

Evaluation of Field-Collected Drifter and In Situ Fluorescence Data Measuring Subsurface Dye Plume Advection/Dispersion and Comparisons to High-Frequency Radar-Observation System Data for Dispersed Oil Transport Modeling

APPENDIX D – DRIFTER DATA

**A Final Report Submitted to
The Coastal Response Research Center**

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Appendix D. Drifter Data

Appendix D contains summaries of the drifter movements. The raw position data, water depth at each position, and derived products including velocities are available via the web at <http://www.icesb.ucsb.edu/drifter/SDSS/>. Additional figures describing drifter movements and animations for each deployment are also available on the web site.

Between 8 and 10 drifters were deployed by the *Response 2* for all experiments. Two drifters were deployed as the dye release began in the center of the dye patch. The remaining drifters were deployed around the periphery.

Drifters were drogued at a depth of 1 m in the earlier experiments (November, 5, 2005 and March 21, 2006). During the March 22, 2006 experiment, drogues for two of the drifters were set at a depth of 5 m and the remaining were set at 1 m depth. It was observed that drifters set with their drogue at 5 m appeared to track the dye most accurately, whereas the drifters drogued at 1 m moved down-wind just ahead of the dye plume. The depth of drifters deployed for the June and November 2006 experiments were split between 2 m and 4 m in an attempt to better track the plume.

D.1 Results of November 8, 2005 Experiment

Table D-1. Summary data for drifters set out for the November 8, 2005 experiment.

Drifter Number	Start time (PST)	Stop Time (PST)	Average u (cm/s)	Average v (cm/s)	Average Speed (cm/s)	Deployment Depth (m)
15723677	11:19	16:00	11.9	35.5	37.4	1
16692089	10:55	16:12	10.8	36.2	37.8	1
16757527	10:55	16:00	9.5	35.7	36.9	1
16757543	10:50	16:00	11.1	35.8	37.5	1
16757571	10:50	16:11	9.8	37.2	38.4	1
16757579	10:59	16:10	10.4	36.0	37.5	1
16759762	10:41	16:01	10.6	36.0	37.6	1
16766605	10:52	16:12	9.6	36.2	37.4	1
16767590	10:32	16:10	8.7	35.2	36.2	1
Mean for 1m drifters			10.3	36.0	37.4	

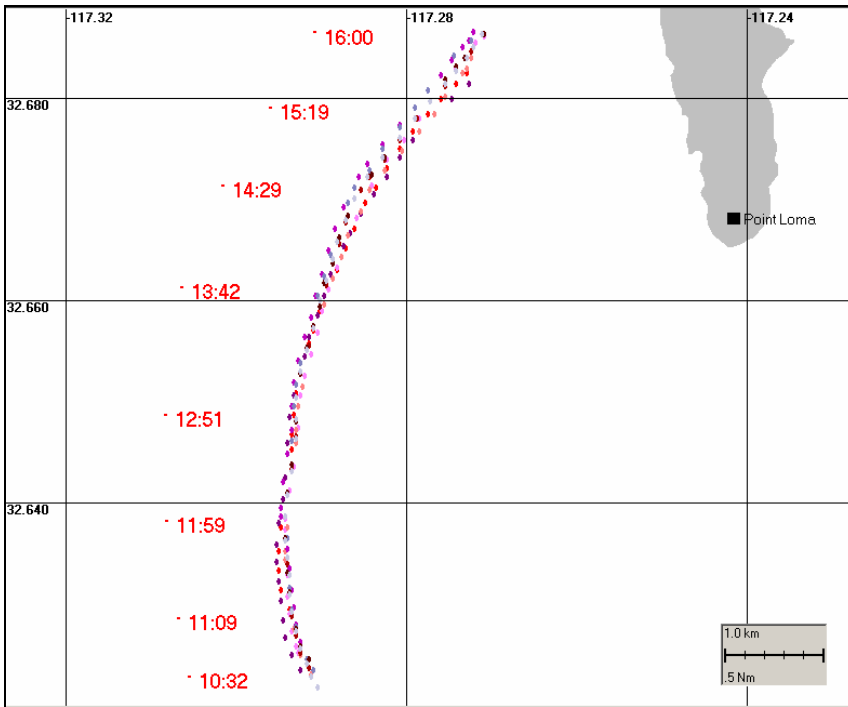


Figure D-1. Drifter tracks and corresponding times (all 1m deployment depth) for the November 5, 2005 experiment.

D.2 Results of March 21, 2006 Experiment

Table D-2. Summary data for drifters set out for the March 21, 2006 experiment.

Drifter Number	Start time (PST)	Stop Time (PST)	Average u (cm/s)	Average v (cm/s)	Average Speed (cm/s)	Deployment Depth (m)
15723677	11:49	13:12	3.2	-7.1	7.8	1
16692089	12:22	13:30	2.9	-8.3	8.8	1
16757527	12:30	13:30	2.7	-9.6	9.9	1
16757543	12:39	13:12	1.4	-12.1	12.2	1
16757571	12:20	13:24	2.8	-5.6	6.3	1
16757579	11:49	13:16	3.6	-6.5	7.5	1
16759762	12:19	13:24	1.9	-6.1	6.4	1
16766605	11:49	13:12	3.1	-6.2	6.9	1
16767590	12:22	13:50	2.9	-11.3	11.7	1
Mean for 1m drifters			2.74	-8.09	8.61	

