Salmon & White River Flood Hazard Mapping

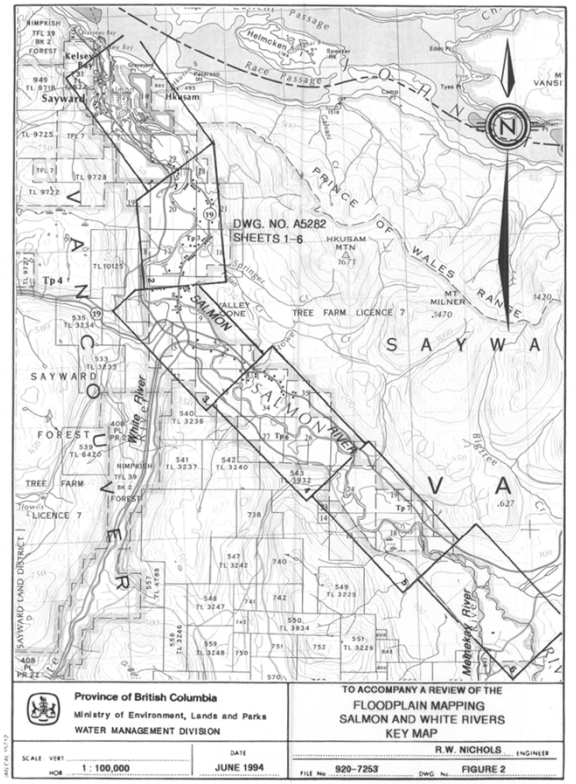
Study Update and Preliminary Findings

June 8, 2021

What are we talking about today?

Sayward and the SRD have engaged McElhanney to Update the Floodplain Mapping in the Sayward Valley

- Why re-study the floodplain issues now?
  - Things have changed since the 1980s. We need to get up-to-date!
  - Things will continue to change. We need to plan for the future!
- The past is the key to the Future:
  - The Hydrology (the flows in the Rivers) has been updated.
  - New Hydraulic modelling (how the flow moves through the Valley)
  - Consider Changes to Climate and Sea Level Rise (SLR)
  - Conceive of a plan to protect the community, and
  - Plan for the future (Integrate with OCP)
- Public Engagement



The Watersheds

Salmon River & White River

- Salmon River Drainage Area is 1324 km^2 with the White River about 367 km^2
- Last review of Flood Discharges was completed in 1995. Discharges for 1:200 Year Flood at:
  - Salmon River = 2329 m^3/s
  - White River = 1069 m^3/s
- Discharges were based on records from Water Survey of Canada Gauge on the Salmon River (3 gauges as far back as 1956)

