/2008	11:45	M1	COLATR	6.9	35	MNS-03	
				7.4	45		
				6.4	32		
				7.1	45		
				6.0	32		
				5.4	20		
				6.0	27		
				6.1	25		
				6.3	31		
				6.8	34		
				6.9	35		↑ 1 jar
9/29/2008	11:45	M1	COLATR	6.3	26		
				5.8	22		
				6.3	29		
				5.7	21		
				6.2	25		
				6.3	31		
				~~7.2~~ 6.5 YKP	26		
				5.6	19		
				6.3	32		
				6.6	37		
				6.5	43		
				6.0	29		
				5.9	27		
				5.2	21		↑ 2 jar

Field Record: Makua Shellfish Study	
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON
Data Recorder	YVONNE PARRY
Additional Personnel and Duties	DAWN LECES - FIELD NOTES
Environmental Conditions	

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	11:45	M1	COLATR	6.1	21	MNS-03
				6.3	26	
				4.8	29	
				6.2	31	
				5.4	19	
				5.5	28	
				6.0	22	
				6.9	37	
				5.9	28	
				6.0	27	
				5.4	24	
				6.4	28	
9/29/2008	11:45	M1	COLATR	6.4	32	MNS-03
				7.3	52	
				5.8	25	
				6.3	24	
				5.7	29	
				4.9	23	
				5.1	17	
				5.2	16	
				5.4	19	
				5.7	29	
				5.7	24	
				5.5	32	
				5.5	24	

3rd jar
4th
4th

3/8

Field Record: Makua Shellfish Study						
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LLECES - FIELD NOTES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	1145	M1	COLATR	5.3	18	MNS-03
				6.2	22	
				4.5	11	
				5.6	19	
				5.7	24	
				5.4	18	4th jar
9/29/2008	1145	M1	COLATR	5.1	18	MNS-03
				6.6	35	
				6.2	26	
				4.6	17	
				4.7	15	
				5.4	21	
				4.6	16	
				6.0	28	
				5.4	20	
				5.3	21	
				5.5	29	
				5.0	17	
				5.2	17	
				5.6	19	
				4.2	11	
				6.0	23	
				5.1	22	
				5.6	19	
				5.2	15	5th jar

Field Record: Makua Shellfish Study	
Sample Processor	SUSAN CARLSTENN, MAREN ANDERSON
Data Recorder	YVONNE PARRY
Additional Personnel and Duties	DAWN LLECES - FIELD NOTES
Environmental Conditions	

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	1145	M1	COLATR	6.0	24	MNS-03
↓	↓	↓	↓	5.4	18	↓
↓	↓	↓	↓	5.0	15	↓
9/29/2008	11:45	M1	COLATR	5.3	18	MNS-03
↓	↓	↓	↓	4.8	15	↓
↓	↓	↓	↓	3.4	7	↓
↓	↓	↓	↓	5.7	22	↓
↓	↓	↓	↓	4.5	11	↓
↓	↓	↓	↓	5.2	22	↓
↓	↓	↓	↓	4.0	10	↓
↓	↓	↓	↓	5.0	13	↓
↓	↓	↓	↓	5.7	27	↓
↓	↓	↓	↓	4.9	15	↓
↓	↓	↓	↓	4.9	19	↓
↓	↓	↓	↓	4.5	13	↓
↓	↓	↓	↓	4.0	16	↓
↓	↓	↓	↓	4.4	12	↓
↓	↓	↓	↓	4.6	14	↓
↓	↓	↓	↓	4.5	13	↓
↓	↓	↓	↓	4.0	16	↓
↓	↓	↓	↓	5.2	15	↓
↓	↓	↓	↓	4.5	9	↓
↓	↓	↓	↓	4.8	10	↓
↓	↓	↓	↓	3.6	8	↓
↓	↓	↓	↓	5.2	15	↓

↑ 5th
6th ↓

↕

5/8

Field Record: Makua Shellfish Study						
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LLECES - FIELDNOTES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	1145	M1	COLATR	4.4	14	MNS-03
			COLATR	5.5	31	
				5.0	14	
				4.5	10	
				5.1	18	
				4.3	10	
				3.6	7	
				4.9	16	
				4.0	8	
				4.5	10	
				4.3	8	
				5.0	16	
				5.6	22	6th
9/29/2008	1145	M1	COLATR	5.0	15	MNS-03 7th
				5.0	19	
				5.2	18	
				4.8	9	
				5.2	18	
				4.6	14	
				4.8	14	
				4.6	11	
				4.9	19	
				5.0	15	
				4.8	13	
				5.1	18	

