

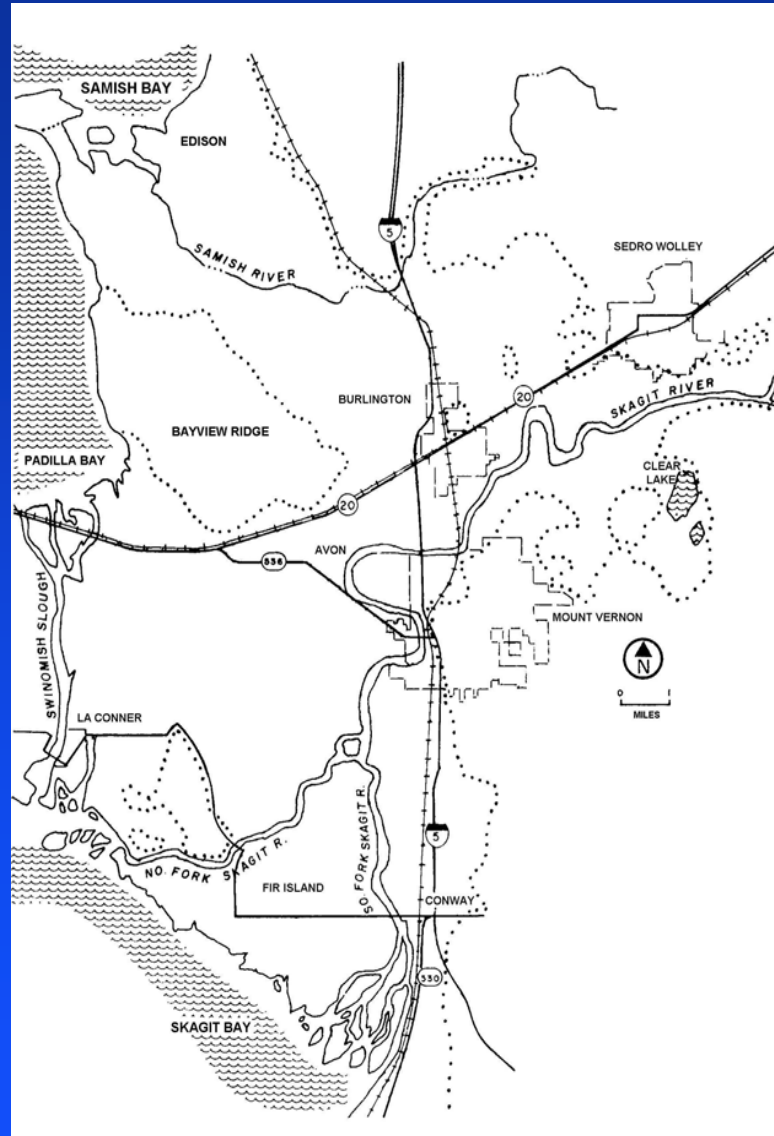
U.S. Army Corps
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Seattle District

Skagit Flood Risk Management Working Group

Presentation by Ron Malmgren
9/14/2000



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Question 1

- What happens if the Mount Vernon revetment flood fight efforts fail - say before the levee by the Mount Vernon sewage treatment plant? Any ideas on how that would change the economics?

With flood fighting the levee will fail downstream and back flood into Mount Vernon. If flood fighting efforts fail the businesses nearest the revetment will be inundated.



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Question 2

- What is the storage volume in the Nookachamps? How much of the crest of a flood could we get in there?

The storage volume of the Nookachamps depends on the flood heights, the higher the stage the more volume of the flood can be stored.

Reduction in the flood crest due to storage in the Nookachamps depends on the duration of the flood, short floods large reduction, long floods small reduction.



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Question 3a

- How do levee setbacks affect the flooding between Mount Vernon and Burlington?

Setting levees back, including widening the bridge corridors, will increase the channel capacity of the river. This will allow more water to be conveyed through the system for the same river stage.



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Question 3b

- How far would the levees need to be setback in order to accommodate a 100-yr event?

In the reconnaissance phase of the study setbacks of 500 to 1,000 feet, both sides of the river, were studied. The setback distance depends on the type of setback, full channel or overbank.



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Question 3c

- Give us some examples of various setback scenarios and how much water could be accommodated by them. Include lengthening the railroad bridge span.

