

## Now that you've arrived at sea level,

walk over to the South Bay shore. Here, you can begin a seven-stop tour of the major hydrologic features of the Bay and Delta, and examine how the Model works along the way.

### ④ SOUTH BAY

These still, shallow reaches of the Bay lack the strong tidal action and the cleansing flushes of powerful river inflows found in the estuary's more northerly waters. The lack of water movement encourages pollutants, sediments and salts to accumulate here — leading to Model studies on topics such as salinity buildup and where to locate urban wastewater outfalls. In the distance, look for the pumps and sumps used to generate ocean tides. Use video kiosk to learn more.

### ⑤ CENTRAL BAY & OAKLAND HARBOR

Among the familiar landmarks, you'll see the deep angular shipping channels of the Port of Oakland, the areas of bayfill hosting Treasure Island, Alameda, San Francisco and Oakland Airports, and the Bay's narrow opening into the Pacific. Here is the deepest, busiest and most urbanized part of the Bay, frequented by giant container ships, oil tankers and yachts. The ports and marinas on these Central Bay shores must be regularly dredged to enable vessels to pass without grounding. All dredging in San Francisco Bay is carefully planned and managed by the U.S. Army Corps of Engineers in addition to other state and regional agencies. As the size and draft of world-class container ships increase (the largest require at least 50 feet), channels must be deepened — changing water salinity, velocity and circulation patterns. Scientists and port planners have used the Model to simulate the effects of these changes on existing conditions. Look for the notched fingers of Richmond's shoreline piers, where oil tankers load and unload their liquid wares. Use video kiosk to learn more.

### ⑥ SAN PABLO BAY

The northern shores of San Pablo Bay host more rural land uses — grassy pastures protected from flooding by earthen embankments called levees, and traversed by the meanders of the Napa River. Long ago, Costanoan and Miwok Indians lived in the surrounding uplands — attracted by plentiful fish and fowl, and reliable water supplies. Use video kiosk to learn more.

### ⑦ CARQUINEZ STRAIT

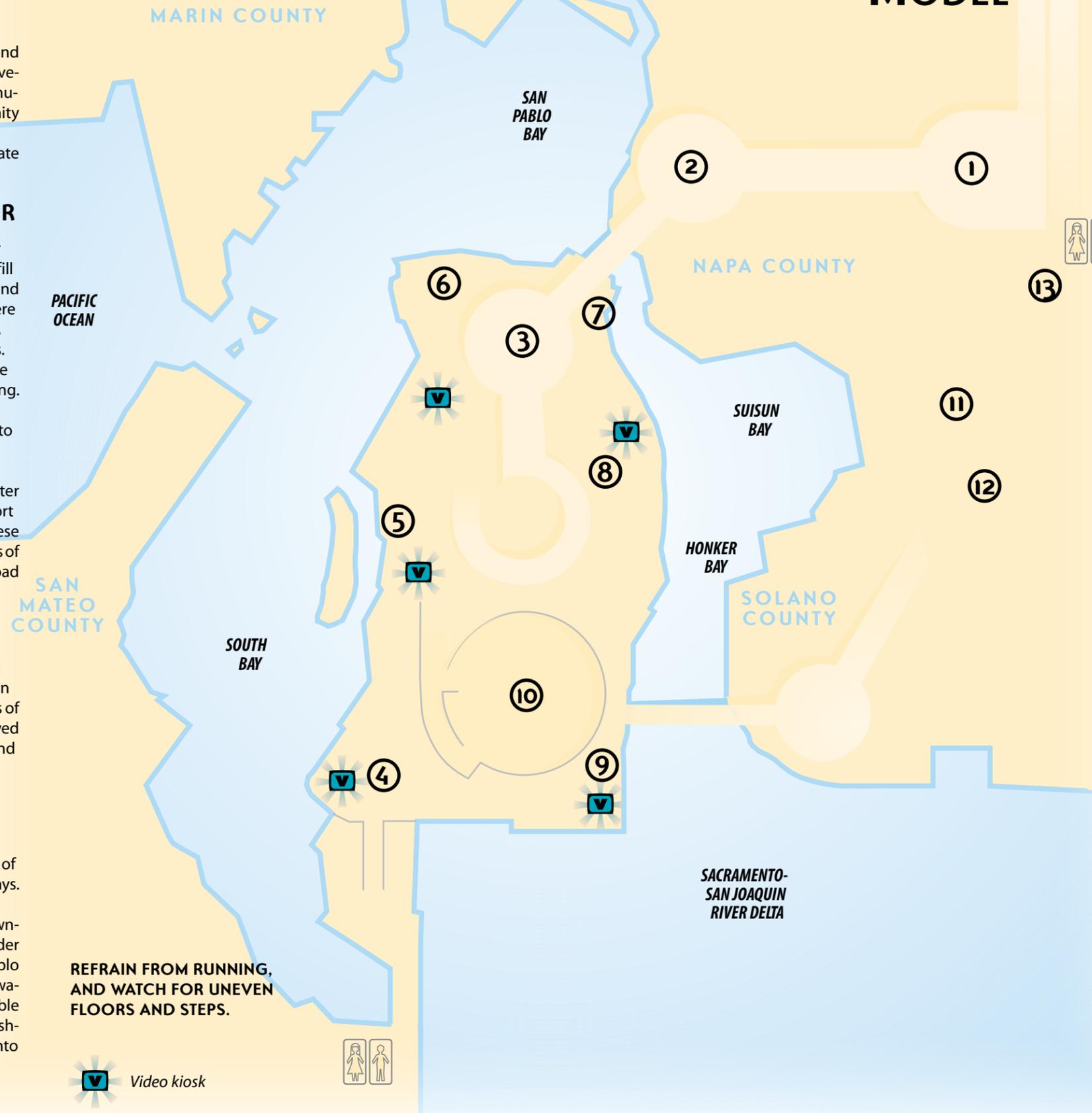
The narrow Carquinez Strait is the second-deepest part of the estuary at 110 feet — connects San Pablo and Suisun Bays. A tongue of heavier saltwater moves up the strait with the tides, overlaid with a layer of lighter freshwater flowing downstream. This ecologically rich mixing zone (see Null Zone under *Lingo & Gizmos*) spreads over the much larger area of San Pablo Bay, until upstream dams and diversions reduced the freshwater barrier holding back the tides. The model was an invaluable tool for studying the delicate dynamics of the estuary's freshwater and saltwater mix as the saltwater intrudes farther into the Delta — threatening farm irrigation and drinking-water supplies.