~~795~~ ~~972~~
~~1389~~ 1716
501
2217
6.66
2883
7.88
3671

6/8

Field Record: Makua Shellfish Study							
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON						
Data Recorder	YVONNE PARRY						
Additional Personnel and Duties	DAWN LLECES - FIELD NOTES						
Environmental Conditions							
Date	Time	Location	Species	Length/Width (cm) ~~(g)~~	cm ~~Mass (g)~~	Composite ID	
9/29/2008	1145	M1	COLATR	4.5/10	4.6/16	MNS-Ø3	
				6.1/28	4.2/11		
				4.5/14	5.1/20		
				5.4/24	4.9/10		
				4.8/14	5.5/18		
				4.9/18	4.6/19		
				4.2/10	4.5/14		
				4.7/15	6.2/20		
				4.4/9	4.3/11		7th
9/29/2008	1145	M1	COLATR	4.8/18	4.5/16	MNS-Ø3	8th
				5.0/18	4.9/10		
				5.9/23	4.2/16		
				5.0/25	4.0/8		
				4.9/17	4.5/13		
				4.6/13	5.1/16		
				4.8/15	4.3/12		
				4.0/15	4.0/6		
				4.0/13	4.6/20		
				4.9/15	4.3/11		
				4.4/10	5.0/20		
				4.7/19	5.8/27		
				4.9/15	5.2/18		
				5.0/19	5.1/16		8th
9/29/2008	1145	M1	COLATR	5.8/26	4.9/15	MNS-Ø3	9th
				4.8/17	4.1/10		

7/8

Field Record: Makua Shellfish Study						
Sample Processor	SUSAN CARSTENN, MAREN ANDERSON					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LEECES- FIELD NOTES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm) / mass	Length/width Mass (g)	Composite ID
9/29/2008	1145	M1	COLATR	4.4 / 15	4.3 / 11	MNS-03
				4.4 / 11	5.4 / 26	-
				4.2 / 8	4.9 / 20	-
				3.8 / 9	5.5 / 22	-
				4.8 / 18	4.9 / 15	
				4.9 / 13	4.5 / 11	
				3.4 / 21	4.0 / 32	
				3.3 / 22	4.9 / 30	
				3.5 / 15	3.4 / 15	
				3.4 / 17	4.7 / 29	
				3.4 / 16	3.4 / 19	
				3.5 / 15	9/29/2008 YKP	
9/29/2008	1145	M1	COLATR	3.4 / 19	3.1 / 14	MNS-03
				3.5 / 21	3.4 / 11	
				2.9 / 10	3.6 / 16	
				4.0 / 21	3.3 / 13	
				3.1 / 11	3.5 / 15	
				4.0 / 23	4.0 / 19	
				3.7 / 17	3.3 / 17	
				4.0 / 15	4.0 / 18	
				2.6 / 13	3.5 / 19	
				4.3 / 24	3.5 / 15	
				3.5 / 20	2.5 / 13	
				3.6 / 13	2.9 / 9	
				3.1 / 11	YKP 3.9 / 16	

9th

9th jar

10th jar

10th jar

/	/
/	/
/	/
/	/

YKP see back of page

Date	Time	Location	Species	Length/width	Mass [g]	composite ID
9/29/2008	1145	M1	COLATR	3.4	16	MNS#3
				3.5	17	
				4.0	15	
				3.7	17	
				3.4	14	
				2.7	10	
				2.5	9	
				2.5	7	
				2.6	12	
				3.2	14	
				3.4	21	
				2.2	15	
				3.0	10	
				3.7	15	
				3.6	18	
				4.0	20	
				3.2	14	
				4.1	21	
				4.2	26	

↓ 11th ja

Field Record: Makua Shellfish Study						
Sample Processor	SUSAN CARSTENN / MAREN ANDERSON					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LLECES - FIELD NOTES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	11:55	M1	GRATEN	1.0	7	~~MNS~~ MNS-02

Field Record: Makua Shellfish Study						
Sample Processor	MAREN ANDERSON, SUSAN CARSTENN					
Data Recorder	YVONNE PARRY					
Additional Personnel and Duties	DAWN LLECES					
Environmental Conditions						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID
9/29/2008	11:45	Mi MNS inner tidal	PACPL/MP	3.3	19	MNS-01
9/29/2008	12:57	North Huliwai	PLADEP SCYSER	7.1	163	MNM-04 jar 1
9/29/2008	12:57	North Huliwai	SCYSER	9.0	224	MNM-04 ziplock 1