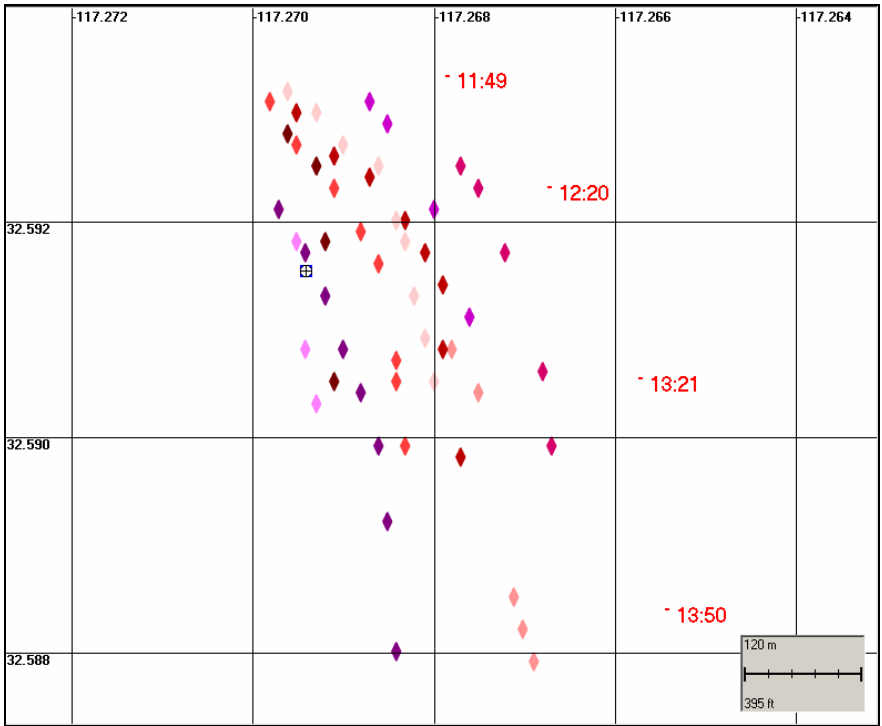


Figure D-2. Drifter tracks and corresponding times (all 1m deployment depth) for the March 21, 2006 experiment.

D.3 Results of March 22, 2006 Experiment

Table D-3. Summary data for drifters set out for the March 22, 2006 experiment.

Drifter Number	Start time (PST)	Stop Time (PST)	Average u (cm/s)	Average v (cm/s)	Average Speed (cm/s)	Deployment Depth (m)
15723677	10:49	14:19	16.9	-0.7	16.9	1
16692089	10:09	14:22	14.4	0.3	14.4	1
16757527	09:59	14:39	12.5	3.5	13.0	5
16757543	10:12	14:30	14.8	-4.0	15.3	1
16757571	10:09	14:26	13.9	-0.1	13.9	1
16757579	10:22	14:22	15.5	0.1	15.5	1
16759762	10:30	14:25	15.4	-0.1	15.4	1
16766605	10:00	14:42	12.7	3.1	13.1	5
16767590	10:09	14:19	14.7	-0.3	14.7	1
Mean for 1m drifters			15.09	-0.68	15.17	
Mean for 5m drifters			12.61	3.27	13.03	

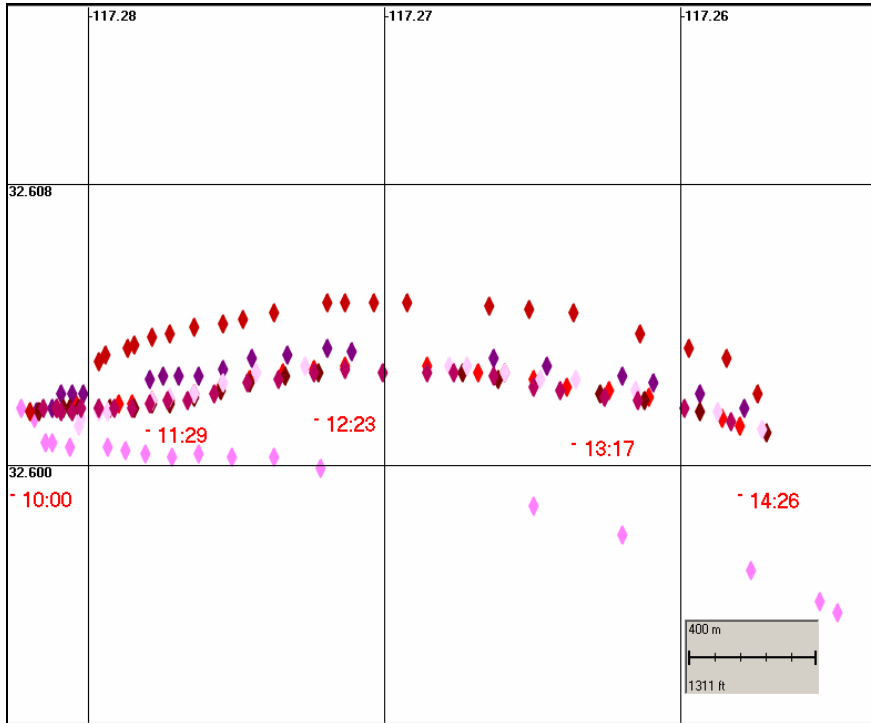


Figure D-3. Tracks and corresponding times of drifters deployed at 1m depths for the March 22, 2006 experiment.

