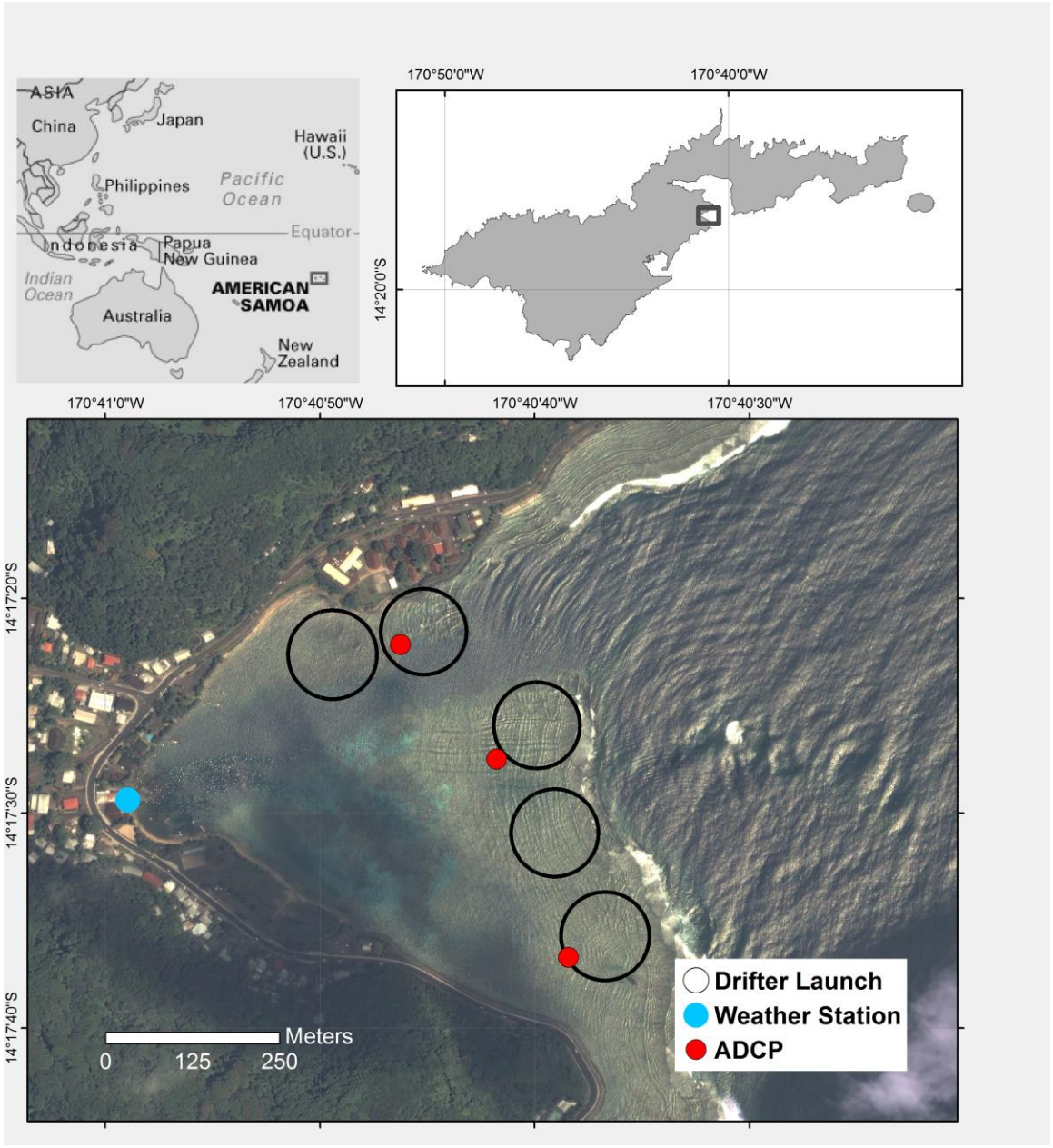

Figure 1. Data collection locations in Faga'alu Bay. Wind speed and direction was recorded at the weather station (WxStation), a Dobie wave gauge recorded wave height and period (Wave Gauge), three ADCP's were deployed for one week to measure current speed and direction, and five GPS-logging drifters were deployed from the same five launch zones (DrifterLaunch) for thirty separate deployments (January to March, 2014).

