

Siuslaw River Sediment Evaluation, 1991

Abstract

According to CWA and MPRSA requirements, Siuslaw River sediments from the federal navigation project were evaluated and determined to be suitable for unconfined in-water or upland disposal. The sediments are medium sands low in organic content and below established concern levels for chemical contaminants.

Introduction

1. The outlet of the Siuslaw River is located about 160 miles south of the mouth of the Columbia River. The river is 118 miles long and drains a watershed of 773 square miles. The estuary of the Siuslaw River is narrow and crooked extending 25 miles up-river from the mouth. The estuary covers about 1,780 acres. Tidelands are few between the mouth and river mile 5.0 then become extensive upstream from there. Annually, an average of 2,300,00 acre-feet of fresh water is flushed through the drainage basin. Normal river flow at the mouth is estimated to be 3,150 cfs. The mean tide range is 5.2 feet with an extreme of 11.0 feet.
2. The Federal Project is described as follows: an entrance channel 18 ft deep and 300 ft wide runs from deep water to RM 0.2. From there, the channel is 16 ft deep and 200 ft wide to RM 5.0. At bends in the river the channel widens. Opposite the dock at RM 5.0 a turning basin is 16 ft deep, 400 ft wide and 600 ft long. From Florence the channel is 12 ft deep and 150 ft wide to RM 16.5. At Rm 15.8 the channel widens into a turning basin 12 ft deep, 300 ft wide and 500 ft long. The recent, 5-year average volume of material dredged from the project was 153,000 cubic yards (1). This material was placed in an Ocean Dredged Material Disposal Site.
3. Industrial and commercial activity in the area is mostly related to the forest products industry. Sources of pollutants from industry are few. Sewage from Florence is processed through a sewage treatment plant.
4. Species of recreational or commercial interest found in the Siuslaw River estuary are salmon, redbtail seaperch, bay mussels, pile perch, dungeness crab and softshell clams. Less common are shiner perch, staghorn sculpin, piddocks and gaper clams (2).

History

5. The U. S. Army Corps of Engineers conducted sediment studies during the early 1960's and 1970's and again in 1987 (2,3). Sediments from the Siuslaw River were fine to medium sands low in fines and organic content (around 1.0 % volatile solids).
6. Portland District guidelines suggest that if the fines content of sediment exceeds 20 % and the volatile solids content exceeds 5.0 % then chemical evaluation of the sediment may be necessary in order to satisfy Clean Water Act (CWA) and Marine Protection, Research and Sanctuaries Act (MPRSA) requirements. Because Siuslaw River sediments have met CWA and MPRSA exclusionary criteria, no chemical analyses were performed on the sediment samples from these earlier studies. District environmental specialists decided to sample Siuslaw River sediments conducting chemical analyses on at least one of the samples, even though guidelines

would not suggest the necessity for chemical analyses. The chemical data gathered would serve as background information on Siuslaw River sediment.

Methods

7. Eight sediment samples were taken at various project locations between the river mouth and RM 7.2 (figure 1) using a modified 0.09 m Gray O'Hare box corer. Samples for physical analysis were placed in zip-lock bags and delivered to the U. S. Army Corp of Engineers Materials Lab in Troutdale, Oregon where standard dredge test analyses were run. These include resuspended density, void ratio, specific gravity, volatile solids and grain size distribution. The first three are used in dredge contract administration, the latter two in sediment evaluations used to assess environmental consequences of dredging. One sample, S-1, was sub-sampled for chemical analyses of the sediment. This portion was placed in an I-Chem jar and topped with a teflon lined lid. This sample was cold stored and shipped to Columbia Analytical Associates (CAS), Kelso, Washington. CAS analyzed the sample for metals, pesticides, PCB's, PAH's, phenols and Total Organic Carbon (TOC).