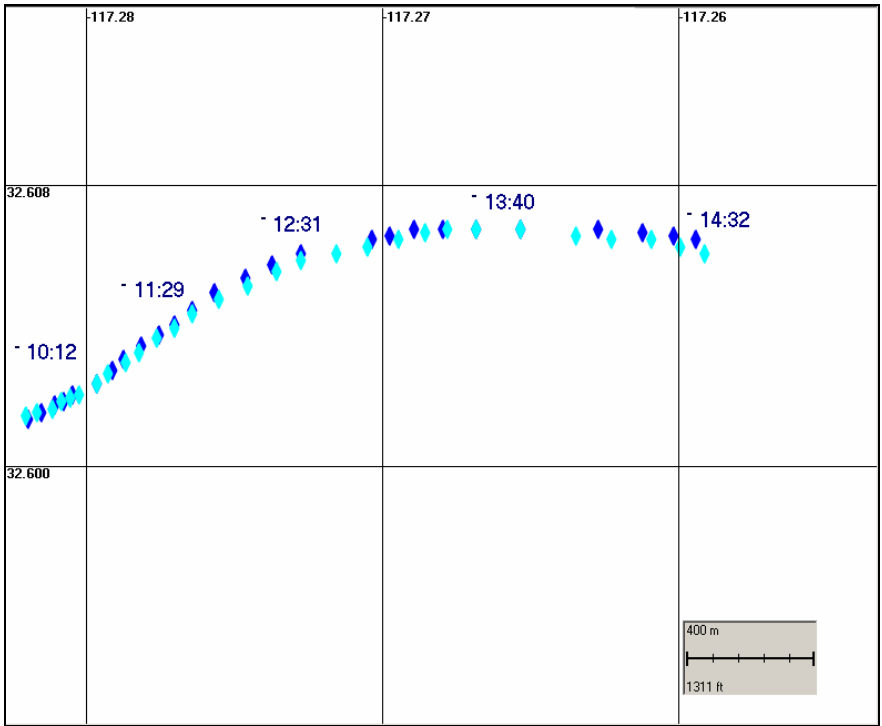


Figure D-4. Tracks and corresponding times of drifters deployed at 5m depths for the March 22, 2006 experiment.

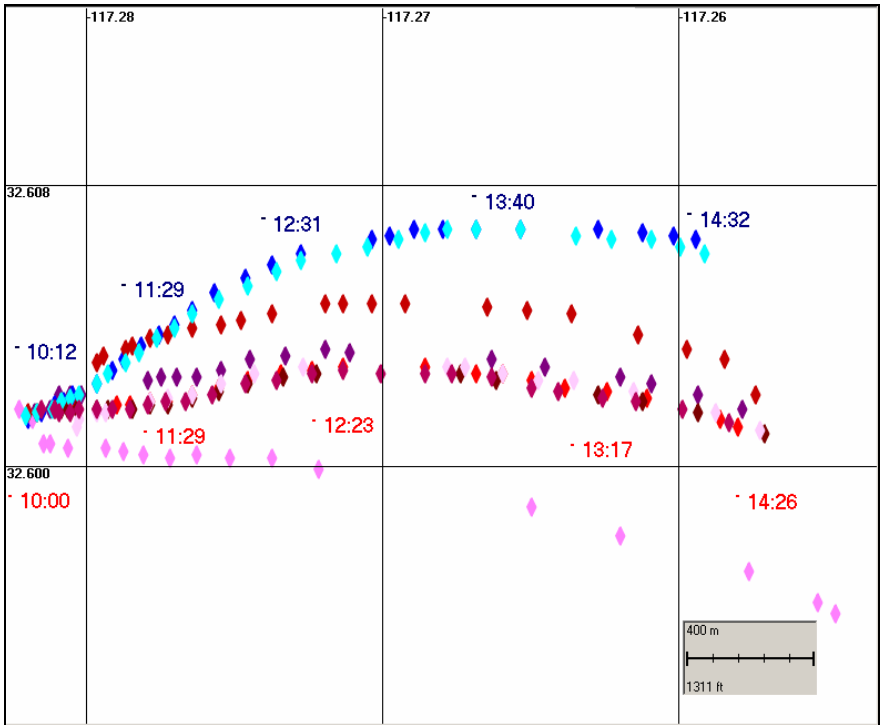


Figure D-5. All drifter tracks (reds/purples = 1m, blues = 5m deployment depths) and corresponding times (red font = 1m drifters, blues font = 5m drifters) for the March 22, 2006 experiment.

D.4 Results of June 21, 2006 Experiment

Table D-4. Summary data for drifters set out for the June 21, 2006 experiment.

Drifter Number	Start time (PDT)	Stop Time (PDT)	Average u (cm/s)	Average v (cm/s)	Average Speed (cm/s)	Deployment Depth (m)	Notes: description of location when picked up
15723677	12:42	15:54	12.0	-15.9	19.9	4	North of diffuse plume tail
16692089	12:40	15:19	17.7	-17.2	24.7	2	In center of plume; confirmed by air; rip in kite
16757527	12:41	15:50	11.7	-15.3	19.3	4	North of diffuse plume tail
16757543	12:39	15:41	19.7	-16.9	26.0	2	In center of plume; confirmed by air
16757571	12:56	15:30	21.7	-15.6	26.7	2	In center of plume
16757579	12:40	15:54	12.5	-15.7	20.0	4	North of diffuse plume tail
16757863	12:19	15:40	19.3	-17.1	25.7	2	In center of plume; confirmed by air
16766605	12:30	15:52	11.8	-15.5	19.5	4	North of diffuse plume tail
16767590	13:09	15:42	10.3	-14.9	18.1	4	North of diffuse plume tail, lost kite, went flying off to east, picked up, fixed and replaced on east edge of patch, redeployed at 12:57, so these data are after redeployment
Mean for 2m drifters			19.6	-16.7	25.8		
Mean for 4m drifters			11.7	-15.5	19.4		

