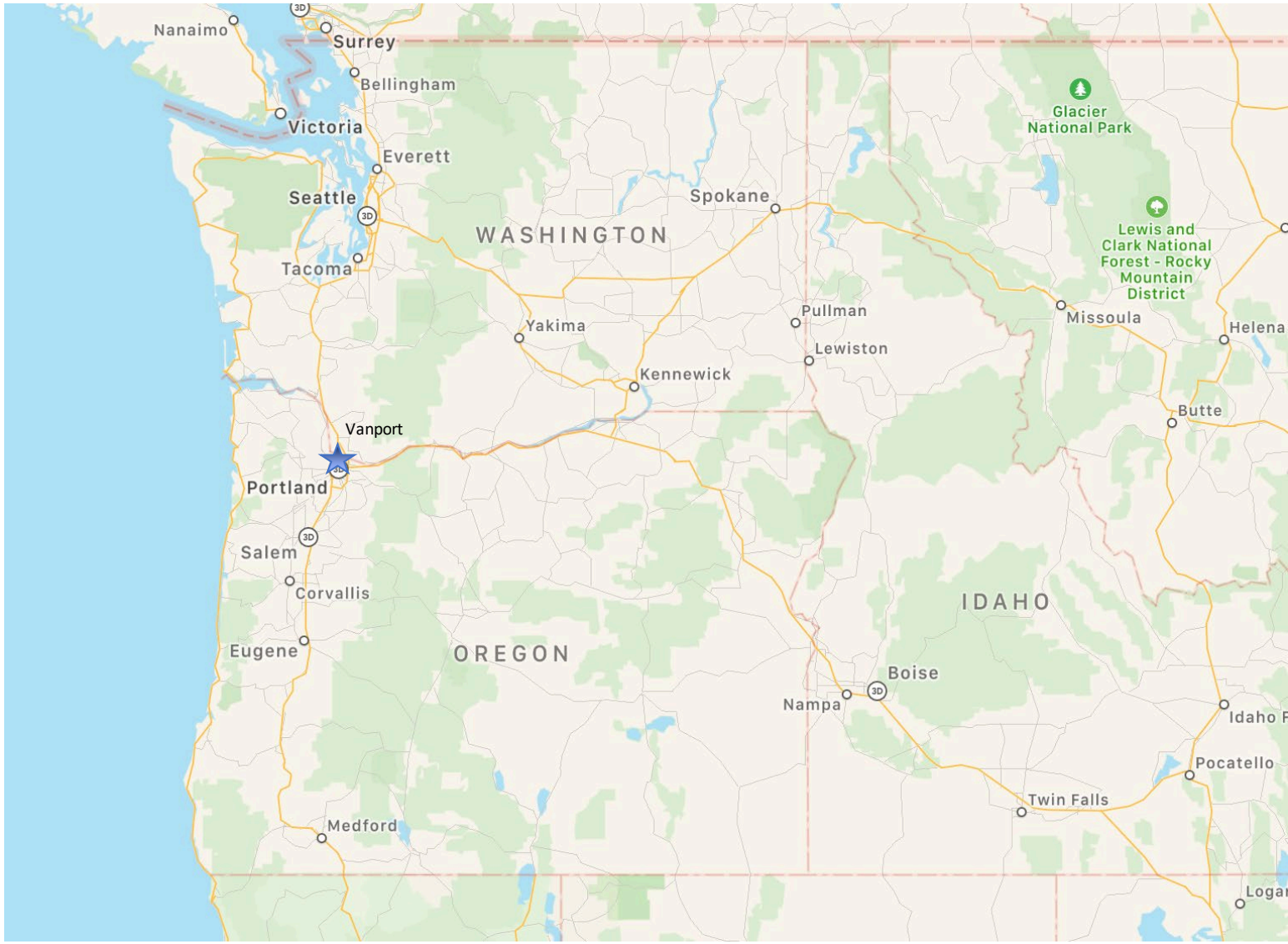
70th Anniversary
Columbia River Dike Failure
Vanport, Oregon