Makua Beach Sept. 30, 2008

0914 Tetra Tech team arrives at MMR Range Control to sign in and check out Makua Beach keys and Range Control radio.

0925 Tetra Tech team arrives at Makua beach and sets up sample station near south muliwai. Tetra Tech personnel on site: Dawn A. Lleces and Maren Anderson

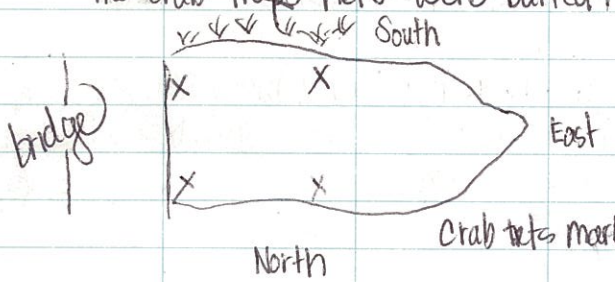
1015 Field conditions: Sunny weather with gusty trade winds coming out of south west. Temperatures around 85°F.

1035 Oceanic Institute team crew arrives on site with Malama Makua. Oceanic Institute personnel Tom Ogawa and Don De Lepena. Dr. Fred Dodge is the representative for Malama Makua Contact information for Dr. Dodge:
cell 808 227-2756
home 808 696-4677

10:45 Tail gate safety meeting held with entire field team + Malama Makua

11:00 Minnow traps left over night at South muliwai were checked. Both contained akupa, mosquito fish and tilapias. Traps were rebaited and redeployed.

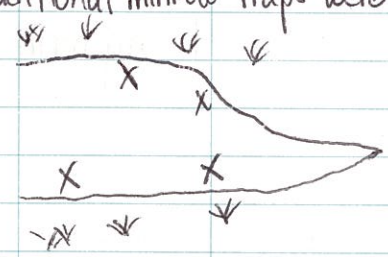
11:17 Minnow traps left over night at North muliwai were pulled. Traps contained mosquito fish, akupa. These traps were brought in to be redeployed at the south muliwai.
The crab ~~traps~~ nets were baited. Four crab nets were deployed at four corners of north muliwai. 01 team checked nets periodically and when net lines were pulled taut. Bait, when nets were checked on showed signs of being torn.



Crab nets marked with X

1:51 Team arrives at south muliwai. Dr. Dodge leaves and asks that he be called if the team relocates to the Nanakuli muliwai.

1:52 Two additional minnow traps were deployed in the south muliwai.



Crab nets marked with X

12:15 Passive crab traps 15 gallon buckets deployed at near shore rocky area

13:07 Team arrives at North to check on crab traps. Two crab traps were pulled ~~on north~~ up empty (southwestern corner and north eastern corner). The northwestern net was deployed in southwestern corner to see if something would bite

3:15 Crab net from south eastern was pulled with a juvenile Samoan crab.

1330 Field crew returns to sample station to process samoan crab from north muliwai

1335 Passive crab trap pulled up empty from rocky near shore area.

1343 Minnow traps from south muliwai pulled up with tilapia, mosquito fish and akupa

1350 Field team broke down team sample station

~~1440~~ 1415 Tetra Tech personnel returned to Range Control to return keys and radio and to sign out.

