

Corps Shoaling Analysis Tool (CSAT)

Updates

- Shoaling Rate per CWIS project
- Volume tables from CSAT support Dredging Optimization work.

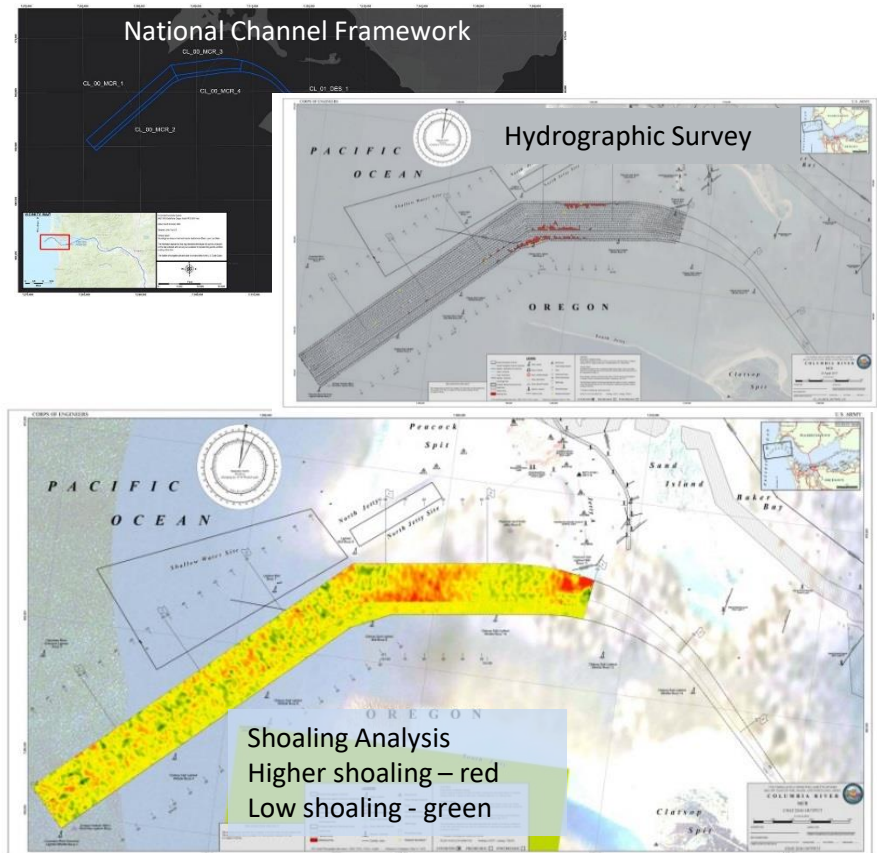
Dredge Cut (ft)	Now (CY)	6 months (CY)	12 months (CY)	18 months (CY)	24 months (CY)	30 months (CY)	36 months (CY)
-45	195,320	271,020	373,070	492,200	624,890	771,020	931,220
-44	125,140	173,140	238,620	331,710	444,910	572,680	713,450
-43	76,249	109,860	153,260	210,570	293,080	399,730	522,310
-42	43,628	65,655	95,990	135,350	186,480	258,070	356,920
-41	24,409	37,093	56,313	83,402	119,100	165,270	227,370
-40	14,958	21,022	31,470	48,147	72,041	104,370	146,170
-39	10,060	13,343	18,250	26,832	41,017	61,922	91,020
-38	7,083	9,092	11,945	16,084	23,035	34,823	53,059
-37	5,194	6,480	8,241	10,728	14,312	19,888	29,576
-36	3,865	4,787	5,944	7,496	9,673	12,784	17,358
-35	2,806	3,555	4,412	5,465	6,843	8,751	11,457

Model Access: CIRP page:

<http://cirp.usace.army.mil/products/csat.php>

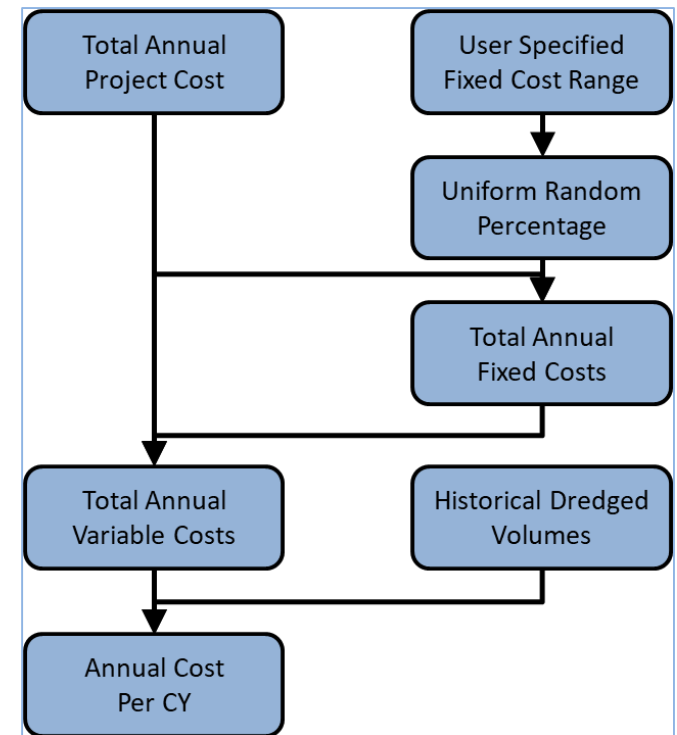
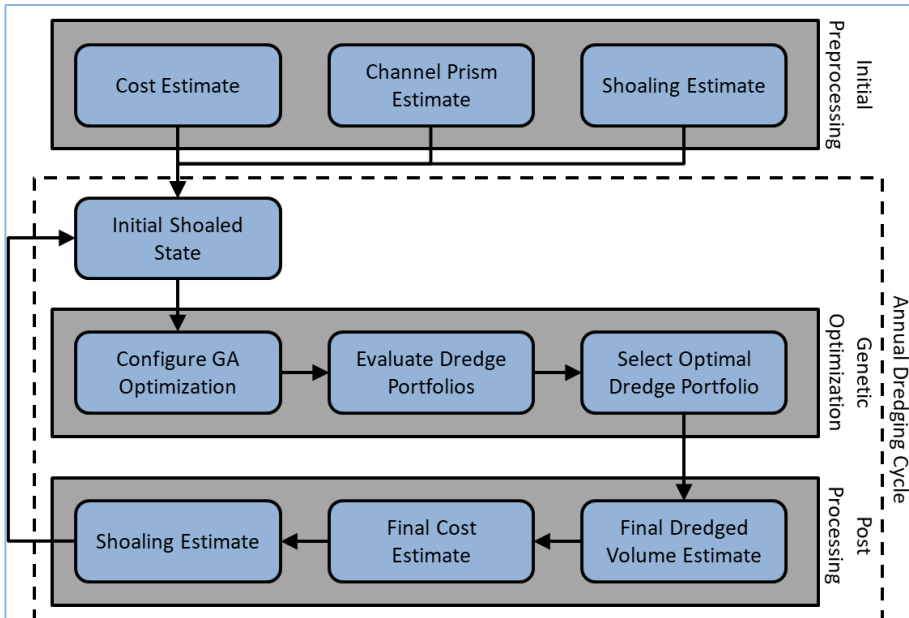
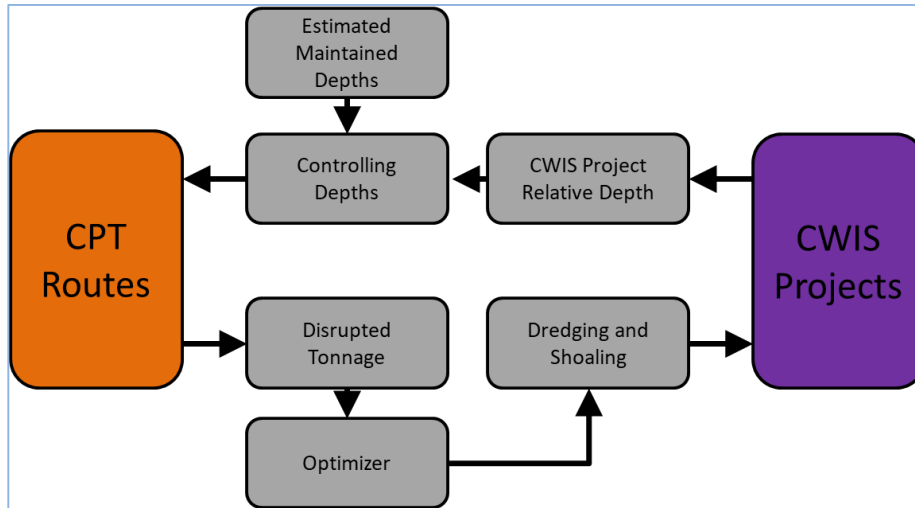
POC: Lauren Dunkin,

