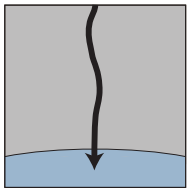
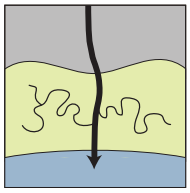
FLUVIAL-TIDAL INTERFACE LOCATION

HISTORICAL



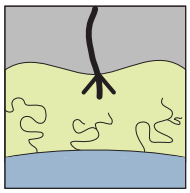
Bay

Channels entered directly into the Bay without passing through baylands.



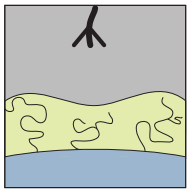
Tidal marsh channel with natural levee

Channels reached the baylands and merged into a tidal channel network.



Tidal marshland with natural levee

Channels entered baylands and dissipated without connecting to a larger tidal channel network.

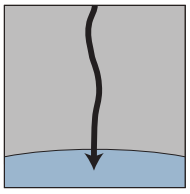


Disconnected on alluvial plain with natural levee

Channels dissipated on alluvial plains or freshwater wetlands prior to reaching the baylands.

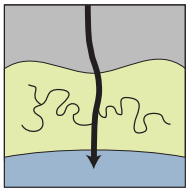
Circles denote creeks with natural levees, which indicates a high watershed sediment yield.

CONTEMPORARY



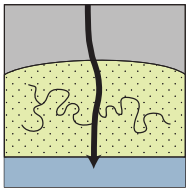
Bay

Channels enter directly into the Bay without passing through baylands.



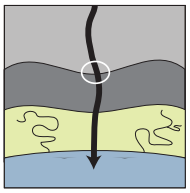
Tidal marsh channel

Channels reach the baylands and merge into a tidal channel network.



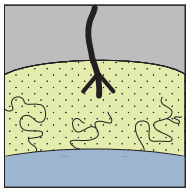
Tidal channel through diked baylands

Channels enter diked baylands and merge into a tidal channel network.



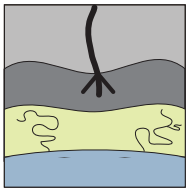
Tidal channel through bayfill

Channels flow through historical baylands that have been filled before reaching the Bay.



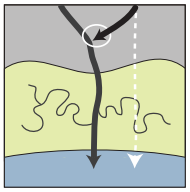
Diked baylands

Channels enter baylands that are now diked (e.g. salt ponds, managed marsh) but dissipate without connecting to a tidal channel network.



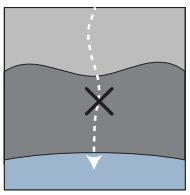
Bayfill

Channels enter and then dissipate within filled historical baylands.



Tributary channel

Channels that historically reached the baylands but have been re-routed to flow into another historical channel prior to reaching the baylands.



Channel no longer present

Channels that were historically present but have been filled.

FLOOD CONTROL 2.0 SFEI AQUATIC SCIENCE CENTER
SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER

METHODS

What sources were referenced?

For classification of the historical (mid-19th century) fluvial-tidal (F-T) interface types, we used EcoAtlas and historical ecology studies completed throughout the Bay which draw on historical documents including U.S. Coastal and Geodetic Survey t-sheets, U.S. Geological Survey maps, U.S. Department of Agriculture soil surveys, Mexican land grant maps, General Land Office public land surveys, and other sources. For contemporary F-T interface classification, we used SFEI's 2011 and 2014 Bay Area Aquatic Resources Inventory (BAARI) and SFEI's 1998 Modern Baylands layer.

Which channels were included in mapping?

Historical channels were included in the mapping if the channel either connected to the tidal marshlands, tidal marsh channel or directly to the Bay. Channels that were historically disconnected from the baylands in the mid-19th century and now make it directly to the tidal marshlands, tidal marsh channel, or Bay (using SFEI's 2014 BARRI) were also included. However, if a channel was disconnected from the tidal marshlands historically and is still currently disconnected it was not included in this study. If a channel was historically disconnected and is now re-routed to be a tributary to a larger system, it was also not included in the mapping. Only historical channels choosen for this study were given a contemporary F-T interface type. Therefore, channels which presently interface with the baylands but did not historically (e.g. recently built channels) are not included in the mapping.

How was the F-T interface determined?

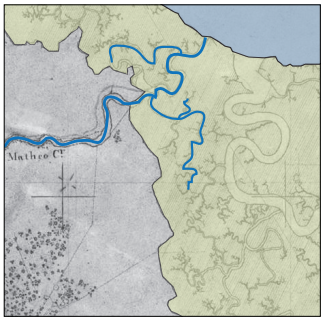
Using historical maps, the historical F-T interface was defined by the location at which a stream channel first intersects with either the tidal marshlands, tidal marsh channel, the Bay, or at a channel's terminus for disconnected channels. A small sub-set of the historical channels also had a natural levee present at their F-T interface. However, this determination was not systematically captured for all areas of the Bay. The level of detail in mapping also varied for the historical baylands layer.