Photo Log — Makua Beach — Sept 30, 2008

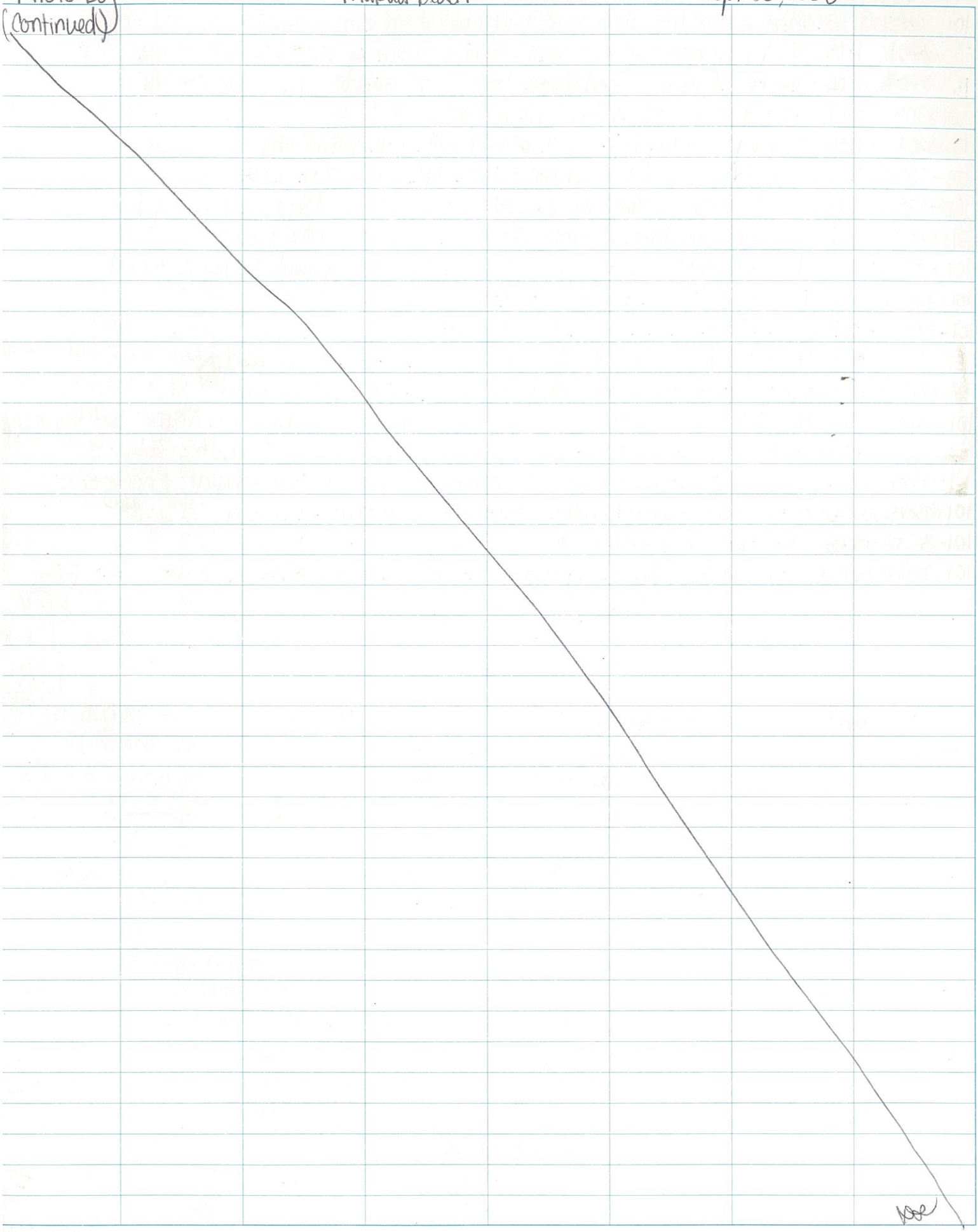
101-3300	11:00	First minnow trap from South muliwai pulled up with mosquito fish and akupa
101-3301	11:05	Second minnow trap from South muliwai pulled up with the large akupa,
101-3302	11:06	Release of mosquito and tilapia from second minnow trap in south muliwai
101-3303	11:17	First trap (minnow trap) from North muliwai pulled.
101-3304	11:21	Second minnow trap from north muliwai pulled with juvenile akupa.
101-3305	11:21	(Juvenile) akupa from second minnow trap left over night in north muliwai.
101-3306	11:22	Plant growing at the eastern edge of the muliwai. May be a tomato plant.
101-3307	11:24	Crab nets being baited before being deployed at north muliwai.
101-3308	1152	Two additional minnow traps deployed in the south muliwai. Facing ~~East~~ West
101-3309	1312	Crab nets at North muliwai are checked and redeployed.
101-3310	1321	Juvenile Samoan crab pulled from Norther Muliwai
101-3311	1343	Minnow trap at south muliwai, north eastern corner facing south east.
101-3312	1345	Minnow trap at south muliwai, northwestern corner facing southeast
101-3313	1350	Minnow trap at south eastern corner of south muliwai pulled up with akupa and mosquito fish.
101-3314	1522	crab trap at southwestern corner of Nanakuli muliwai. Facing East
101-3315	1526	crab trap #2 at north end of Nanakuli muliwai.
101-3316	1528	Nanakuli muliwai
101-3317	1641	Crab net #1 recovered from water - southeastern corner

"Rite in the Rain" ALL-WEATHER WRITING PAPER

Photo Log (continued)

Makua Beach

Sept 30, 2008



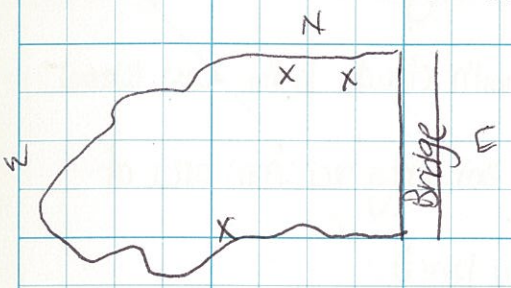
Makua Beach

Sept. 30, 2008

Field notes continued.

