

# GREEN/DUWAMISH RIVER POTENTIAL FLOOD EVENT

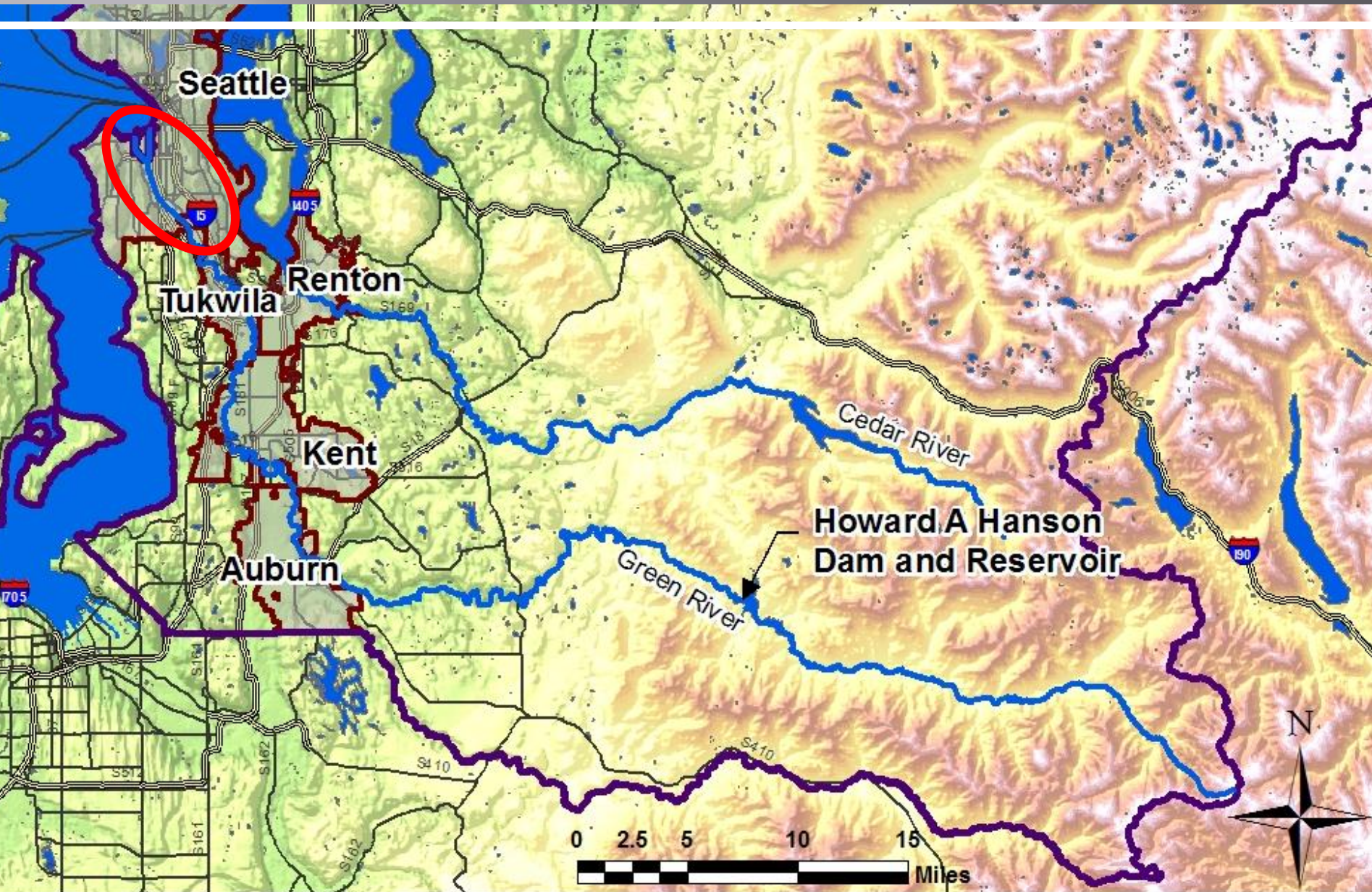
Impacts to the Port of Seattle and  
Neighboring Businesses