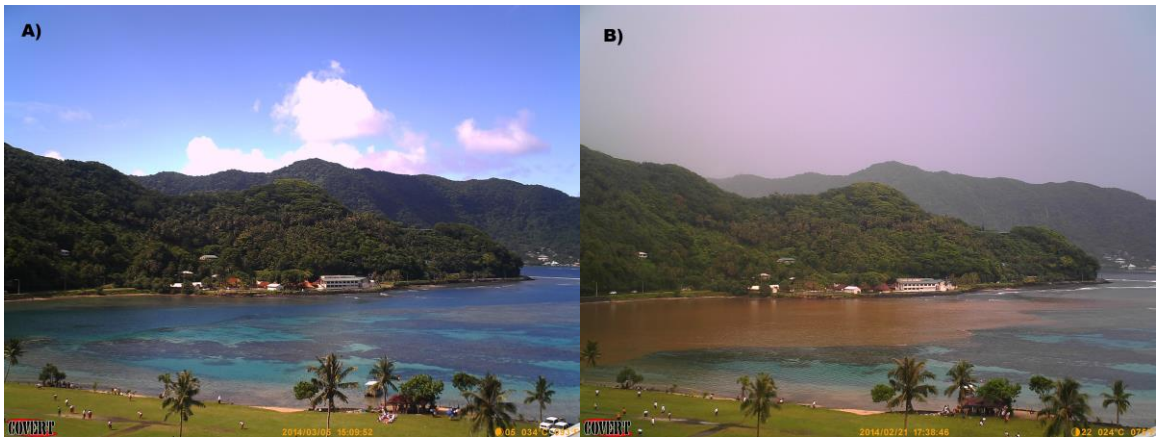

Figure 2. A) Image of the embayment on a typical, rain-free day. The darker areas of the bay are live coral, and the light areas are deeper pools with carbonate sand bottom. B) Image of a flood plume (2/21/14) in the northern portion of the bay following a heavy precipitation event. Plumes usually persist for several hours, and rarely are seen after 24h due to the flushing of water through the deep channel and out to sea.