1417 Tetra Tech and OI leaving Makua to pick up additional supplies and to mobilize to Nanakuli

1513 Tetra Tech and OI assessing Nanakuli muliwai to set crab traps/nets.



1515 Three crab nets were baited and prepared for deployment in the Nanakuli muliwai.

X = crab nets deployed

1523 crab net set at southwestern corner of Nanakuli muliwai

1525 crab net # 2 set at north end of Nanakuli muliwai

1528 crab net #3 set at northeast end of Nanakuli muliwai

conditions of Nanakuli muliwai: Very shallow water. Clear to plants growing on bottom. Entire ground covered in seaweeds.

1641 recovery of crab net #1 at southwest corner of Nanakuli muliwai

1644 recovery of crab net #2 at north edge of Nanakuli muliwai

1649 recovery of crab net #3 at northeastern corner of Nanakuli muliwai

all crab nets #'s 1-3 were brought up empty.

1656 Tetra Tech team leaves Nanā kuli Muliwai

"Rite in the Rain" ALL-WEATHER WRITING PAPER

Sandy Beach Oct 1, 2009

9:04 Tetra Tech Team arrives at Sandy Beach. Tetra Tech team includes Susan Carstenn, Dawn A. Lleces, Maren Anderson.

10:04 Oceanic Institute team arrives on site. OI team includes Tom Ogawa and Don De Lepena.

10:15 Tail gate safety meeting.

10:18 Site conditions: Temperatures are approximately 85° F, sunny with clouds to the east. Wave conditions are flat to 1 ft.

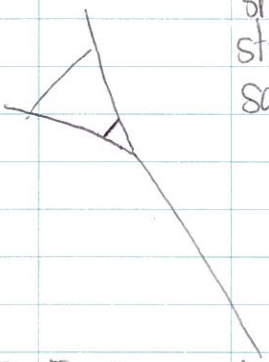
10:20 Team sets up sample station and starts to harvest helmet urchin in the rocky near shore area at Sandy Beach

2:00 Lower East Sandy Beach. Field crew relocates to Lower east sandy Beach

2:25 Processing samples retrieved from Sandy Beach intertidal zone)
OBNS - Sample code for Sandy Beach

3:10 Field crew breaks down sampling station at lower east Sandy Beach location and returns to Sandy Beach intertidal zone. Ocean conditions at the lower east location become too rough to be safe.

3:20 Focus for harvesting shifts from sea urchins to rock crab. Field team is attempting to use traditional method for crabbing. A bamboo pole with two bamboo sticks taped in a Y shape at the end and sugi line tied between the widest point of the sticks is the tool being used. Samples continue to be processed at the sample station



~~3:40~~ 14:20 Environmental conditions Light rain coming in from the north, over cast with strong, constant trade winds, water conditions are flat to 1 ft. Tide is coming in.

~~15:20~~ 15:20 Environmental conditions. Rain and cloud clears.