**REFRAIN FROM RUNNING, AND WATCH FOR UNEVEN FLOORS AND STEPS.**

 Video kiosk



# SAN FRANCISCO BAY-DELTA MODEL



### ⑧ SUISUN BAY

Notice the expanse of green - the largest remaining tidal wetland in California (72,000 acres) - much of it brackish (salt-water and freshwater). This nutrient rich zone is home to a variety of fish and birds such as halibut, perch, cormorants and various species of gulls. Use video kiosk to learn more.

### ⑨ SACRAMENTO – SAN JOAQUIN RIVER DELTA

Look for the deep channels of the Sacramento and San Joaquin Rivers which join in the Delta before entering the Bay. This rich river delta drains over 40 percent of California's fresh water. It holds the pumps, dams and canals that supply irrigation water to over 4.5 million acres of farmland and water to over 22 million people. Over half of the rivers' inflow is diverted each year as cities, farms and wildlife compete for this limited resource. At the turn of the century, farmers diked and drained most of the Delta to create over 60 islands surrounded by 1100 miles of levees. These islands are made up of peat, a fine-grained organic soil. This fragile soil has subsided over the many years. As a result many of the islands in the Delta are 8-15 feet below sea level — inspiring Model studies of the potential impacts from levee failure and flooding. Use video kiosk to learn more.

### ⑩ THE CORPS OF ENGINEERS AT WORK

Learn about the U.S. Army Corps of Engineers and its work to protect wetlands, control flooding, manage natural disasters and ensure the navigability of our waterways. Other exhibits introduce different Bay habitats and the creatures that live in them.

### ⑪ MARINSHIP 1942★1945

Venture into Sausalito's past when the Bay Model building was part of a major World War II shipbuilding facility. During this three-year period Marinship produced 93 Liberty ships and T-2 tankers.

### ⑫ RECYCLE THIS MAP

Please help us to conserve resources by returning this brochure for re-use. Simply drop this map into the box near the exit door!

### ⑬ BOOKSTORE OPERATED BY THE BAY MODEL ALLIANCE

Stop by the Bookstore to browse or purchase books on seashore life, maritime history, sailing, shorebirds, coastal access, the aquatic ecosystem and more. Proceeds benefit educational programs at the Bay Model.

## LINGO & GIZMOS

Your key to the language, layout and technology of the Model.

## COLORS

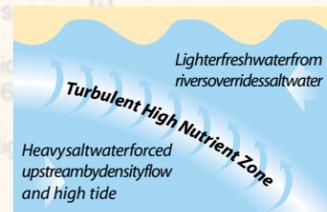
Model colors help you identify different land uses around the Bay.