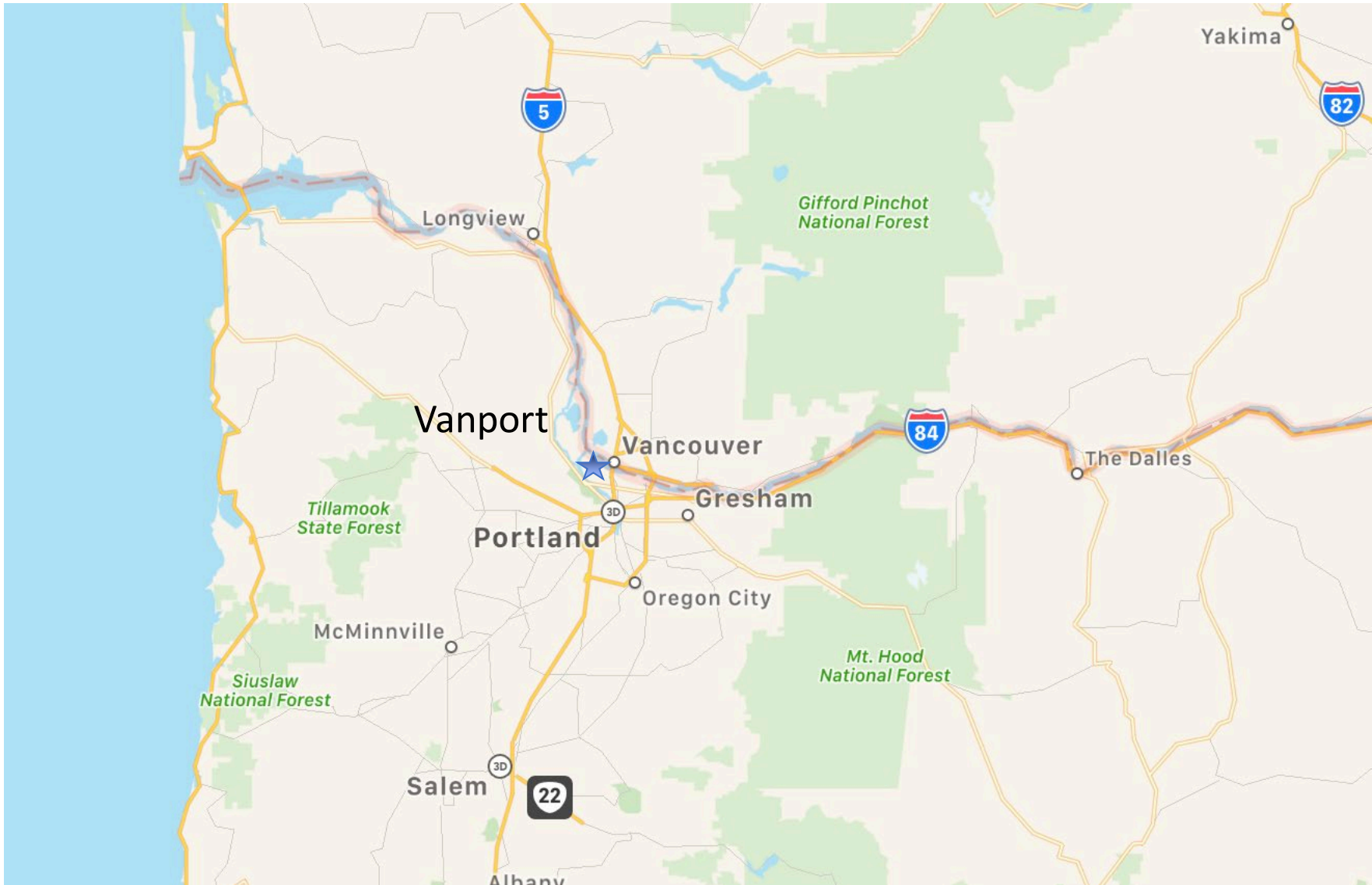
ASDSO Dam Safety 2018
Seattle, WA
September 2018