# Background

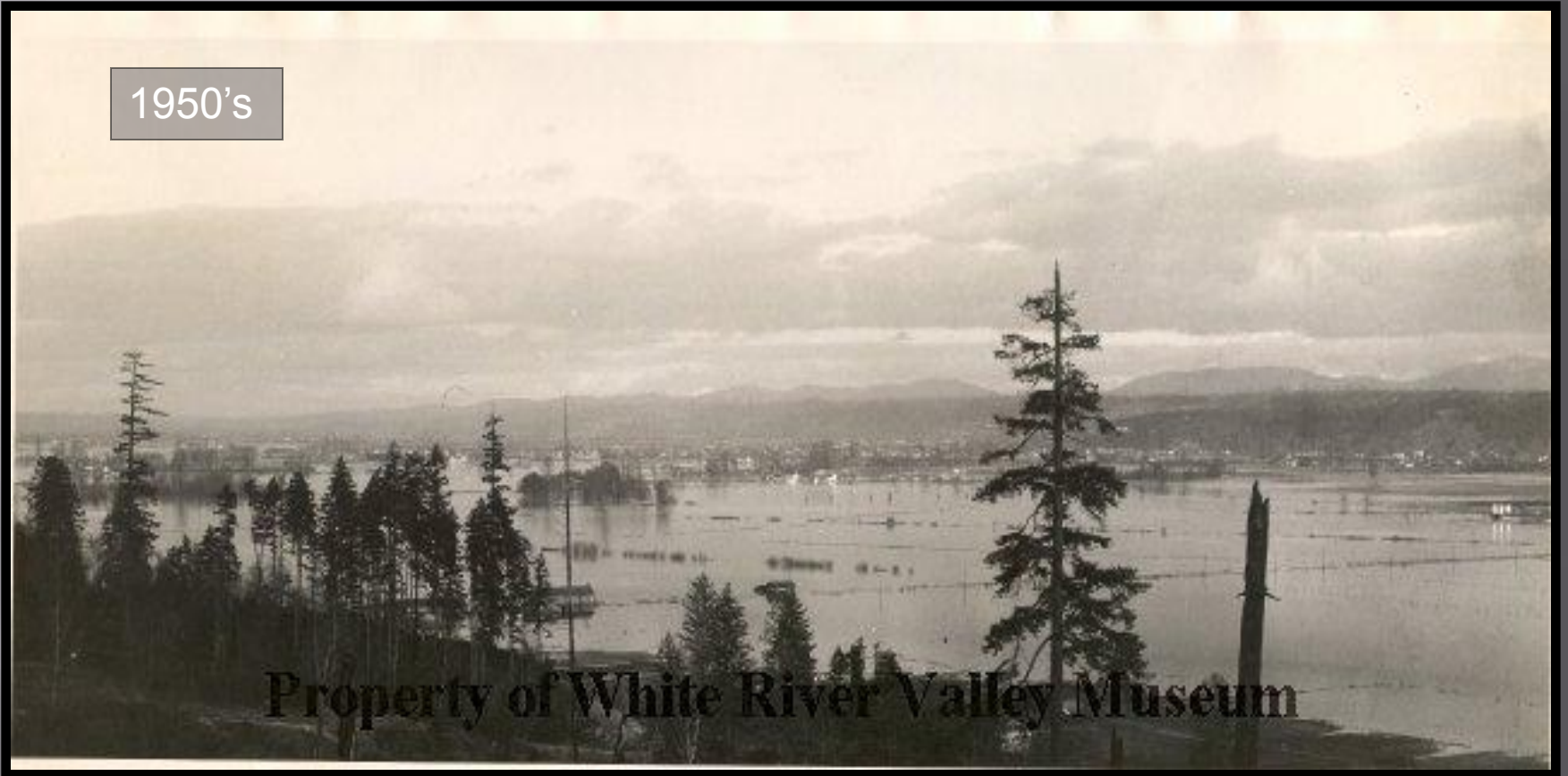
- ▣ Howard Hanson Dam was built in 1962 for flood control in the Kent Valley
- ▣ The Valley is now home to industrial, commercial, manufacturing, retail and residential units
- ▣ Plus roads, bridges, railroad lines, electrical substations, fuel pipelines, sewage treatment plants, hospitals, schools and more
- ▣ Damage discovered during the Jan. '09 rain event will limit the dam's effectiveness until a permanent repair is in place
- ▣ A repeat '09 rain event will result in significant flooding downstream

