



**Notes to Users**

1. Please refer to the **Disclaimer** below.
2. Please review the associated project report before referring to the maps: Northwest Hydraulic Consultants Ltd. (NHC). 2023. 'Northwest Vancouver Island Tsunami Risk Assessment (Phase 2)'. Report prepared for Ocean Networks Canada. NHC project number 3006332.
3. Tsunami model results shown correspond to an earthquake with a magnitude of 9.2 from the Alaska-Aleutian Subduction Zone. Please refer to the project report for additional information on tsunami source.
4. Initial water level for tsunami simulations consists of current-day Higher High Water Mean Tide (HHWMT) which at Winter Harbour and Gold River terminal correspond to an elevation of 1.5 m above the Canadian Geodetic Vertical Datum of 2013 (CGVD2013). HHWMT is defined as the average from all the higher high waters from 19 years of tidal predictions.
5. Information shown on maximum tsunami amplitude maps corresponds to model results of maximum water surface elevation above a reference plane corresponding to HHWMT. Over the ocean this information corresponds to the maximum tsunami amplitude, which is defined as the vertical distance of the tsunami wave crest above the reference plane. Overland this information corresponds to the maximum tsunami runup, which is defined as the vertical distance of the leading edge (most upland reach) of the tsunami flow above the reference plane.
6. Information shown on maximum tsunami-induced current velocity maps corresponds to model results of maximum current velocity encountered during the tsunami. Tsunami simulations were performed for a constant tide level and therefore do not include the influence of tidal currents, on which can be superimposed tsunami-induced currents.
7. No safety factor, or freeboard was applied to the results shown on these maps. Any inundation visible on these maps corresponds to the inundation as estimated by the numerical model without any adjustment and should be considered as indicative only. For inundation extents, refer to maps of tsunami inundation level for emergency planning to which a safety factor is applied.
8. These maps provide results for one possible tsunami scenario with associated earthquake magnitude and subduction zone rupture mechanism. Inundation characteristics and associated effects can vary for different tsunami scenarios that may occur.
9. The influence stream flow may have on the propagation and inundation of tsunamis in rivers and creeks was not included in the numerical model.

**Data Sources and References**

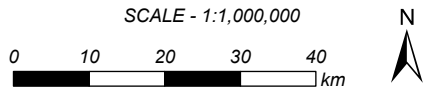
1. Topographic basemaps from Esri Canada, Natural Resources Canada, and Esri Canadian Community Maps contributors.
2. Imagery basemaps from Esri and Maxar.
3. Coastline and riverbanks from GeoBC 1:20,000 scale Freshwater Atlas data.
4. First Nation administrative boundaries based on GeoBC data with adjustments by NHC and should be considered as approximate only.
5. Road locations and classification based on GeoBC Digital Roads Atlas data with adjustments by NHC and should be considered approximate only.
6. Ferry route, municipal boundary, and regional district boundary data from GeoBC.

**Disclaimer**

These maps have been prepared by **Northwest Hydraulic Consultants Ltd.** for the benefit of **Ocean Networks Canada Society and The Lake Family's All One Fund** for specific application to the **Northwest Vancouver Island Tsunami Risk Assessment Phase II** project undertaken to support emergency planning in Nootka Sound and Quatsino Sound, British Columbia. The information and data contained herein represent **Northwest Hydraulic Consultants Ltd.**'s best professional judgement in light of the knowledge and information available to **Northwest Hydraulic Consultants Ltd.** at the time of preparation and was prepared in accordance with generally accepted engineering and geoscience practices. Except as required by law, these maps and the information and data contained herein are for the information of **Ocean Networks Canada Society and The Lake Family's All One Fund**, their officers, and employees. **Northwest Hydraulic Consultants Ltd.** denies any liability whatsoever to other parties who may obtain access to these maps for any injury, loss, or damage suffered by such parties arising from their use of or reliance upon these maps or any of their contents.



- 1:100,000 (REGIONAL SCALE) HAZARD MAP SHEET
- REGIONAL DISTRICT BOUNDARY
- FERRY ROUTE
- HIGHWAY
- ROAD
- RECREATION/RESOURCE ROAD

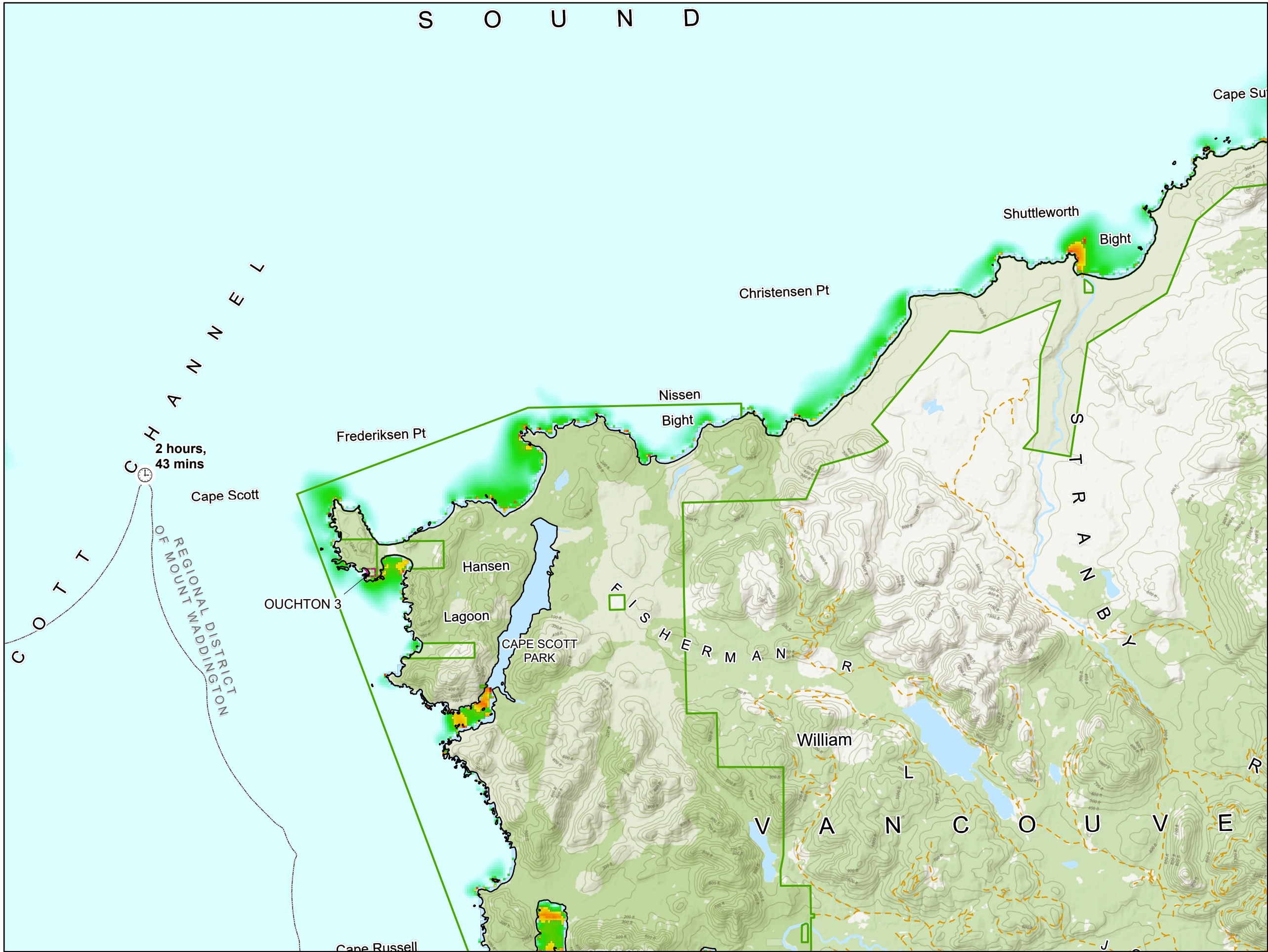


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|---------------------------------------------------------------|---------------------|-----------------|
| Coordinate System: NAD 1983 CSRS UTM ZONE 9N<br>Units: METRES |                     |                 |
| Engineer<br>PSG                                               | GIS<br>SWM          | Reviewer<br>GFL |
| Job Number<br>3006332                                         | Date<br>11-MAY-2023 |                 |

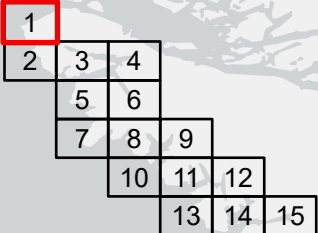
**NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT**

**REGIONAL SCALE  
OVERWATER HAZARD MAP  
INDEX & NOTES  
ALASKA TSUNAMI**









 TSUNAMI ARRIVAL TIME

 APPROXIMATE COASTLINE

 FERRY ROUTE

 HIGHWAY

 ROAD

 RECREATION/RESOURCE ROAD

 FIRST NATION TREATY LANDS

 FIRST NATION ADMINISTRATIVE BOUNDARY

 MUNICIPAL BOUNDARY

 REGIONAL DISTRICT BOUNDARY

 PROVINCIAL PARK

 AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

 >9 KNOTS

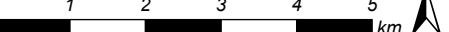
 6 KNOTS

 3 KNOTS

 0 KNOTS

REFER TO INDEX MAP FOR COMPLETE NOTES. NO SAFETY FACTOR WAS APPLIED TO THE RESULTS SHOWN. FOR INUNDATION EXTENTS, REFER TO MAPS OF TSUNAMI INUNDATION LEVEL FOR EMERGENCY PLANNING.