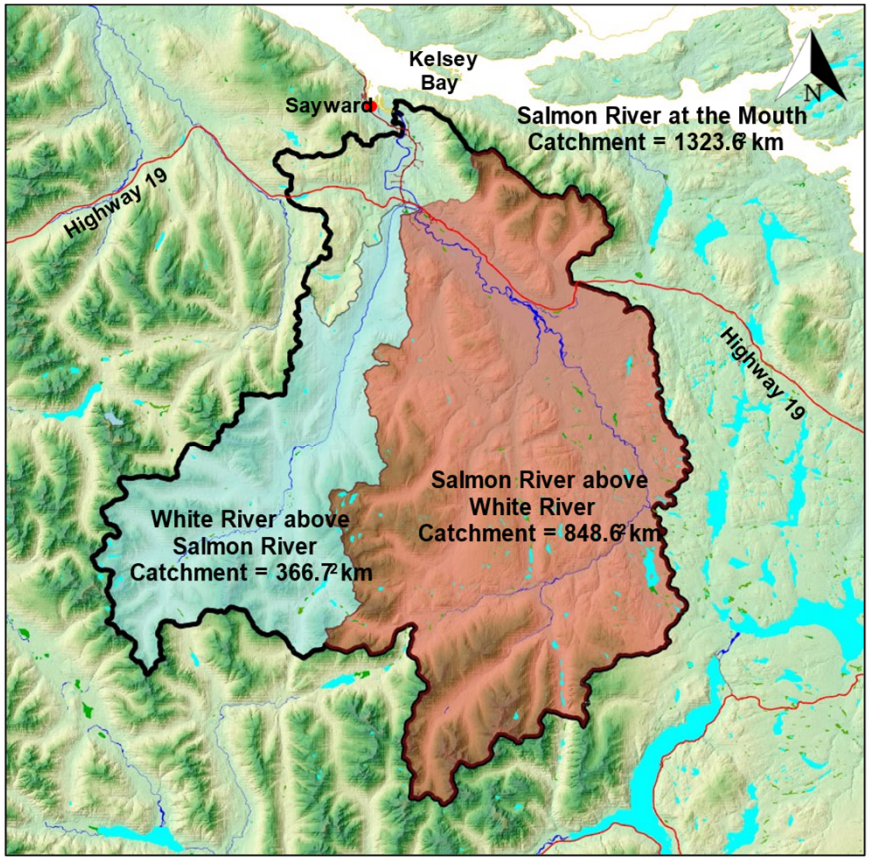


Figure 2: Salmon and White Rivers Catchment Areas

The Watersheds

Salmon River & White River

- New Data since 1995 and the Salmon River Diversion has been decommissioned

- 2020 Estimates for the 1:200 Year Flood
  - Salmon River = 2331 m^3/s (almost the same, no diversion)
  - White River = 877 m^3/s (18% less than 1995, more data = better estimate)

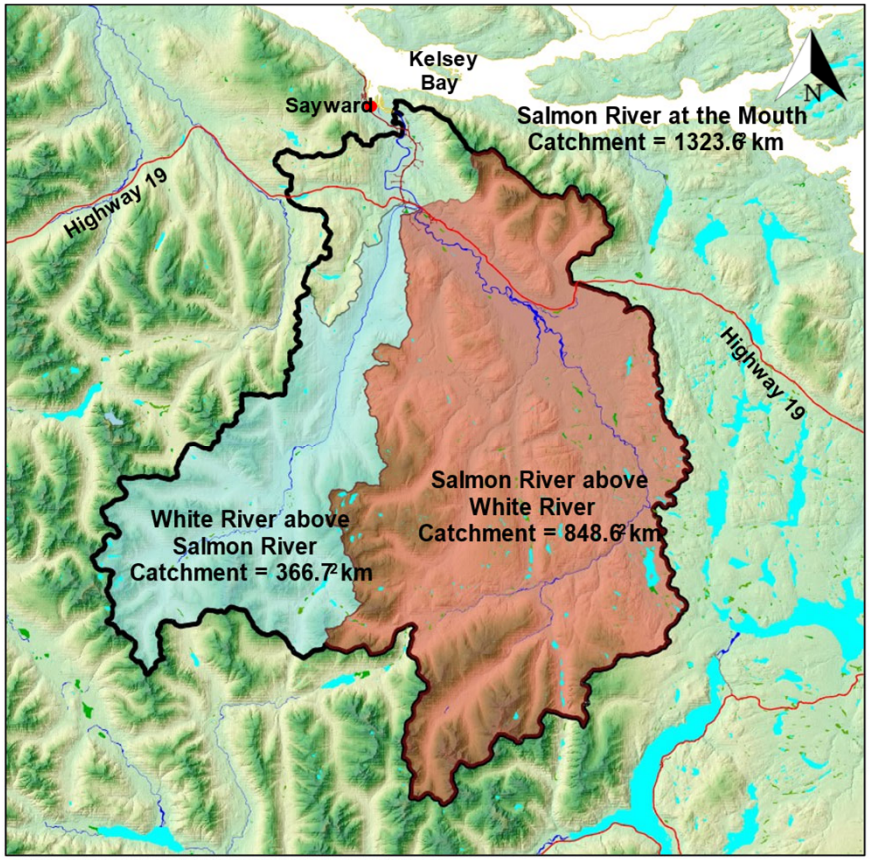
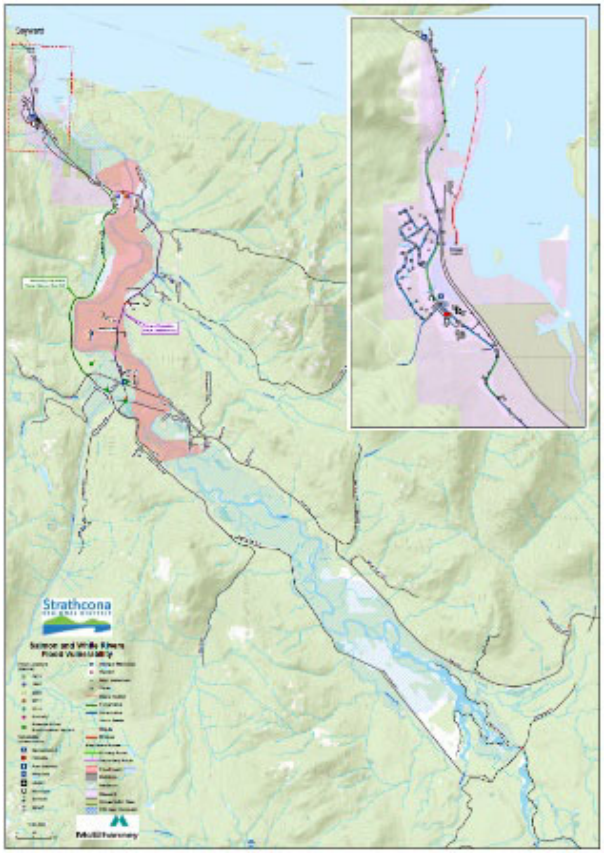