Steve Durgin
USDA-NRCS

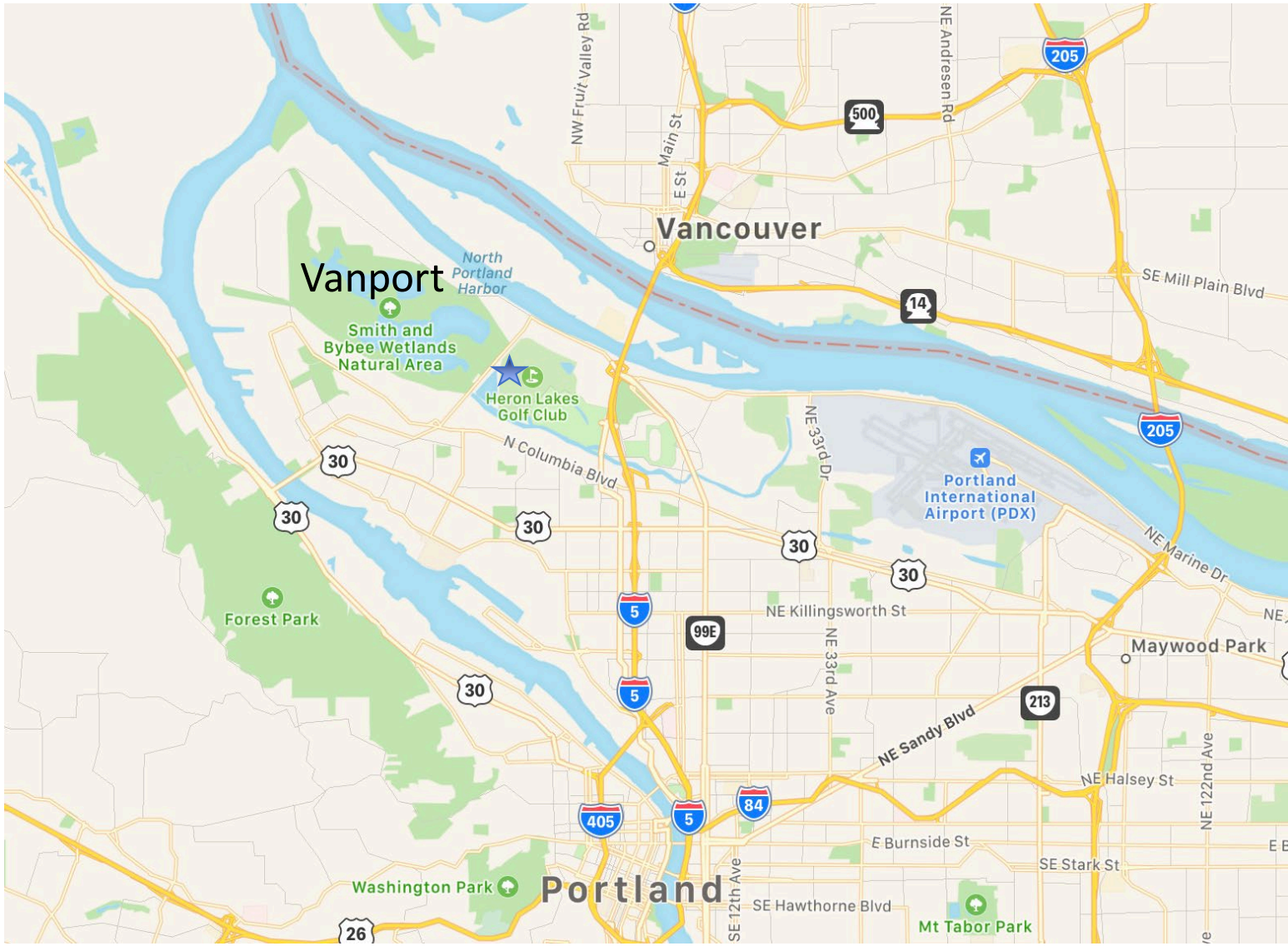
Vanport - Location



Vanport - Location



Vanport - Location



Columbia River Drainage

Columbia River

Columbia River

Largest River in North America draining into the Pacific Ocean

258,000 square mile drainage area

1,243 miles long

250,000 cfs typical daily discharge at the mouth

Drains parts of seven states and one province: Washington, Oregon, Idaho, Montana, Nevada, Utah, Wyoming, British Columbia

Columbia River

Major tributaries of the Columbia

- Kootenai
- Flathead
- Pend Oreille
- Clark Fork
- Snake
- Willamette
- Okanogan

Vanport History

A city that grew up over night

Vanport History

Originally called Kaiserville

Built by Henry Kaiser as temporary housing for shipyard workers during World War II

First residents in December 1942

Vanport History

Built on the Columbia River Floodplain

It was diked on three sides; the fourth side was a railroad berm

Only one entrance to the entire area

Houses were wooden with wooden foundations

Vanport History

Population was 42,000 at its peak; second largest city in Oregon at the time

About 40 percent of the population was African American

After the war, the population declined; however returning servicemen helped stabilize the population