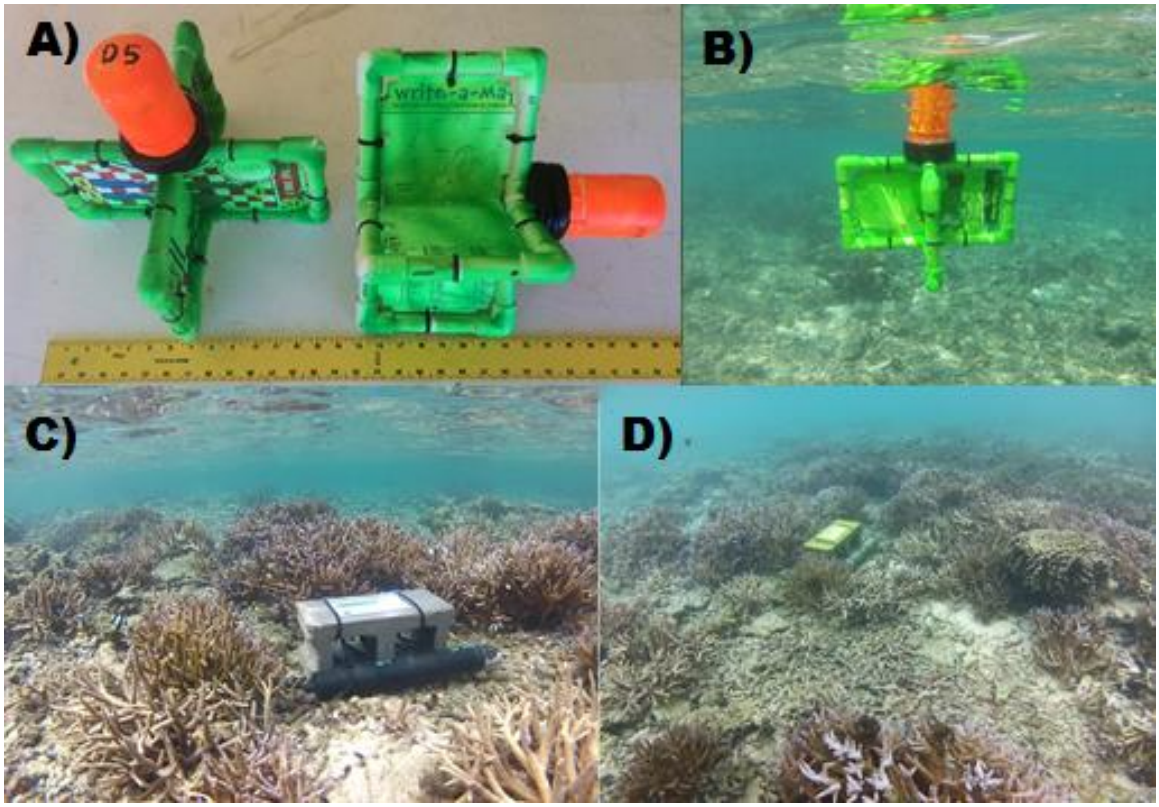

Figure 3. TOP: Images of the shallow-water drifters on land, and deployed in the field. BOTTOM: Images of the acoustic current profilers deployed on the southern reef flat (AS1).