Figure 2: Salmon and White Rivers Catchment Areas

Historical Flooding

The 2019 Flood Risk Assessment reviewed historical flooding

- **Flooding as recently as 2016**
- **Floods have been recorded since the 1800s**
- **Major Flood in 1927**
- **Other significant Flood Events: 1975, 1990, 2008, 2011, 2014 and 2016**



Floodplain Mapping

Original Mapping Issued Dec 1980

- Showed wide spread flooding in the Valley
- Did not cover a significant portion of the Village
- Used older technology in predictions and was based on older data

Updating the 1980 Mapping

Much has changed since 1980 and 1995.

Though the Valley remains similar to then in terms of land use, we must look to the future

We must account for changing climates and changing Seas

What does the Future Hold?

Sea Level Rise (SLR)

- 1m rise as a guide for the year 2100

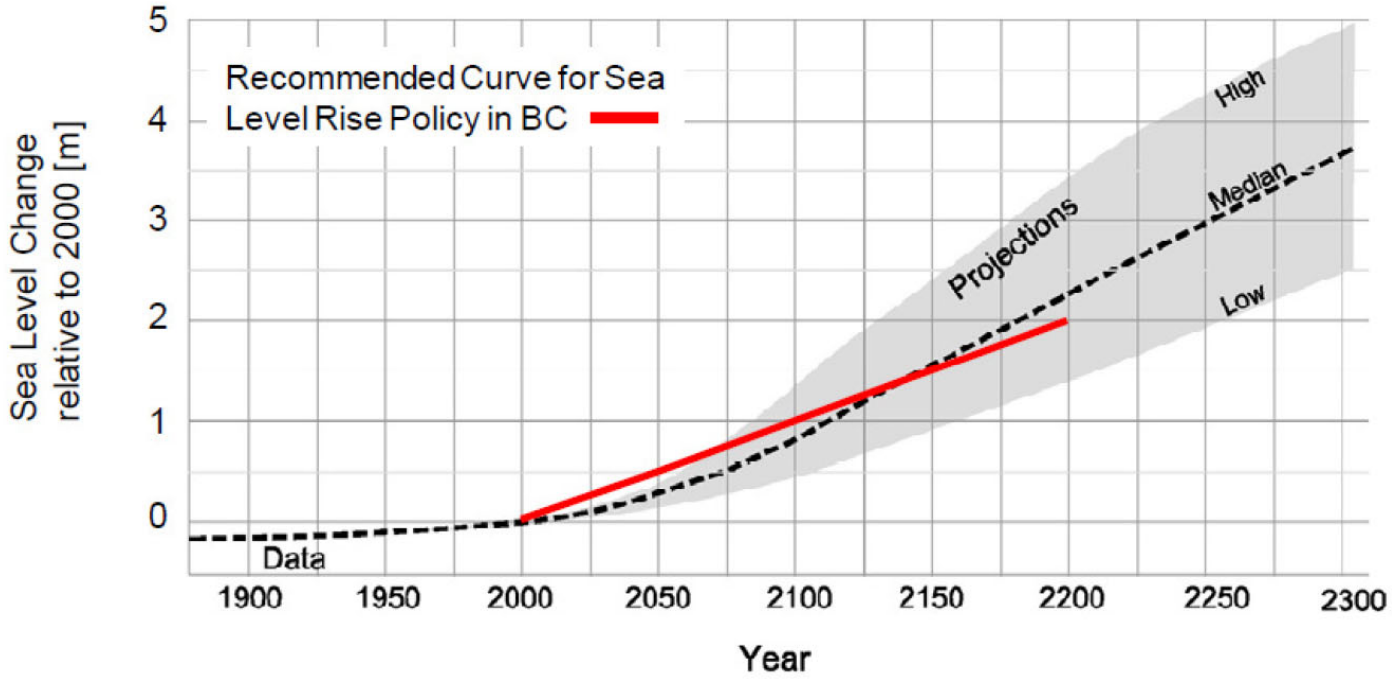


Figure 2-2: Recommended Global Sea Level Rise Curve for Planning and Design in BC (Ausenco Sandwell, 2011a)