lauren.m.dunkin@usace.army.mil

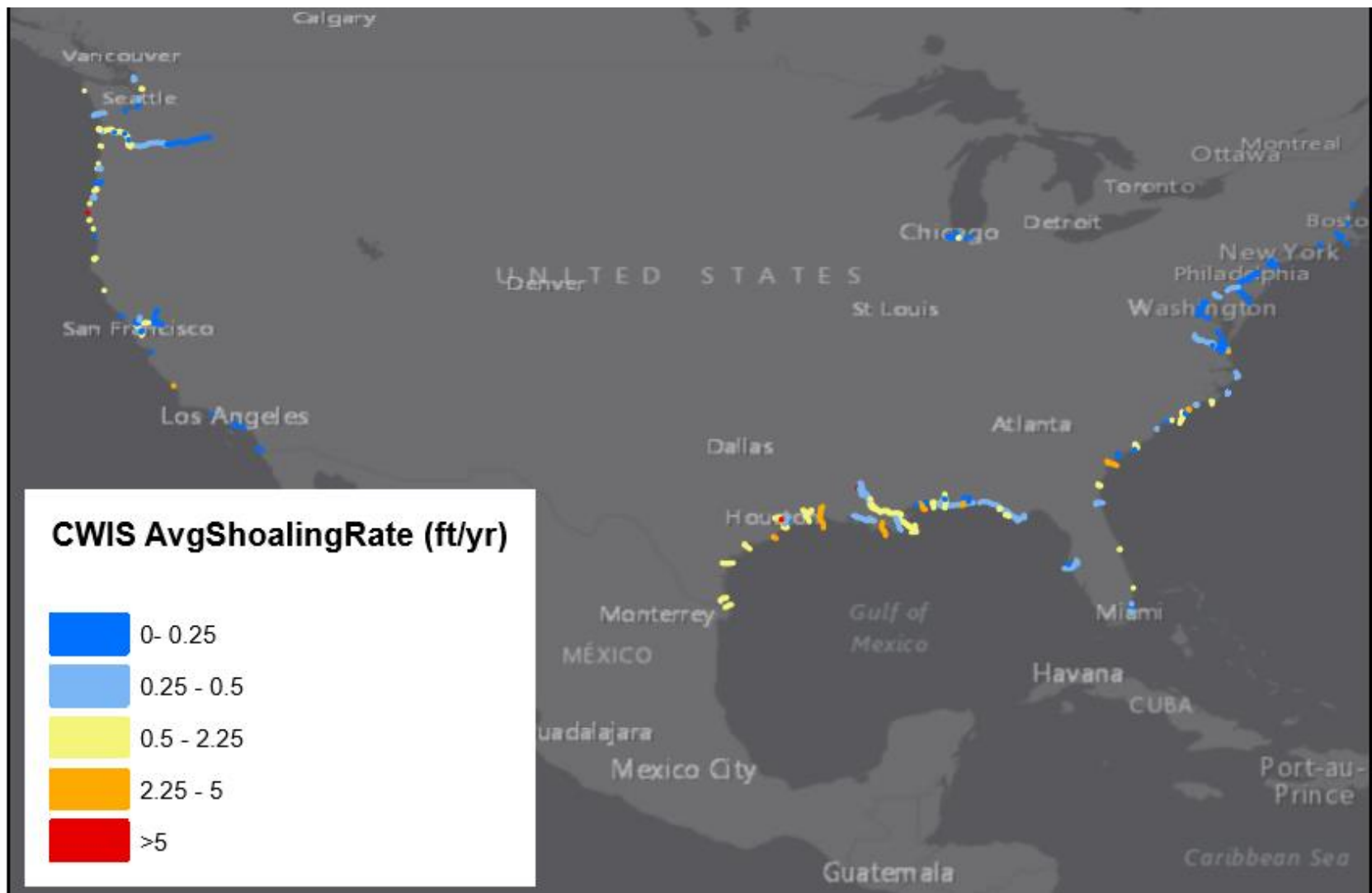


National Channel Framework, hydrographic survey map sheet from eHydro, and the shoaling rate prediction for Columbia River, OR.