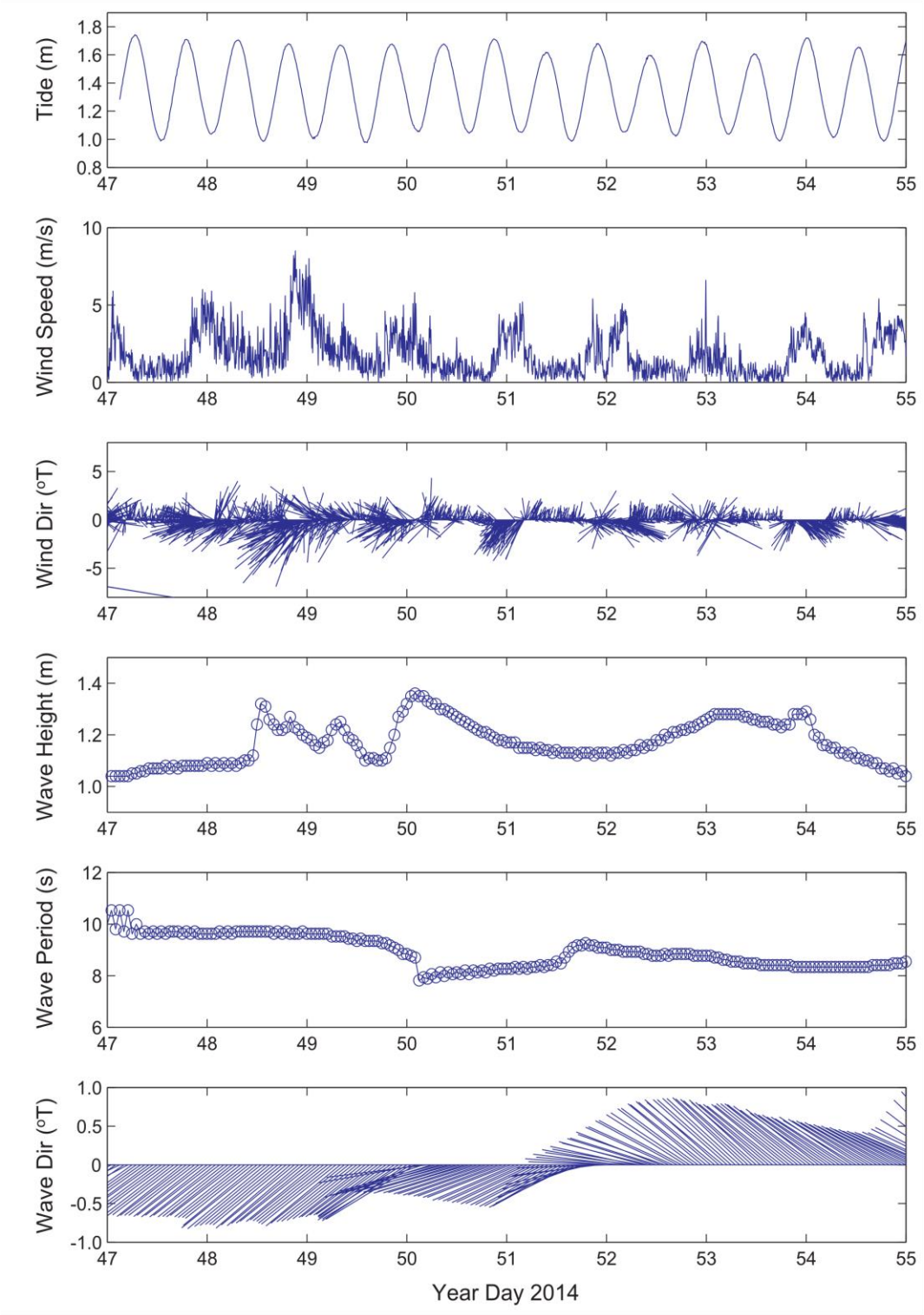

Figure 4. Time series of physical forcing: Tide stage, wind speed, wind direction from NDBC station NSTP6, wave height and direction from NOAA WW3. Day 47=16 Feb 2014, Day 54=23 Feb 2014.

Table 1. End member periods			
End member	Year Day 2014	Gregorian Day (UTC)	Gregorian Day (Local)
Tide/Calm	50-51	2/19-2/20	2/18-2/19
Wind	47-49	2/16-2/18	2/15-2/17
Wave	52-55	2/21-2/24	2/20-2/23