What does the Future Hold?

Sea Level Rise (SLR)

- 1m rise as a guide for the year 2100
- Flood Construction Level for Sayward **is likely to be about 5.0m**, includes, tidal effects, storm surge, wave effects and freeboard (Safety Factor)
- McElhanney and GreatPacific are working on site specific analysis

Table 2-4: Preliminary 2100 FCL Estimates for Various Locations (Ausenco Sandwell, 2011b)

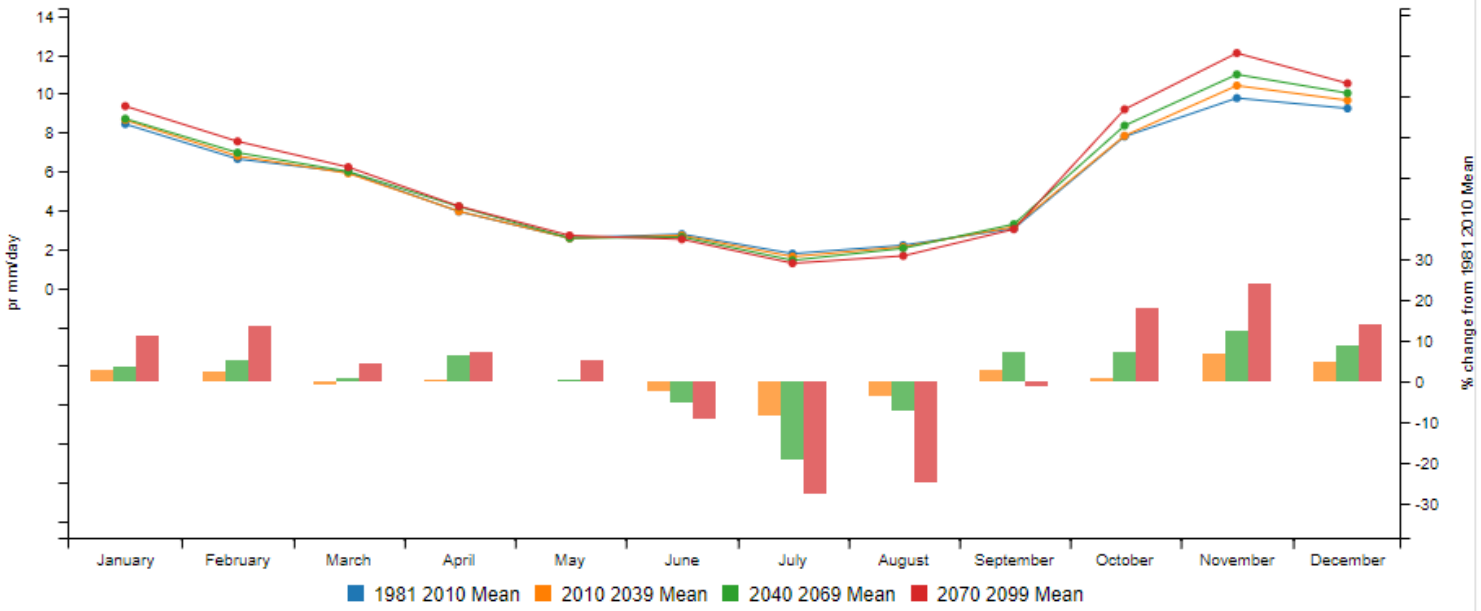
FCL Component	Fraser River Delta	Vancouver Harbour	Squamish River Delta	East Vancouver Island	West Vancouver Island	Central and North Coast
Global SLR (2100)				1 m		
Regional Adjustment	+0.21 m	0 m	0 m	-0.17 m	-0.27 m	-0.22 m
HHWLT	2.0 m	1.9 m	2.05 m	1.6 m	2.0 m	3.8 m
Storm Surge	1.7 m	1.4 m	1.3 m	1.3 m	1.3 m	1.7 m
Wave Effect	0.65 m	0.65 m	0.65 m	0.65 m	0.65 m	0.65 m
Freeboard	0.6 m	0.6 m	0.6 m	0.6 m	0.6 m	0.6 m
FCL	**6.2 m**	**5.6 m**	**5.6 m**	**5.0 m**	**5.3 m**	**7.5 m**

