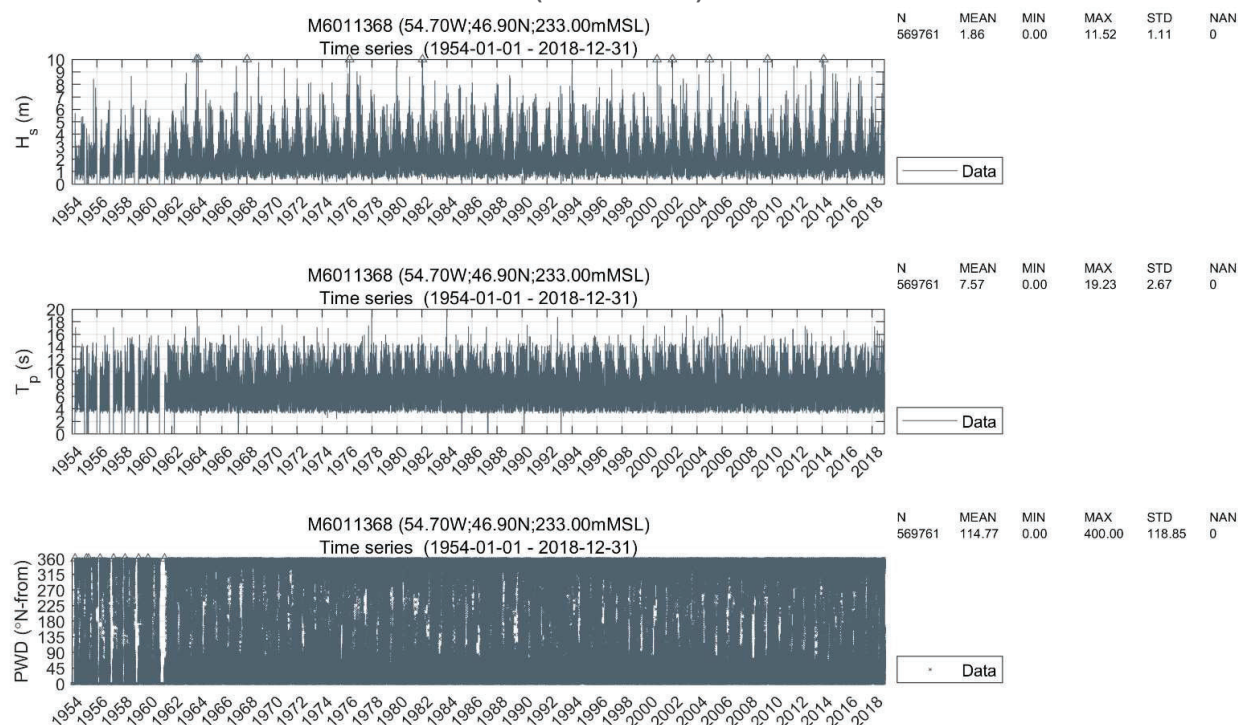


# **APPENDIX J**

Monthly Wave Rose Data

## Placentia Bay – MSC50 M6011368, Wave Climate

**FIGURE 1: M6011368 TIMESERIES (1954-2018), SIGNIFICANT WAVE HEIGHT (TOP), PEAK WAVE PERIOD (MIDDLE), WAVE DIRECTION (BOTTOM)**



**FIGURE 2: SIGNIFICANT WAVE HEIGHT (HS, M) M6011368 FREQUENCY OF OCCURRENCE PER DIRECTION**

M6011368 (54.70W;46.90N;233.00mMSL)  
Frequency of Occurrence [%] (1954-01-01 - 2018-12-31) All