# Green River Watershed



# History of Local Flooding

1950's



Property of White River Valley Museum

# January 2009 Flood

- ▣ Inflow to the dam reservoir peaked at 30,500 cubic feet per second (cfs); all outlets closed
- ▣ Pool of Record - elevation 1,188.9 feet (above sea level)
- ▣ Dam water storage capacity kept the Auburn gauges below 12,000 cfs (flood stage)
- ▣ Overall, the dam kept river flow rates just below the over-topping/breach level
- ▣ May 2009 tests showed that the Dam can no longer safely provide this protection

# HHD Reservoir Levels

- ▣ 1206' \_\_\_\_\_ Spillway
- ▣ 1189' \_\_\_\_\_ Record Pool, Jan 2009
- ▣ 1167' \_\_\_\_\_ Conservation Pool, May 2009 test
- ▣ 1155' \_\_\_\_\_ Current "safe operation" level
- ▣ 1075' \_\_\_\_\_ "Empty" Pool

# Current Work at HH



# Current Situation

- ▣ Army Corps is installing grout as a temporary fix while searching for a permanent solution
- ▣ Cannot predict how well temporary “fix” will work, cannot fully test until next spring
- ▣ Odds of flooding as high as 1:3 for a single event during the 2009-10 season
- ▣ King County and City of Renton have pre-declared an emergency
- ▣ State Office Emergency Management at Alert Level 2



# Current Situation, cont.

- ▣ May take 5 years or more for a permanent solution, probably a cutoff wall
- ▣ 400,000 sandbags have been ordered
- ▣ As many as 35,000 people may need to be evacuated from flood plain
- ▣ County spending \$35 million on mitigation efforts
- ▣ Proposed raising of levees may not be possible
- ▣ FEMA says severe flooding in the area could cause in excess of \$4 billion in damage