Notes:
1. Reproduced from Ausenco Sandwell (2011b), Table 3-2.
2. Regional adjustment based on current values. Vancouver and Squamish assumed to be neutral.
3. HHWLT = Higher High Water Large Tide. Varies by site and location in BC.
4. Storm surge allowance includes allowances for local wind setup.
5. Wave effect allowance assumes runup on natural gravel-pebble shoreline.
6. FCLs are elevations relative to Canadian Vertical Geodetic Datum.

Climate Change in the Watershed

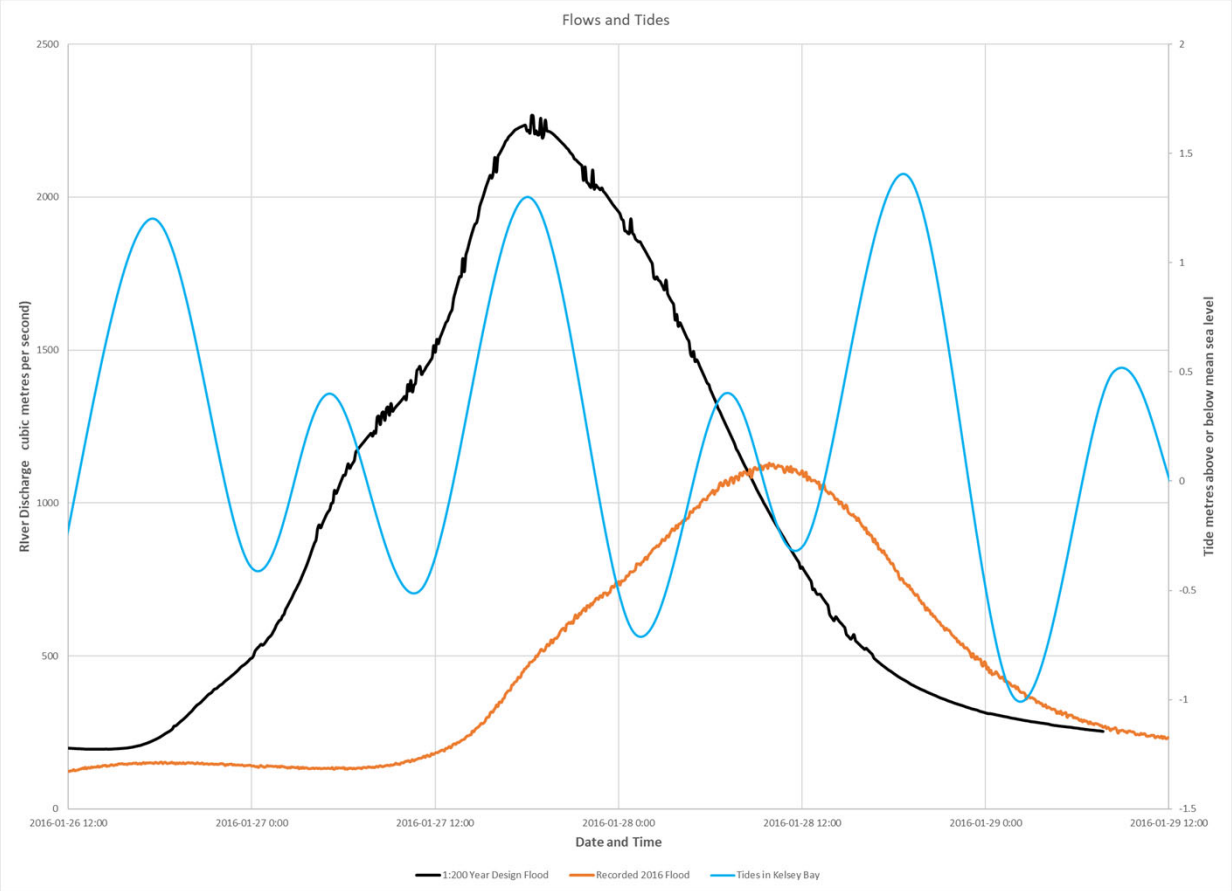