MWD [°N-from] - Data

|        | [-15-15[ | [15-45[ | [45-75[ | [75-105[ | [105-135[ | [135-165[ | [165-195[ | [195-225[ | [225-255[ | [255-285[ | [285-315[ | [315-345[ | Total | Accum |
|--------|----------|---------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|
| [9-10[ | -        | -       | -       | -        | -         | 0.0       | 0.0       | 0.0       | 0.0       | -         | -         | -         | 0.0   | 100.0 |
| [8-9[  | -        | -       | -       | -        | -         | 0.0       | 0.0       | 0.0       | 0.0       | -         | -         | -         | 0.1   | 100.0 |
| [7-8[  | -        | -       | -       | -        | 0.0       | 0.0       | 0.0       | 0.0       | 0.1       | 0.0       | -         | -         | 0.1   | 99.9  |
| [6-7[  | -        | -       | -       | -        | 0.0       | 0.0       | 0.1       | 0.1       | 0.2       | 0.0       | -         | 0.0       | 0.4   | 99.8  |
| [5-6[  | 0.0      | 0.0     | 0.0     | 0.0      | 0.0       | 0.1       | 0.3       | 0.3       | 0.3       | 0.1       | 0.0       | 0.0       | 1.1   | 99.3  |
| [4-5[  | 0.0      | 0.0     | 0.0     | 0.1      | 0.1       | 0.2       | 0.6       | 0.9       | 0.8       | 0.2       | 0.0       | 0.0       | 3.0   | 98.2  |
| [3-4[  | 0.1      | 0.1     | 0.2     | 0.2      | 0.3       | 0.6       | 1.5       | 2.2       | 2.0       | 0.9       | 0.2       | 0.1       | 8.3   | 95.2  |
| [2-3[  | 0.6      | 0.5     | 0.7     | 0.8      | 1.0       | 1.6       | 3.3       | 5.7       | 4.3       | 2.1       | 1.0       | 0.7       | 22.3  | 86.9  |
| [1-2[  | 1.8      | 1.4     | 1.1     | 1.5      | 1.9       | 3.1       | 7.1       | 14.6      | 7.1       | 2.6       | 1.8       | 1.8       | 45.9  | 64.6  |
| [0-1[  | 0.3      | 0.4     | 0.3     | 0.3      | 0.6       | 1.8       | 6.6       | 5.6       | 1.8       | 0.5       | 0.3       | 0.2       | 18.7  | 18.7  |
| Total  | 2.9      | 2.5     | 2.4     | 2.8      | 3.8       | 7.5       | 19.5      | 29.6      | 16.7      | 6.4       | 3.2       | 2.9       | 100.0 | -     |
| Accum  | 2.9      | 5.4     | 7.7     | 10.5     | 14.3      | 21.8      | 41.2      | 70.8      | 87.5      | 93.9      | 97.1      | 100.0     | -     | -     |

**FIGURE 3: PEAK WAVE PERIOD (TP, S) M6011368 FREQUENCY OF OCCURRENCE PER DIRECTION**

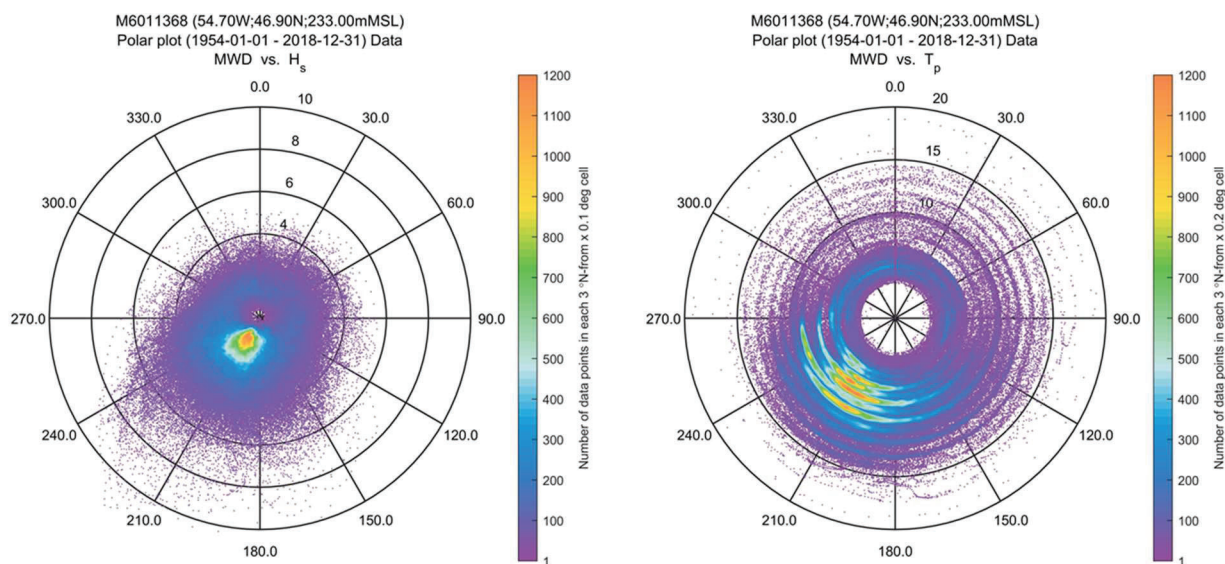
M6011368 (54.70W;46.90N;233.00mMSL)