# Regional Preparations



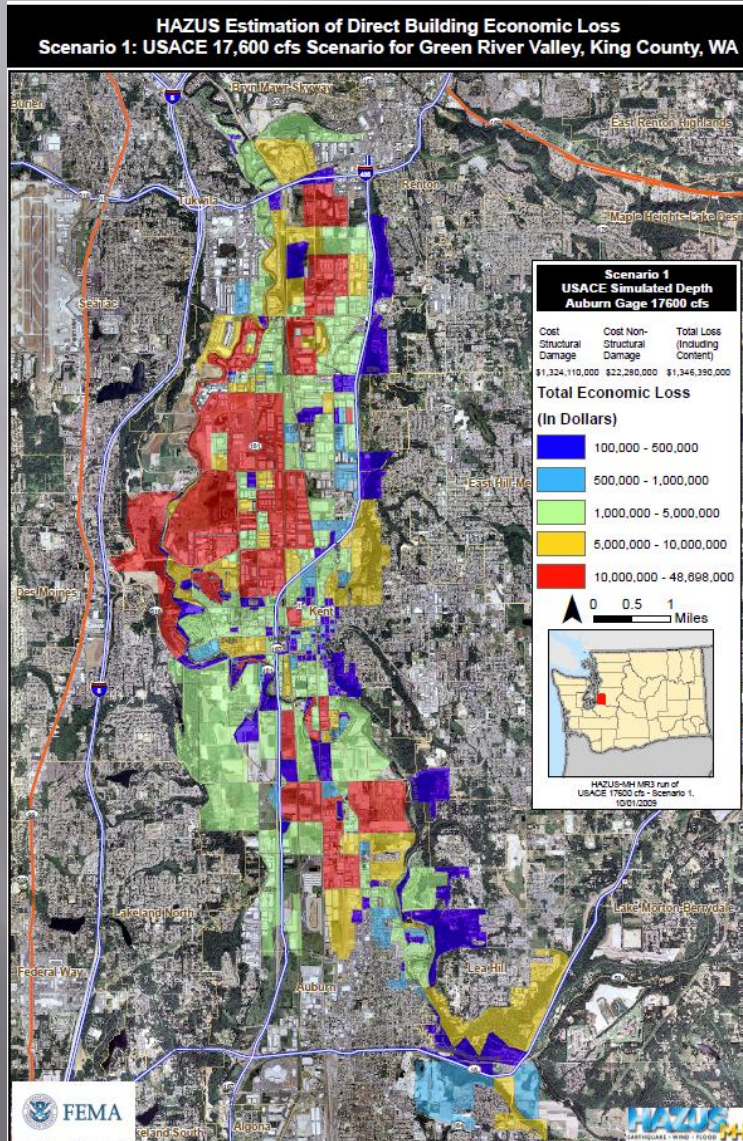
# NOAA Winter Weather

- ▣ NOAA has predicted we are in a mild El Nino this winter
- ▣ El Nino can mean average precipitation totals may be slightly lower for the year
- ▣ Does not mean we will not have rain and lots of it
- ▣ In 4 of the last 5 El Nino years, there has been major flooding in the region

# Maps/Scenarios

- ▣ Scenario 1: 17,600 cfs river flow rate at Auburn gauge
- ▣ Scenario 2: 12,800 dam discharge rate (this is water released from the dam, it will combine with an unknown volume of water from downriver tributaries resulting in a river flow rate higher than the 17,600 in Scenario 1
- ▣ Local flood planning has included a 25,000 cfs level as well

# Losses to Buildings at 17,600 cfs



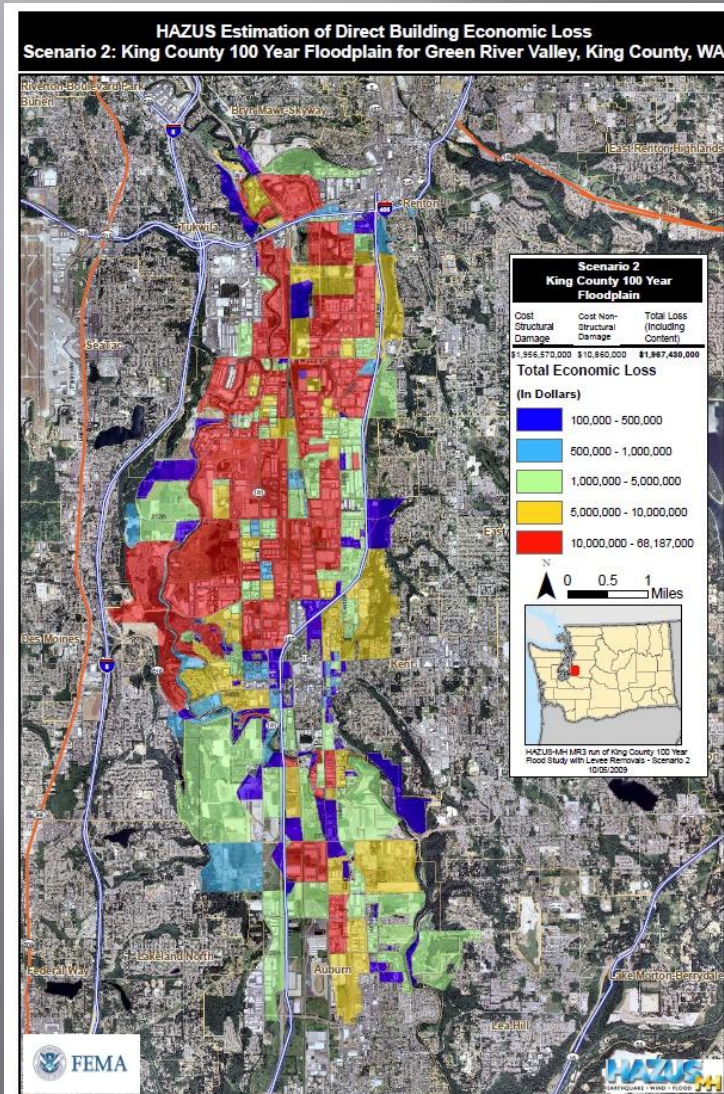
## SCENARIO 1:

Losses in the flood plain with intact levees

Direct building economic losses

Overtopping only, no breaks in levee

# Losses to Buildings in Scenario 2



## SCENARIO TWO:

At 12,800 HH Dam discharge rate

Green = \$1m - \$5m

Red = \$10m - \$68m

# Potential Port Impacts

- ▣ SEAPORT:
- ▣ Increased siltation in the Turning Basin and navigable waterway
- ▣ Large debris and hazards to navigation washed downriver into Duwamish and Elliott Bay
- ▣ Potential damage to vessels at Harbor Island Marina - including Police Boat
- ▣ Storm water back-up at area facilities
- ▣ Contamination of area facilities if upriver Waste Water Treatment Plant fails

# Potential Port Impacts

- ▣ AIRPORT
- ▣ Electrical power outages at airport and other facilities that could last several days or weeks
- ▣ Shut down of jet fuel lines to airport
- ▣ A recent study showed 1/2 of all airport employees (POS and all others ) live in impacted areas – either in the flood zone, or use transportation routes through it



# Potential Port Impacts, cont

- ▣ ALL
- ▣ Disruption to transportation routes for trucks, trains, bridges and roadways
- ▣ Commuters from the south will have difficulty getting to work
- ▣ Closure of Distribution Centers in Valley may impact movement of freight and air cargo
- ▣ Staff absenteeism for employees living in potential evacuation areas

# Potential Port Impacts, cont.

- ▣ 80% of the region's food storage is in the valley
- ▣ Warehouse distribution system is the largest in the Northwest – so not possible to just move things elsewhere
- ▣ State of Alaska depends on cargo flights from SeaTac for winter supplies
- ▣ Local companies and jurisdictions are looking to the POS for assistance, e.g. relocation sites

# Evacuation and Sheltering

- ▣ County estimates as many as 35,000 people may need to be evacuated from the Valley
- ▣ They are planning on needing shelter accommodations for up to 5000
- ▣ King County has requested rental of Smith Cove Cruise Terminal as a temporary shelter

# Planning and Preparation

- ▣ POS Working groups are being established for:
- ▣ Keeping staff, customers and public informed
- ▣ Identifying potential staffing problems
- ▣ Keeping air cargo and freight moving through the area
- ▣ Land use issues
- ▣ Utility concerns – electricity, natural gas, jet fuel, waste water
- ▣ Debris management, clean-up activities
- ▣ Ensuring coordination of agencies and that Port issues are considered in the regional planning process

# Emergency Declaration

- ▣ Although PSE has plans for maintaining electric power supply to STIA, there is increased risk of extended interruption
- ▣ RCW 39.04 and Res 3605 recognize emergency in “real, immediate threat to the proper performance of essential functions”
- ▣ CEO declared emergency on October 16
- ▣ Authorizes procurements and staff effort to establish emergency backup power generation at STIA