Climate Change

- According to PCIC – The Pacific Climate Impacts Consortium
- Dryer summers, wetter winters
- +/-20% more rain in November and December from 2070-2099



Initial Modelling

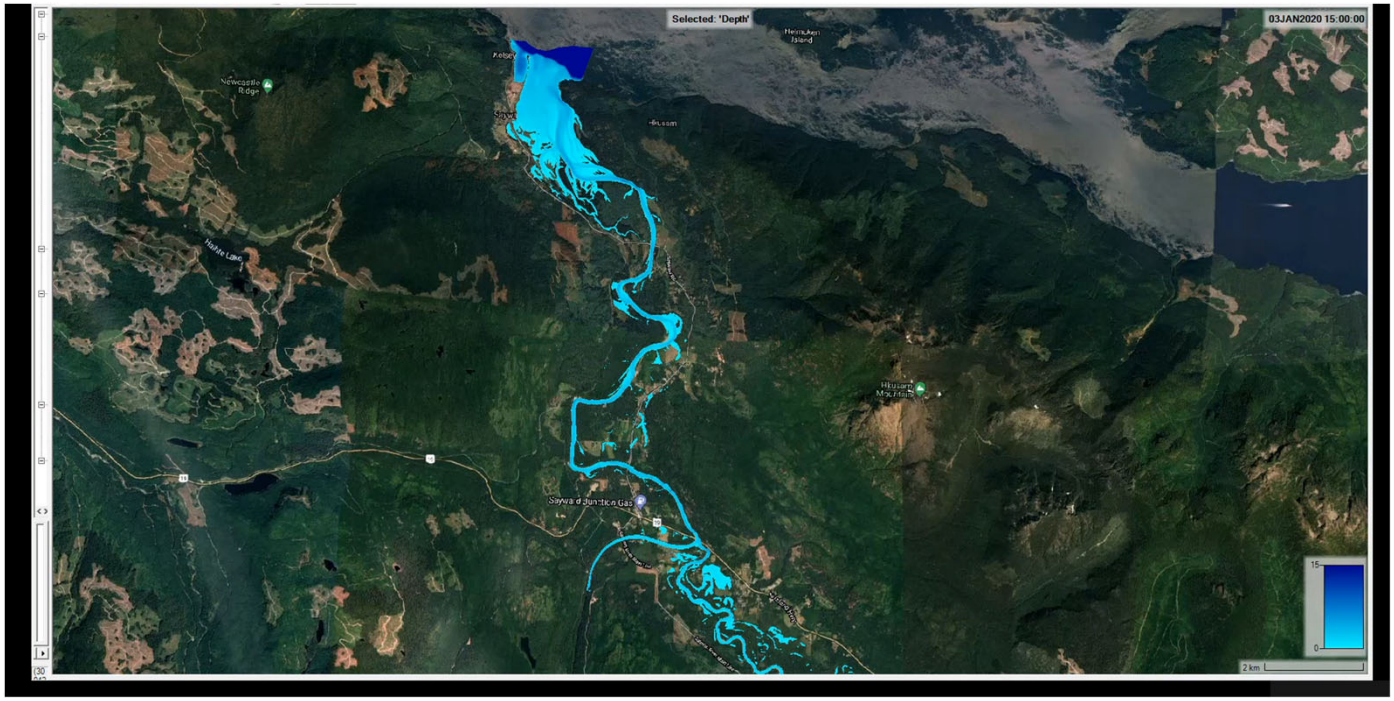
Simulate a 200 Year Design Event and compare to existing records



Initial Modelling

Updated Flood Model

- Use latest elevation data. LiDAR data collected in 2020
- New 2D computer models propagates flood wave in all directions as it moves through the Valley



