Depth to Consolidated Sediment and Floc Depth at Refuge EVPA Sites

Mike Waldon
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Since the meeting of the "*TOC Working Group to Examine Refuge TP Concentrations in May and June 2005*" in September 2005, additional data have become available. For some time, field crews have been recording "depth to consolidated sediment" or DCS on the field data sheets for the EVPA and LOXA sampling. DCS is not entered into DBHYDRO because it was not previously measured and there is no data field for it. The field in DBHYDRO called "Total Depth" or TDEPTH is the depth of clear water over the floc layer. This definition of total depth has led to some past confusion.

If you subtract TDEPTH from DCS you get the depth of the floc layer (floc depth)

$$FlocDepth = DCS - TDEPTH$$

DCS has been recorded in field notes since late 2004, and a Refuge volunteer has compiled values into a spreadsheet. These data have been used to calculate floc depths for the available period of record (Table 1, Figure 1). Floc depth is rather variable, with maximum values increasing with DCS (Figure 2).

May and June 2005 floc depths appear to be exceptionally low in both the EVPA and LOXA samplings (Figure 2). The floc depth recovered to its historic distribution by the July sampling dates. This observation is additional evidence that something unusual happened in May and June. A large portion of the floc layer must have been entrained into the overlying water. Mixing of a large portion of the floc layer into the "clear water" layer would account for the high observed values. This mixing is consistent with the hypothesis that damage to the SAV or emergent communities (e.g., hurricanes) made the Refuge susceptible to this entrainment event, but I am sure other explanations are possible. The proximal and ultimate causes of this event may never be known with certainty, but their investigation could lead us to a better understanding of this ecosystem's dynamics.

Data and analysis of floc depth provide additional evidence that a real, though unusual, event happened in the May-June time period. The wide spatial distribution of the reduced floc depth is consistent with the wide spatial extent of the elevated phosphorus samples in May and June 2005.

	Site																
Date	**LOX10**	**LOX11**	**LOX12**	**LOX13**	**LOX14**	**LOX15**	**LOX16**	**LOX3**	**LOX4**	**LOX5**	**LOX6**	**LOX7**	**LOX8**	**LOX9**	**Count**	**Median**	**Average**
8/9/2004									3			14	15				
8/10/2004		19	0	16	6	18	18				0				10	14.5	10.9
9/21/2004	14							37	14	10		7	25	11			
9/23/2004		25	10	12	20	17	25				5				14	14	16.6
10/18/2004	18							5	7	15		15	4	24			
10/19/2004		42	8	11	14	15	44				11				14	14.5	16.6
11/15/2004	6							8	18	5		24	11	14			
11/16/2004		27	0	6	7	0	0				7				14	7	9.5
12/13/2004	9							10	4	9		21	10	11			
12/14/2004		11	5	3	4	4	7				3				14	8	7.9
1/10/2005	8							4	7	4		5	7	11			
1/11/2005		22	21	6	7	14	23				2				14	7	10.1
2/7/2005	6	28	8	0	1	24	10	9	3	11	0	13	10	8	14	8.5	9.4
3/7/2005	9	12	16	19	13	20	22	2	9	8	10	10	11	5	14	10.5	11.9
4/4/2005	8							6	3	5		12	7	6			
4/5/2005		15	20	9	14	23	4				12				14	8.5	10.3
5/2/2005									3			3	2				
5/3/2005		4	1	7	6	5	3				3				10	**3**	**3.7**
6/13/2005	2							4	4	3		1	2	5			
6/14/2005		2	3	4	3	6	10				4				14	**3.5**	**3.8**
7/11/2005	10							7	8	13.5		14	3	17			
7/12/2005		23	27	2	13	14	20				27				14	13.75	14.2
8/8/2005	14							5	11	3		20	10	11			
8/9/2005		20	26	14	15	25	28				4				14	14	14.7
9/19/2005	7							6	12	8		21	7	15			
9/21/2005		36	42		14	17	19				12				13	14	16.6
Count	12	14	14	13	14	14	14	12	14	12	14	14	14	12			
Median	8.5	21	9	7	10	16	18.5	6	7	8	4.5	13.5	8.5	11			
Average	9.3	20.4	13.4	8.4	9.8	14.4	16.6	8.6	7.6	7.9	7.1	12.9	8.9	11.5			

Table 1. Floc depth (cm) for EVPA sites calculated by subtracting depth of clear water (TDEPTH) form depth to consolidated sediment. Note that floc depths for May and June are the lowest since recording of DCS was initiated.