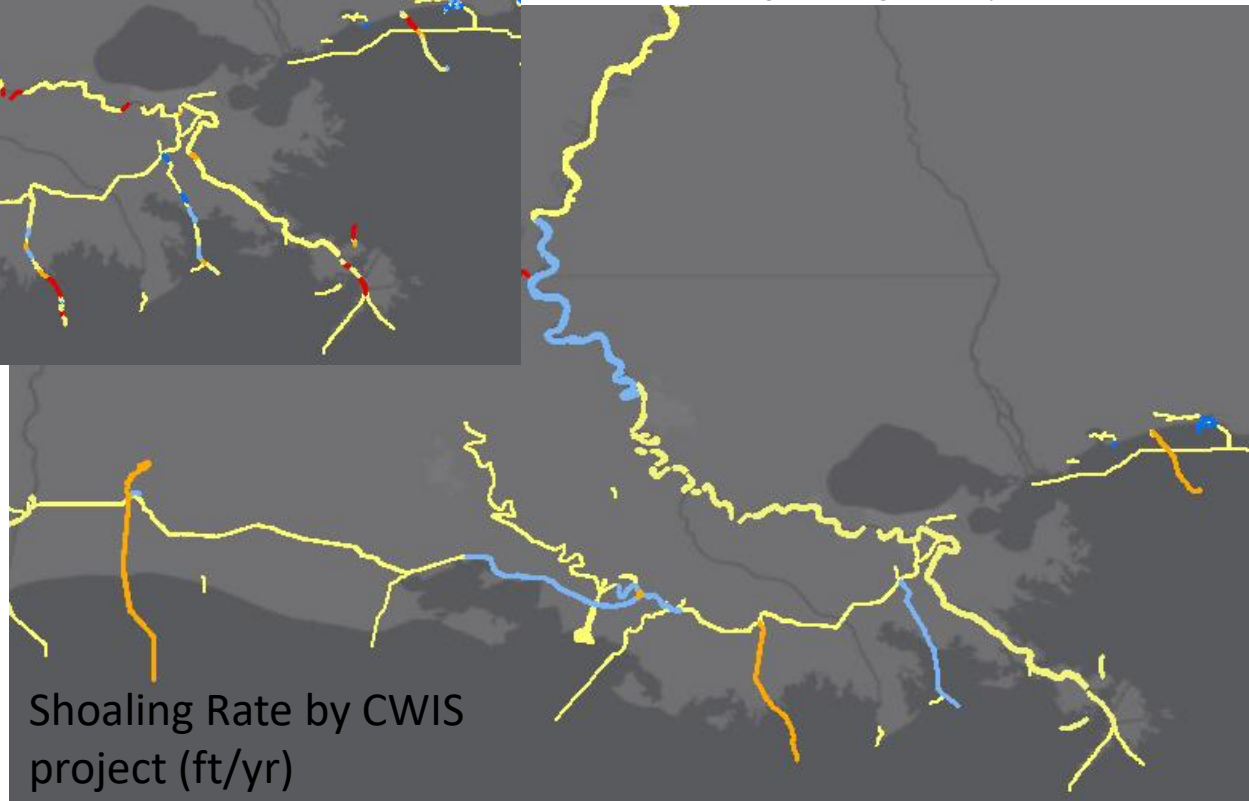
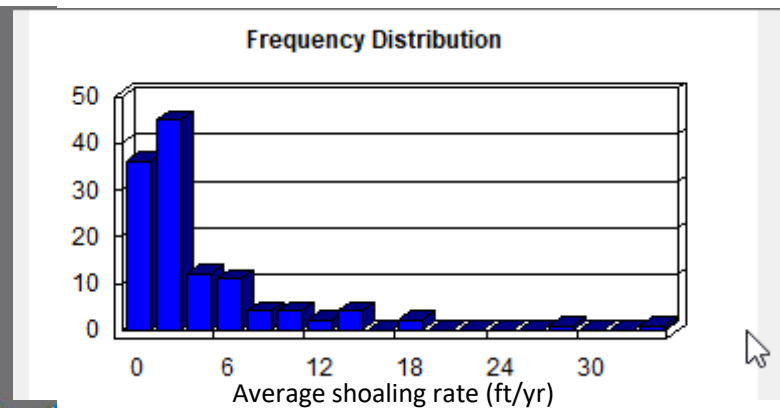
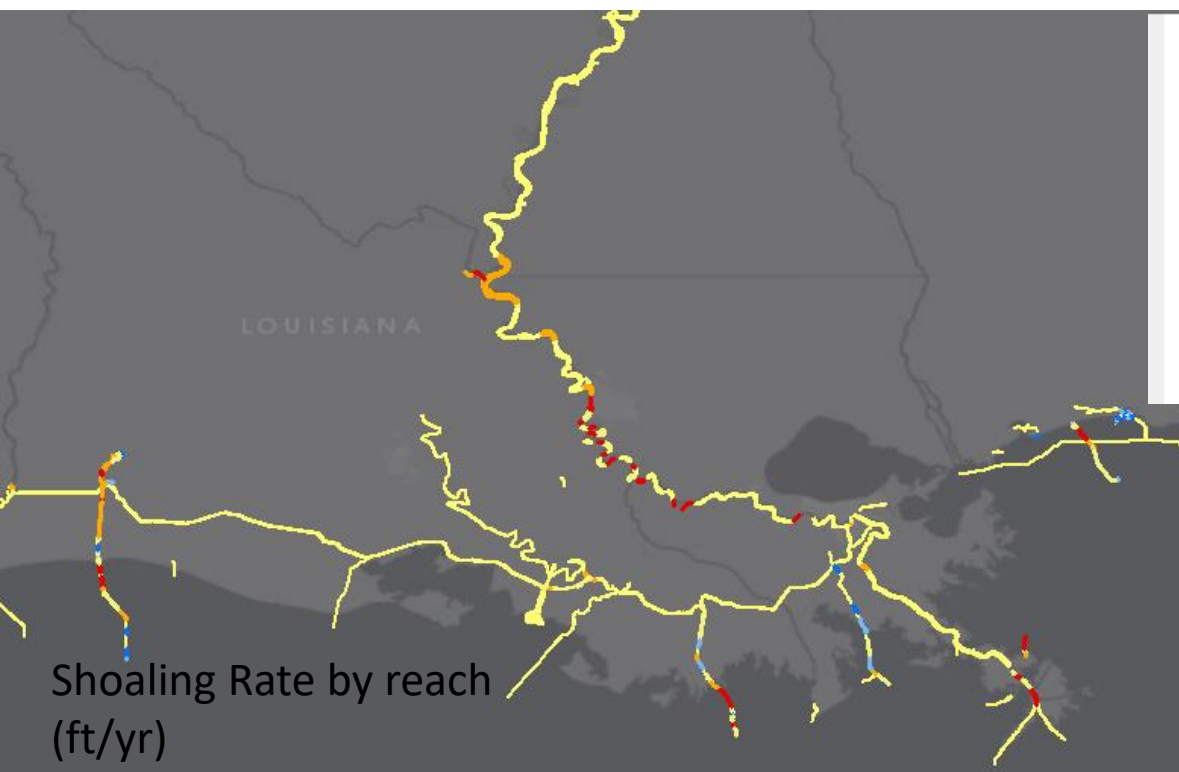
Examples of how the data inputs are combined and related to each other to inform the dredging optimization models