Frequency of Occurrence [%] (1954-01-01 - 2018-12-31) All

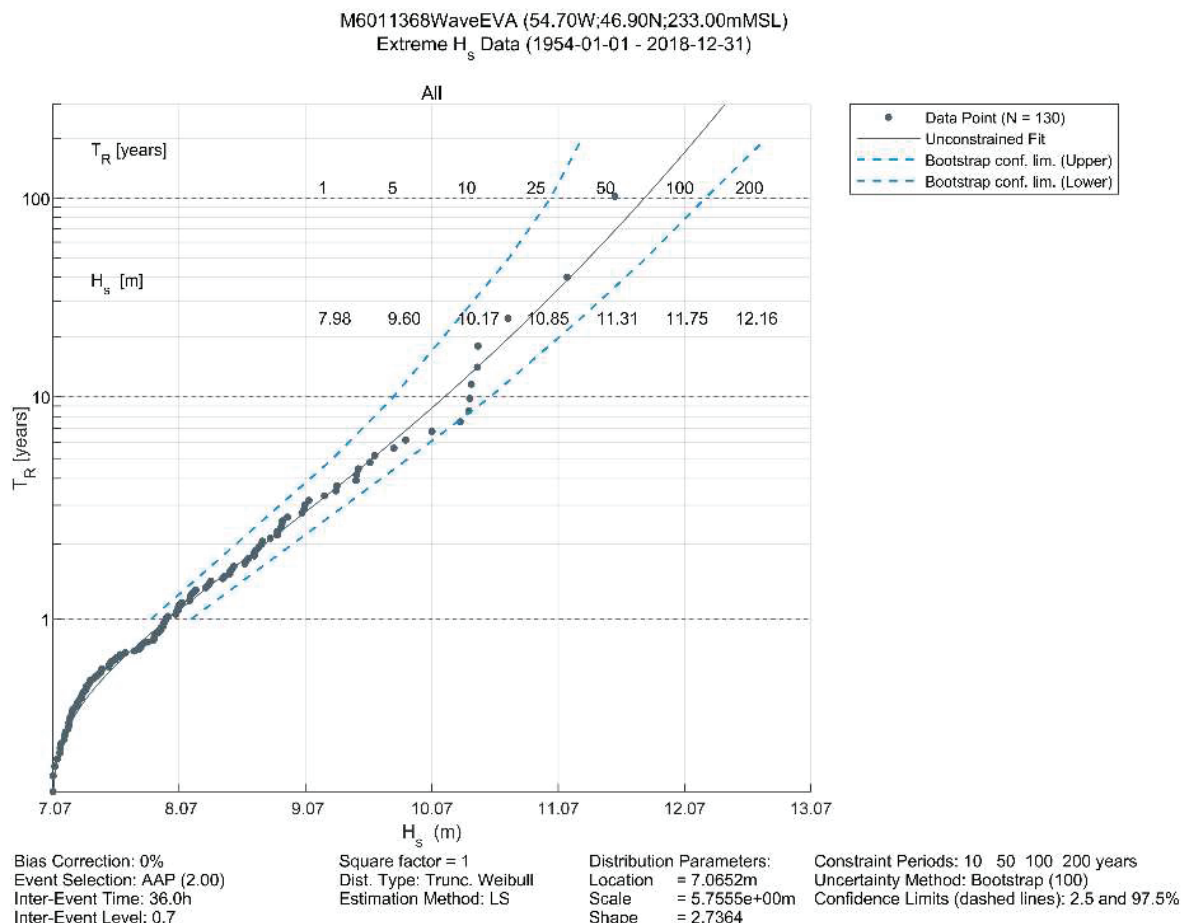
MWD [°N-from] - Data

|                           | [-15-15[ | [15-45[ | [45-75[ | [75-105[ | [105-135[ | [135-165[ | [165-195[ | [195-225[ | [225-255[ | [255-285[ | [285-315[ | [315-345[ | Total | Accum |
|---------------------------|----------|---------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|
| T <sub>p</sub> [s] - Data |          |         |         |          |           |           |           |           |           |           |           |           |       |       |
| [18-20[                   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0   | 100.0 |
| [16-18[                   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | -         | 0.1   | 100.0 |
| [14-16[                   | 0.0      | 0.0     | 0.0     | 0.0      | 0.1       | 0.1       | 0.2       | 0.3       | 0.1       | 0.0       | 0.0       | 0.0       | 0.8   | 99.9  |
| [12-14[                   | 0.0      | 0.1     | 0.1     | 0.1      | 0.2       | 0.3       | 0.8       | 1.0       | 0.5       | 0.1       | 0.0       | 0.0       | 3.3   | 99.1  |
| [10-12[                   | 0.1      | 0.1     | 0.2     | 0.3      | 0.6       | 1.1       | 2.3       | 3.5       | 1.9       | 0.4       | 0.1       | 0.1       | 10.5  | 95.8  |