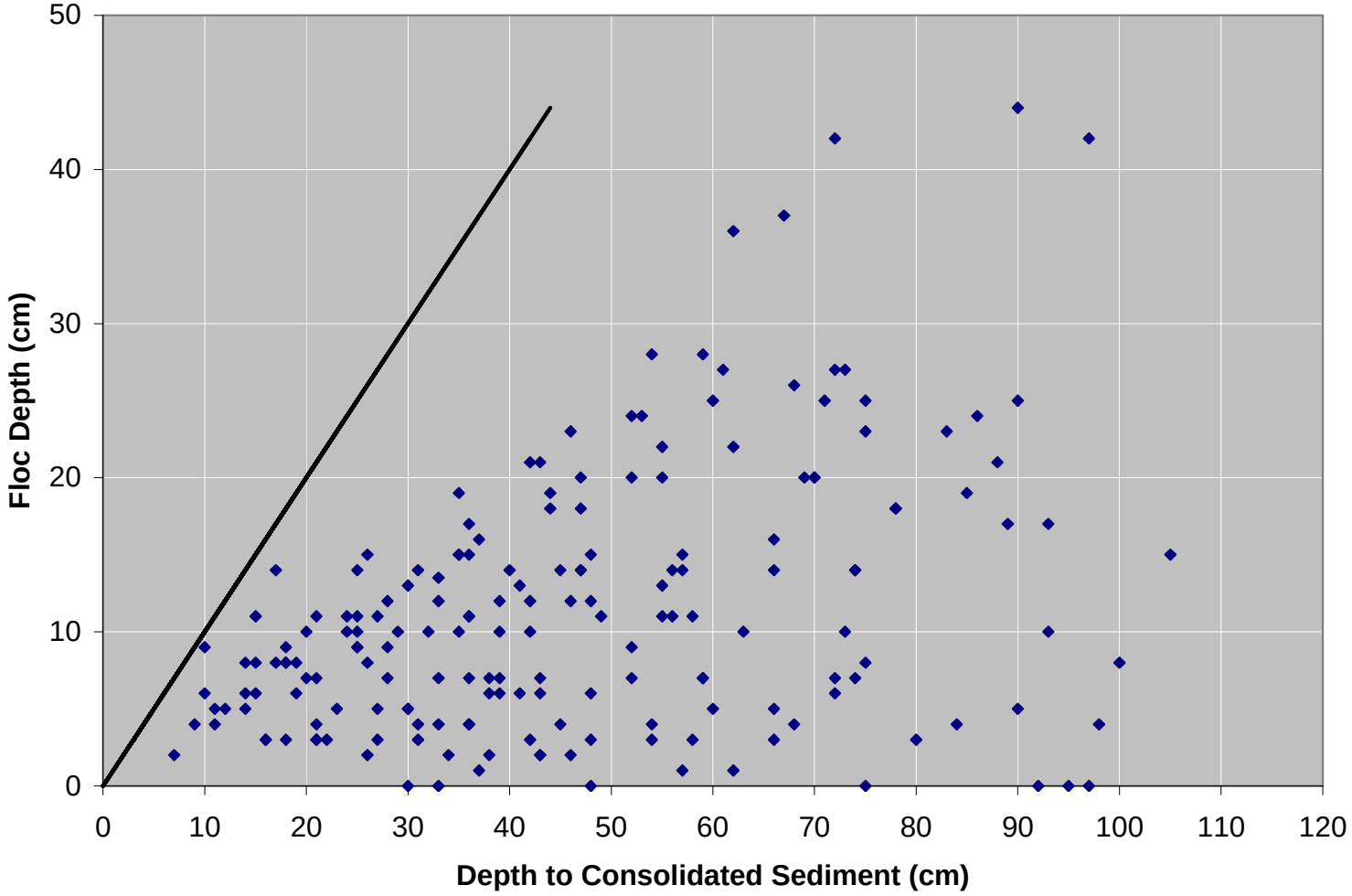

Figure 1. Floc depth versus depth to consolidated sediment (DCS) for EVPA sites. A 1:1 line is drawn for reference.