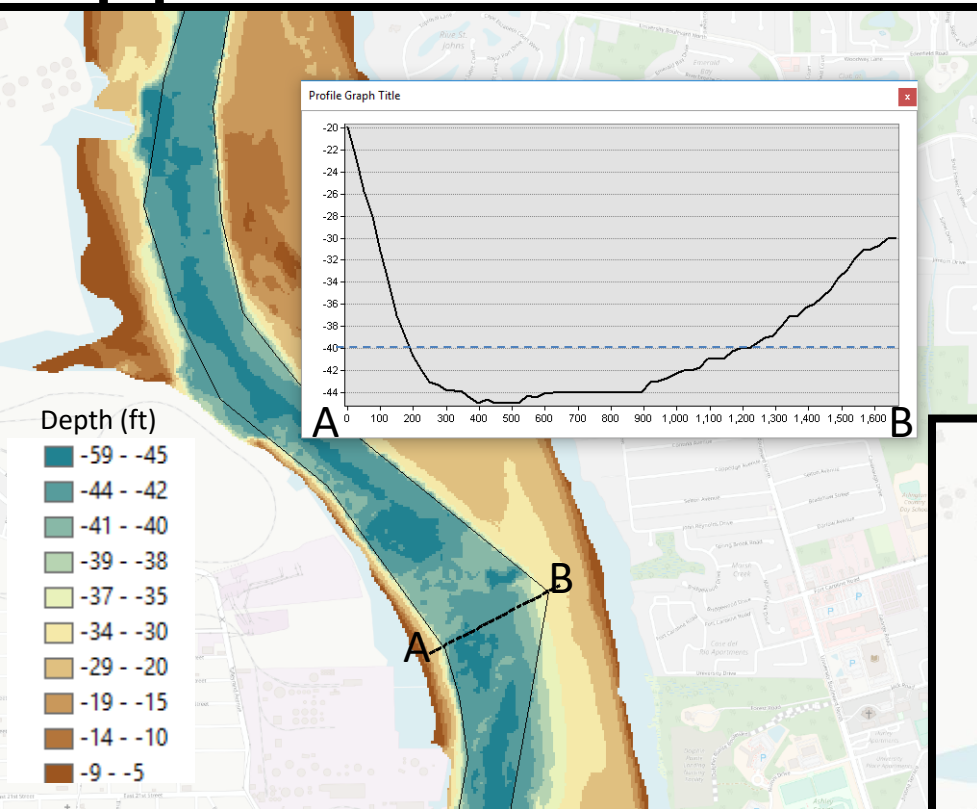


MVN



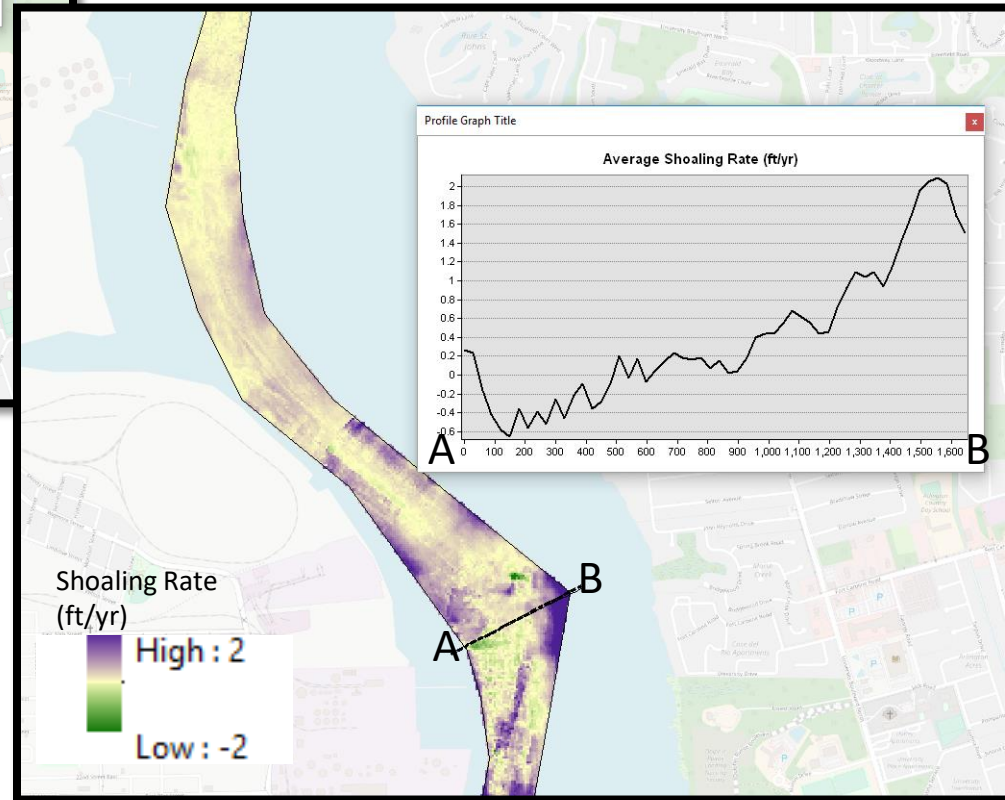
Jacksonville Harbor

Upper Reach – 40' maintained depth



Average shoaling rate and cross-section profile for an upper reach of Jacksonville Harbor. Note the shoal encroaching from the outer boundary of the channel (B).

Bathymetric Survey and cross-section profile for an upper reach of Jacksonville Harbor.