| [8-10[                    | 0.1      | 0.2     | 0.2     | 0.4      | 1.1       | 2.7       | 5.8       | 10.5      | 6.3       | 1.7       | 0.3       | 0.2       | 29.5  | 85.3  |
| [6-8[                     | 0.4      | 0.4     | 0.6     | 0.4      | 0.8       | 2.4       | 5.1       | 11.0      | 4.9       | 1.7       | 0.5       | 0.3       | 28.7  | 55.8  |
| [4-6[                     | 2.0      | 1.6     | 1.2     | 1.4      | 0.9       | 0.8       | 1.5       | 3.2       | 2.8       | 2.2       | 2.1       | 2.1       | 21.9  | 27.1  |
| [2-4[                     | 0.1      | 0.1     | 0.1     | 0.1      | 0.1       | 0.1       | 0.1       | 0.1       | 0.2       | 0.2       | 0.2       | 0.1       | 1.6   | 5.2   |
| [0-2[                     | 0.0      | 0.0     | 0.0     | -        | -         | -         | 3.6       | 0.0       | 0.0       | 0.0       | -         | 0.0       | 3.6   | 3.6   |
| Total                     | 2.9      | 2.5     | 2.4     | 2.8      | 3.8       | 7.5       | 19.5      | 29.6      | 16.7      | 6.4       | 3.2       | 2.9       | 100.0 | -     |
| Accum                     | 2.9      | 5.4     | 7.7     | 10.5     | 14.3      | 21.8      | 41.2      | 70.8      | 87.5      | 93.9      | 97.1      | 100.0     | -     | -     |