The contemporary F-T interface type was defined by where present-day channels either intersect with the historical bayland extent, merge with another historical channel, or are no longer present (using SFEI's 2014 BAARI). Contemporary channels which intersect with the historical baylands extent were further classified by determining the majority of the land type adjacent to the channel before it reaches the Bay. If two contemporary channels merge after entering the historical baylands extent, the land type designation for the smaller tributary was determined from the point of entry to the point of channel intersection. The land type was determined using SFEI's 1998 Modern Baylands layer and 2011 BAARI, which is separated into diked baylands (diked, leveed, or managed baylands), bayfill, or tidal marsh that is still intact or has been restored from historical conditions. While the majority land type was choosen to define the F-T interface type, it is recognized that many channels go through a combination of land types before reaching the Bay.

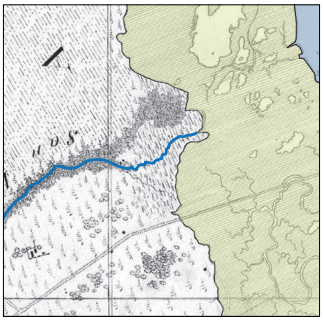
The F-T interface locations on the map represent the *historical* F-T interface point. In some cases a stream channel has been re-routed, altering the contemporary F-T interface location (e.g. San Leandro Creek), however this is not reflected in the map symbol locations.

Bay

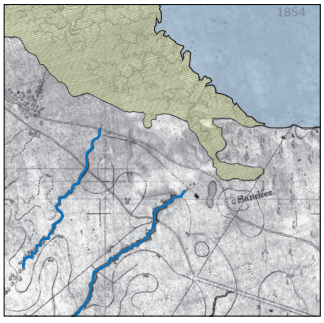
Tidal marsh channel



Tidal marshland



Disconnected



F-T INTERFACE OCCURRENCES

	Historical F-T Interface	# Channels		Contemporary F-T Interface	# Channels
●	Bay	38	●	Bay	11
◎	Tidal marsh channel (with natural levee)	58 (5)	●	Tidal marsh channel	31
◎	Tidal marshland (with natural levee)	163 (3)	▶	Tidal channel through diked baylands	94
◎	Disconnected on alluvial plain (with natural levee)	83 (3)	▶	Tidal channel through bayfill	85
			■	Diked baylands	19
	Total channels	353	■	Bayfill	3
			▶	Tributary channel	6
			✕	Channel no longer present	104
				Total channels	353

Among the total 353 historical channels mapped, a range of F-T interface types were present in mid-19th century. While there are a small number of present day channels that have the same F-T interface type as they did historically, the F-T interface type for the majority of channels has changed with alterations due to agriculture and development over the last 150 years. Many of the channels that were historically disconnected have been extended to connect to the baylands (83). Also, a large portion of channels (104) are no longer part of the landscape.

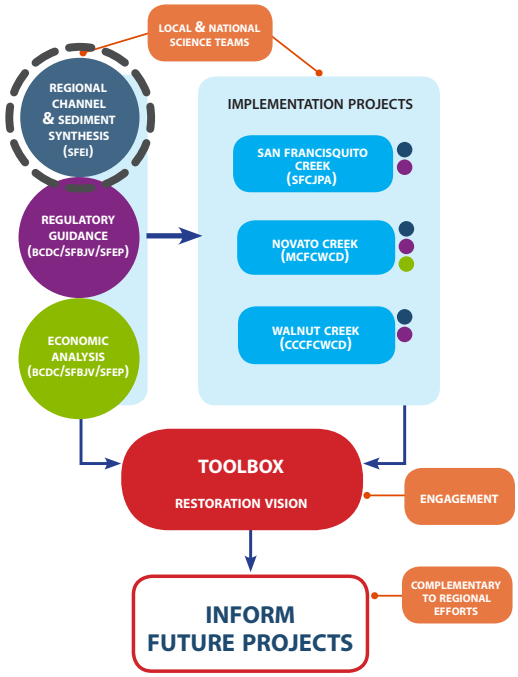
Thesechannel modifications over the last 150 years have implications for channel management in relation to sediment dynamics, flood control, and ecological functioning. These maps represent a starting point at understanding regional scale modifications, with additional analysis and implications for future Bay Area channel management forthcoming.

WHAT'S NEXT?

This effort is a component of an ongoing multi-year project, called Flood Control 2.0. Flood Control 2.0 brings together diverse agencies and stakeholders in an effort to improve the management of flood control channels around the Bay. The project will provide tools to help managers redesign channels that meet current and future flood control and sediment management needs while improving the ecological function and resilence of these systems.

The historical and contemporary F-T interface mapping is part of the Regional Channel & Sediment Synthesis effort. In addition to the mapping illustrated here, SFEI is gathering data related to contemporary sediment supply, storage, & re-use for a subset of flood control channels. Collectively, these components will conclude with a regional channel conceptual model and classification scheme (or typology).

Final project completion for Flood Control 2.0 will be in 2016.



MORE INFORMATION: www.sfei.org/projects/flood-control-20

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY · SAN FRANCISCO ESTUARY PARTNERSHIP · SFEI · bcdc · SAN FRANCISCO BAY JOINT VENTURE · COUNTY OF MARIN · Contra Costa County Public Works Department · SAN FRANCISQUITO CREEK JOINT POWERS AUTHORITY