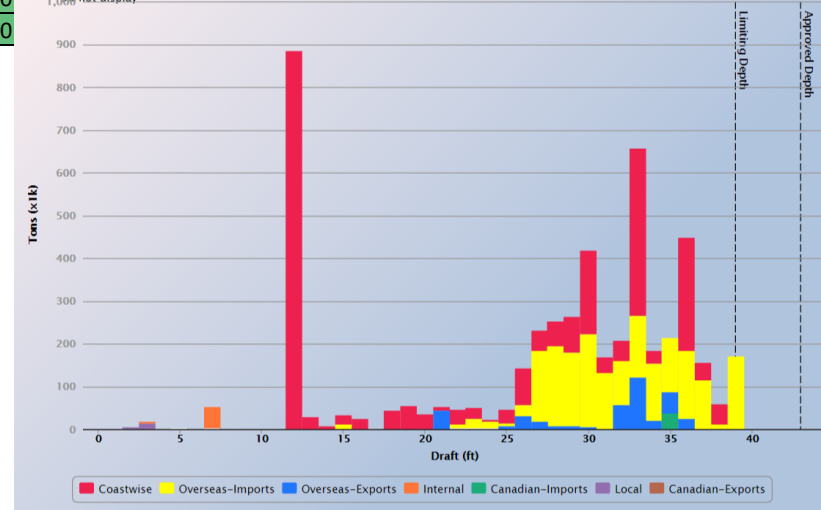
Jacksonville Upper Reach (JH_01_JAH_ 32, 33, 34, 35)



Depth (ft)	0	0.5	1	1.5	2	2.5	3
-45	375,100	402,100	429,600	457,500	485,600	513,800	542,200
-44	230,600	250,900	272,400	295,300	319,400	344,700	370,700
-43	131,100	145,900	161,600	178,100	195,600	214,000	233,300
-42	63,400	73,800	85,000	97,100	109,900	123,500	137,900
-41	25,300	30,200	36,100	43,000	51,000	60,200	70,400
-40	9,900	11,800	14,100	16,800	20,200	24,300	29,200
-39	3,900	4,600	5,500	6,700	8,000	9,700	11,600
-38	1,700	2,000	2,300	2,700	3,200	3,800	4,600
-37	700	900	1,000	1,200	1,400	1,700	2,000
-36	200	300	400	500	600	700	800
-35	-	-	100	100	200	200	200

Depth (ft)	0	0.5	1	1.5	2	2.5	3
45	3.3836	4.8761	6.2427	7.4904	8.63	9.6736	10.6309
44	4.3021	6.24	8.0306	9.6722	11.1701	12.5334	13.7706
43	5.1678	7.5574	9.8141	11.9341	13.9152	15.7559	17.4529
42	5.9345	8.7432	11.4326	13.9957	16.4285	18.7282	20.8948
41	6.3723	9.485	12.5333	15.5022	18.3751	21.1401	23.7856
40	6.5483	9.795	13.0193	16.2174	19.3828	22.5028	25.565
39	6.4395	9.6453	12.8402	16.0223	19.1895	22.3397	25.47
38	6.1271	9.1834	12.2339	15.2776	18.3139	21.3419	24.3598
37	5.6339	8.4476	11.2584	14.066	16.8698	19.6691	22.4632
36	5.3218	7.9811	10.639	13.2953	15.9498	18.6022	21.2525
35	3.8868	5.8298	7.7722	9.714	11.6553	13.5958	15.5353
34	3.3103	4.9653	6.6202	8.275	9.9296	11.5839	13.2379
33	2.74	4.1101	5.4801	6.85	8.22	9.5899	10.9597
32	1.5877	2.3816	3.1754	3.9693	4.7632	5.557	6.3509
31	1.1985	1.7978	2.3971	2.9963	3.5956	4.1949	4.7941
30	0.8023	1.2034	1.6045	2.0056	2.4068	2.8079	3.209

RankingDetail St. Johns River, FL (Mile 17.4 To Mile 19.0) (339102) Reach Traffic Draft vs. Average Yearly Tons for



wait to dredge – year 3 (3) at 40’.

\$/CY: 3.00

Mob/demob: \$1M



FiNDER - Federal Navigation Data Repository

- Home
- NAV Project Info
- Map Book
- Survey Age
- Map Library
- Permits
- Dredge Contracts
- Project Management
- FY Reports
- SPQ

Select Project::

JAMES RIVER

Reach:

DANCING POINT TO SWANN POINT CHANNEL

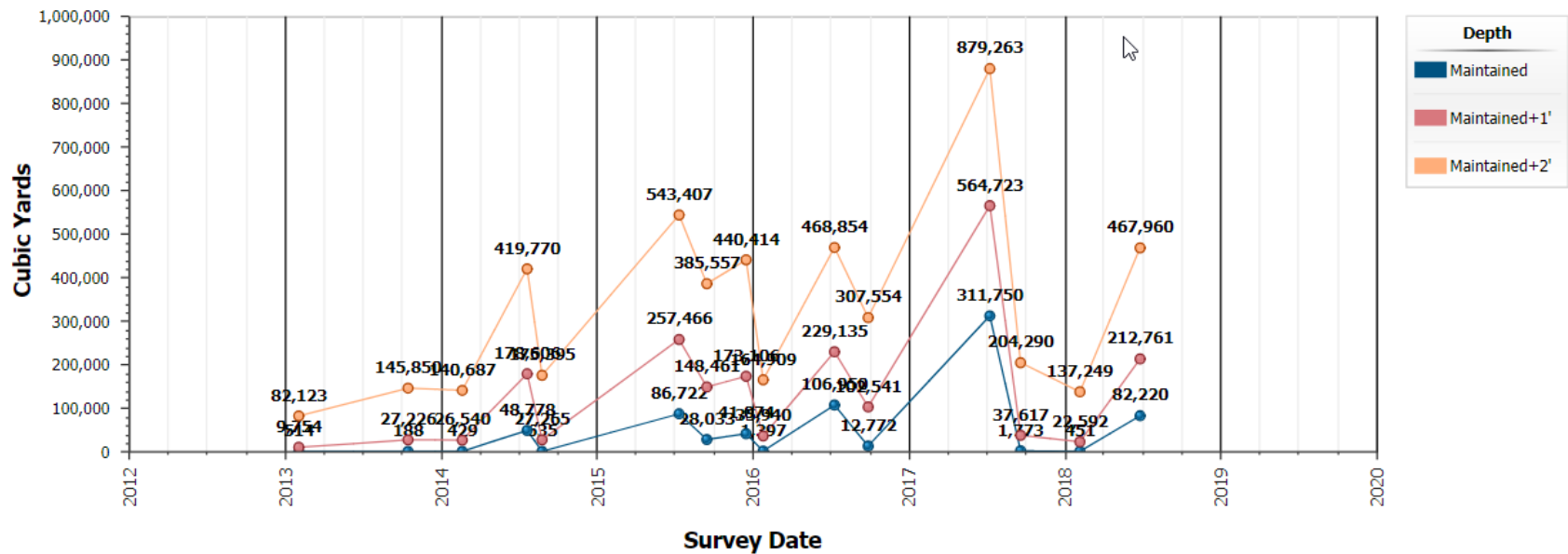
Full Project

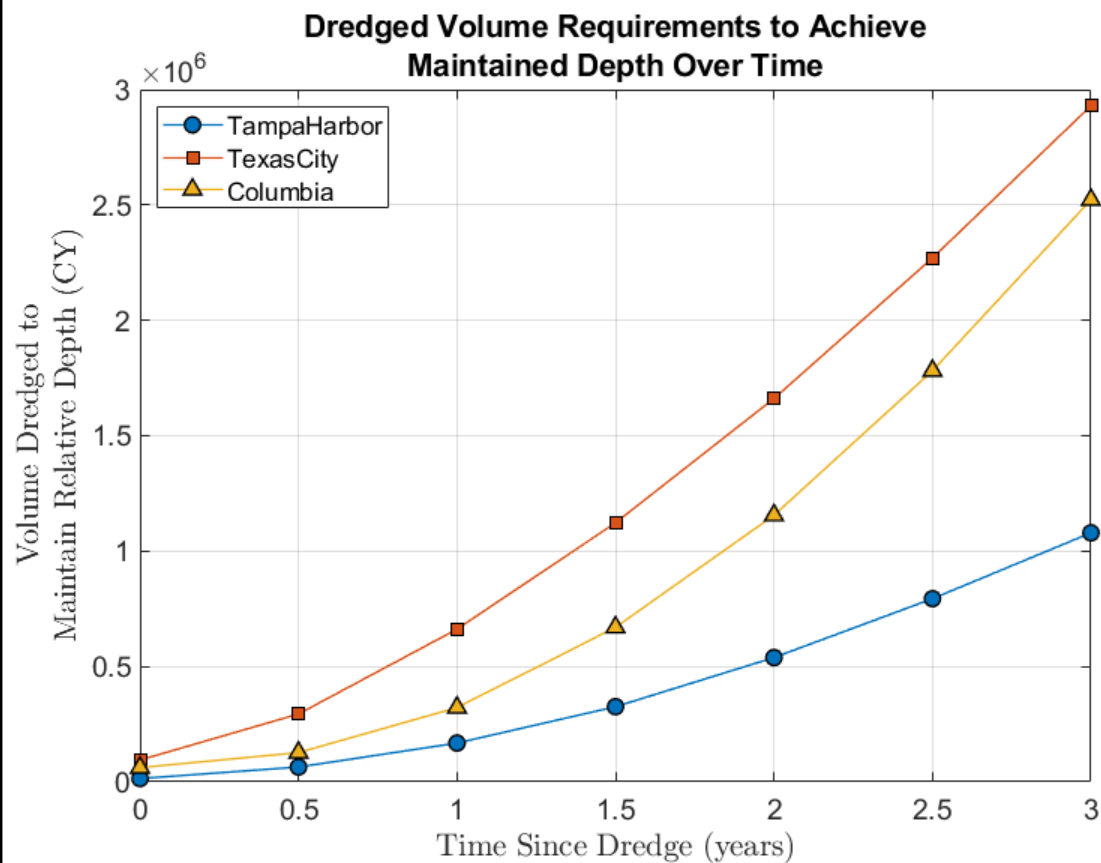
☒ DANCING POINT TO SWANN POINT CHANNEL

Reach Name

☐ Dancing Point to Swann Point Channel

Selected Full Project Spatial Planning Quantities



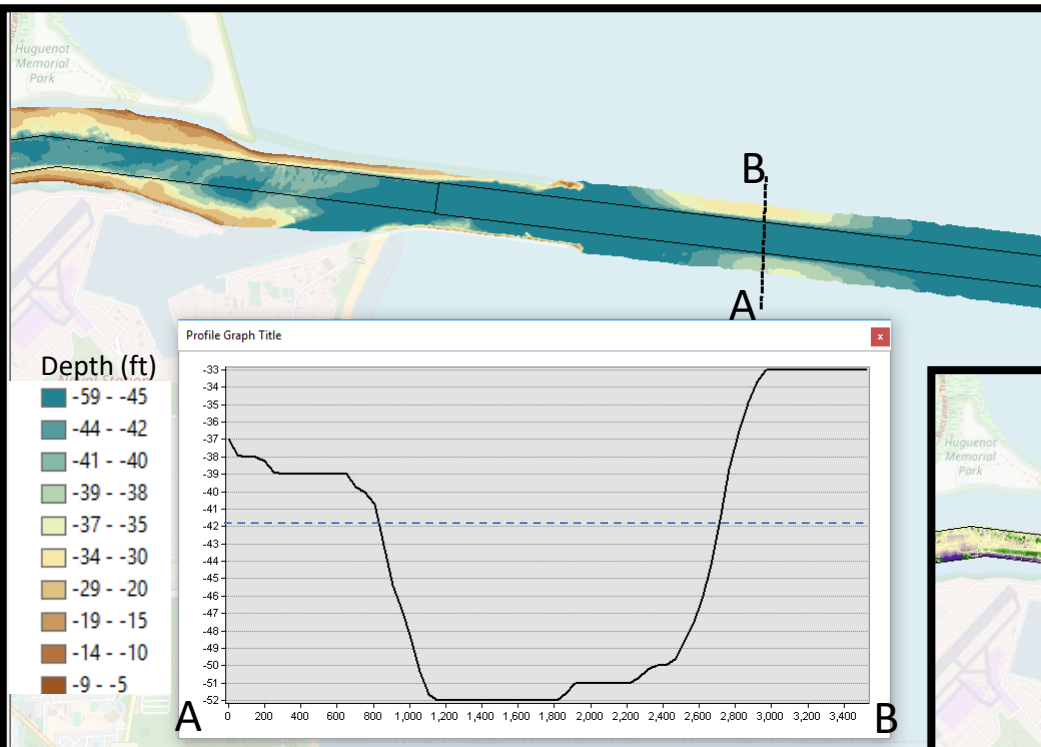


State	Channel	Maintained Depth (ft)	Average Rate (ft/yr)
Florida	Tampa Harbor	43	0.6
Texas	Texas City	41,46	2
Oregon	Columbia River	43	1.4