Next Steps

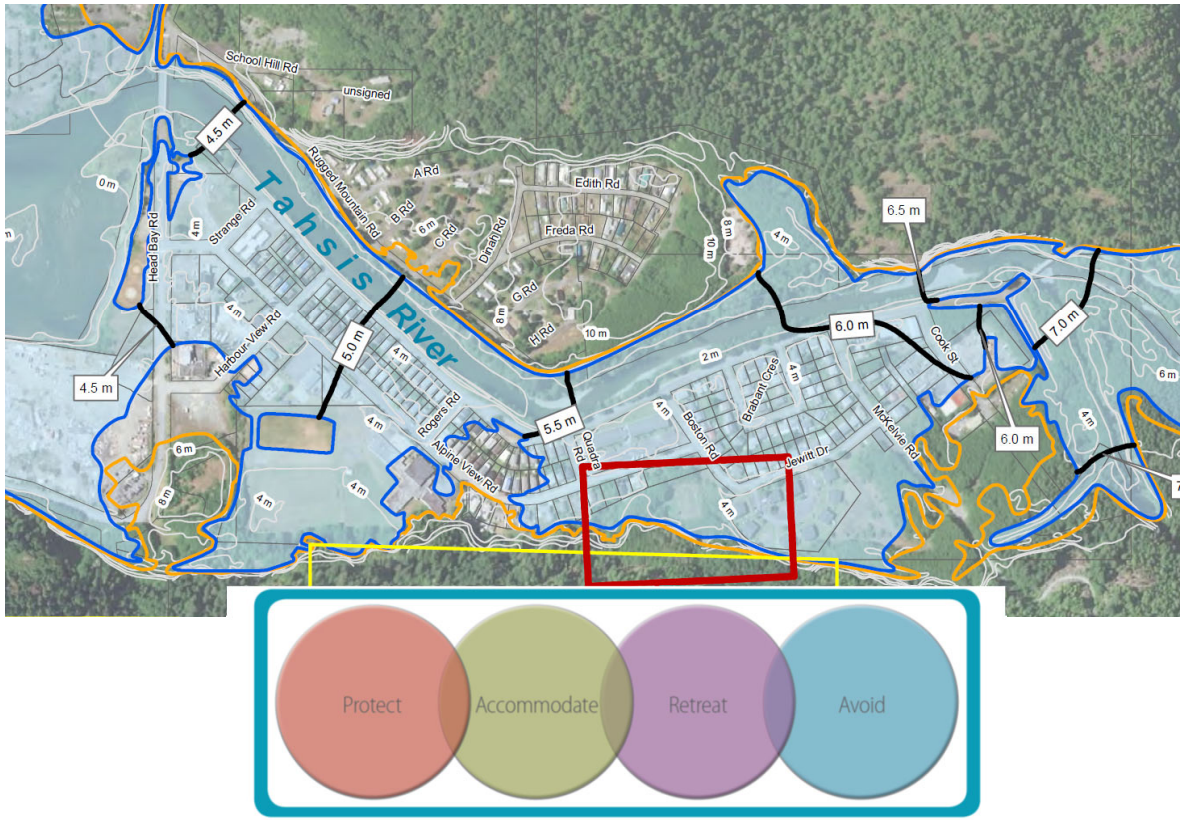
Determine New and Future Flood Extents

- Complete Modeling of Ocean Levels in Kelsey Bay incl SLR
- Refine Model and Determine Flood Extents for 2021 & 2100
- Prepare Flood Maps

Mitigation Strategy

- PROTECT
- ACCOMMODATE
- RETREAT
- AVOID

Planning (OCP) and Bylaws (Floodplain Bylaw)
Capital Works – Upgrade dikes



Next Steps

Use Study for Emergency Planning

- Preparation
- Emergency Response
- Recovery

Credit Bureau of Campbell River
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The Campbell River **Courier**

'BEST WEEKLY IN CANADA' 1973 NATIONAL AWARD WINNER

TWENTY-SEVENTH YEAR NO. 53 PRESS RUN 5,500 CAMPBELL RIVER, B.C. FRIDAY, NOV. 14, 1975 COURIER PHONE 287-7464 20c PER COPY

SAYWARD FLOODS — RESCUE CONTINUES

HUNDREDS EVACUATED

By RON PERCIVAL

SAYWARD -- A Canadian Forces rescue helicopter airlifted 100 stranded people from the roofs of flooded homes here Thursday as one of the most devastating floods in local memory poured into the Sayward Valley.