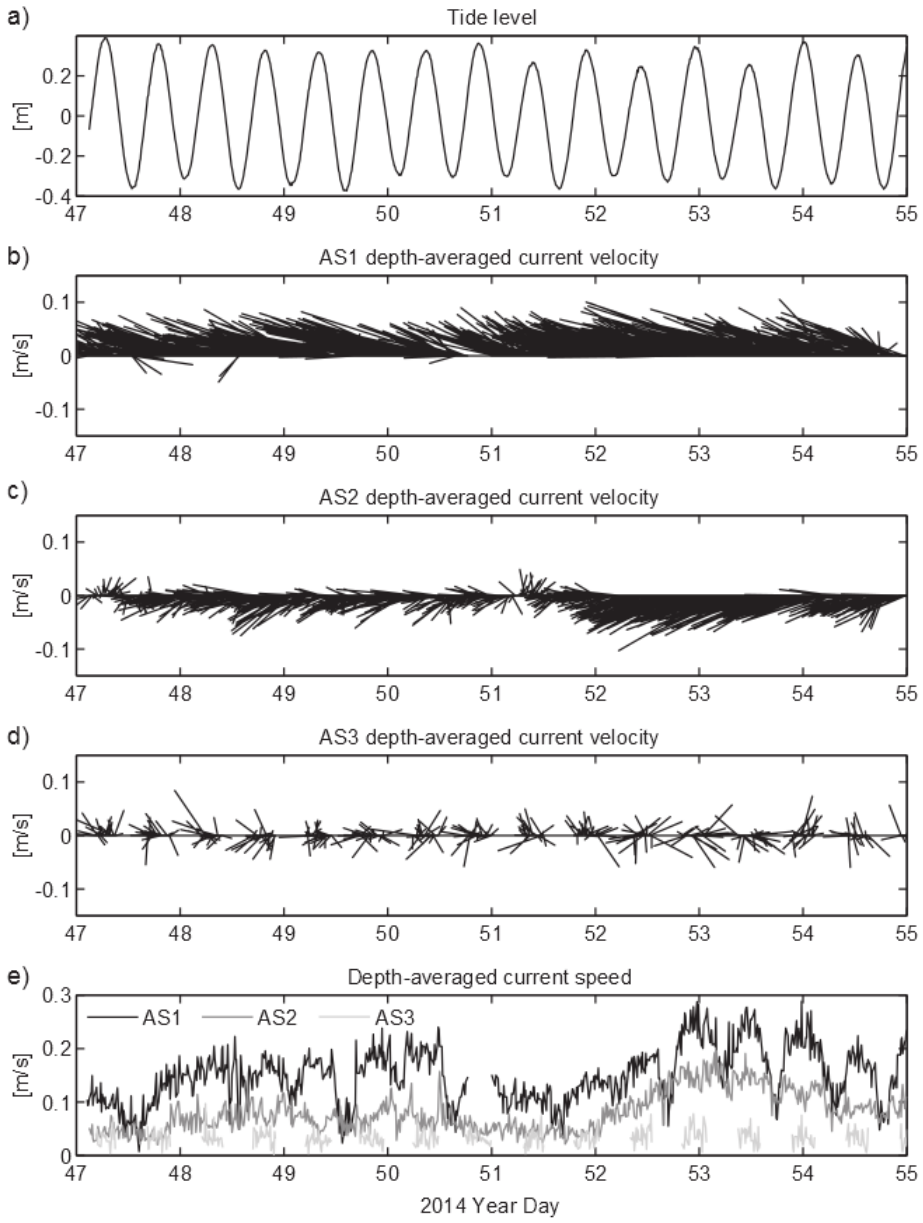

Figure 5. Time series of the resulting flow measured by the acoustic current profilers. Water depths at low tide were too shallow to measure flow data at AS3. Note the variations in current speeds both in space and time due to the different forcing conditions.

Table 2. Drifter deployment dates and conditions. Red numbered Deployments coincide with ADCP deployment										
Deployment	Year Day 2014 (local)	Start Time	End Time	Tide Start	Tide End	Tide movement	Wind Speed Avg	Wind Gust Max	Wind Direction Avg	Wave Height(m)
1	19	1300	1500	1.5	1.0	-0.6	1.2	4.0	232	0-1
2	20	1615	1730	1.0	1.2	0.2	2.4	7.0	193	1-2
3	20	1750	1900	1.2	1.9	0.7	3.2	10.0	258	1-2
4	32	900	1100	3.7	2.6	-1.2	5.3	11.0	96	0-1
5	32	1130	1300	2.2	0.9	-1.3	5.7	13.0	100	0-1
6	32	1700	1900	1.5	3.2	1.7	4.2	13.0	187	0-1
7	39	1415	1545	3.1	3.4	0.4	5.2	18.0	140	2-4
8	39	1605	1800	3.3	2.5	-0.8	6.0	20.0	144	2-4
9	47	1654	1846	2.4	3.2	0.9	3.2	9.0	168	0-2
10	48	1245	1500	1.6	1.1	-0.5	9.7	28.0	79	2-4
11	48	1530	1700	1.1	1.6	0.5	5.9	20.0	101	2-4
12	48	1710	1840	1.6	2.6	0.9	5.2	15.0	89	2-4
13	49	1245	1445	2.1	1.3	-0.8	4.9	14.0	97	2-4
14	49	1445	1700	1.3	1.4	0.1	4.7	15.0	194	2-4
15	50	1205	1440	2.9	1.5	-1.4	5.8	11.0	39	2-4
16	50	1445	1720	1.5	1.2	-0.3	6.6	15.0	54	2-4
17	51	840	1045	2.5	3.2	0.6	4.8	13.0	290	0-2
18	51	1100	1200	3.2	3.0	-0.2	4.3	11.0	117	0-2
19	51	1210	1430	3.0	2.1	-1.0	3.0	12.0	237	0-2
20	51	1500	1630	1.8	1.3	-0.6	5.9	13.0	290	0-2
21	52	920	1040	2.4	3.0	0.6	2.9	11.0	253	4-6
22	52	1040	1145	3.0	3.3	0.3	3.8	11.0	111	4-6
23	52	1300	1400	3.2	3.0	-0.3	3.0	16.0	193	4-6
24	52	1500	1550	2.4	1.9	-0.5	3.7	11.0	152	4-6
25	53	1100	1215	2.7	3.2	0.5	5.5	14.0	313	4-6
26	53	1220	1315	3.2	3.4	0.2	6.3	12.0	301	4-6
27	53	1600	1700	2.4	1.9	-0.5	4.2	10.0	310	4-6
28	53	1700	1845	1.9	1.2	-0.7	2.0	10.0	242	4-6
29	54	1040	1210	2.0	2.9	0.9	7.2	15.0	304	2-4
30	54	1210	1255	2.9	3.3	0.4	5.3	11.0	260	2-4