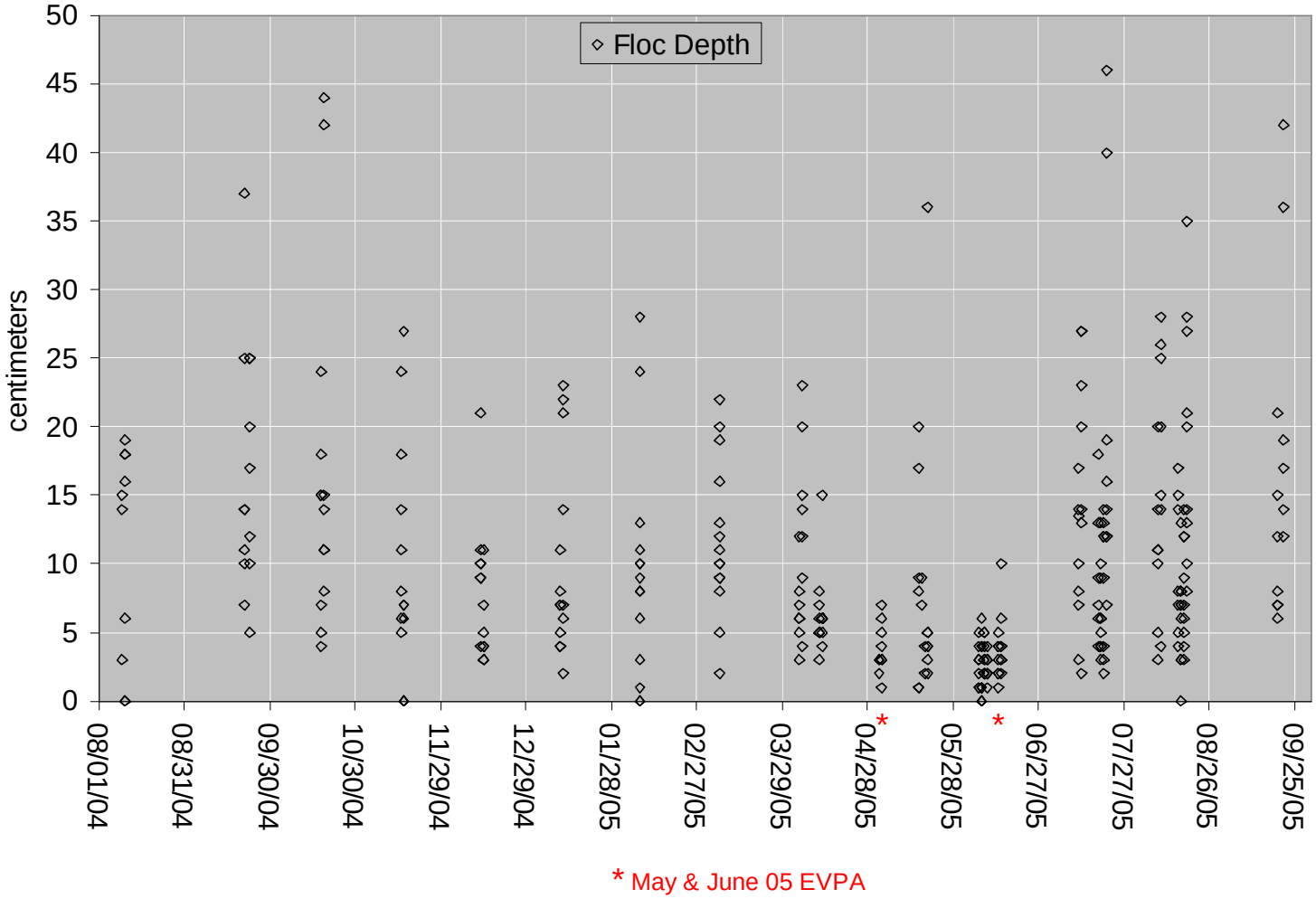

Figure 2. Floc depth for EVPA and LOXA sites are plotted over the available period of record. May and June 2005 EVPA sampling dates are indicated with an asterisk.