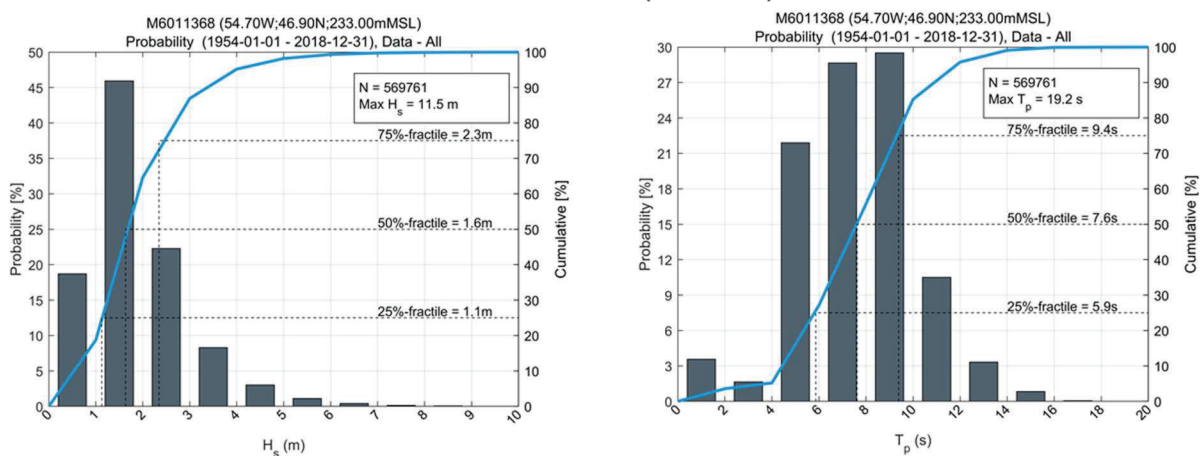
**FIGURE H.4: M6011368 SIGNIFICANT WAVE HEIGHT POLAR PLOT (LEFT), PEAK WAVE PERIOD POLAR PLOT (RIGHT)**