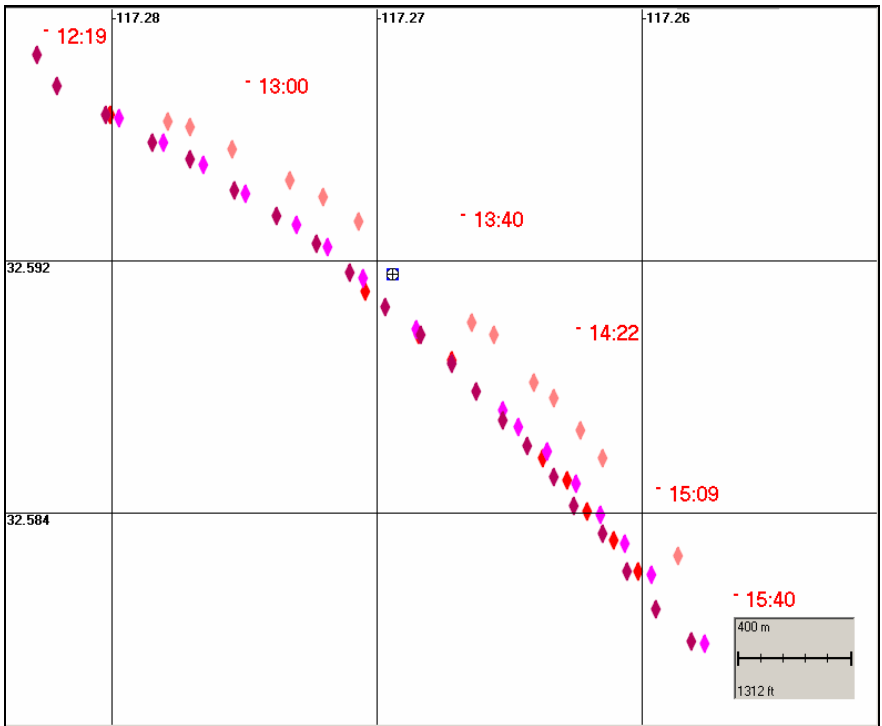


Figure D-6. Tracks and corresponding times of drifters deployed at 2m depths for the June 21, 2006 experiment.

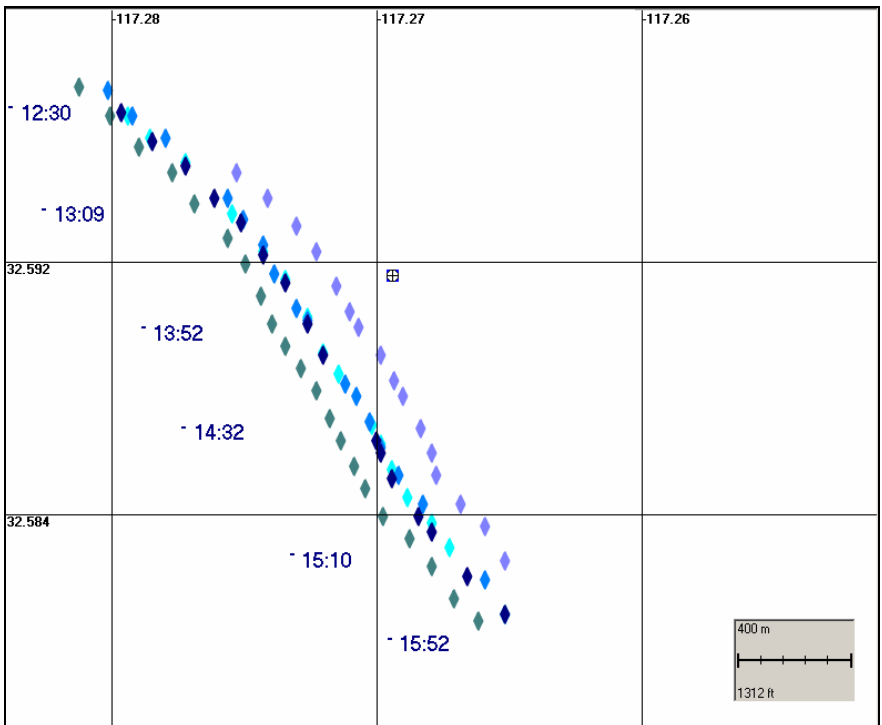


Figure D-7. Tracks and corresponding times of drifters deployed at 4m depths for the June 21, 2006 experiment.

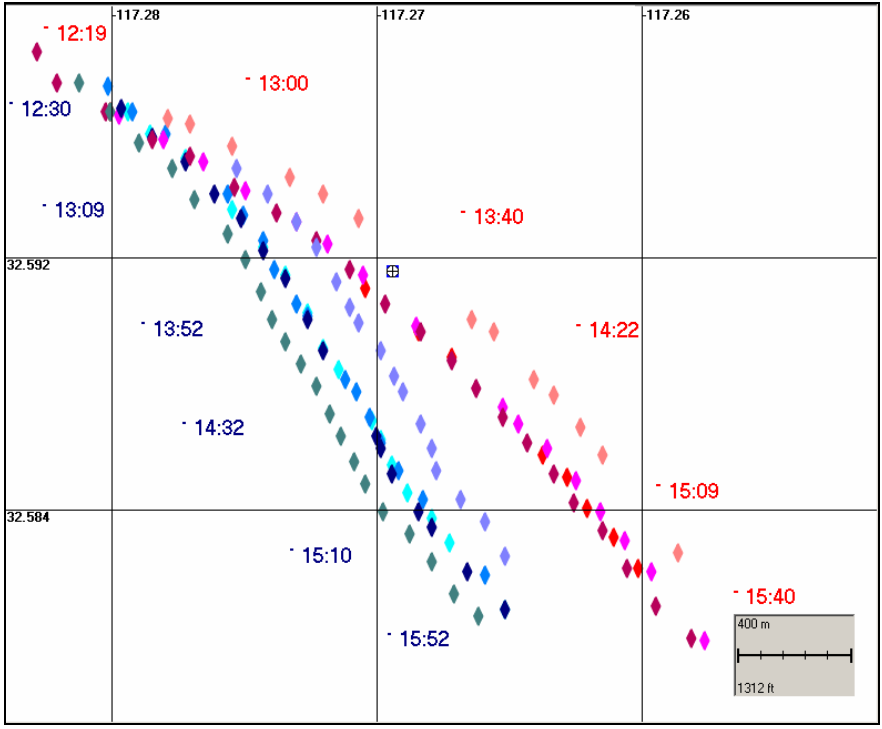


Figure D-8. All drifter tracks (reds/purples = 2m, blues = 4m deployment depths) and corresponding times (red font = 2m drifters, blues font = 4m drifters) for the June 21, 2006 experiment.

D.5 Results of June 22, 2006 Experiment

Table D-5. Summary data for drifters set out for the June 22, 2006 experiment.

