

NOAA Hazardous Waste Site Report

Frontera Creek (II-111)
Rio Abajo, Puerto Rico
April 13, 1984

Location and Nature of Site:

Frontera Creek is a small, shallow creek located in Rio Abajo, Puerto Rico (Figure 1). The stream has a slow flow rate and varies in width from two feet near the industrial park to twenty-five feet near the ocean. The creek receives waste discharges from the industrial park and drains into the Caribbean Sea two miles downstream. Raw sewage is believed to be discharged into the creek from a residential area further upstream from the industrial park. Adjacent to the creek are two large brackish water lagoons encompassing approximately 640 acres. Frontera Creek passes between these lagoons in an elevated channel between two man-made dikes. Land in the immediate vicinity of the lagoon is used for cattle ranching and sugar cane production. There is a sand barrier at the mouth of the creek due to high sedimentation and the slow flow rate. The lagoons and much of the surrounding land now belong to the government of Puerto Rico.

Proximity of Chemical Hazard to Marine Resources:

Testing by the Environmental Protection Agency (EPA) during the 1970's found evidence of mercury and lindane (a pesticide) discharges into Frontera Creek. The immediate concern was that these contaminants might enter the aquatic food chain.

Phytoplankton, macrophytes and fish are capable of biomagnifying mercury concentrations in water a thousand times (1). Biological methylation of mercury can occur when it is present in the sediment. This is significant since it can allow mercury to be constantly present at a low level in the water column.

The Puerto Rico Environmental Quality Board found lindane in the effluent of a company named Reedco. Lindane was used at this facility as an additive in some of their shampoos to control lice. Lindane is thought to anaerobically degrade with time.

A water quality and sediment sampling survey performed in Frontera Creek during October, 1979 found mercury levels in the sediments ranging from less than 0.1 parts per million up to 30 parts per million. Mercury in the water column for seven of these samples was measured also. Mercury in the water column ranged from less than 0.2 parts per billion to 1.6 parts per billion. It is evident that most of the mercury in the creek is tied up in bottom sediments. Mercury present in