SCALE - 1:100,000



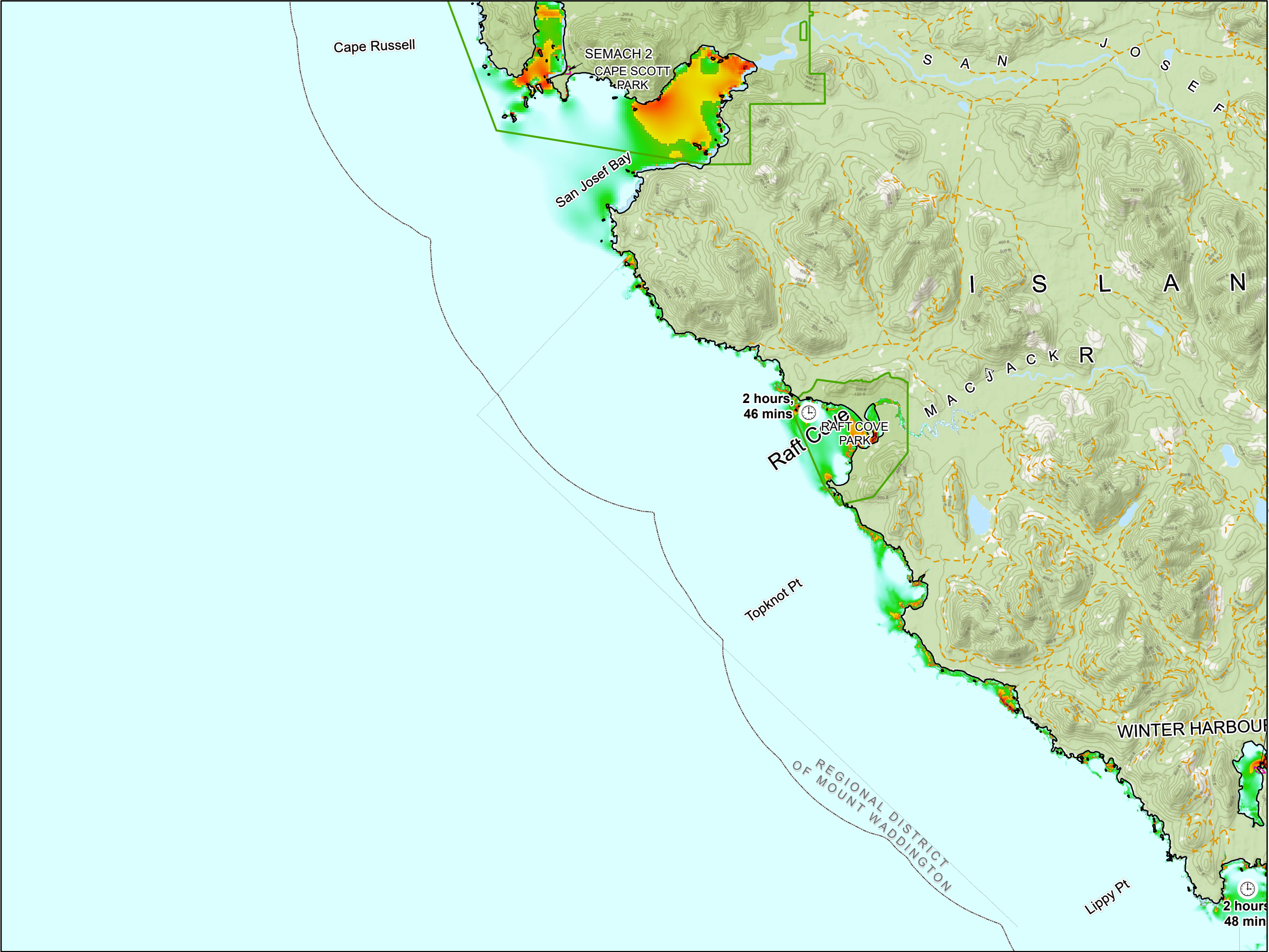
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Units: METRES

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NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI

SHEET 1 OF 15





TSUNAMI ARRIVAL TIME

APPROXIMATE COASTLINE

FERRY ROUTE

HIGHWAY

ROAD

RECREATION/RESOURCE ROAD

FIRST NATION TREATY LANDS

FIRST NATION ADMINISTRATIVE BOUNDARY

MUNICIPAL BOUNDARY

REGIONAL DISTRICT BOUNDARY

PROVINCIAL PARK

AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

|  |          |                                                                                                                                                                                     |
|--|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | >9 KNOTS | REFER TO INDEX MAP FOR COMPLETE NOTES. NO SAFETY FACTOR WAS APPLIED TO THE RESULTS SHOWN. FOR INUNDATION EXTENTS, REFER TO MAPS OF TSUNAMI INUNDATION LEVEL FOR EMERGENCY PLANNING. |
|  | 6 KNOTS  |                                                                                                                                                                                     |
|  | 3 KNOTS  |                                                                                                                                                                                     |
|  | 0 KNOTS  |                                                                                                                                                                                     |

SCALE - 1:100,000

Coordinate System: NAD 1983 CSRS UTM ZONE 9N  
Units: METRES

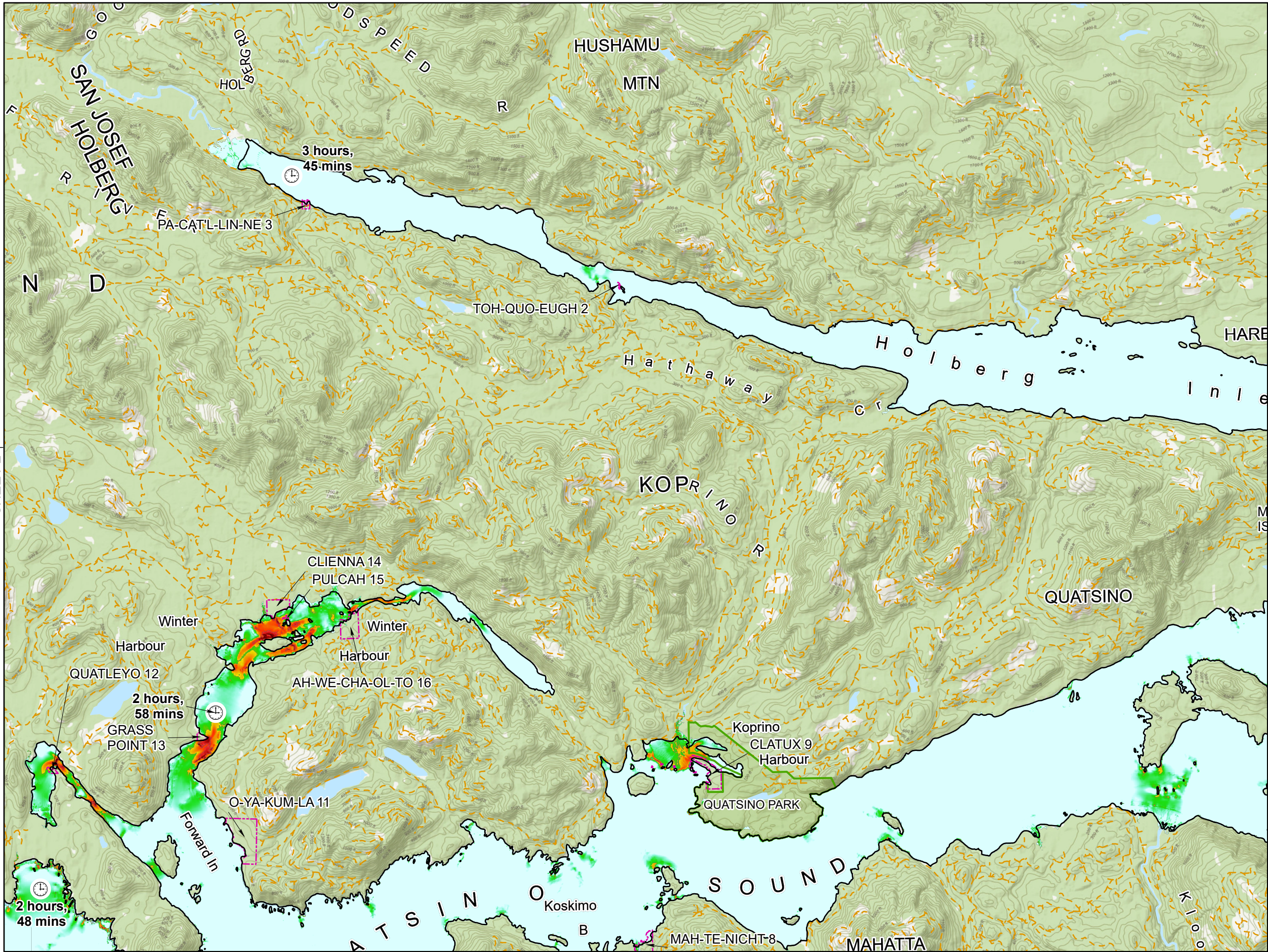
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NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI

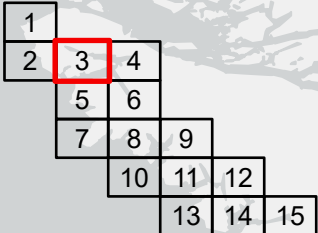
SHEET 2 OF 15

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 TSUNAMI ARRIVAL TIME

 APPROXIMATE COASTLINE

 FERRY ROUTE

 HIGHWAY

 ROAD

 RECREATION/RESOURCE ROAD

 FIRST NATION TREATY LANDS

 FIRST NATION ADMINISTRATIVE BOUNDARY

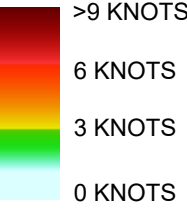
 MUNICIPAL BOUNDARY

 REGIONAL DISTRICT BOUNDARY

 PROVINCIAL PARK

 AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI



>9 KNOTS  
6 KNOTS  
3 KNOTS  
0 KNOTS

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SCALE - 1:100,000

0 1 2 3 4 5 km



Coordinate System: NAD 1983 CSRS UTM ZONE 9N  
Units: METRES

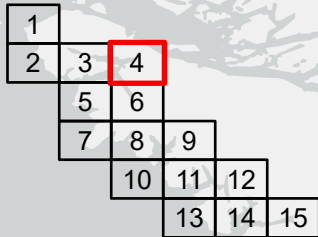
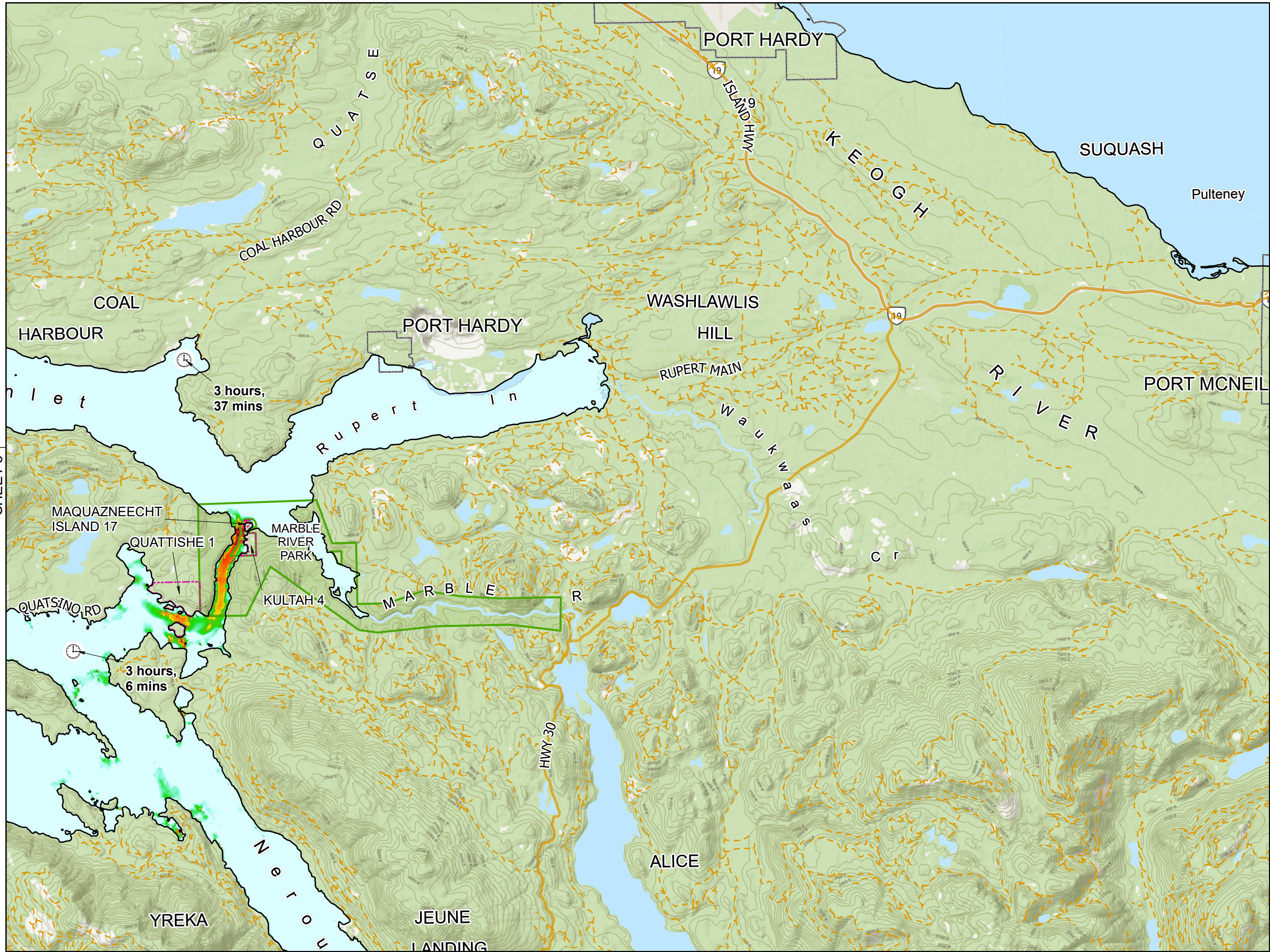
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NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI

SHEET 3 OF 15

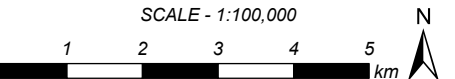
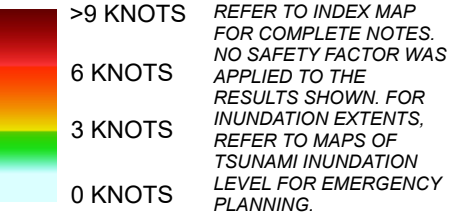
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- TSUNAMI ARRIVAL TIME
- APPROXIMATE COASTLINE
- FERRY ROUTE
- HIGHWAY
- ROAD
- RECREATION/RESOURCE ROAD
- FIRST NATION TREATY LANDS
- FIRST NATION ADMINISTRATIVE BOUNDARY
- MUNICIPAL BOUNDARY
- REGIONAL DISTRICT BOUNDARY
- PROVINCIAL PARK
- AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

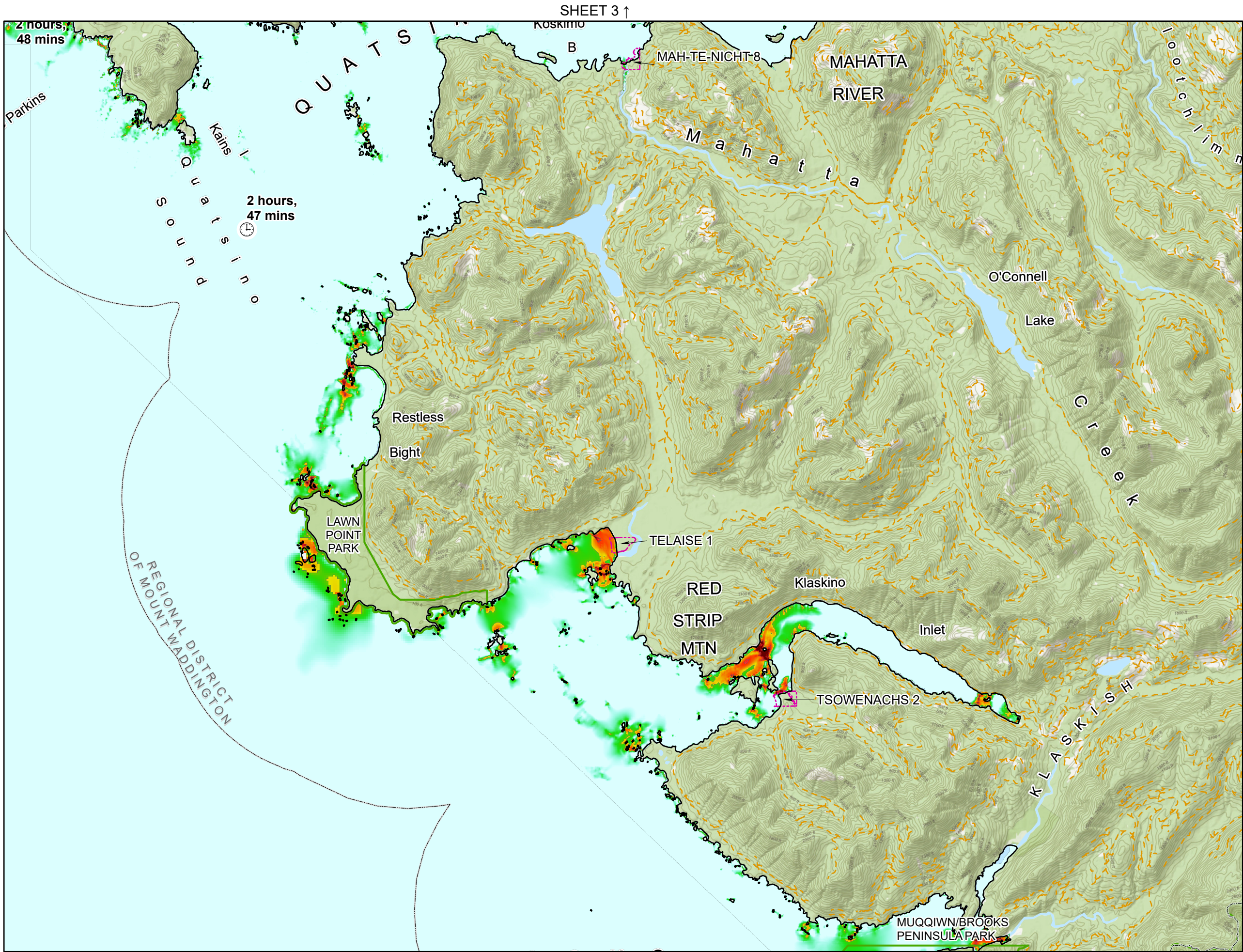


Coordinate System: NAD 1983 CSRS UTM ZONE 9N  
Units: METRES

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| Job Number | 3006332 | Date | 11-MAY-2023 |          |     |

NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI





TSUNAMI ARRIVAL TIME

APPROXIMATE COASTLINE

FERRY ROUTE

HIGHWAY

ROAD

RECREATION/RESOURCE ROAD

FIRST NATION TREATY LANDS

FIRST NATION ADMINISTRATIVE BOUNDARY

MUNICIPAL BOUNDARY

REGIONAL DISTRICT BOUNDARY

PROVINCIAL PARK

AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

|  |          |
|--|----------|
|  | >9 KNOTS |
|  | 6 KNOTS  |
|  | 3 KNOTS  |
|  | 0 KNOTS  |

REFER TO INDEX MAP FOR COMPLETE NOTES. NO SAFETY FACTOR WAS APPLIED TO THE RESULTS SHOWN. FOR INUNDATION EXTENTS, REFER TO MAPS OF TSUNAMI INUNDATION LEVEL FOR EMERGENCY PLANNING.