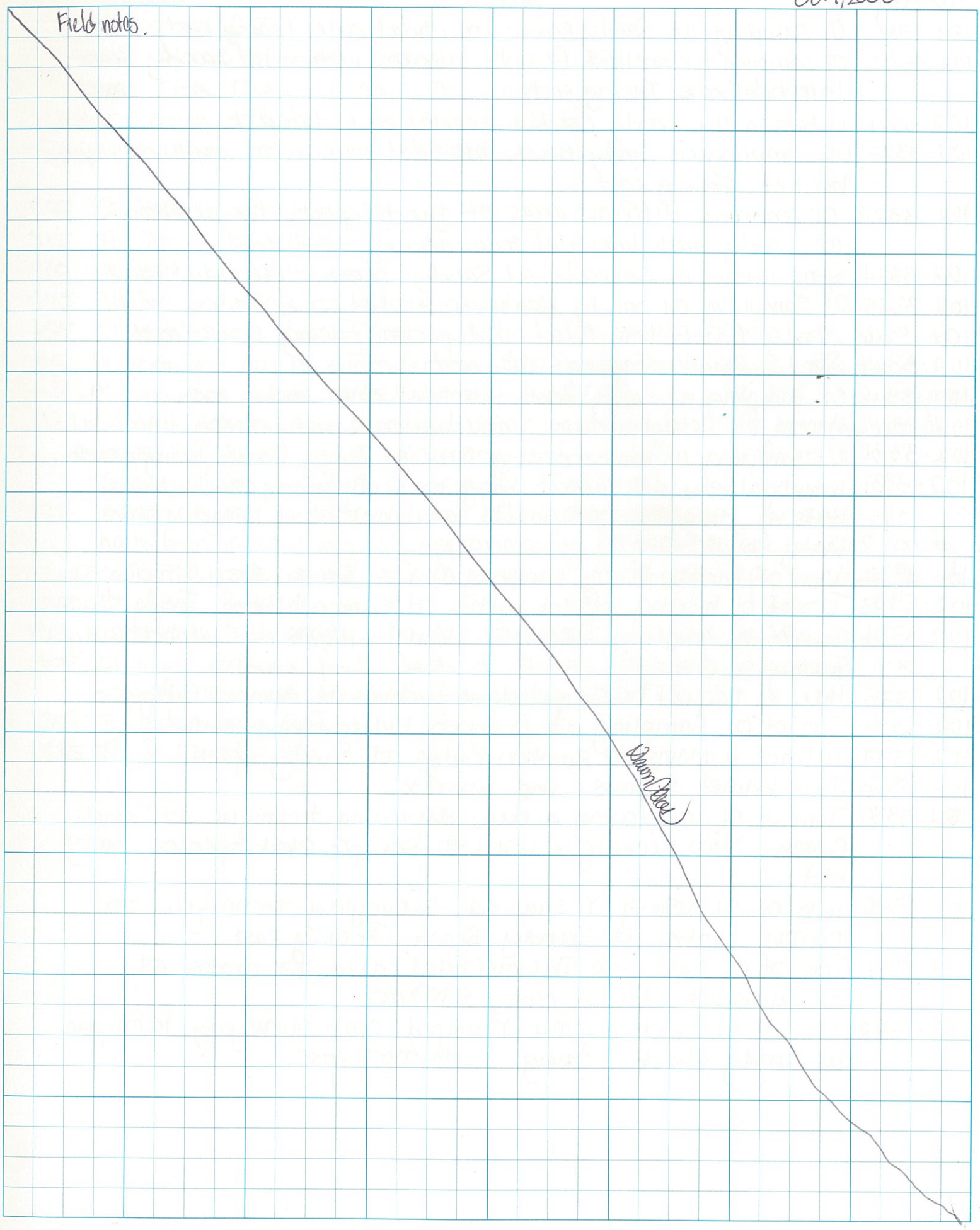
15:30 Scale for weighing samples break

16:00 Yvonne Parry brings an additional scale.

16:15 &

Oct 1, 2009

Field notes.



"Rite in the Rain"
ALL-WEATHER WRITING PAPER

Photo Log — Sandy Beach — Oct. 1, 2008

102-3319	OI sampling at Sandy Beach Intertidal zone. Facing east
102-3320	OI sampling for shellfish (mainly crabs and urchins) at Sandy Beach Intertidal zone. Facing east.
102-3321	Gobies in the Sandy Beach Intertidal zone tidepools.
102-3322	OI sampling at Sandy Beach Intertidal zone with capture bucket. Facing east.
102-3323	OI scanning different areas of the tidepools for shellfish at Sandy Beach Intertidal zone. Facing southeast.
102-3324	Spiny urchin in tidepools at Sandy Beach Intertidal zone.
102-3325	OI sampling at Sandy Beach Intertidal zone. Facing east.
102-3326	Sandy Beach Intertidal tidepools. Facing southeast.
102-3327	Sandy Beach. Facing southeast.
102-3328	OI Sampling at Sandy Beach Intertidal zone. Facing north.
102-3329	Bucket of Helmet urchins sampled from Sandy Beach Intertidal zone.
102-3330	OI sampling at Bamboo Ridge area of Sandy Beach. Facing south.
102-3331	Intertidal zone at Bamboo Ridge area of Sandy Beach. Notes holes in rocky substrate. This is usual habitat of Helmet urchins. Facing south.
102-3332	View of Bamboo Ridge sampling area on Sandy Beach. Facing South.
02-3333	Tom of OI holding Helmet urchin at Bamboo Ridge. Facing South.
02-3334	Tom of OI sampling / looking for Helmet urchins at Bamboo Ridge. Facing southeast.
02-3335	Hole in tidepool housing Helmet urchins at Bamboo Ridge.
02-3336	Don of OI Sampling at Bamboo Ridge. Facing south.
02-3337	Helmet urchins at Bamboo Ridge at Sandy Beach.
02-3338	Two Helmet urchins and murex.
02-3339	Tom of OI employing a new surveying technique at Sandy Beach. New technique used to sample crab species. Facing east.
02-3340	Tom of OI using 'Y-shaped' surveying technique to catch crabs at Sandy Beach. Facing east.
02-3341	Tom of OI surveying the intertidal area for crabs at Sandy Beach. Facing east / southeast.
02-3342	Don of OI employing the 'Y-shaped' crab-surveying technique at Sandy Beach. Facing north/northeast.