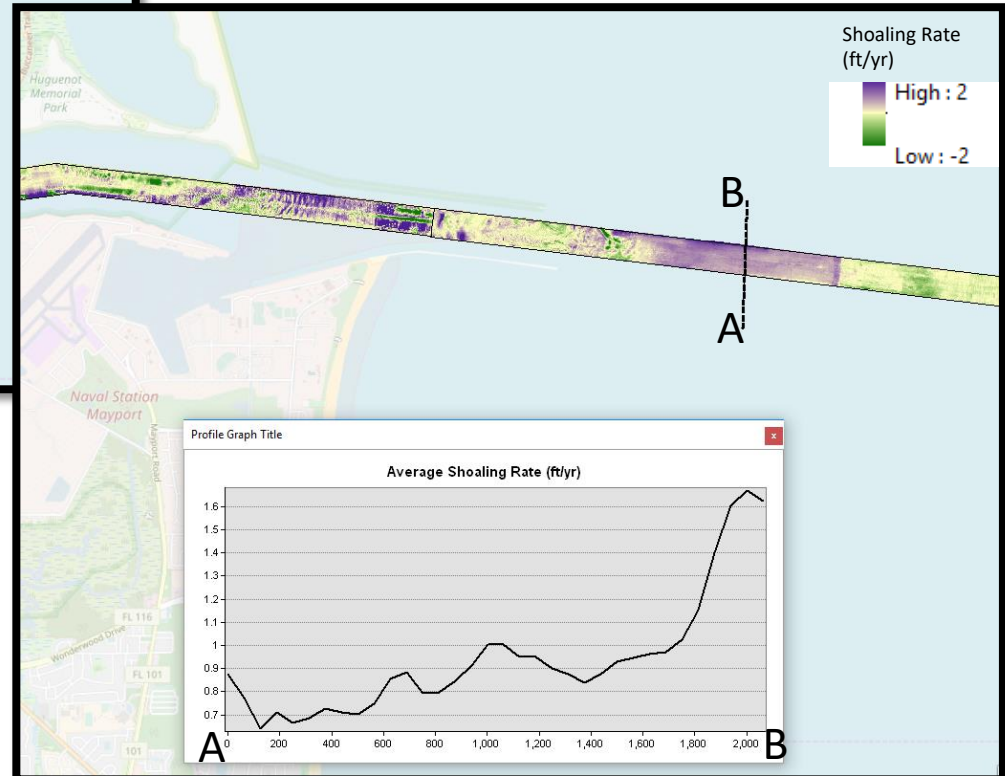
Entrance Channel reaches

Jacksonville Harbor

Entrance – 42' maintained depth



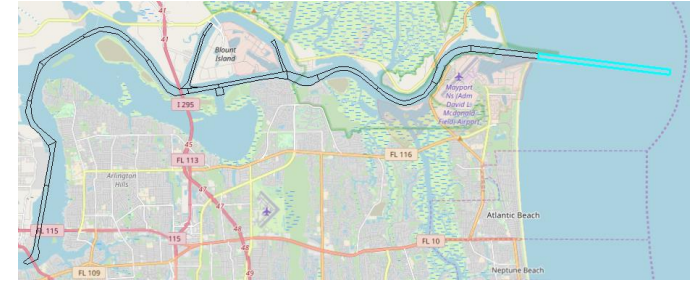
Average shoaling rate and cross-section profile for the entrance channel of Jacksonville Harbor. Note the shoal encroaching from the outer boundary of the channel (B).



Bathymetric Survey and cross-section profile for the entrance channel of Jacksonville Harbor. The navigation channel is much deeper than the maintained depth of 42'. Note the high shoaling in this area as the ebb shoal migrates from north to south.

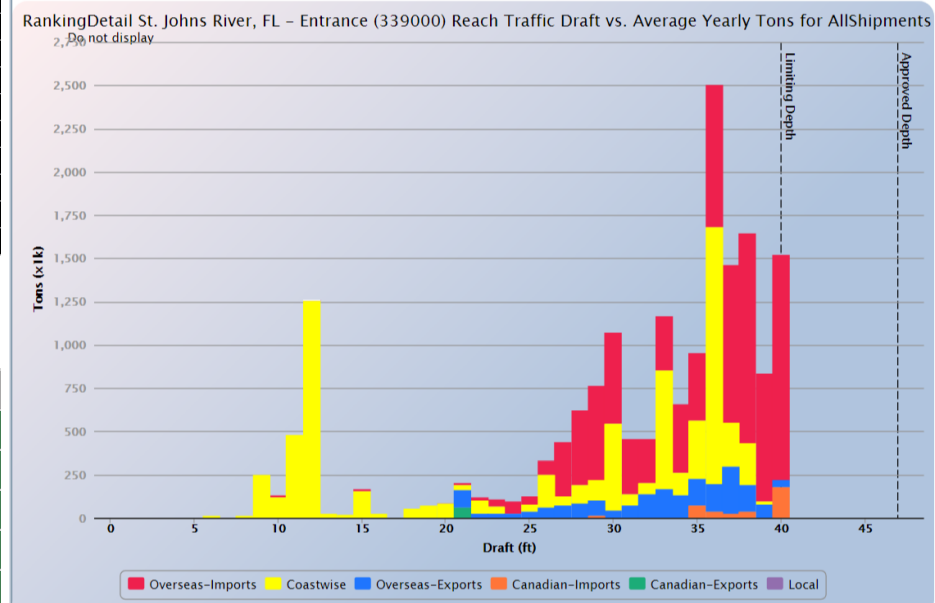
Jacksonville Entrance – 42’

(JH_01_JAH_1)



Depth (ft)	0	0.5	1	1.5	2	2.5	3
55	919,100	936,200	953,400	970,700	988,000	1,005,400	1,022,800
54	736,700	753,000	769,300	785,800	802,300	818,900	835,500
53	563,500	578,900	594,400	610,000	625,700	641,500	657,300
52	398,700	413,500	428,300	443,200	458,100	473,100	488,100
51	241,100	255,100	269,200	283,400	297,700	312,000	326,500
50	106,100	117,000	128,200	139,600	151,400	163,400	175,600
49	36,100	39,100	42,600	46,600	51,200	56,500	62,700
48	16,100	17,400	18,700	20,100	21,600	23,200	25,000
47	6,600	7,300	7,900	8,600	9,400	10,200	11,000
46	2,200	2,500	2,800	3,100	3,500	3,800	4,200
45	400	500	600	700	800	1,000	1,200
44	-	-	-	-	-	-	100
43	Limited impact from shoaling at deepest						
42	depths – 42’ maintained depth.						
41	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-

Depth (ft)	0	0.5	1	1.5	2	2.5	3
47	16.1795	24.0988	31.8224	39.2538	46.2597	52.6859	58.3533
46	16.3659	24.4906	32.5395	40.4729	48.2376	55.7521	62.9036
45	16.4189	24.6133	32.787	40.9224	48.9954	56.9682	64.7939
44	16.4337	24.6471	32.8539	41.0493	49.2301	57.3841	65.4877
43	16.435	24.6524	32.8694	41.0846	49.2951	57.4964	65.6822
42	16.435	24.6525	32.87	41.0875	49.3048	57.5216	65.736
41	16.3787	24.568	32.7573	40.9466	49.136	57.3253	65.5146
40	16.2871	24.4307	32.5743	40.7178	48.8614	57.005	65.1485
39	12.9222	19.3833	25.8445	32.3056	38.7667	45.2278	51.6889
38	11.3479	17.0218	22.6958	28.3697	34.0437	39.7176	45.3916
37	8.8632	13.2948	17.7264	22.158	26.5896	31.0212	35.4528
36	7.0543	10.5815	14.1087	17.6358	21.163	24.6902	28.2173
35	2.0173	3.026	4.0347	5.0433	6.052	7.0607	8.0693
34	0.0348	0.0521	0.0695	0.0869	0.1043	0.1217	0.1391



wait to dredge – year 3 (3) at 42-44’.