Drifter Number	Start time (PDT)	Stop Time (PDT)	Average u (cm/s)	Average v (cm/s)	Average Speed (cm/s)	Deployment Depth (m)	Notes: description of location when picked up
15723677	15:20	17:20	6.0	1.6	6.2	4	Out of green water; to north of plume
16692089	16:02	17:42	10.4	2.5	10.7	2	Out of green water; along north edge of plume
16757527	16:00	17:40	8.5	4.3	9.6	4	In faint green water ~west (up wind) of plume
16757543	15:19	17:39	11.4	2.8	11.7	2	In faint green water along north edge of plume
16757571	15:09	17:50	15.0	3.2	15.3	2	Well out of the plume ~east (down-wind). Kite lost at some unknown time - string broke.
16757579	15:09	17:39	6.8	2.2	7.1	4	In faint green water ~west (up wind) of plume
16757863	15:09	17:50	11.9	3.0	12.2	2	In really dark green plume (near leading edge of southern-most finger). Lost kite upon retrieval - string broke.
16759762	14:49	17:40	11.7	3.3	12.1	2	In really dark green plume (near leading edge of northern-most finger)
16766605	14:59	17:29	6.8	2.6	7.3	4	Out of green water; to north of plume
16767590	15:09	17:29	7.1	2.1	7.4	4	In faint green water ~W (up wind) of plume
Mean for 2m drifters			12.1	3.0	12.4		
Mean for 4m drifters			7.0	2.6	7.5		

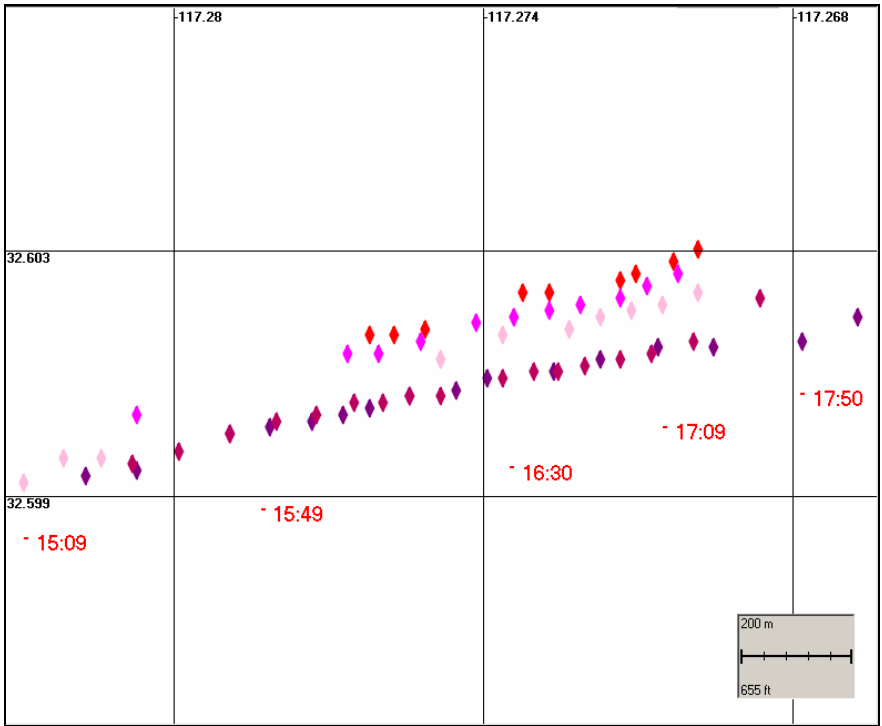


Figure D-9. Tracks and corresponding times of drifters deployed at 2m depths for the June 22, 2006 experiment.

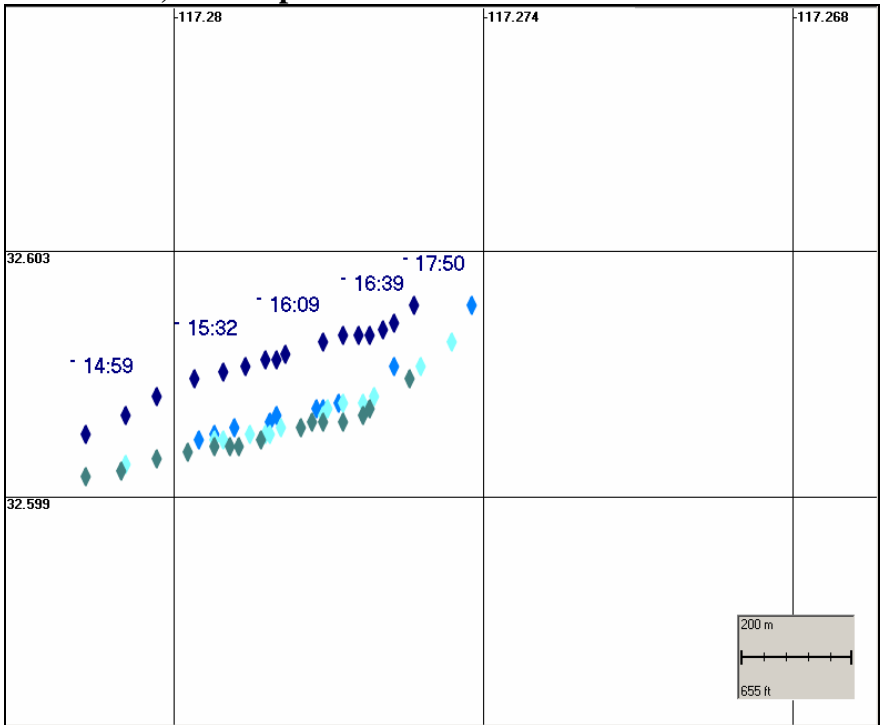


Figure D-10. Tracks and corresponding times of drifters deployed at 4m depths for the June 22, 2006 experiment.