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Jason A. Lieces					
Additional Personnel and Duties						
Environmental Conditions	See field notes					
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**
10/1/09	1200	SBNS/ Habitat	COLATR	7.1	62	SBNS-01
↓	↓	↓	↓	6.2	43	↓
↓	↓	↓	↓	6.6	45	↓
↓	↓	↓	↓	5.4	38	↓
↓	↓	↓	↓	6.9	67	↓
↓	↓	↓	↓	4.9	20	↓
↓	↓	↓	↓	5.4	22	↓
↓	↓	↓	↓	6.2	47	↓
↓	↓	↓	↓	6.2	40	↓
↓	↓	↓	↓	5.8	44	↓
↓	↓	↓	↓	6.5	42	↓
↓	↓	↓	↓	6.0	51	↓
↓	↓	↓	↓	5.1	24	↓
↓	↓	↓	↓	5.2	23	↓
↓	↓	↓	↓	7.5	55	↓
↓	↓	↓	↓	6.9	54	↓
↓	↓	↓	↓	5.6	47	↓
↓	↓	↓	↓	6.5	30	↓
↓	↓	↑	↑	6.0	43	↓
↓	↓	↑	↑	6.2	25	↓
↓	↓	↑	↑	6.9	60	↓
↓	↓	↑	↑	7.4	39	↓
↓	↓	↑	↑	6.5	36	↓
↓	↓	↑	↑	5.9	30	↓
↓	↓	↓	↓	5.4	25	↓

Jar 1 3pp

Jar 2 410

Jar 3

1012

Field Record: Makua Shellfish Study						
Sample Processor	Maren Anderson					
Data Recorder	Dawn A. Lleces					
Additional Personnel and Duties						
Environmental Conditions	See field notes					
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**
10/11/09	1200	SBNS/Habitat	COLATR	6.7	50	SBNS-01
↓	↓	↓	↓	6.7	30	↓
				6.9	50	
				6.5	36	
↓	↓	↓	↓	4.9	19	↓
				7.0	39	
				4.5	10	
				3.7	5	
				4.6	11	
				3.6	9	
				5.1	22	
				5.5	22	
				4.5	12	
				5.1	15	
				6.2	29	
				5.0	15	
				4.1	11	
				4.5	19	
				4.1	10	
				4.9	14	
				3.7	9	
				5.0	14	
				5.2	34	
				4.0	7	
↓	↓	↓	↓	4.6	13	↓

Jar 3 (cont) 451

Jar 4

513

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/1/09	1200	SBNS/Habitat	COLATR	3.7	10	SBNS-01	Jar 4
↓	↓	↓	↓	5.8	26	↓	(cont.)
↓	↓	↓	↓	5.2	15	↓	371
				3.9	6		Jar 5
				5.5	21		
				5.4	17		
				5.0	15		
				3.7	10		
				5.4	28		
				3.6	6		
				4.7	14		
				4.0	9		
				5.3	17		
				4.7	12		
				4.4	8		
				4.5	10		
				5.5	19		
				4.0	9		
				4.9	19		
				5.0	24		
				4.0	8		
				4.3	12		
				4.9	19		
				5.9	24		
↓	↓	↓	↓	4.7	14	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn Lieces						
Additional Personnel and Duties							
Environmental Conditions	See Field notes						
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**	
10/01/08	12:00	SBNS/Habitat	COLATR	5.6	25	SBNS-01	Jar 5 (cont.)
↓	↓	↓	↓	4.1	10	↓	
				4.8	15		
				4.3	9		453
				4.2	9		
				4.3	15		
				4.2	14		
				4.3	8		
↓	↓	↓	↓	5.6	29	↓	sample
				5.2	15		Jar 6
				3.6	7		
				4.0	16		
				4.5	16		
				5.3	17		
				3.8	10		
				6.9	46		
				5.6	25		
				4.8	15		
				4.9	13		
				4.7	15		
				5.3	21		
				5.5	16		
				5.5	20		
				3.4	8		
↓	↓	↓	↓	5.1	19	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See field notes						
Date	**Time**	**Location**	**Species**	**Length/Width (cm)**	**Mass (g)**	**Composite ID**	
10-01-08	1200	SBNS/Habitat	COLATR	4.7	10	SBNS-01	Jar 6 (cont.)
↓	↓	↓	↓	4.7	19	↓	
				3.8	10		
				4.3	13		398
				4.4	15		
				5.3	24		
↓	↓	↓	↓	6.0	20	↓	
				4.7	14		Jar 7
				4.0	8		
				4.2	11		
				5.7	30		
				3.5	6		
				4.1	10		
				3.4	9		
				5.2	17		
				5.5	23		
				5.5	26		
				4.9	15		
				4.8	15		
				4.7	14		
				4.9	17		
				4.7	17		
				3.9	5		
				4.7	16		
↓	↓	↓	↓	4.1	15	↓	