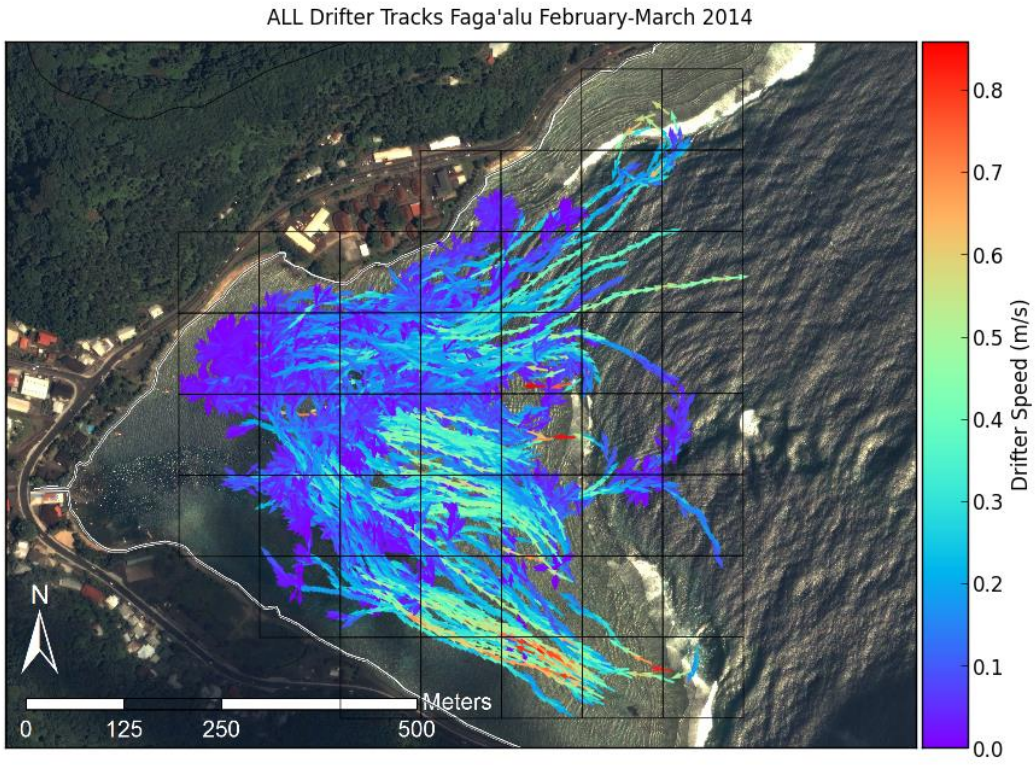

Figure 6. Map of all drifter tracks, colored by speed, recorded during the experiment.

