Adapting to Rising Tides

## Port of Oakland - Seaport Vulnerability and Risk Profile

The Port of Oakland's maritime facilities include berth terminals, railway terminals, 20 deep water berths, and 35 container cranes, and the site is served by local roads, interstates, warehouses and intermodal rail yards. It is owned and operated by the Port of Oakland, which is an autonomous department of the City of Oakland that is governed by a Board of Commissioners and funds its own operations. The Port of Oakland's seaport is the fourth busiest container port in the United States and handles 99 percent of containerized goods moving through Northern California. The Port's primary trading partners are Asia, Europe, Australia/New Zealand/South Pacific Islands and domestic and military trade. The container volume for 2011 was valued at $24,604,000 for imports and $14,533,000 for exports. The Port is linked to the region, state, and nation through rail lines and roads such as Interstate 880.

## Key Issues

While most Port facilities themselves are not particularly vulnerable to climate impacts, sea level rise and storm events will affect rail and interstate access to and from the seaport in the near term. Temporary or permanent disruption of rail and interstate access to the seaport will result in economic impacts to the city, region, and state, including disrupting jobs that are both directly and indirectly related to the seaport. Disruption of rail access at the seaport would result in more trucks being necessary to move cargo, which would have impacts on the surrounding neighborhoods, local roadways, and interstates, as well as on air quality.

## Vulnerabilities

**Timing**

- Mid-century: Rail and interstate access will be exposed to storm events with 16" of sea level rise
- End-of-century: Most of the maritime facilities will not be exposed to impacts until 55" of sea level rise.

**Physical and Functional Qualities**

- Rail that serves the seaport is sensitive due to its location near the shoreline and its elevation.
- As a corridor, rail cannot operate if any of the line is exposed to sea level rise or storm event flooding.
- Interstate access to the seaport is sensitive due to its location near the shoreline and its elevation.
- Both the rail and interstate corridors lack redundancy, with no alternative route for rail cargo and little additional capacity for truck traffic on alternative interstates.
- Rising groundwater increases the risk of liquefaction, which could damage runways or cause levee failure.
- One of the Port's functions is to transport fresh agricultural products, which would spoil if flooding caused delays or closures.
- In the event of an impact over a large portion of the Port, there could be insufficient capacity at the marine terminals to handle displaced shipping needs.

**Management Control**

- Different entities, including private companies as well as the Port, own and manage the facilities that comprise the Port, as well as vital transportation links such as rail (owned by Union Pacific and Burlington Northern Santa Fe) and highways (Caltrans is responsible for Interstate 880); these entities will need to work together to develop and implement adaptation strategies.

## Consequences

**Scale**

- Adjoining properties and neighborhoods
- City of Oakland
- Region
- National and International

**Ecosystem Services**

- Contaminants present at various sites within the Port could be released into the Bay with floodwaters, or contaminate rising groundwater.
- If rail is disrupted, an alternative may be to increase the use of trucks to bring goods to and from the Port, with associated air quality impacts.

**People**

- Temporary or permanent disruption at the seaport would affect people's employment and capacity to ship and receive goods.
- Disruption of rail access to the seaport could result in new truck traffic within the surrounding neighborhoods and congestion on the local roads and Interstate system.

**Economy**

- The Port of Oakland's seaport imported over $24 million of container cargo and exported over $14 million of container cargo in 2010.
- The seaport supports employment in a variety of sectors, ranging from directly Port-related jobs such as longshoremen, to rail & truck operators, to farmers in the Central Valley. In 2011, cargo activity at the Port generated 28,833 direct, induced, and indirect jobs in the Bay Area.