For all setback scenarios a minimum 500 feet would be required to pass the 100 year flood.

All bridge spans would need to be widened to pass the 100 year flood. The railroad bridge would also need to be raised



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Question 4

- What happens if you eliminated all of the dikes on the river and bays? Can you show the group?

If all levees were removed on the river and bays there would be daily flooding due to tides and probably monthly floods due to the river.



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Question 5

- **Table 4 on page 34 of the Skagit River reconnaissance report shows that the flow for the 100-yr flood at Mount Vernon is 180,000 cfs. Please explain why we are considering for 235,000 cfs for the 100-yr event here.**

The 100 yr. flows at Sedro Wooley is 235,000 cfs. The maximum levee contained discharge at Mount Vernon is approximately 180,000, depending on the levee failure scenario.



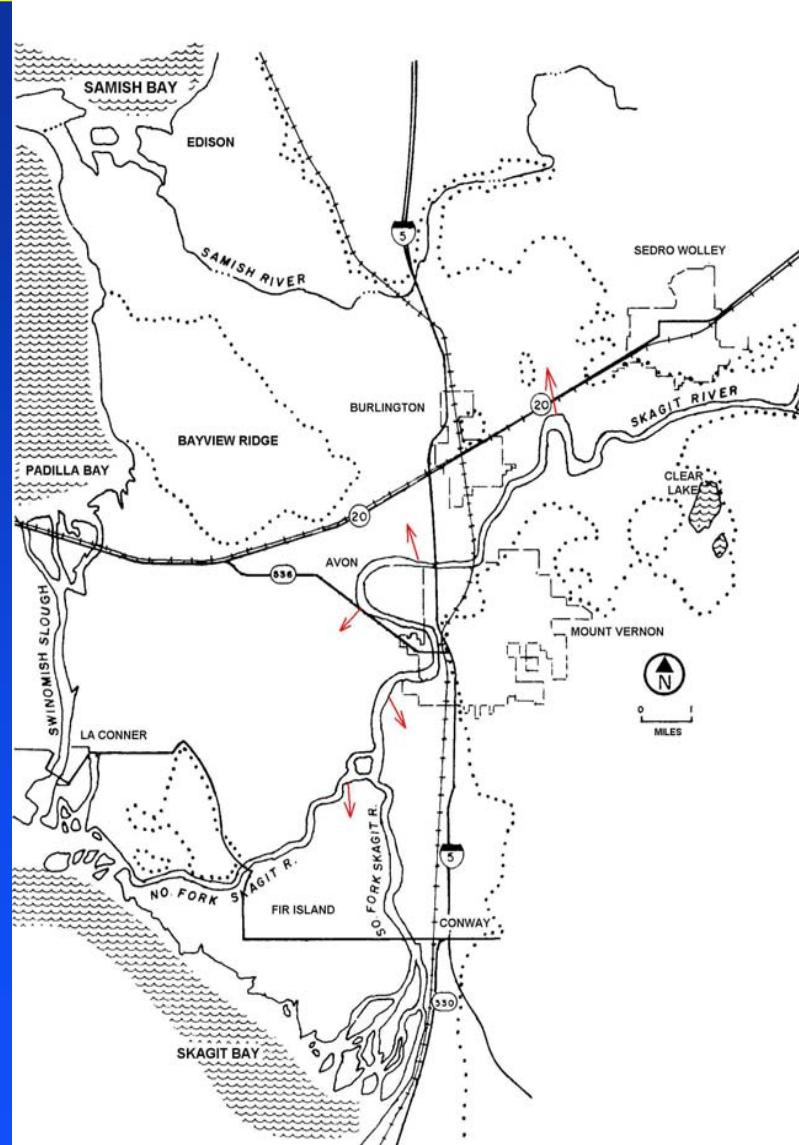
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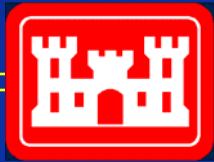
Question 6