Results/Discussion

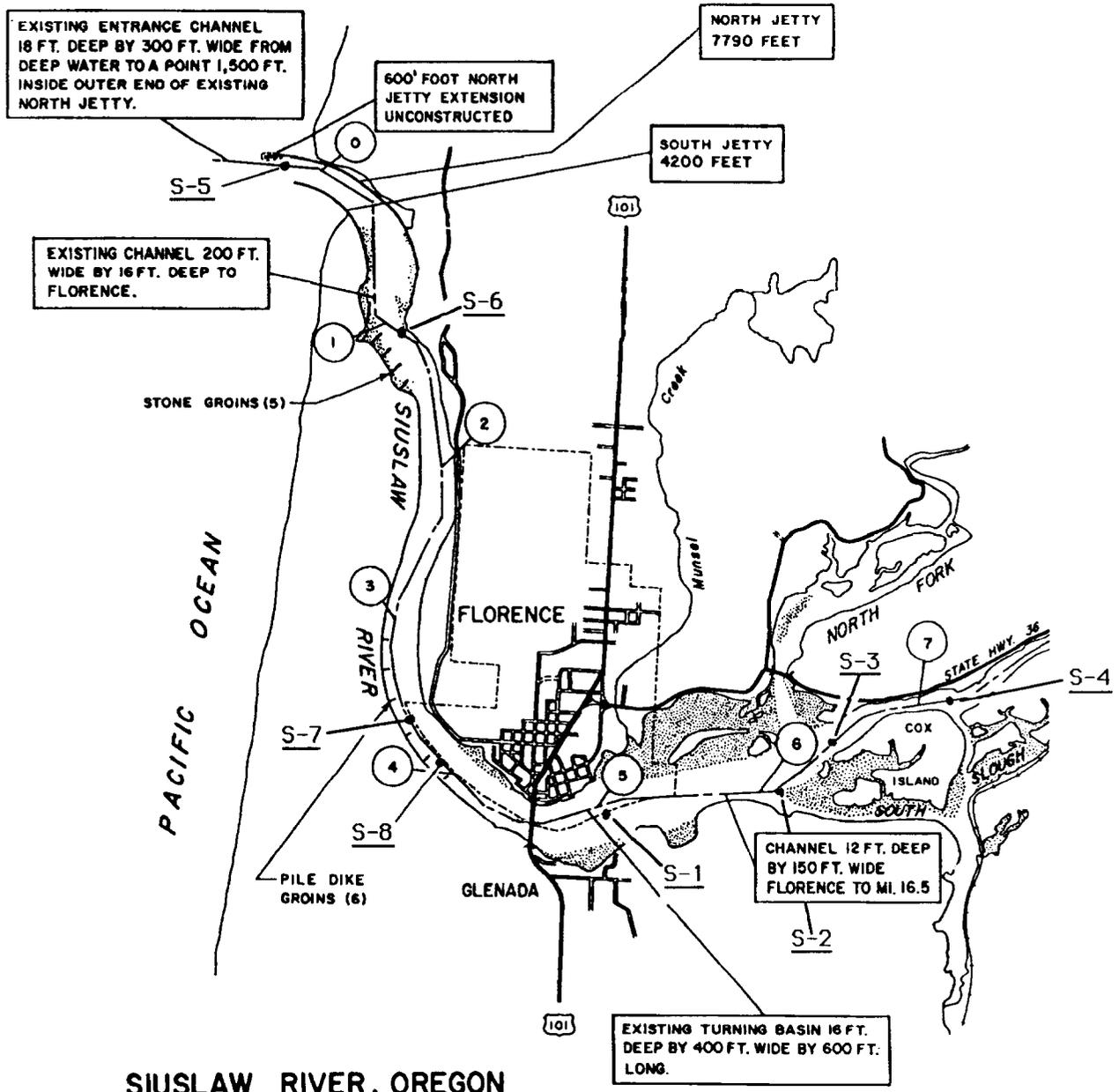
8. Table 1 shows the results of physical analyses of the sediment samples. Siuslaw River sediments are 99.9 % poorly graded sand with a low volatile solids content (1.1 %). The mean median grain size (0.32 mm) was that of medium sand. These values are typically associated with clean sand free of contaminants.

9. The results of the chemical analysis of one sample, S-1, are shown in Table 2. Sample S-1 was taken from the turning basin at RM 5.0 near the town of Florence. Metals concentrations were below USACE, Portland District concern levels and EPA, Region 10 screening levels. No pesticides, PCBs, PAHs or phenols were detected at the detection limits noted.

Recommendations

10. Siuslaw River sediments are acceptable for unconfined in-water and upland disposal with no unacceptable adverse environmental impacts expected.

Figure 1. Location of Stuslaw River sediment samples.



SIUSLAW RIVER, OREGON



U.S. ARMY ENGINEER DISTRICT, PORTLAND

Table 1.

Results of physical analyses of Siuslaw River sediments.

sample	median grain size	sand	finer	volatile solids	TOC
	mm		%		mg/g
S-1	0.34	99.9	0.1	1.3	1.9
S-2	0.26	99.7	0.3	2.3	
S-3	0.45	100.0	0.0	0.9	
S-4	0.33	99.8	0.2	1.5	
S-5	0.30	100.0	0.0	0.5	
S-6	0.34	99.9	0.1	0.5	
S-7	0.22	99.8	0.2	0.8	
S-8	0.32	99.9	0.1	0.8	
mean	0.32	99.9	0.1	1.1	

Table 2.

Results of chemical analyses of a Siuslaw River sediment sample.

sample	metals (ppm)								organics* (ppb)
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	
S-1	2.0	nd	11.0	nd	2.0	nd	5.0	21.0	nd

* detection limits (ppb)
 pesticides 2-6 (60 for toxaphene)
 PCBs 20
 PAHs 20-40
 phenols 20-50

REFERENCES

1. Navigation Branch, Operations Division, U. S. Army Corps of Engineers, Portland District. 1991. Federal Navigation Projects: The Oregon Coast Maintenance Program. (a book describing dredging projects along the Oregon coast)
2. Percy et al. 1974. Oregon's Estuaries. Sea Grant College program, Oregon State University.
3. Reservoir Regulation & Water Quality Section, Planning and Engineering Division, U. S. Army Corps of Engineers, Portland District. Sediment quality database.