SCALE - 1:100,000

0 1 2 3 4 5 km

N

Coordinate System: NAD 1983 CSRS UTM ZONE 9N  
Units: METRES

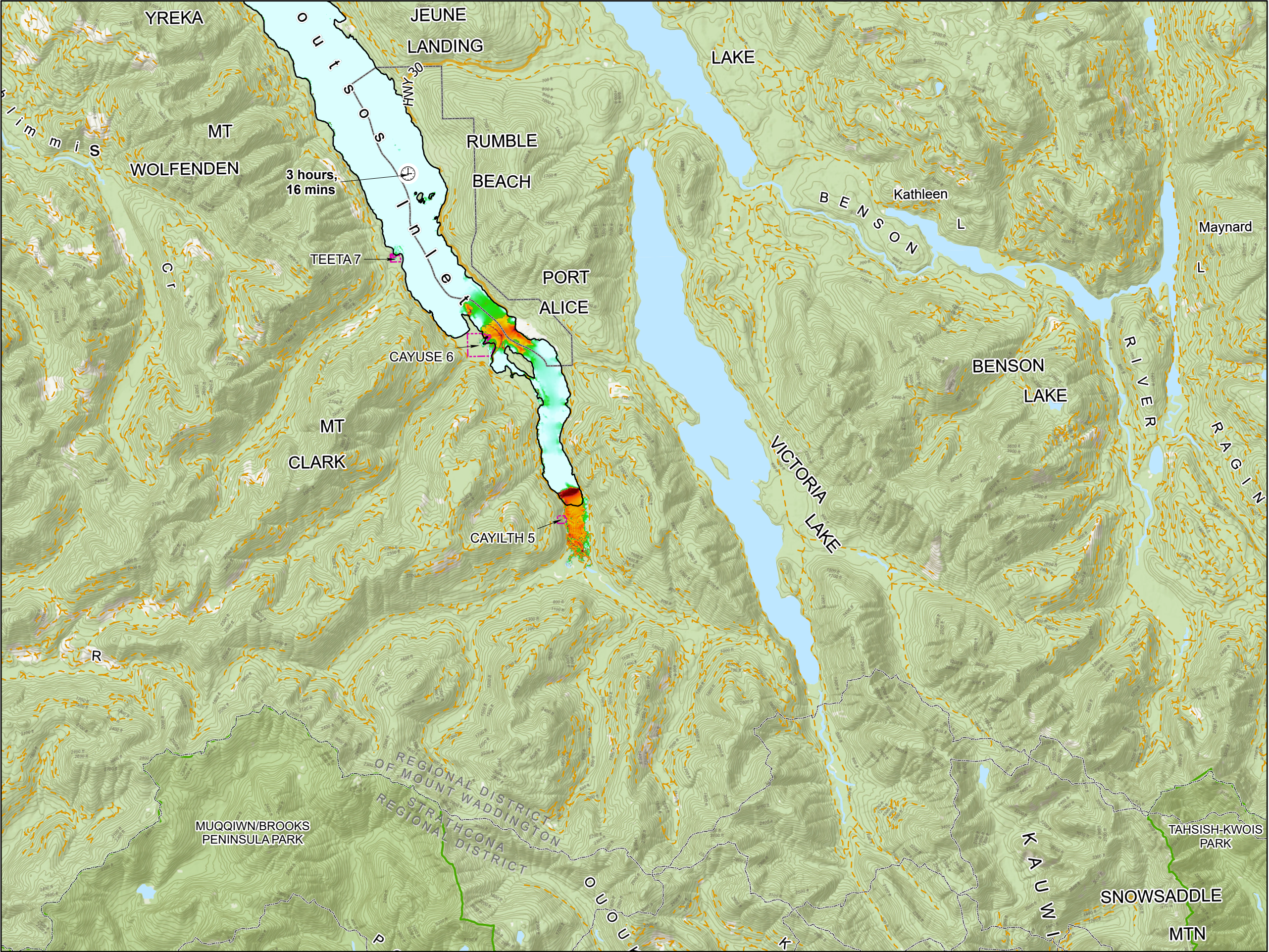
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NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
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ALASKA TSUNAMI

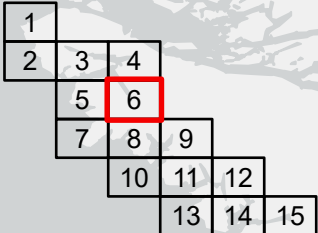
SHEET 5 OF 15

SHEET 6 ↓









 TSUNAMI ARRIVAL TIME

 APPROXIMATE COASTLINE

 FERRY ROUTE

 HIGHWAY

 ROAD

 RECREATION/RESOURCE ROAD

 FIRST NATION TREATY LANDS

 FIRST NATION ADMINISTRATIVE BOUNDARY

 MUNICIPAL BOUNDARY

 REGIONAL DISTRICT BOUNDARY

 PROVINCIAL PARK

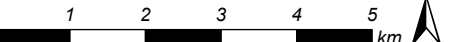
 AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

|                                                                                       |          |
|---------------------------------------------------------------------------------------|----------|
|  | >9 KNOTS |
|  | 6 KNOTS  |
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SCALE - 1:100,000



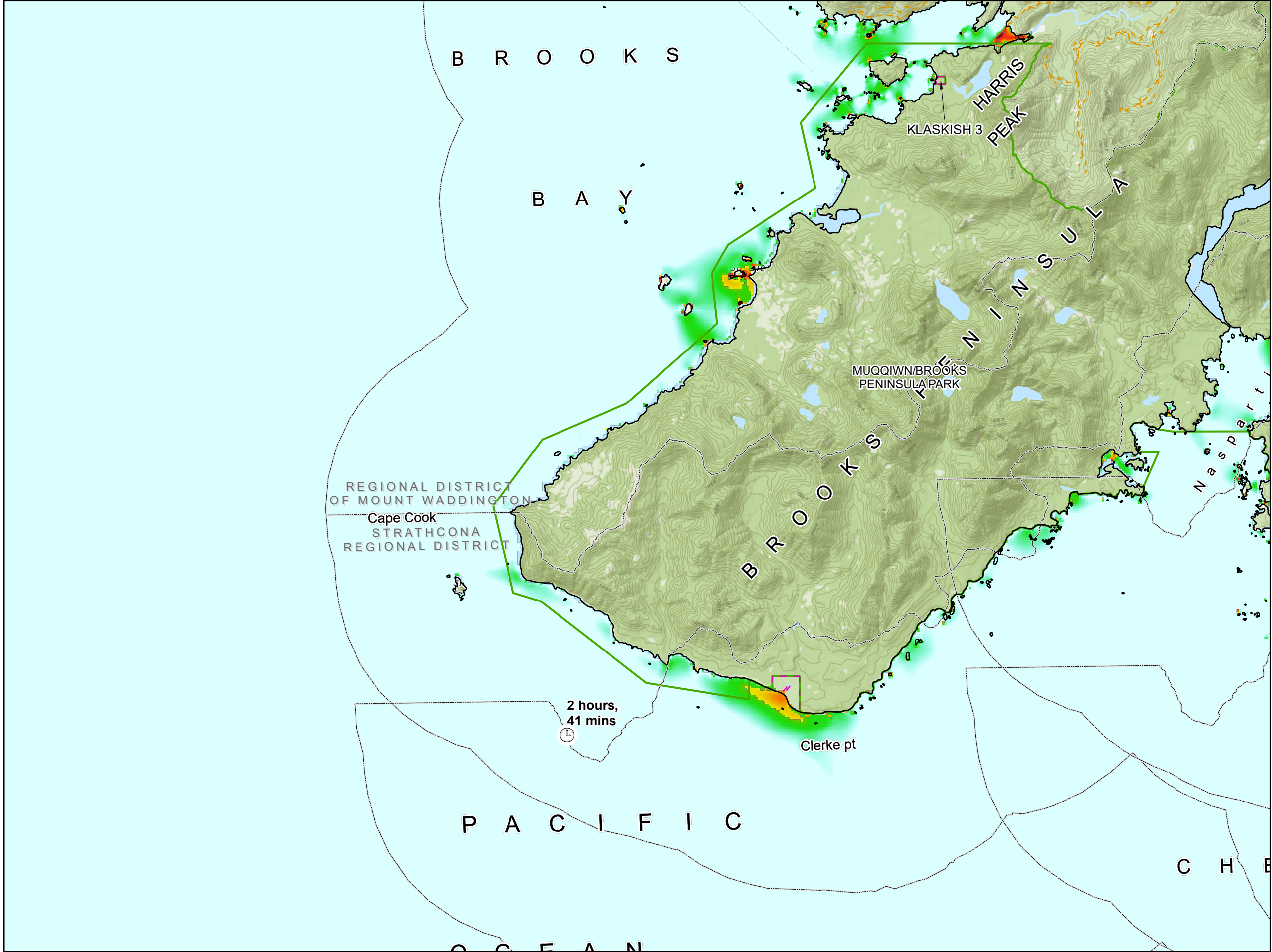
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Units: METRES

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| Engineer   | PSG     | GIS | SWM  | Reviewer    | GFL |
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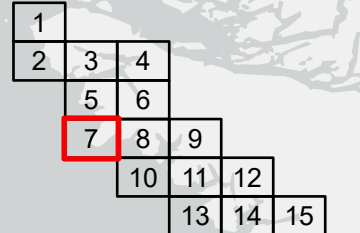
NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI