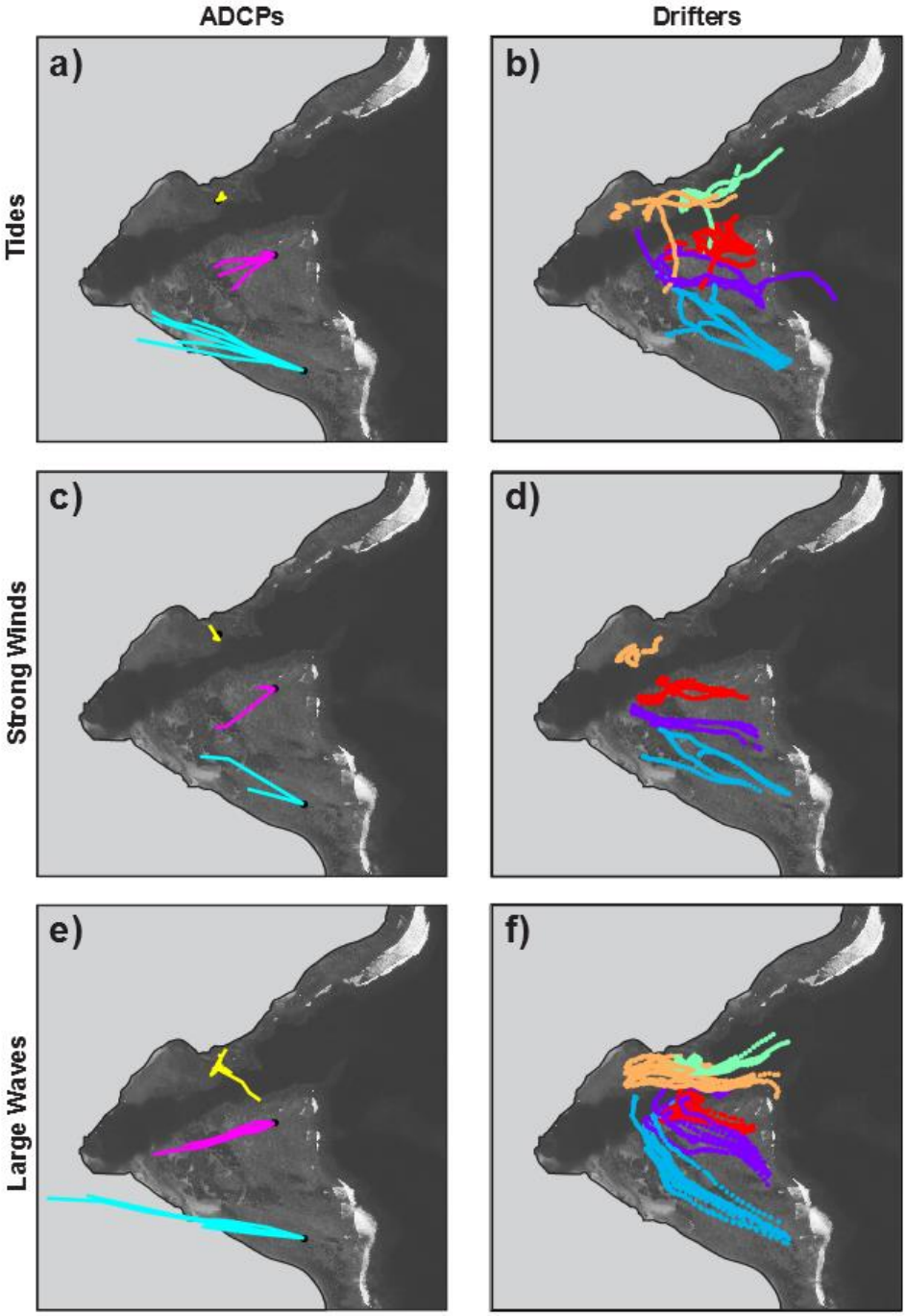

Figure 7. Progressive vectors calculated from ADCP data, compared to actual Lagrangian drifter tracks under different forcing conditions.