At the time of the flood, the population was 1,800

The Floods of 1948

Columbia River flows in the late spring are usually driven by snowmelt

In early April, the snowpack was not particularly unusual

Snowpack in the North was slightly above average

Snowpack in Eastern Oregon and Southern Idaho was slightly below average

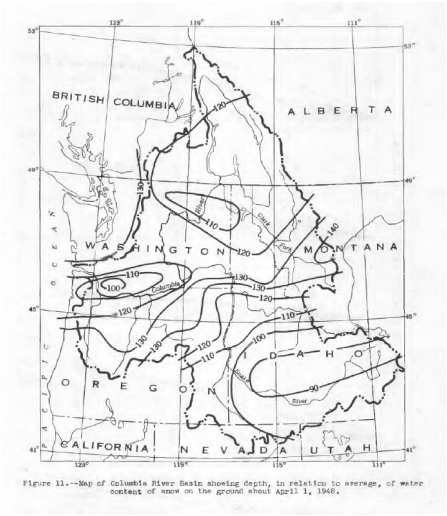


Figure 11.--Map of Columbia River Basin showing depth, in relation to average, of water content of snow on the ground about April 1, 1948.

The Floods of 1948

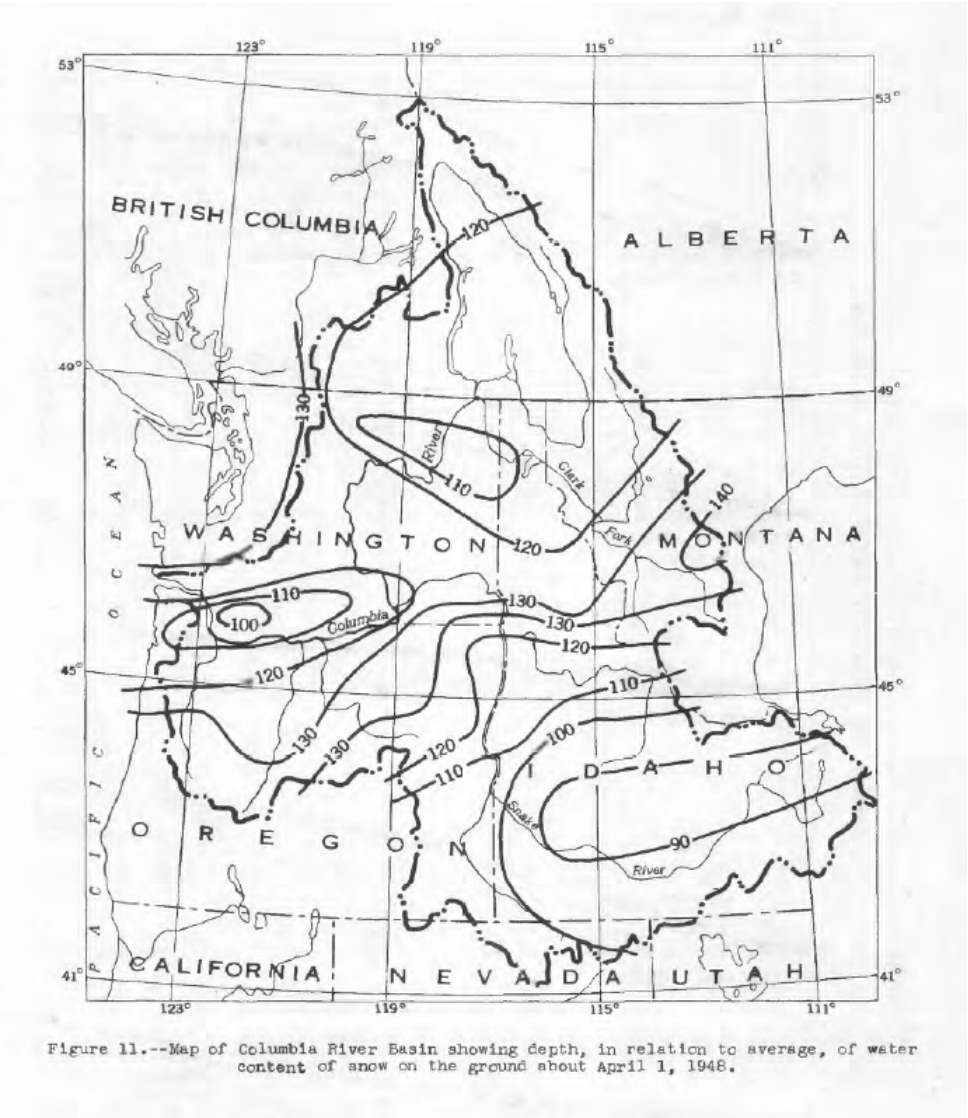


Figure 11.--Map of Columbia River Basin showing depth, in relation to average, of water content of snow on the ground about April 1, 1948.