SHEET 6 OF 15









 TSUNAMI ARRIVAL TIME

 APPROXIMATE COASTLINE

 FERRY ROUTE

 HIGHWAY

 ROAD

 RECREATION/RESOURCE ROAD

 FIRST NATION TREATY LANDS

 FIRST NATION ADMINISTRATIVE BOUNDARY

 MUNICIPAL BOUNDARY

 REGIONAL DISTRICT BOUNDARY

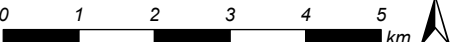
 PROVINCIAL PARK

 AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

|                                                                                       |          |                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | >9 KNOTS | REFER TO INDEX MAP FOR COMPLETE NOTES. NO SAFETY FACTOR WAS APPLIED TO THE RESULTS SHOWN. FOR INUNDATION EXTENTS, REFER TO MAPS OF TSUNAMI INUNDATION LEVEL FOR EMERGENCY PLANNING. |
|  | 6 KNOTS  |                                                                                                                                                                                     |
|  | 3 KNOTS  |                                                                                                                                                                                     |
|  | 0 KNOTS  |                                                                                                                                                                                     |

SCALE - 1:100,000



Coordinate System: NAD 1983 CSRS UTM ZONE 9N  
Units: METRES

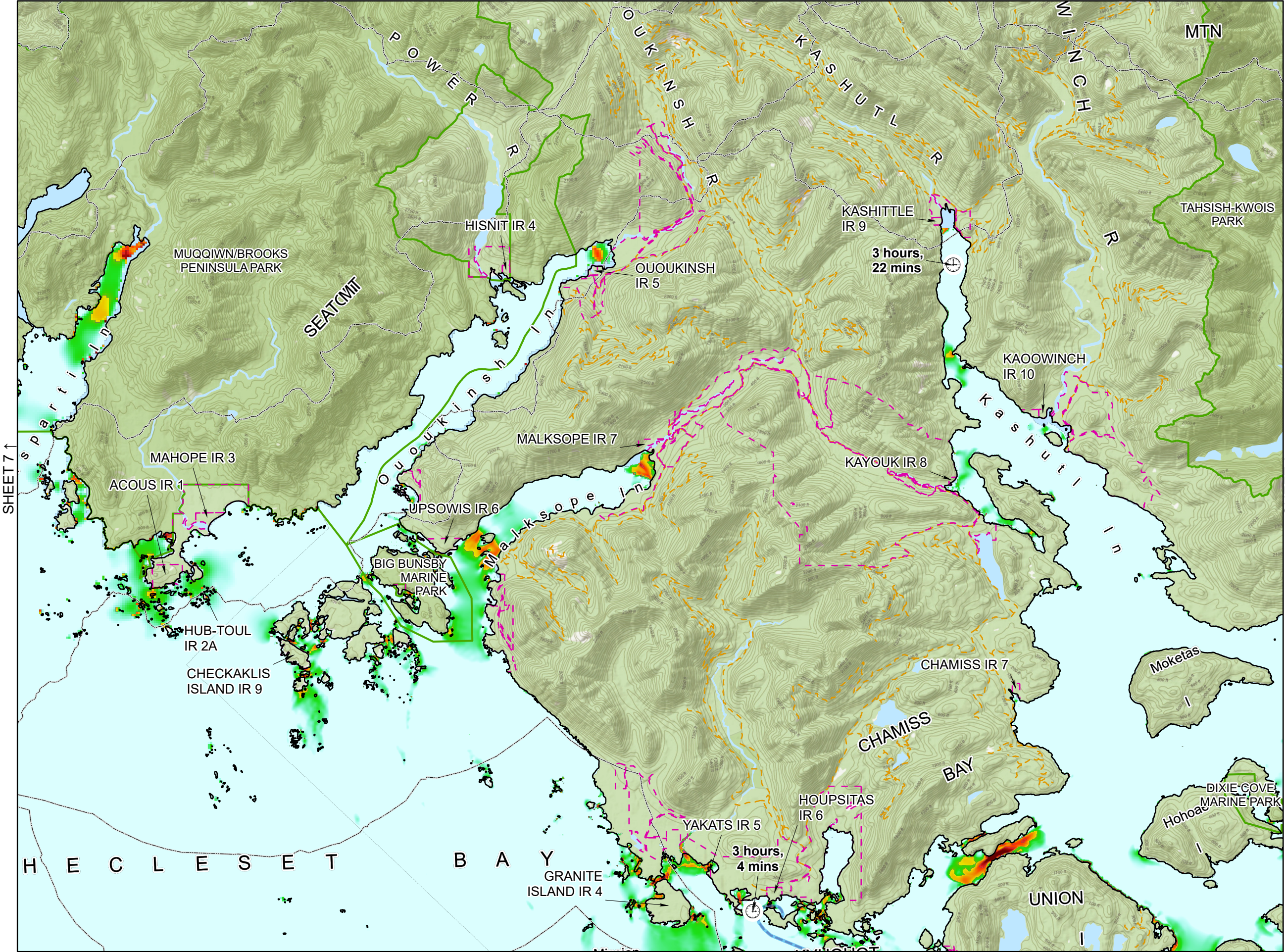
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NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI

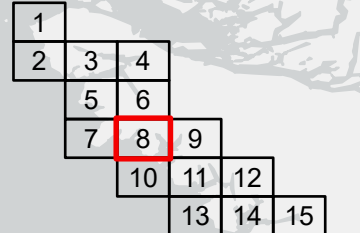
SHEET 7 OF 15

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 TSUNAMI ARRIVAL TIME

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 PROVINCIAL PARK

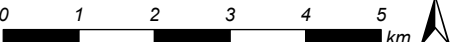
 AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

|                                                                                       |          |
|---------------------------------------------------------------------------------------|----------|
|  | >9 KNOTS |
|  | 6 KNOTS  |
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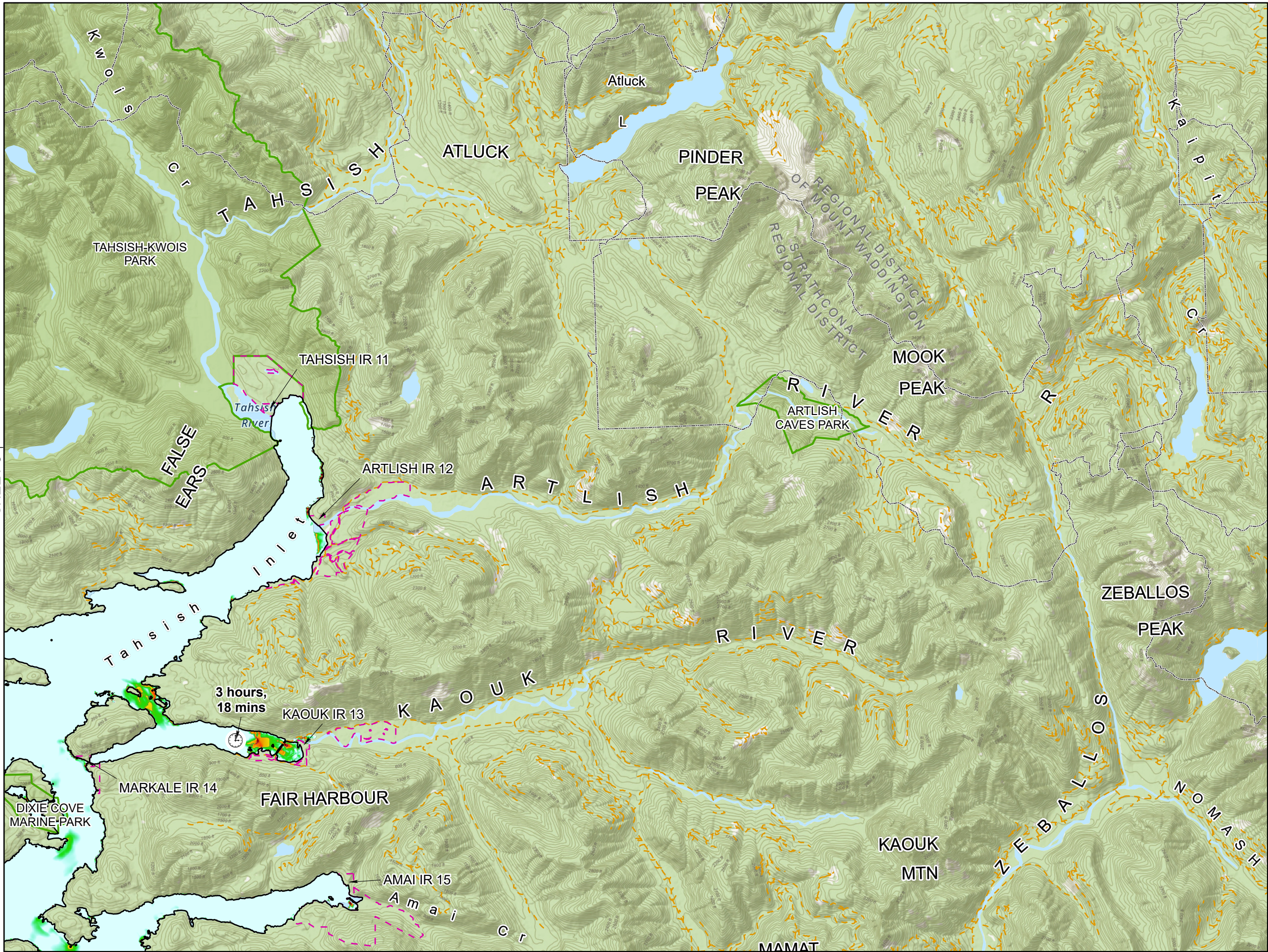
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TSUNAMI RISK ASSESSMENT PROJECT  
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CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI

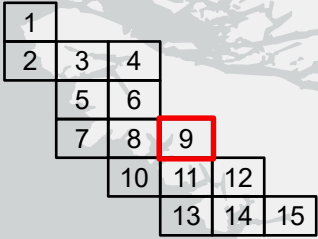
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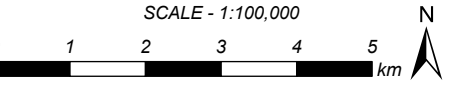
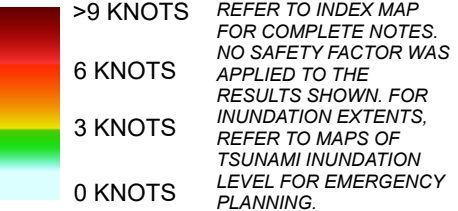
SHEET 8 ↑

SHEET 11 ↓



- TSUNAMI ARRIVAL TIME
- APPROXIMATE COASTLINE
- FERRY ROUTE
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- FIRST NATION TREATY LANDS
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- PROVINCIAL PARK
- AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI



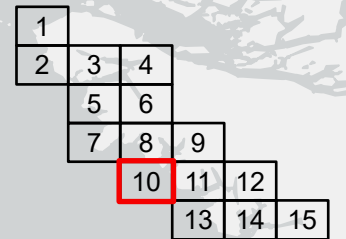
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NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI

SWM: \\mainfile-van\Projects\Active\3006332 NW Vancouver Island Tsunami Risk Assessment - Phase 2\95 GIS\3006332\_map\_100K\_HazardMap\_1.aprx





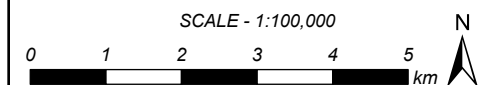
- Legend:**

  - TSUNAMI ARRIVAL TIME
  - APPROXIMATE COASTLINE
  - FERRY ROUTE
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  - PROVINCIAL PARK
  - AREA NOT CAPTURED BY MODEL

**MAX CURRENT VELOCITY INDUCED BY TSUNAMI**

| Color       | Velocity (KNOTS) |
|-------------|------------------|
| Dark Red    | >9 KNOTS         |
| Red         | 6 KNOTS          |
| Orange      | 3 KNOTS          |
| Yellow      | 3 KNOTS          |
| Light Green | 0 KNOTS          |
| Light Blue  | 0 KNOTS          |

*REFER TO INDEX MAP FOR COMPLETE NOTES. NO SAFETY FACTOR WAS APPLIED TO THE RESULTS SHOWN. FOR INUNDATION EXTENTS, REFER TO MAPS OF TSUNAMI INUNDATION LEVEL FOR EMERGENCY PLANNING.*

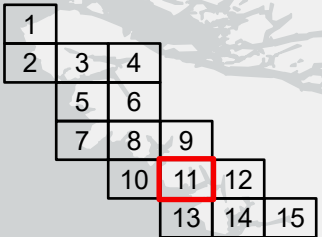
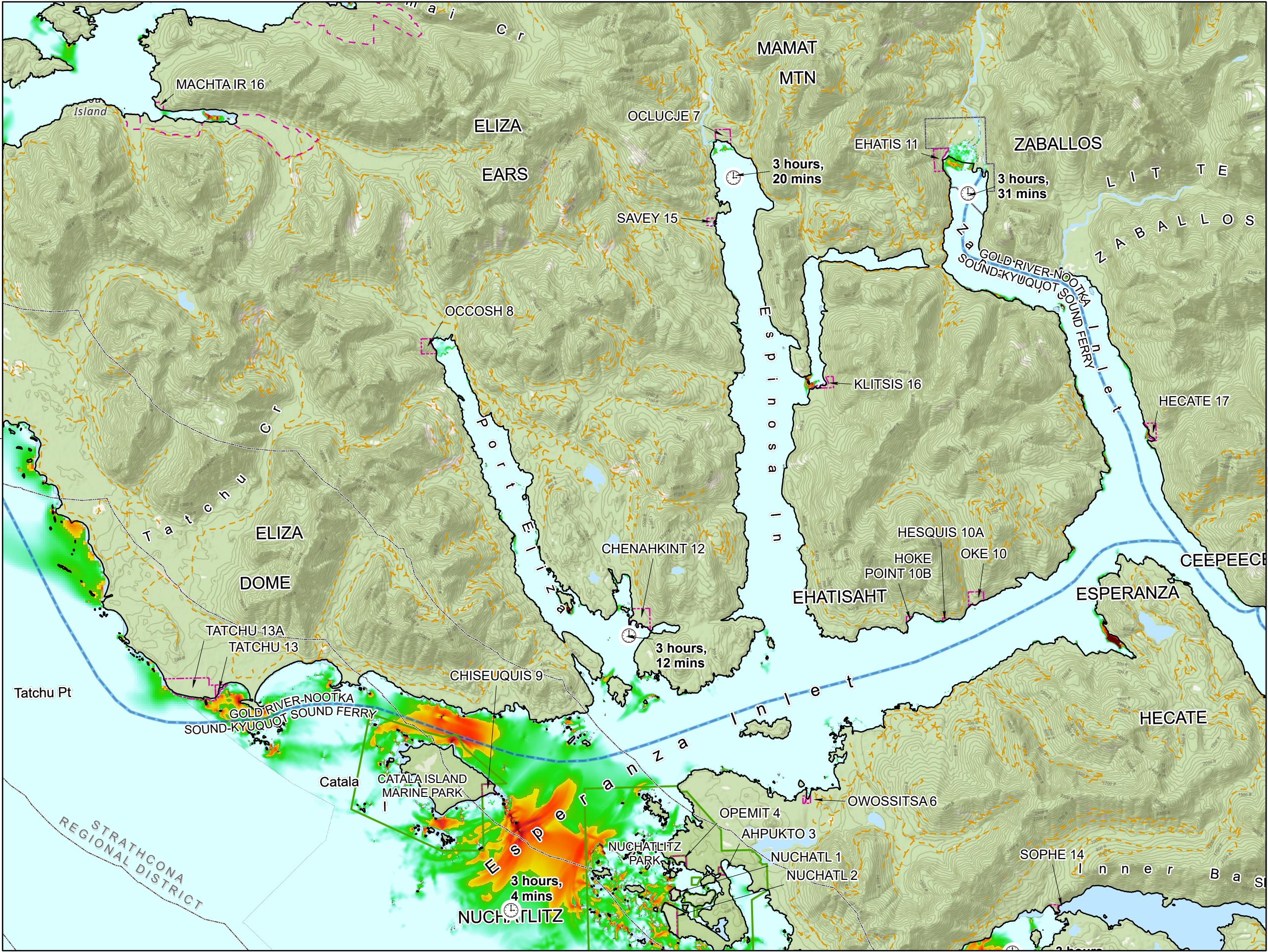


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Units: METRES

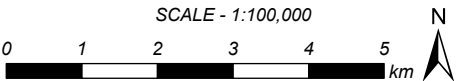
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NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI





- ⌚ TSUNAMI ARRIVAL TIME
  - APPROXIMATE COASTLINE
  - FERRY ROUTE
  - HIGHWAY
  - ROAD
  - - - RECREATION/RESOURCE ROAD
  - ▭ FIRST NATION TREATY LANDS
  - ▭ FIRST NATION ADMINISTRATIVE BOUNDARY
  - ▭ MUNICIPAL BOUNDARY
  - ▭ REGIONAL DISTRICT BOUNDARY
  - ▭ PROVINCIAL PARK
  - ▭ AREA NOT CAPTURED BY MODEL
  - MAX CURRENT VELOCITY INDUCED BY TSUNAMI
    - >9 KNOTS
    - 6 KNOTS
    - 3 KNOTS
    - 0 KNOTS
- REFER TO INDEX MAP FOR COMPLETE NOTES. NO SAFETY FACTOR WAS APPLIED TO THE RESULTS SHOWN. FOR INUNDATION EXTENTS, REFER TO MAPS OF TSUNAMI INUNDATION LEVEL FOR EMERGENCY PLANNING.