- We would like to see how specifically channeling the water off at various locations would affect the overall flood scenario. Please make an analysis of the following scenarios and present them as graphics.
- Consider an extreme case of a 100-year flood being 235,000 cfs at Burlington and Mount Vernon. First, make a spillway in the Sterling area and present the results of spilling 1) 5000 cfs; 2) 25,000 cfs; 3) 50,000 cfs; 4) 75,000 cfs; and finally 5) 100,000 cfs
- Next examine overtopping in the river bend location at the same flow intervals. The overtopping sections on the river bend should be located at about a 2500' section at Pulver Road on the north arm and the old dike break location on the south arm.
- The next location for analysis would be on both sides of the river just to the north of the fork, again using the same flow intervals.
- The final location for evaluation of an overtopping section is at Fir Island. Please use your discretion for a location (s). Please be aware that there is a potential fish habitat project at Dry Slough so the 1990 Fir Island dike break may not be the best location.
- After running the extreme cases, try combining spills at all locations. For example, what happens if 20,000 cfs goes over at Sterling, 20,000 cfs goes over at the river bend (10,000 per section), 20,000 cfs just north of the fork and 20,000 at Fir Island?
- Examine the effects of an overtopping section on the northeast side of the Northfork Fir Island bridge for a 50-year, 75-year, and 100-year event.
- How would opening up Dry Slough for a minimal amount of flow (say 20,000 cfs or less) affect flooding?.



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Question 7

- If Gages Slough were to be reconnected and used to conduct water through the city, what volume could it handle and not cause too much damage?

The capacity of Gages Slough is very small when compared to the amount of water being transported through Burlington due to either levee failures or overtopping.

Is directing flood water through a community a safe and prudent way to handle flooding.



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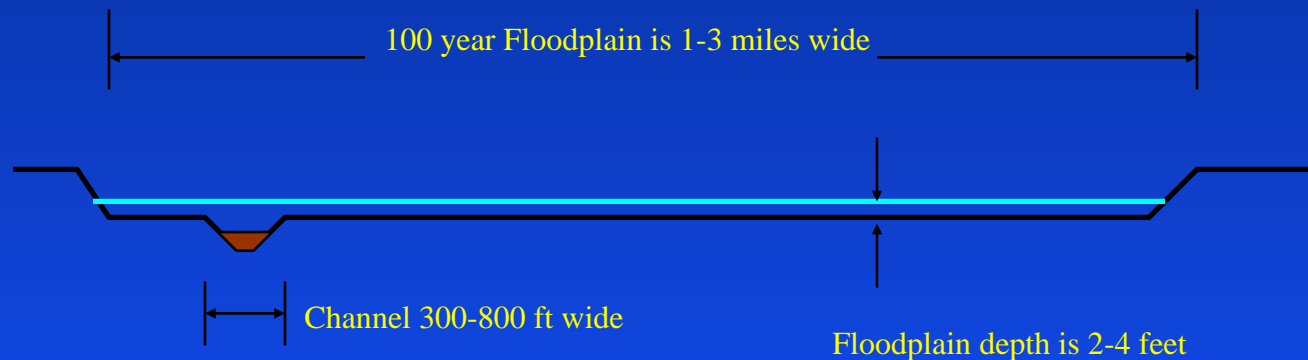
Question 8

- Dredging the mouth of the river is a very popular belief. Can you simulate the effects of dredging there to demonstrate whether or not it will help? Is there a project there that would help move sediment farther out into the bay?

Dredging the mouths of the North and south Forks will not reduce the flooding on the main stem. There might be limited localized benefits during low tide in the lower reaches of the North and South Forks but the main stem will not see these benefits due to limited channel capacity.



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The river needs to be dredged to convey 100,000 cfs of water that now will flow in the floodplain 2 miles wide by 3 feet deep at over 3 fps. The channel will need to be dredged 10-20 ft deep to convey this additional water.



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Question 9

- Again, in this same vicinity, there is a rock jetty that partitions Swinomish Channel from the North Fork mouth. This jetty must be considered as there are not only flood concerns but habitat concerns as well. Early information suggests that the mixing of the fresh and salt water in the Swinomish Channel does not take place to the extent that is beneficial for smoltification. Also, there are some concerns that this jetty is compounding the flooding problem. I have no basis for an opinion but I would think that the model would be an excellent tool for demonstrating any effects of flooding.



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Question 10

- Please be prepared to suggest some design concepts for very large outlet structures in the Bay dikes. Also, if you have any information on levee construction considerations or other flood control structures that would be useful to educate these folks on PLEASE bring and it and share. I find that visuals - such as pictures - are THE BEST!!