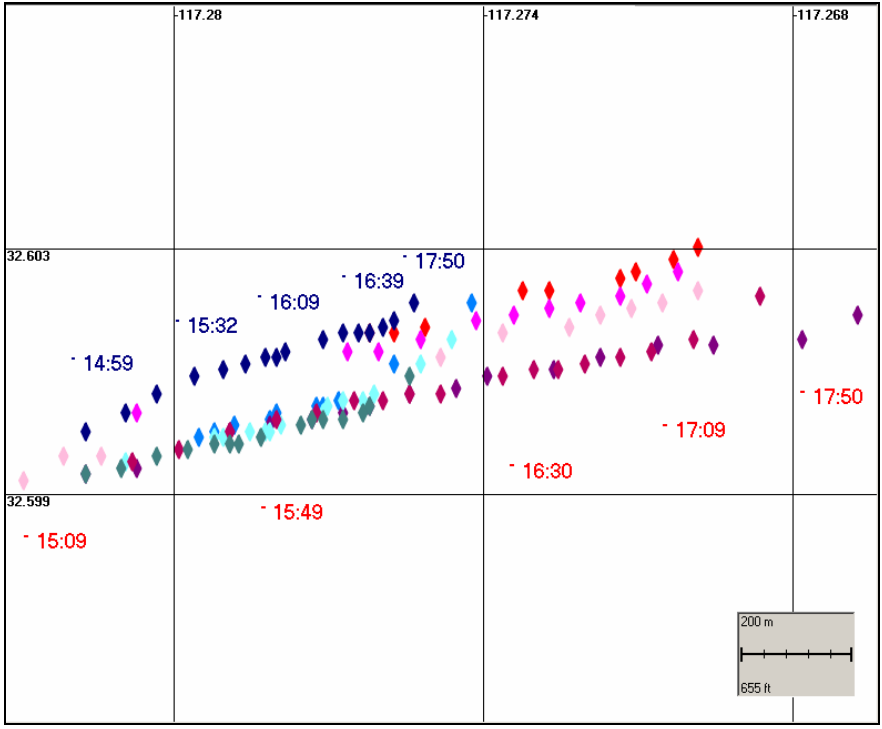


Figure D-11. All drifter tracks (reds/purples = 2m, blues = 4m deployment depths) and corresponding times (red font = 2m drifters, blues font = 4m drifters) for the June 22, 2006 experiment.

D.6 Results of November 1, 2006 Experiment

Table D-6. Summary data for drifters set out for the November 1, 2006 experiment.

Drifter Number	Start time (PST)	Stop Time (PST)	Average u (cm/s)	Average v (cm/s)	Average Speed (cm/s)	Deployment Depth (m)	Notes: description of location when picked up
15660155	12:10	14:59	1.6	-8.1	8.3	2	Downwind of plume
15724672	12:28	15:21	3.2	-6.7	7.4	4	In plume
16193815	12:23	14:59	1.2	-6.5	6.6	4	In plume
16692089	12:44	15:09	3.6	-7.5	8.3	2	To right of and outside plume
16757573	12:09	15:09	2.1	-7.9	8.1	4	In plume
16759762	12:21	15:23	3.2	-7.2	7.9	4	In the plume (upwind portion)
16766538	12:44	15:27	6.0	-8.5	10.4	2	On leading edge of plume
16767717	12:40	15:25	4.4	-7.3	8.5	2	Downwind of plume, torn kite
Mean for 2m drifters			3.9	-7.9	8.9		
Mean for 4m drifters			2.4	-7.1	7.5		

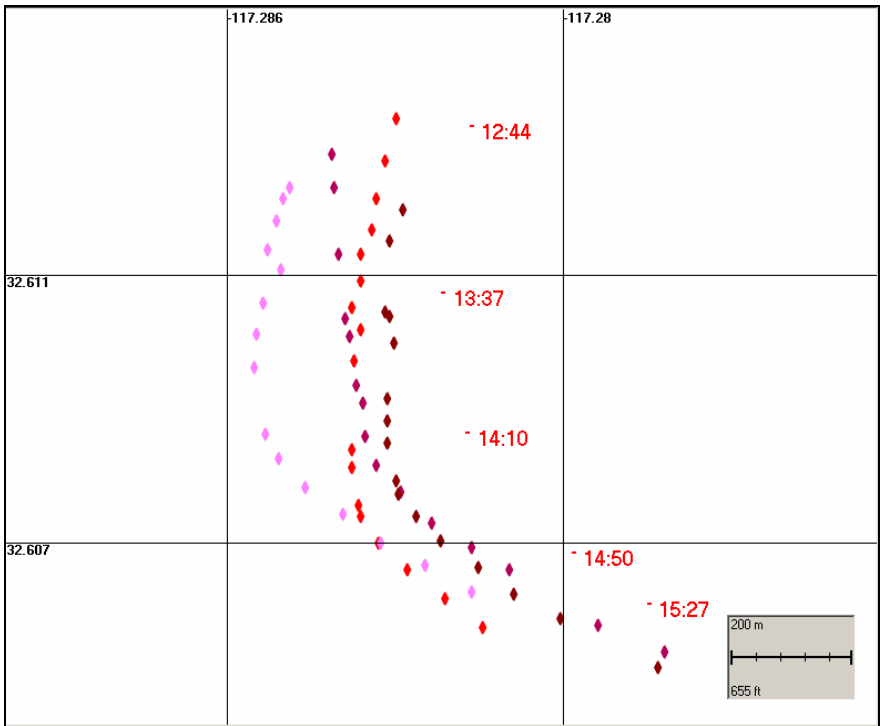


Figure D-12. Tracks and corresponding times of drifters deployed at 2m depths for the November 1, 2006 experiment.