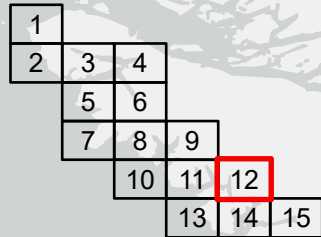
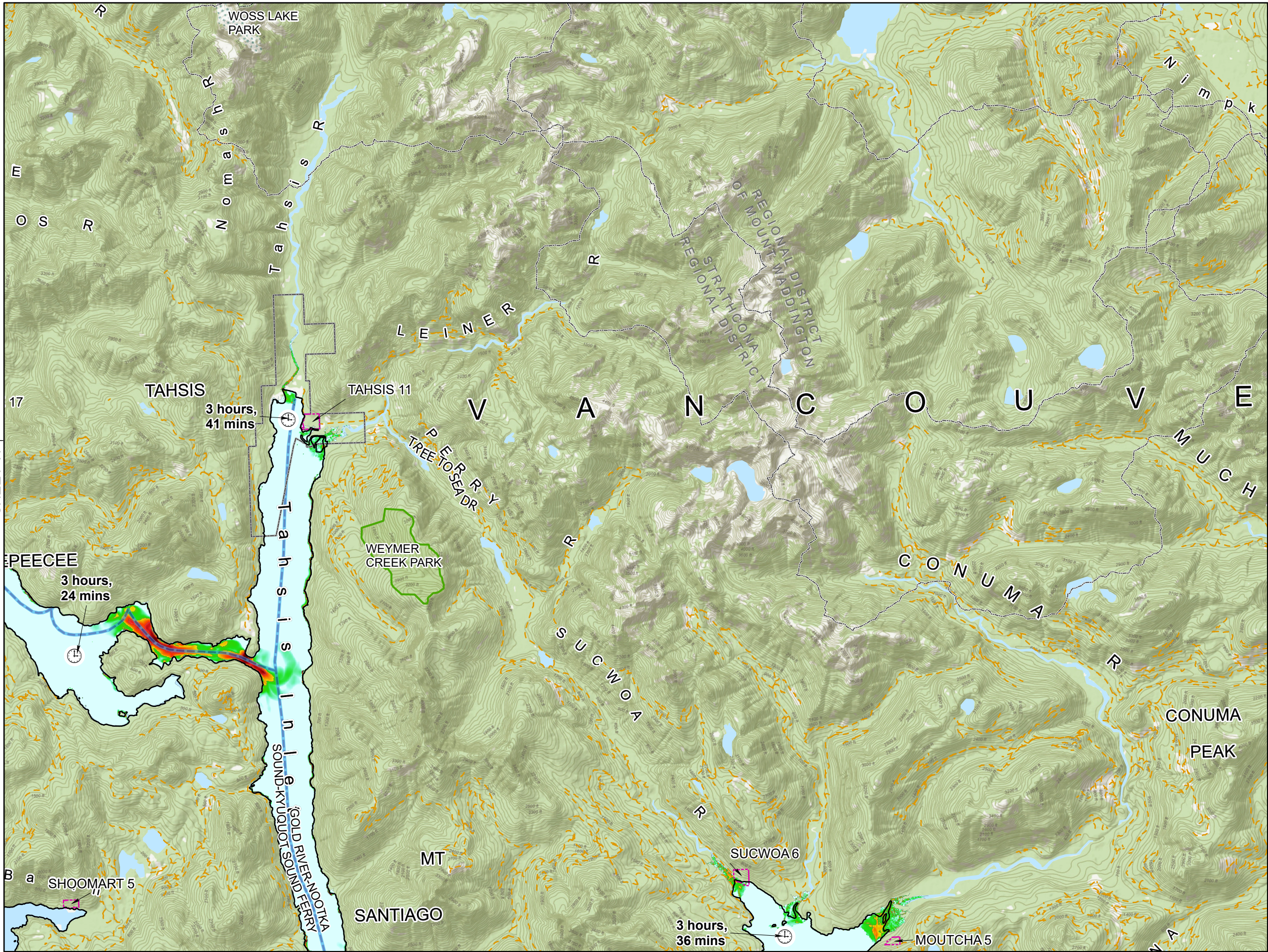


Coordinate System: NAD 1983 CSRS UTM ZONE 9N  
Units: METRES

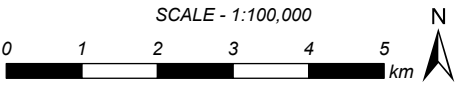
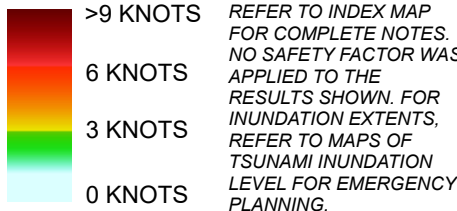
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|------------|---------|------|-------------|----------|-----|
| Engineer   | PSG     | GIS  | SWM         | Reviewer | GFL |
| Job Number | 3006332 | Date | 11-MAY-2023 |          |     |

NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI





- ⌚ TSUNAMI ARRIVAL TIME
- APPROXIMATE COASTLINE
- FERRY ROUTE
- HIGHWAY
- ROAD
- - - RECREATION/RESOURCE ROAD
- - - FIRST NATION TREATY LANDS
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- ▭ PROVINCIAL PARK
- ▭ AREA NOT CAPTURED BY MODEL
- MAX CURRENT VELOCITY INDUCED BY TSUNAMI

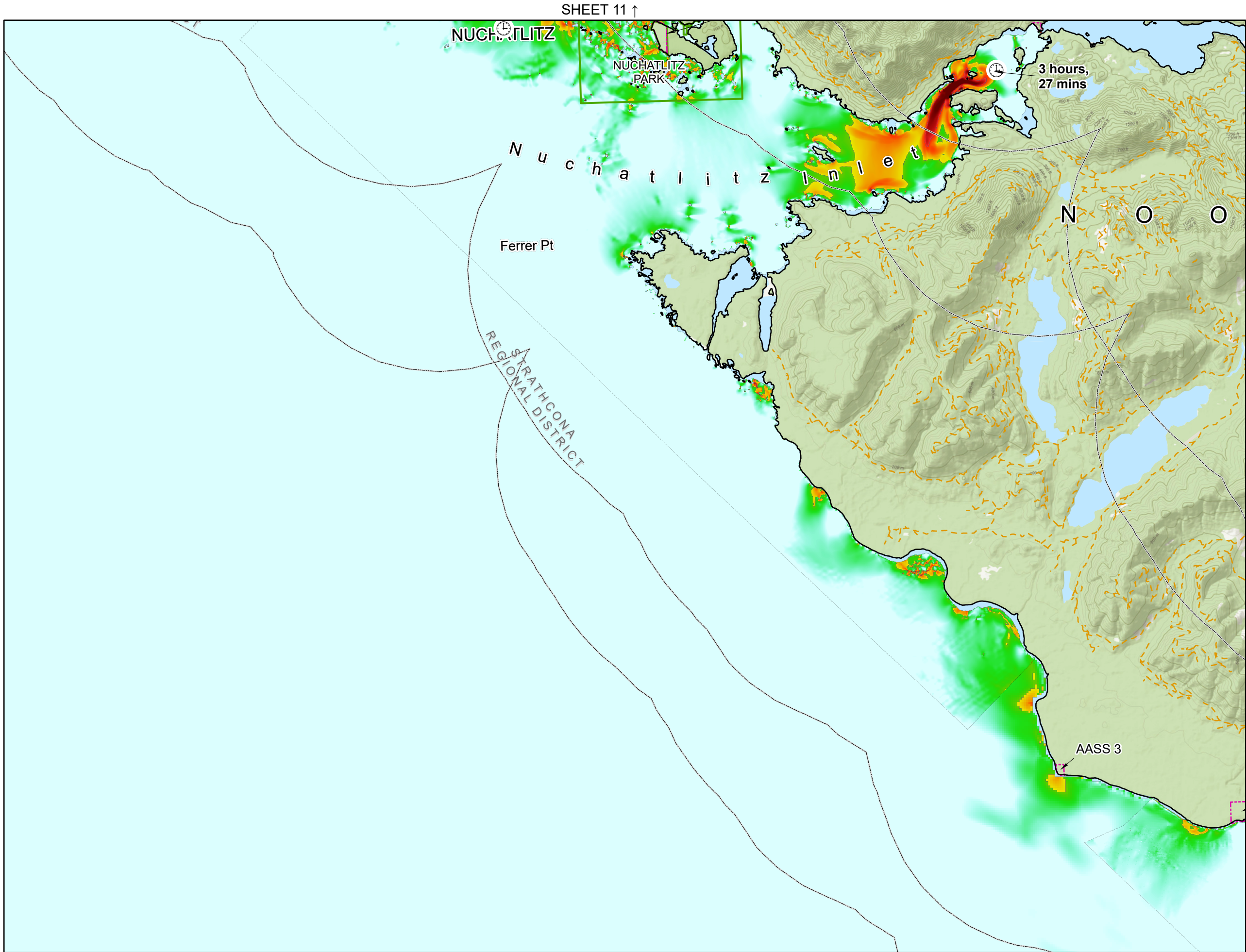


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Units: METRES

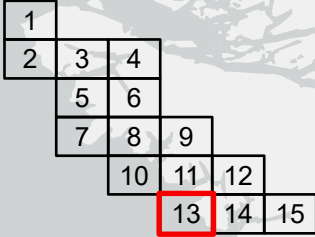
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| Engineer   | PSG     | GIS  | SWM         | Reviewer | GFL |
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NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
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ALASKA TSUNAMI









 TSUNAMI ARRIVAL TIME

 APPROXIMATE COASTLINE

 FERRY ROUTE

 HIGHWAY

 ROAD

 RECREATION/RESOURCE ROAD

 FIRST NATION TREATY LANDS

 FIRST NATION ADMINISTRATIVE BOUNDARY

 MUNICIPAL BOUNDARY

 REGIONAL DISTRICT BOUNDARY

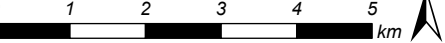
 PROVINCIAL PARK

 AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

|                                                                                       |          |                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | >9 KNOTS | REFER TO INDEX MAP FOR COMPLETE NOTES. NO SAFETY FACTOR WAS APPLIED TO THE RESULTS SHOWN. FOR INUNDATION EXTENTS, REFER TO MAPS OF TSUNAMI INUNDATION LEVEL FOR EMERGENCY PLANNING. |
|  | 6 KNOTS  |                                                                                                                                                                                     |
|  | 3 KNOTS  |                                                                                                                                                                                     |
|  | 0 KNOTS  |                                                                                                                                                                                     |

SCALE - 1:100,000



Coordinate System: NAD 1983 CSRS UTM ZONE 9N  
Units: METRES

|          |     |          |
|----------|-----|----------|
| Engineer | GIS | Reviewer |
| PSG      | SWM | GFL      |