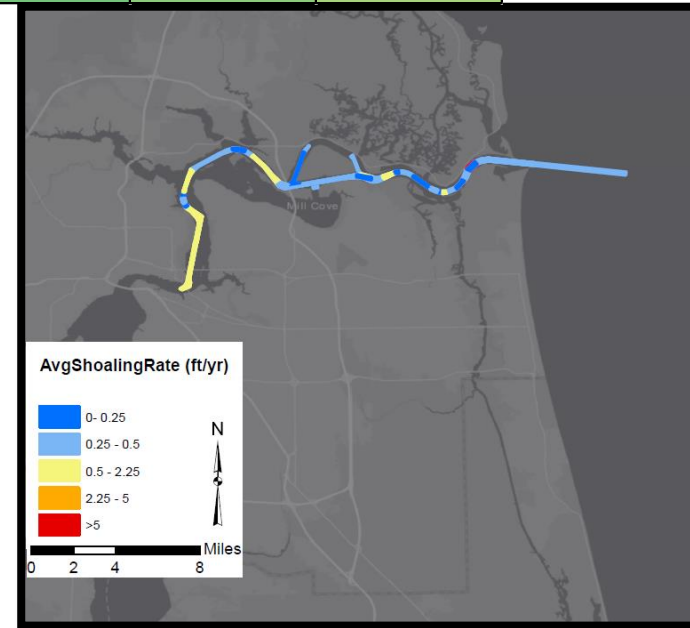
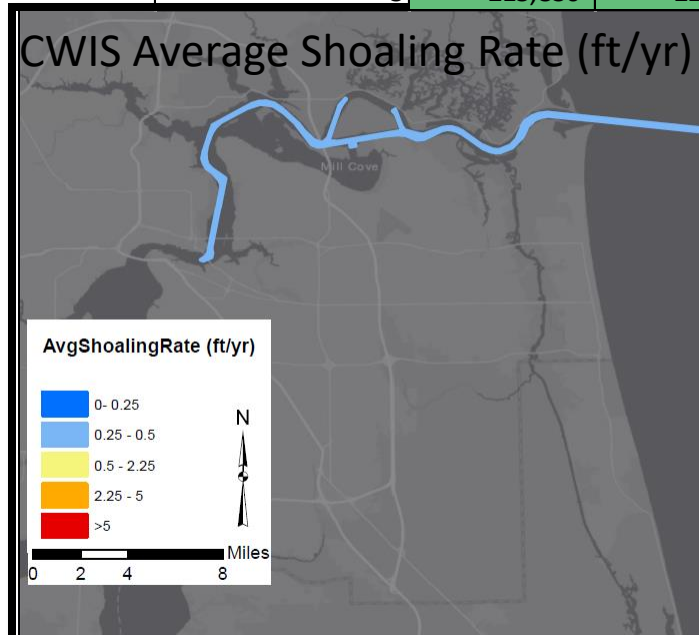
\$/CY: 3.00

Mob/demob: \$1M

Jacksonville Harbor

Full Project

Depth Above Below Maintained	0	0.5	1	1.5	2	2.5	3
5	1,955,416	2,097,803	2,243,024	2,392,398	2,546,025	2,704,558	2,870,020
4	1,324,183	1,452,067	1,584,007	1,720,741	1,862,451	2,008,444	2,158,009
3	923,550	1,033,238	1,147,850	1,267,669	1,393,088	1,523,475	1,658,117
2	684,650	776,100	873,636	977,018	1,086,493	1,201,741	1,321,990
1	550,450	625,040	705,650	792,518	886,146	986,224	1,091,896
0	462,590	527,130	596,470	670,760	750,775	837,363	930,142
-1	392,336	449,840	512,320	579,300	650,280	726,459	808,418
-2	332,078	383,694	440,340	501,670	567,130	636,764	710,920
-3	280,280	324,252	376,110	432,380	493,180	557,890	626,740
-4	241,284	271,744	317,592	369,580	425,710	486,190	550,751
-5	215,830	227,254	264,331	311,487	363,730	419,890	480,390



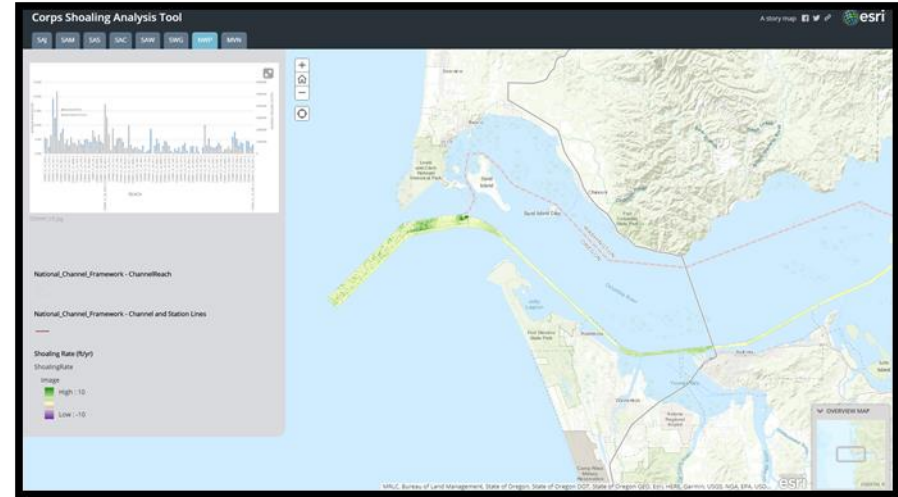
Corps Shoaling Analysis Tool (CSAT)

Applicability

- CSAT shoaling rate grids can be used to identify hot spots or areas of increased sedimentation.
- Limiting the time period for analysis to more closely align with a specific event (e.g. meteorological, change to dredging schedule/type) may provide insight into the effects that these events cause to the sedimentation within the channel.

Example Applications:

- CSAT has been run for all of the high and medium tonnage coastal navigation channels.
- CSAT has also been used by SWG to calibrate & validate sediment transport model of Galveston Bay to guide planning future dredging and placement requirements.



Spatial viewer for CSAT results. Includes data layers for National Channel Framework and shoaling rates from CSAT.

StoryMap: <https://arcg.is/094Lur>