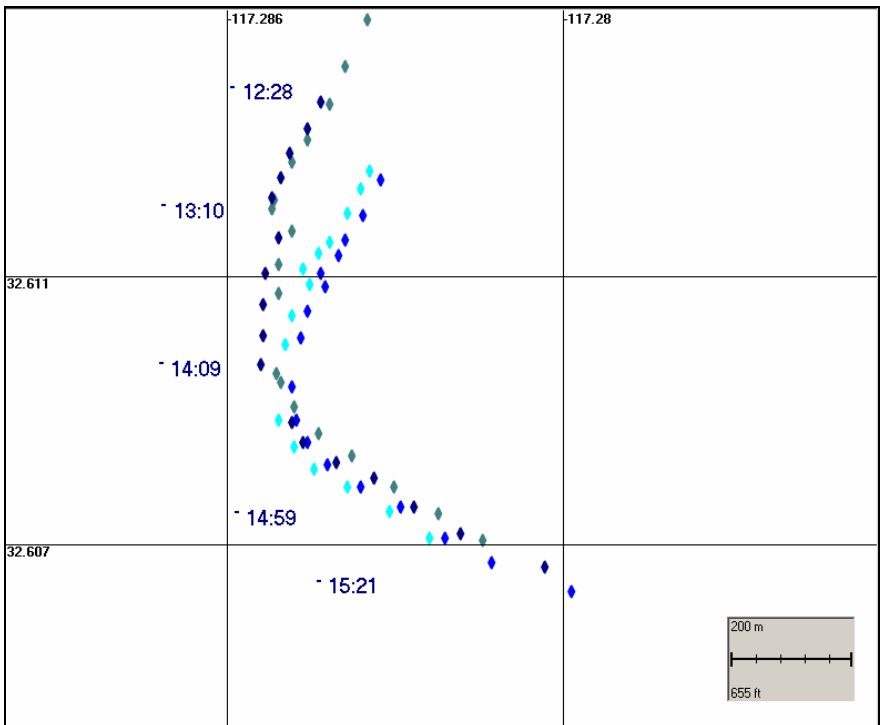


Figure D-13. Tracks and corresponding times of drifters deployed at 4m depths for the November 1, 2006 experiment.

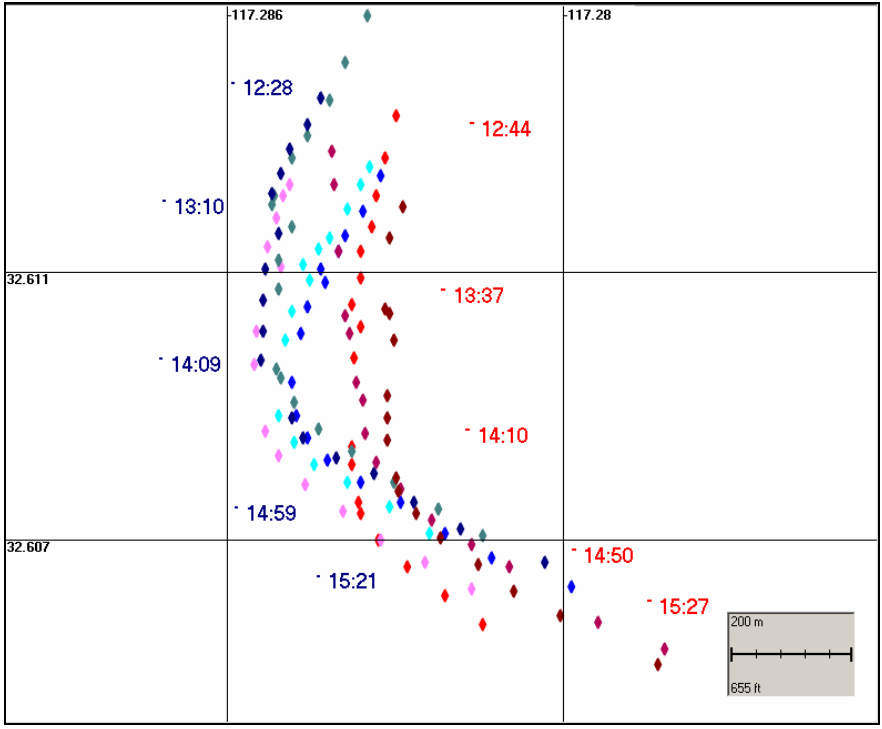


Figure D-14. All drifter tracks (reds/purples = 2m, blues = 4m deployment depths) and corresponding times (red font = 2m drifters, blues font = 4m drifters) for the November 1, 2006 experiment.

D.7 Results of November 2, 2006 Experiment

Table D-7. Summary data for drifters set out for the November 2, 2006 experiment.

Drifter Number	Start time (PST)	Stop Time (PST)	Average u (cm/s)	Average v (cm/s)	Average Speed (cm/s)	Deployment Depth (m)	Notes: description of location when picked up
15660155	11:29	14:59	3.1	-6.3	7.0	4	In middle of plume
15724672	11:29	14:40	3.5	-9.6	10.2	2	Out of plume to south
16193815	11:30	14:49	3.0	-6.5	7.2	4	Just out of plume on east edge
16692089	11:29	14:40	4.9	-7.7	9.1	2	Just out of plume to southeast
16757573	11:29	14:50	3.5	-6.1	7.0	4	East of plume in blue water
16759762	11:30	15:00	3.4	-6.6	7.4	4	In middle of plume
16766538	11:29	14:40	4.6	-8.0	9.3	2	Out of plume 100m to southeast
16767717	11:30	14:50	3.8	-9.0	9.8	2	Just outside plume to south
Mean for 2m drifters			4.2	-8.6	8.8		
Mean for 4m drifters			3.3	-6.4	8.0		