There have been no reported deaths or injuries.

The deep and muddy flood waters cover hundreds of acres in the lower valley and damage is considerable.

The flood began to build Tuesday after heavy rains caused the White and Salmon rivers to begin overflowing their banks but the danger situation did not develop until Thursday morning.

At press time all roads linking Sayward and Kelsey Bay with the rest of Vancouver Island have been cut off by the fast moving water.

Houses and mobile homes everywhere in the lower rural areas are flooded by water up to eight feet deep.

Many homeowners climbed on their roofs to escape the rising waters after all roads became impassable.

Helicopter rescue

A rescue helicopter dispatched from CFB Comox began airlifting Thursday afternoon and as darkness fell 100 people had been evacuated to safe ground in the village.

The air rescue was to resume today at dawn.

There was no reported loss of life at press time although a rescue spokesman said there were reports of missing hunters in the area.

Motorists proceeding north from Campbell River encountered the banks of the flooding watercourse about a mile south of the Salmon River bridge.

All lowlands in the valley from that point north to the river estuary at Kelsey Bay are covered in water up to eight feet deep.

The flood waters engulf homes, farms, trailers, businesses and motor vehicles.

Some of the better known flooded structures include the Sayward Elementary-Junior Secondary School, the White River Court, the Cable Cafe and Link and Pin Museum and Hetty Fredrickson's Valley of a Thousand Faces.

The higher elevated Sayward village is mostly untouched by the flood and the homeless are being airlifted to MacMillan Bloedel accommodations there.

12 inches in 48 hours

Valley residents are hoping the continuous storms which have dumped 12 inches of rain into the Salmon River watershed since Tuesday will subside but forecasters predict more rain this weekend.

Bob Dick, operations manager for MacMillan Bloedel, Kelsey Bay Division, said it is a real tragedy for the 1,300 people who live here.

"It's a very confusing situation here," he said in a telephone interview.

"I can hear the helicopter coming in now with some of the rescued people. Everything is a sea of water."

Dick said all people displaced by the flood will be put up in company

(Continued on page 6)

SAYWARD SCHOOL, in rear, and homes in area have all been evacuated.

Oyster River on a rampage

By LORRAINE LOCHERTY

The Oyster River went on a rampage yesterday, for the second time in a week; forcing one family to row to safety and another to tow their trailer to high ground.

The river is reacting more violently to the torrential

Another couple who live in a trailer perilously close to the river's eroding banks, had the trailer moved to higher ground.

Donna and John Travers are staying with Nancy Little, who owns the lot the trailer was sitting on.

The RCMP dispatched six men to the scene at noon Thursday. They worked alongside residents of the area, sandbagging the banks of the Oyster in an effort to contain the water before a 2 p.m. high tide.

Polls open 8 a.m. to 8 p.m.

Voters will go to the polls here Saturday to elect local government and school board representatives.

Voting hours are between 8 a.m. and 8 p.m. at all polling stations and the results will be tabulated Saturday evening.

Polling stations for municipal council and Campbell River school board are at the Elks Hall and Willow Point Elementary School.

Additional polling stations will be provided for the Campbell River school board election at Discovery Passage, Maple and Evergreen Elementary schools.

Candidates for municipal council are: Wallace Baikie (incumbent), Peter Johnson (incumbent), David MacLaren, Ollie Penman and Wolfgang Rumple. Three will be elected for two year terms.

Candidates for school trustee are: Ian Clague, Mike Henderson (incumbent), Frank Sullivan and Pat Winters. Two will be elected for two year terms.

In addition Quinsam and Oyster River voters will elect one regional district director each for the Comox-Strathcona regional board.

In Quinsam the vote will be held at Evergreen Elementary School to choose the Quinsam director. Candidates

(Continued on page 2)

Your Role

Public Participation:

- Anecdotal Evidence of Historic Flooding is important
  - Photos
  - Reports on property flooding
    - Duration
    - Depth

- Get involved and provide feedback for potential bylaw creation-update
- Feedback on potential long-term planning impacts

THANK YOU

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