The Floods of 1948

Weather patterns changed in April

Temperatures remained cool and atmospheric flows from the Bering Sea and North Pacific delivered moisture

The snowpack in the North continued to build

The Floods of 1948

In mid May, a warm and moist pattern developed

Flows from the Pacific came up from California

Flooding began in many parts of the Columbia Watershed

Preparing for the Flood

On May 25, a flood stage of 23 feet was predicted for Portland and Vanport

The Housing Authority of Portland coordinated with USACE

47,000 sandbags, 150 trucks, 50 men on standby

On May 28, the predicted flood stage was increase to 30 feet by June 1

Preparing for the Flood

On May 29, the Housing Authority of Portland and the Red Cross met

The Housing Authority had temporary shelters for 1,500 people

The Red Cross had temporary shelters for 7,500 people

No call to evacuate at this time

The Flood

On May 30, at 4:00 AM, the Portland Housing Authority distributed fliers to residents with a confusing message:

"DIKES ARE SAFE AT PRESENT. YOU WILL BE WARNED IF NECESSARY. YOU WILL HAVE TIME TO LEAVE. DON'T GET EXCITED."

The Flood

On May 30, at 10:30 AM, seepage seen on the railroad berm

At 4:00 PM, the river was 15 feet higher than the ground surface in the city

At 4:17 PM, the railroad berm breached

A 10 foot wall of water began to inundate the city

The Flood

Air sirens went off

Water initially filled the sloughs surrounding Vanport, slowing the flood of the city

The slowing of the flood waters provided time for evacuations

Schools, churches, and individuals in Portland provided shelter for evacuees

The Flood

Ultimately, 15 people died as a result of the flood

There may have been more victims

Vanport was abandoned and never rebuilt

The Flood

Flooding on the Columbia extended well into June, finally receding by July

The peak flow on the Columbia was 1,010,000 cfs, measured at the Dalles, OR

The peak stage at Vancouver was 31 feet

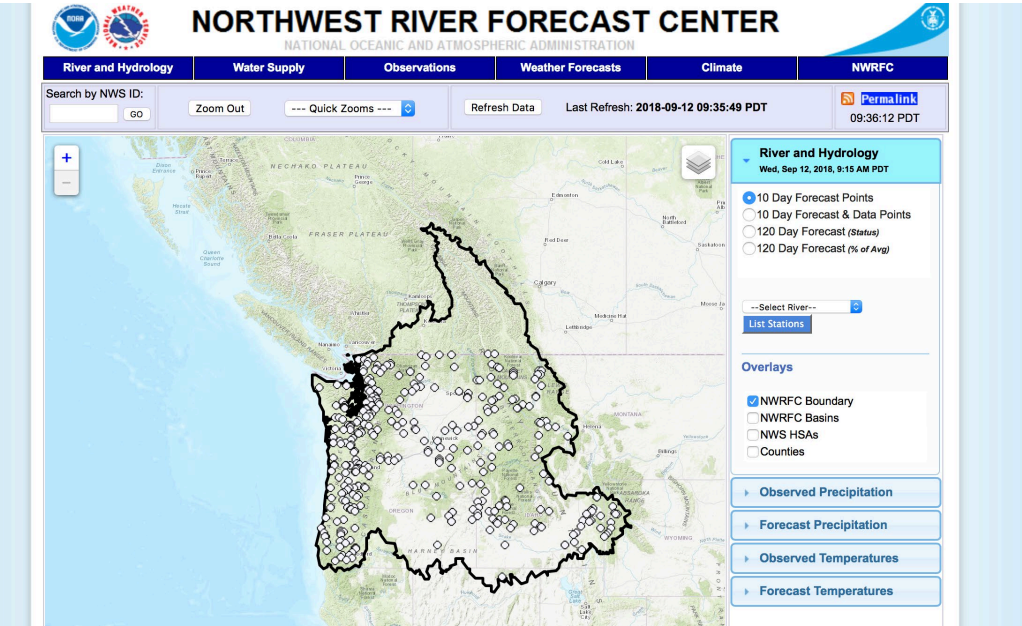
After the Flood

Integration of Vanport residents in the Portland community

Establishment of the Northwest River Forecast Center

Flood Control Act of 1950 authorizing construction of numerous flood control dams

Coordinated management of flows in the Columbia River Basin



Lessons Learned

Lack of communication with the community before the breach. Need to communicate and take action sooner.

A rethinking of water management in the Northwest

Importance of land use planning – Vanport was an example of a significant development in a risky and fragile environment