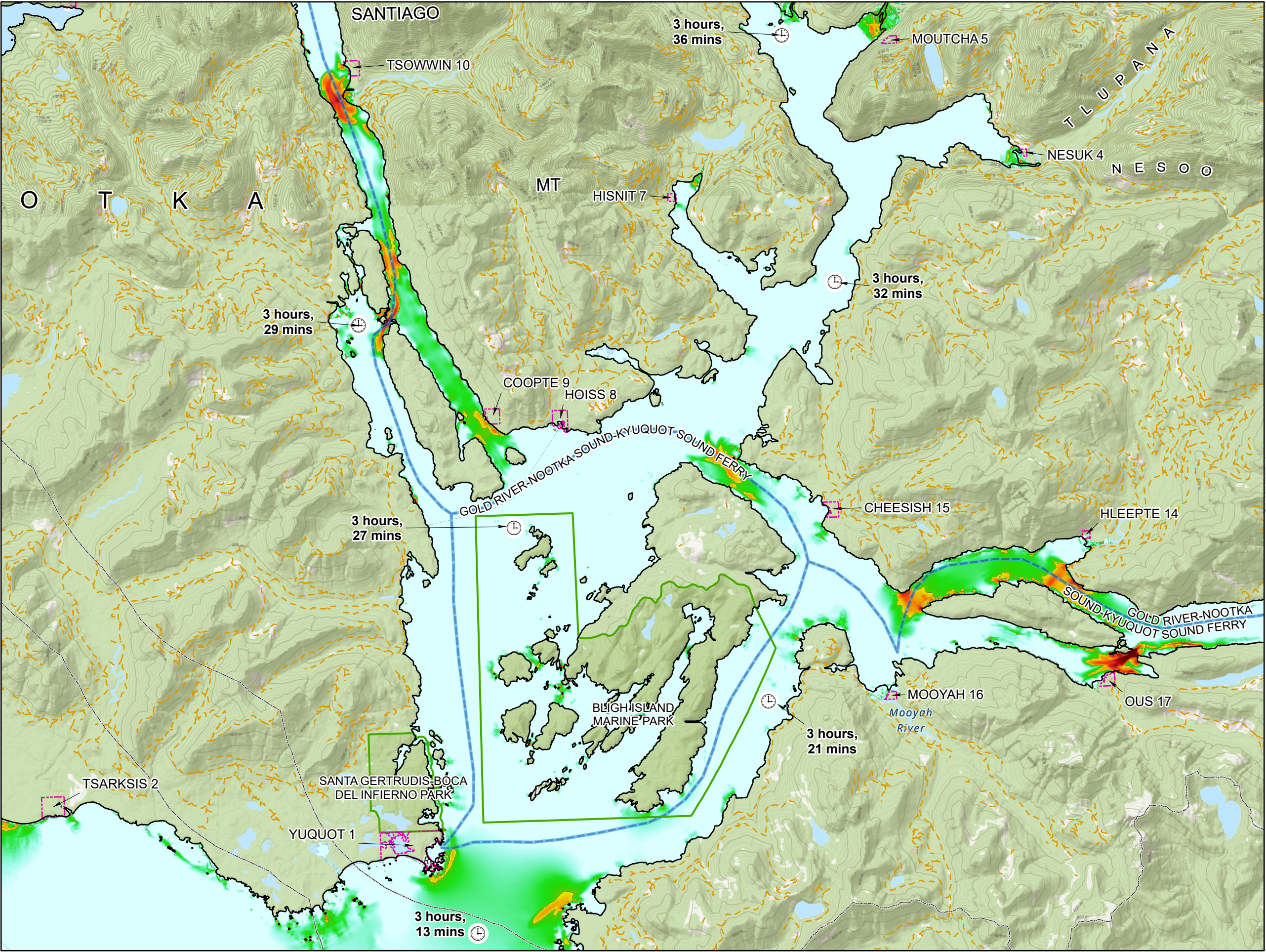
|            |             |
|------------|-------------|
| Job Number | Date        |
| 3006332    | 11-MAY-2023 |

NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
REGIONAL SCALE  
ALASKA TSUNAMI

SHEET 13 OF 15

SWM, \\mainfile-van\Projects\Active\3006332 NW Vancouver Island Tsunami Risk Assessment - Phase 2\95 GIS\3006332\_map\_100K\_HazardMap\_1.aprx

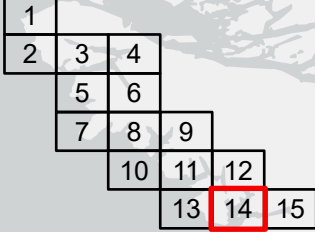




SHEET 13 ↑

SHEET 15 ↑





 TSUNAMI ARRIVAL TIME

 APPROXIMATE COASTLINE

 FERRY ROUTE

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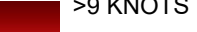
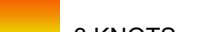
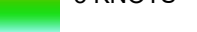
 MUNICIPAL BOUNDARY

 REGIONAL DISTRICT BOUNDARY

 PROVINCIAL PARK

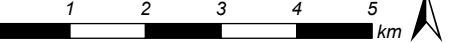
 AREA NOT CAPTURED BY MODEL

MAX CURRENT VELOCITY INDUCED BY TSUNAMI

|                                                                                       |          |
|---------------------------------------------------------------------------------------|----------|
|  | >9 KNOTS |
|  | 6 KNOTS  |
|  | 3 KNOTS  |
|  | 0 KNOTS  |

REFER TO INDEX MAP FOR COMPLETE NOTES. NO SAFETY FACTOR WAS APPLIED TO THE RESULTS SHOWN. FOR INUNDATION EXTENTS, REFER TO MAPS OF TSUNAMI INUNDATION LEVEL FOR EMERGENCY PLANNING.

SCALE - 1:100,000



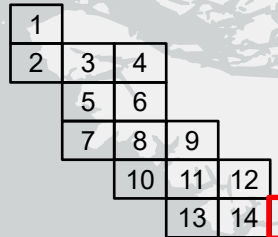
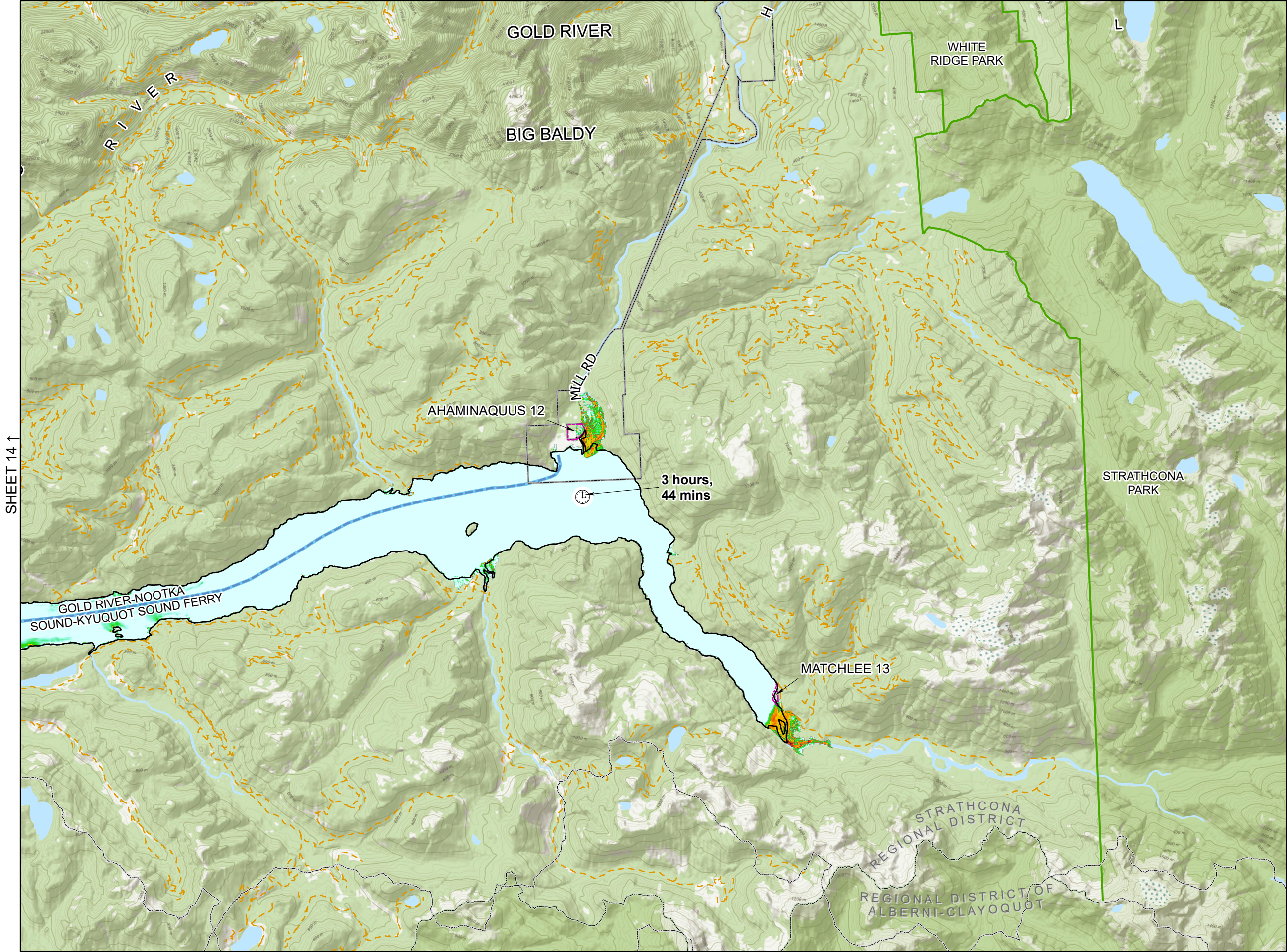
Coordinate System: NAD 1983 CSRS UTM ZONE 9N  
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| Engineer   | PSG     | GIS | SWM  | Reviewer    | GFL |
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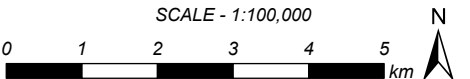
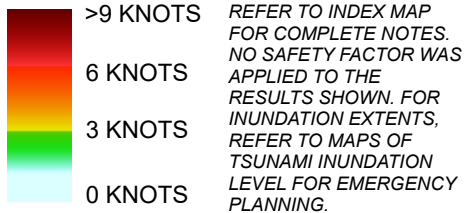
NORTHWEST VANCOUVER ISLAND  
TSUNAMI RISK ASSESSMENT PROJECT  
MAXIMUM TSUNAMI  
CURRENT VELOCITY  
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SHEET 14 OF 15





- TSUNAMI ARRIVAL TIME
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