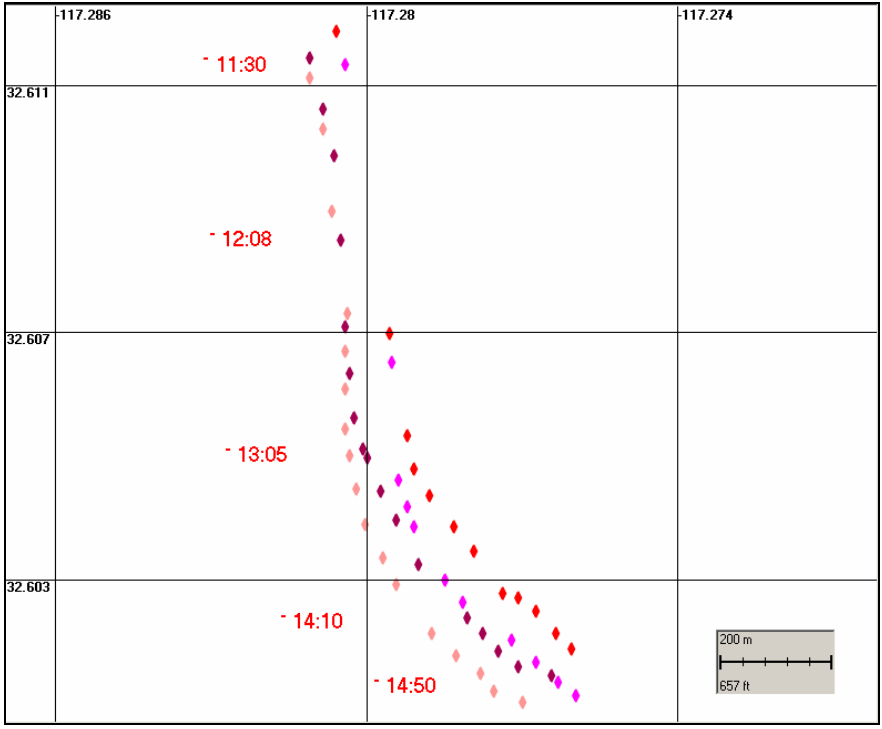


Figure D-15. Tracks and corresponding times of drifters deployed at 2m depths for the November 2, 2006 experiment.

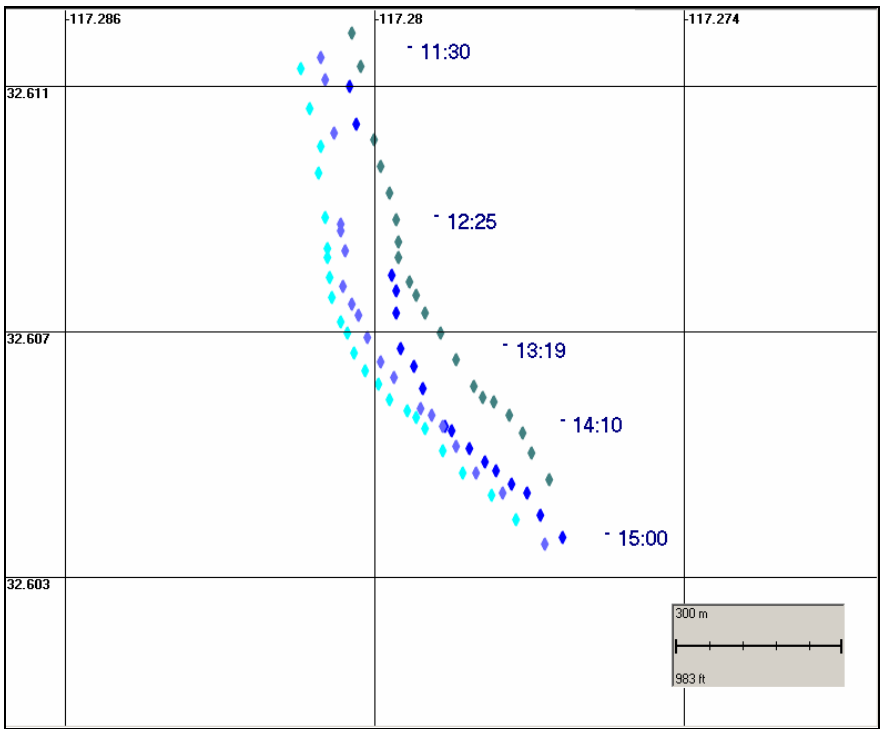


Figure D-16. Tracks and corresponding times of drifters deployed at 4m depths for the November 2, 2006 experiment.

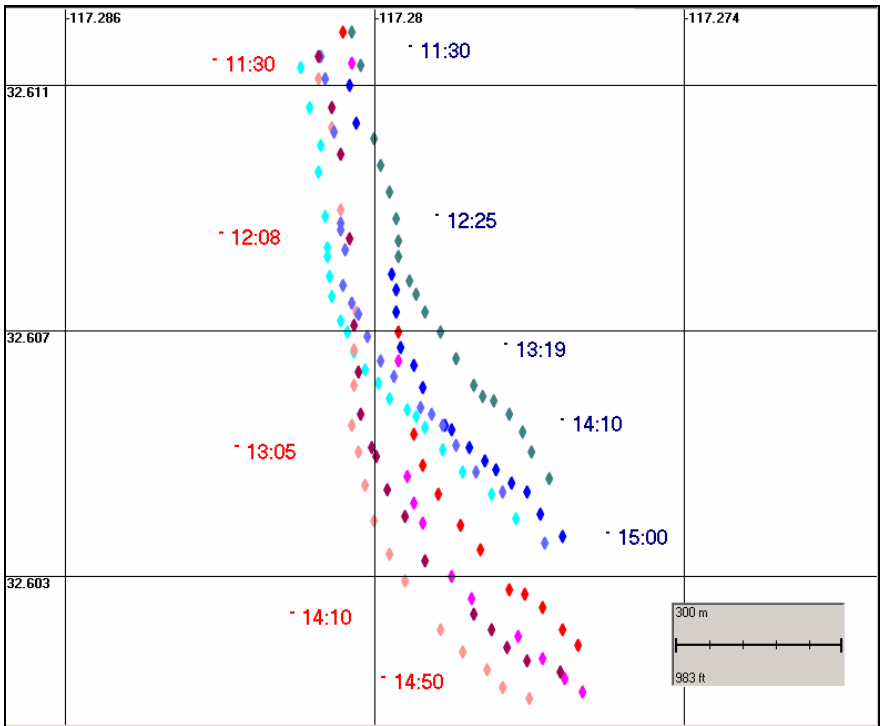


Figure D-17. All drifter tracks (reds/purples = 2m, blues = 4m deployment depths) and corresponding times (red font = 2m drifters, blues font = 4m drifters) for the November 2, 2006 experiment.