Red = roads & bridges;  
Dark brown = uplands;  
Light green = marshes, mudflats & diked islands;  
Light brown = cities & towns;  
Gray = industry;  
Dark green = parks;  
Blue = water

## COPPER TABS

The 250,000 copper tabs rising out of the Model floor compensate for the impact of its distorted scale. Because the Bay is so shallow, if the same scales were used for both the horizontal and vertical aspects, the water in the Model would not be deep enough to measure. The vertical scale is ten times greater than the horizontal scale, further exaggerating the Model's depth. Due to this difference, the water in the Model flows faster than the actual Bay. The copper tabs create water flow resistance so the Model can be calibrated to reflect actual conditions in the Bay.

## NULL ZONE



Freshwater and salt-water mixing in the null zone create turbulence, stirring up nutrients and nurturing plankton growth. The abundance of these microscopic plants and

animals attract fish and other larger organisms, making this zone one of the most ecologically productive parts of the Bay-Delta system.

## SCALES (MODEL TO REAL BAY & DELTA)

Horizontal 1 ft. = 1000 feet  
Vertical 1 ft. = 100 feet  
Velocity 1 ft./sec. = 10 ft./sec.

## AFTER EXPLORING THE MODEL,

take a walk through the Gallery and Visitor Center or venture outdoors.

## VISITOR CENTER

The Bay Model houses a Regional Visitor Center for the U.S. Army Corps of Engineers. The Center offers public and educational programs of environmental, historic and cultural interest, as well as opportunities to volunteer.

## GALLERY

Enjoy the paintings and photographs by local artists hung on the Gallery walls. Examine two separate fish tanks — one fresh and one salt — and their respective fish species.

## DOCK

Step out on the dock and see the *Raccoon* and the *Dillard* — two Corps vessels used to collect debris and other floating hazards in the Bay.

## TOURS

Docent or ranger guided tours are offered by reservation for groups of 10 or more.

Audio tours of the Model are available in English, French, German, Japanese, and Spanish. Audio Tours are also available for the visually impaired.

The Park Manager welcomes your comments.

## BAY MODEL VISITOR CENTER

2100 Bridgeway  
Sausalito, CA 94965

(415)332-3871

(415)332-3870 (recorded information)

Funds for printing this brochure were made possible by the Friends of the Bay Model



US Army Corps of Engineers



BAY MODEL ALLIANCE

# SAN FRANCISCO BAY-DELTA MODEL

## MAP & SELF-GUIDED TOUR

## WELCOME TO THE BAY MODEL...

The San Francisco Bay/Delta Model is a three dimensional model of the San Francisco Bay and Sacramento/San Joaquin Delta. It was built in 1957 by the U.S. Army Corps of Engineers as a scientific tool to test the impact of proposed changes to the Bay and related waterways. Today, the engineering and research mission has evolved into computer-based models located in San Francisco, but the Bay Model enjoys a new life as an educational facility on the natural and cultural history of the San Francisco Bay Watershed. The U.S. Army Corps of Engineers continues to operate the Bay Model to interpret the critical missions of the Corps in environment, navigation, and flood control throughout the watershed.

The Bay Model is impressive! This one-of-a-kind facility once tested salt-water intrusion, movement of water-borne pollution, oil spills and changes to tidal flows as a result of barriers or landfill. The simulated tidal action and currents in the Bay Model change every few minutes and can recreate a 24-hour tidal cycle in 14.9 minutes.

The Visitor Center staff continues to provide public programs and school tours. The staff strives to focus on environmental issues relevant to the Bay and Delta region.

## WALK UP THE RAMP

to sample the Model's introductory exhibits. Just follow the numbered stops marked on the map inside.

## ① FROM THE MOUNTAINS TO THE SEA

Explore the natural history of our watershed from the Sierra Nevada Mountains to the San Francisco Bay.

## ② INTRODUCTORY VIDEO

Get a quick answer to all your questions about the Model and the Bay by watching this short video. Then walk out the other side of the theater to see the Model itself.

## ③ WOW! IT'S BIG AND "WHY WAS THE MODEL BUILT?"

Locate the Pacific Ocean below, you'll see the open expanses of San Francisco's three interconnected bays — South, Central and San Pablo. Locate Suisun Bay and the Delta with its labyrinth of river channels, sloughs and islands.

Proceed to the next overlook and learn about why the model was actually built. Hear first hand accounts from one of the model builders, one of the early engineers and from an engineer who worked on the model just prior to 2000.



US Army Corps of Engineers