Field Record: Makua Shellfish Study	
Sample Processor	Maren Anderson
Data Recorder	Dawn Lleces
Additional Personnel and Duties	
Environmental Conditions	See field notes

Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10-01-00	12:00	SBNS/Habitat	COLATR	4.4	9	SBNS-01	Jar 7
↓	↓	↓	↓	5.1	27	↓	(cont.)
				5.4	17		
				4.9	13		
				4.6	14		409
				5.1	15		
				6.6	30		
↓	↓	↓	↓	5.3	16	↓	
				5.0	17		Jar 8
				4.3	10		
				4.6	14		
				4.3	11		
				4.5	12		
				4.5	10		
				4.5	14		
				5.0	17		
				4.7	12		
				5.7	24		
				5.7	22		
				5.3	19		
				5.7	29		
				5.1	19		
				3.9	8		
				4.2	11		
↓	↓	↓	↓	4.7	15	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/01/08	12:00	SBNS/Habitat	COLATR	5.9	29	SBNS-01	Jar 8
				3.4	9		(cont.)
				4.1	14		
				4.7	17		
				4.9	19		
				5.1	16		417
				4.2	11		
				4.9	13		
				3.7	9		
				4.4	12		
↓	↓	↓	↓	4.7	12	↓	
				6.0	35		Jar 9
				5.7	20		
				5.7	26		
				4.2	14		
				4.9	12		
				4.3	14		
				4.9	13		
				6.3	37		
				5.5	24		
				6.6	34		
				5.2	17		
				6.4	29		
				5.2	12		
↓	↓	↓	↓	4.9	14	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/01/09	1200	SBNS/Habitat	COLATR	4.3	7	SBNS-01	Jar 9
↓	↓	↓	↓	4.4	10	-	
				6.7	35		
				5.0	10		
				3.7	7		448
				4.2	19		
				3.5	9		
				5.6	28		
				~~5~~ 4.7	14	↓	
				5.0	15		Jar 10
				4.6	16		
				7.2	53		
				5.9	25		
				6.6	43		
				5.9	23		
				4.3	15		
				4.3	12		
				6.1	25		
				4.2	9		
				4.9	15		
				4.1	13		
				4.6	11		
				4.6	15		
				4.8	11		
↓	↓	↓	↓	4.5	13	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See on field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10/01/00	12:00	SPNS/Habitat	COLATR	4.0	11	SPNS-01	Jar 10
↓	↓	↓	↓	4.6	10	↓	(cont)
				3.0	9		
				3.9	8		
				4.3	13		
				3.5	5		467
				5.4	18		
				4.2	13		
				5.2	13		
				6.0	30		
				4.6	10		
				3.8	7		
↓	↓	↓	↓	4.1	6	↓	
				4.5	10		Jar 11
				6.2	20		
				4.7	15		
				4.5	15		
				4.6	19		
				5.0	15		
				4.4	12		
				3.9	9		
				6.9	43		
				5.3	16		
				4.9	15		
↓	↓	↓	↓	4.1	9	↓	

Field Record: Makua Shellfish Study							
Sample Processor	Maren Anderson						
Data Recorder	Dawn A. Lleces						
Additional Personnel and Duties							
Environmental Conditions	See a field notes						
Date	Time	Location	Species	Length/Width (cm)	Mass (g)	Composite ID	
10-01-08	1200	SBNS/Habitat	COLATR	4.3	14	SBNS-01	Jar 11
				3.7	7		(cont.)
				5.4	20		
				4.8	14		
				4.0	10		
				3.9	7		
				4.0	12		
				4.4	10		491
				~~5.4~~ 5.5	25		
				5.4	19		
				4.0	14		
				4.6	11		
				5.4	24		
				3.7	~~4~~ 7		
				4.9	14		
				5.1	16		
				4.7	19		
↓	↓	↓	↓	6.3	45	↓	
				6.2	30		Jar 12
				5.5	24		
				6.2	32		
				5.2	30		
				7.3	63		
				5.7	40		
↓	↓	↓	↓	5.7	26	↓	