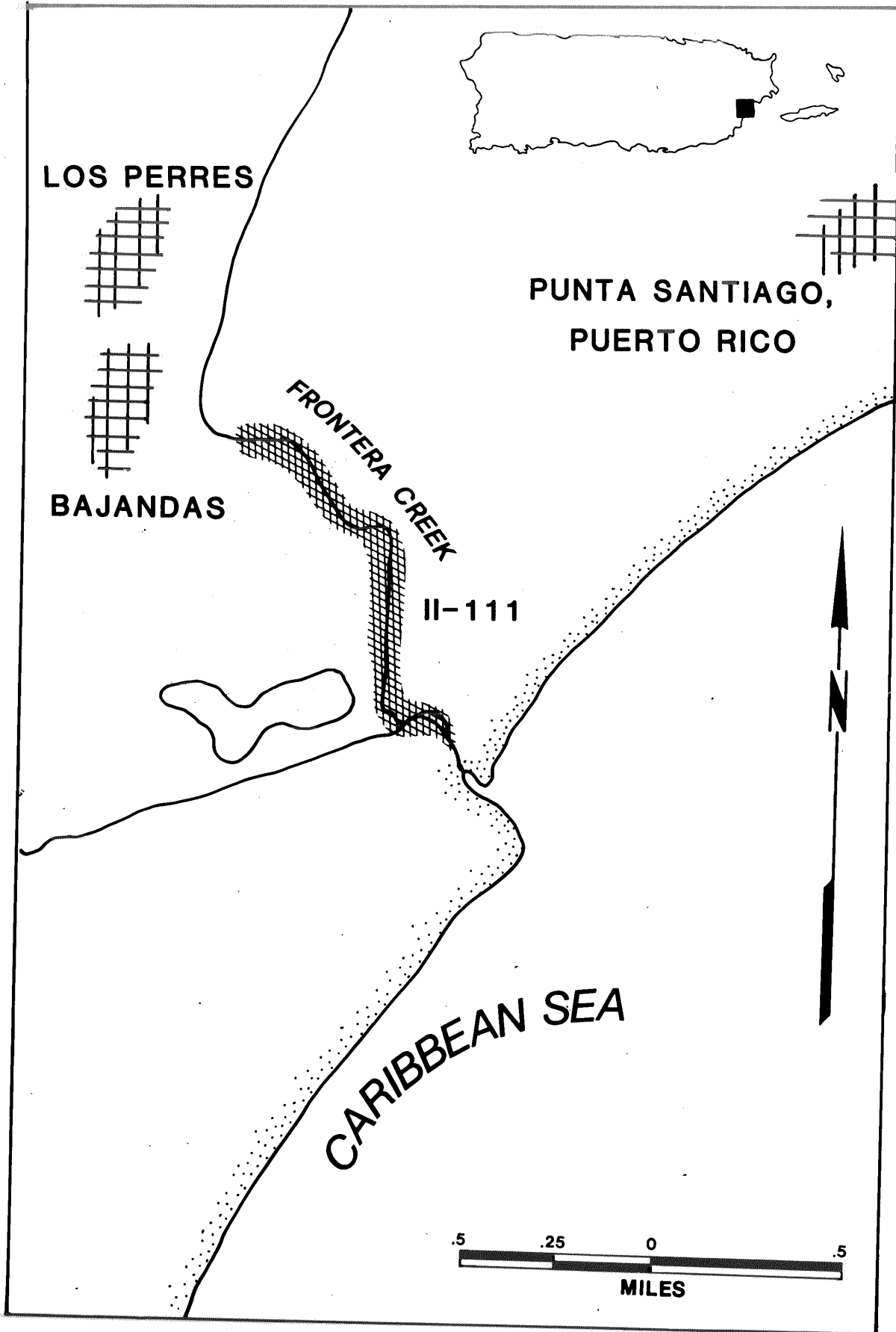


FIGURE 1. Site location.

the water column at the parts per billion level is vastly diluted when it reaches the enormous quantity of Caribbean Sea water. Lindane which was believed to be a problem in Frontera Creek was not found in any of the sediment or water column samples. It is suspected that the lindane has anaerobically degraded with time. The Food and Drug Administration has sampled fish in the lagoon and cows' milk from the area. They found no evidence of mercury or lindane contamination of either. These facts support the belief that little contamination has made it into the lagoons.

As a result of sampling to date, contamination at the site appears to be limited to the deeper bottom sediments. The mercury that is tied up in the sediments could be disturbed during periodic heavy rains and flooding, and cause future mercury releases. Two separate cases of reported dredging of sections of Frontera Creek may have occurred in the past several years (where the dredged material was deposited on the banks of the creek). This could potentially result in mercury releases to the creek and lagoon.

Marine Resources at Risk:

The fishery resources of Puerto Rico are composed mainly of reef-dwelling fish, shellfish, and pelagic fish (Table 1). They generally spawn in the same habitat in which they reside. There are some species whose larval forms are found in the freshwater rivers and canal, but they are not important commercial or recreational species. The commercial and recreational fisheries of Puerto Rico are important to the local economy and support many subsistence fishermen (4).

Table 1. Fishery Resources of the Nearshore Waters
Humacao Area (2-5)

Finfish Species	Adult Habitat	Spawning Area	Nursery Area	Comm. Fish.	Rec. Fish.	Migr. Route
<u>Non-anadromous</u>						
Grunt	x	x	x	x	x	
Snapper	x	x	x	x	x	
Jack	x	x	x	x	x	
Barracuda	x	x	x	x	x	
Mullet	x	x	x	x	x	
Goatfish	x	x	x	x	x	
<u>Shellfish</u>						
Spiny lobster	x		x	x	x	
Conch	x	x	x	x	x	
<u>Other</u>						
Octopus	x	x	x	x	x	

Beaches near the mouth of Frontera Creek are known sea turtle nesting beaches. There is a possibility manatees can be found offshore of this area. Subsistence fishing may also occur offshore in the Caribbean.

The nearshore area in the vicinity of Humacao has been nominated as an estuarine sanctuary (1). Offshore coral reefs and nearby mangrove forests are important habitat for many marine organisms.

The Punta Santiago wetland-lagoon may be the best waterfowl habitat in the eastern half of Puerto Rico. Sightings of 286 species of resident and migratory birds have been occurred in the area. Several endangered species such as the brown pelican and peregrine falcon can also be sighted in the area.

This area is noted as nesting habitat for several species of waterfowl, including the Bahama pintail. Many wading birds, shorebirds, and seabirds can be found here all year, and several species of sea turtle breen and possibly nest in this area. Manatee are relatively common in this region of Puerto Rico (4).

The Puerto Rico Department of Natural Resources expressed the opinion that they feel there has been no impact on ocean marine life from this site. No documentation of marine resource damage was encountered.

Summary of Site-Related Actions:

The Environmental Protection Agency has taken no removal actions at this site. A request for a Remedial Action Master Plan (RAMP) has been implemented. Since no sampling has been performed in over three years, the RAMP will most likely point out the need of a complete sampling program to be performed to determine the present magnitude of site contamination and how it has changed with time. The Puerto Rico Department of Natural Resources is also urging that new sampling be performed. Frontera Creek is considered a low priority site however, for sites on the National Priority List found in Puerto Rico. If results of new sampling show low contamination levels they hope to remove the site from the National Priority list.

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