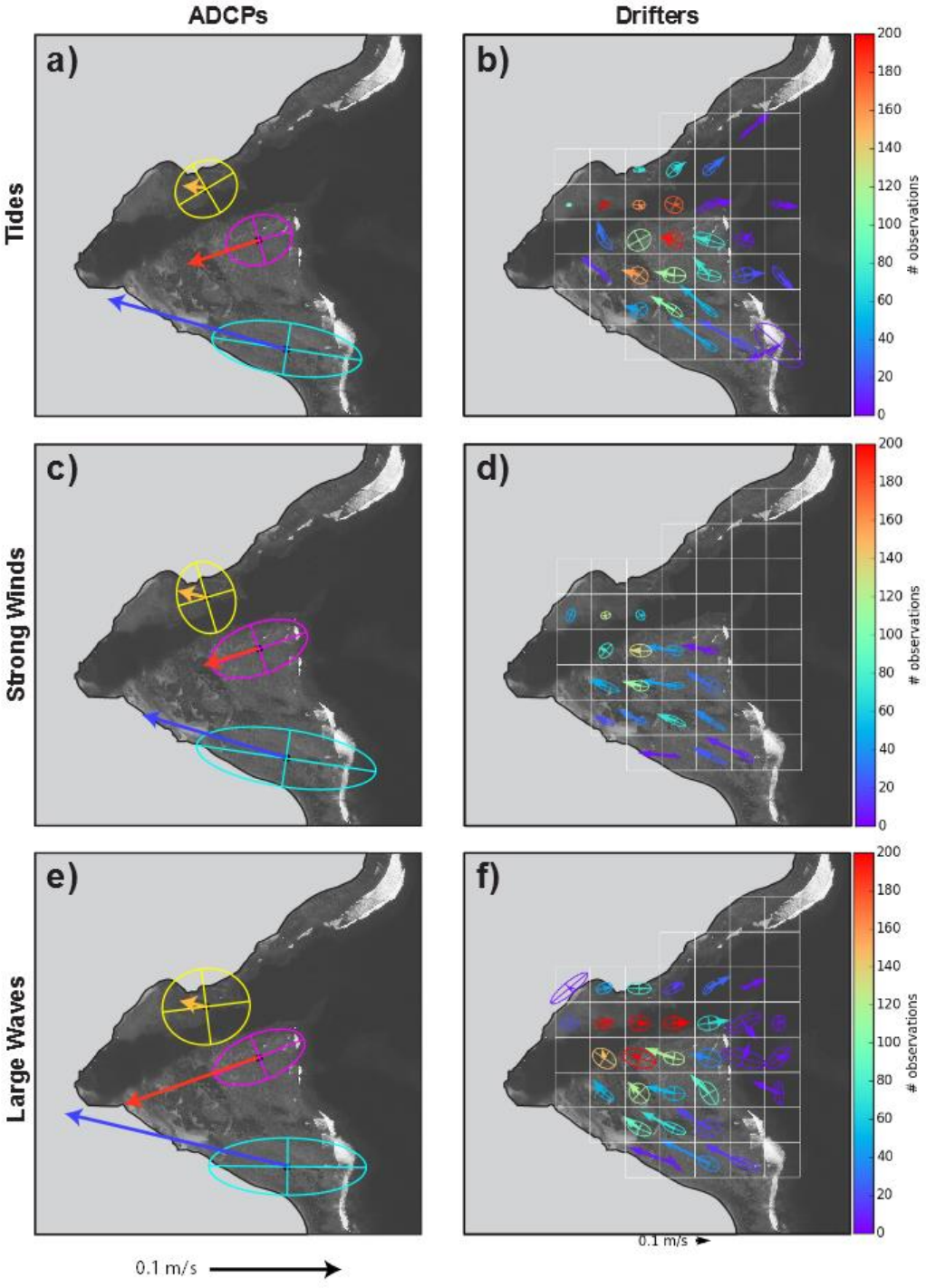

Figure 8. EOF's calculated from ADCP data, compared to EOF's calculated from spatially binned (100m x 100m grid cell) Lagrangian drifter data under different forcing conditions. Drifter EOF's are colored by number of observations to illustrate varying data density depending on grid cell.

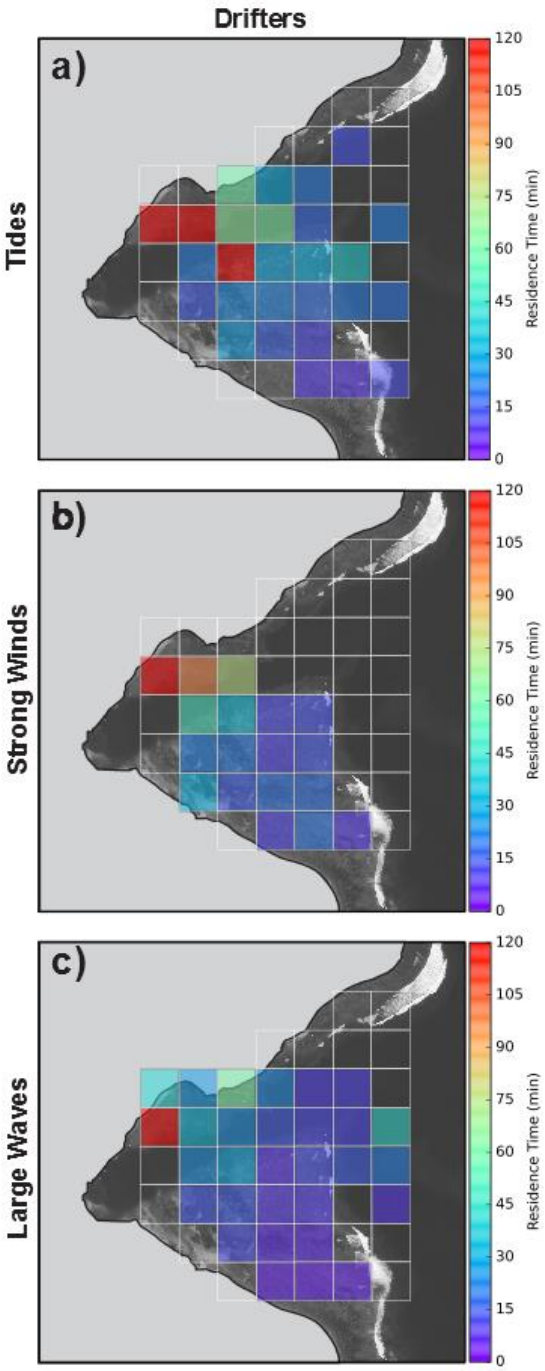

Figure 9. Residence time calculated from mean velocity of drifters under endmember conditions