**FIGURE H.5: EXTREME VALUE ANALYSIS, MSC50 M6011368, SIGNIFICANT WAVE HEIGHT ( $H_s$ , M)**

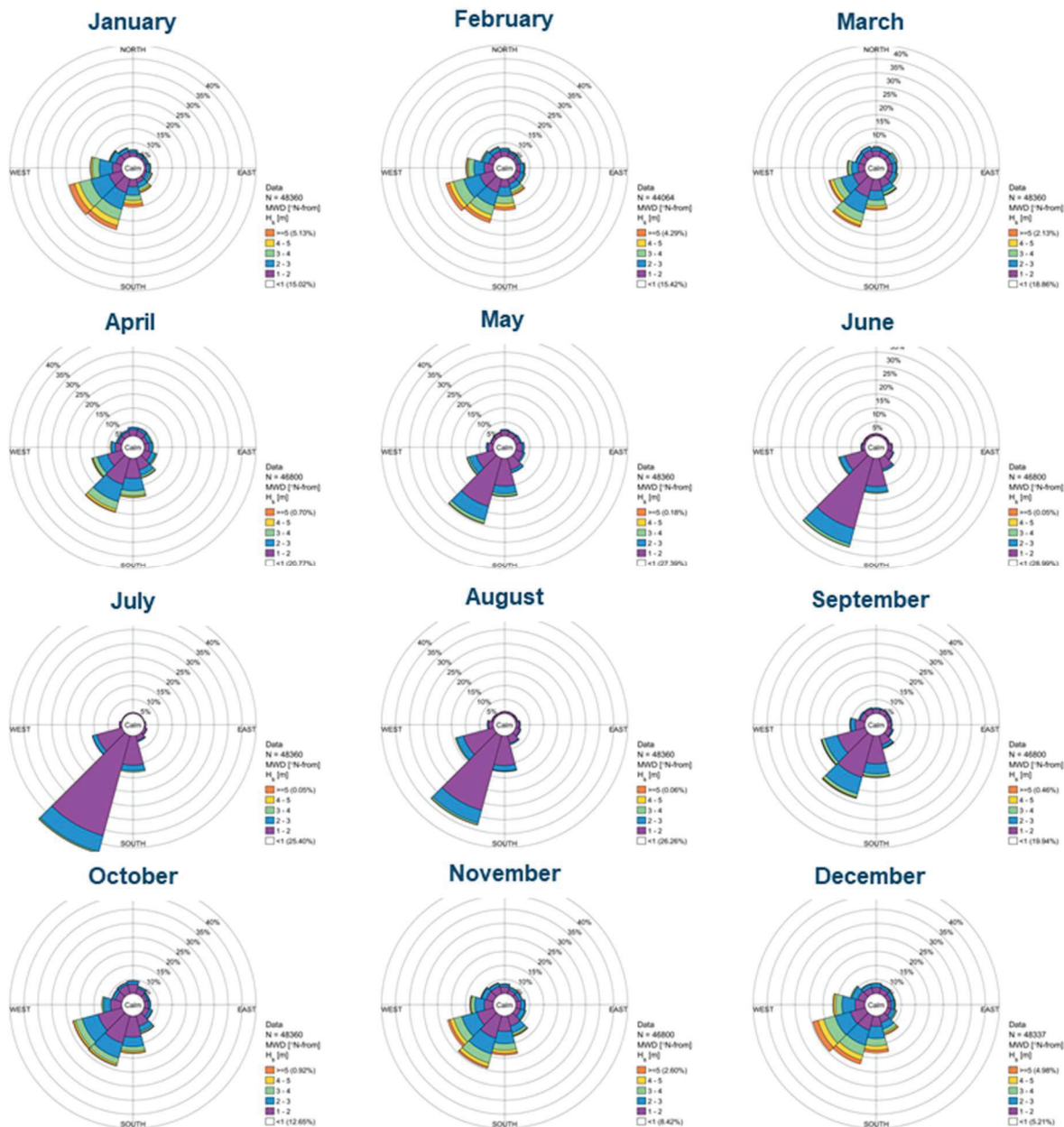


**FIGURE H.6: M6011368 SIGNIFICANT WAVE HEIGHT PROBABILITY OF OCCURRENCE (LEFT), PEAK WAVE PERIOD PROBABILITY OF OCCURRENCE (RIGHT)**





**FIGURE H.7: MONTHLY SIGNIFICANT WAVE HEIGHT ROSES (HS, M) IN THE PERIOD 1954-2018**



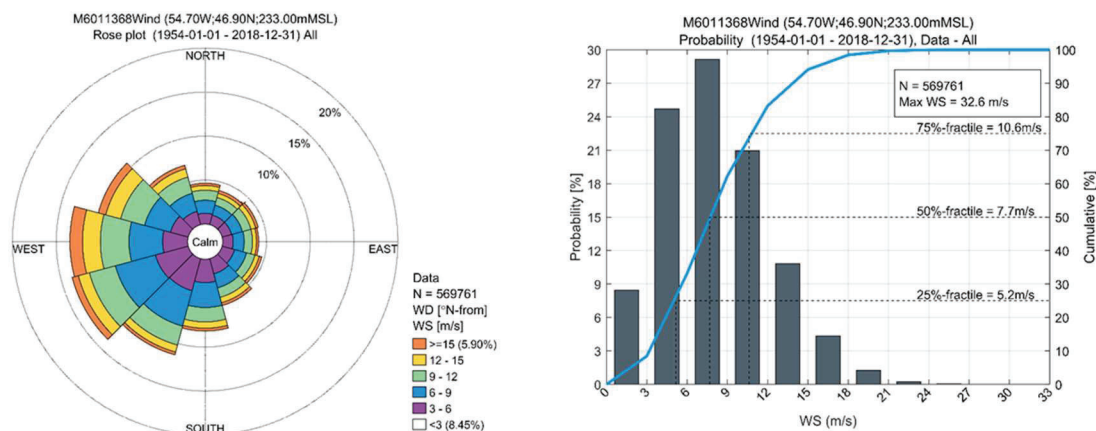
## Placentia Bay – MSC50 M6011368, Wind Climate

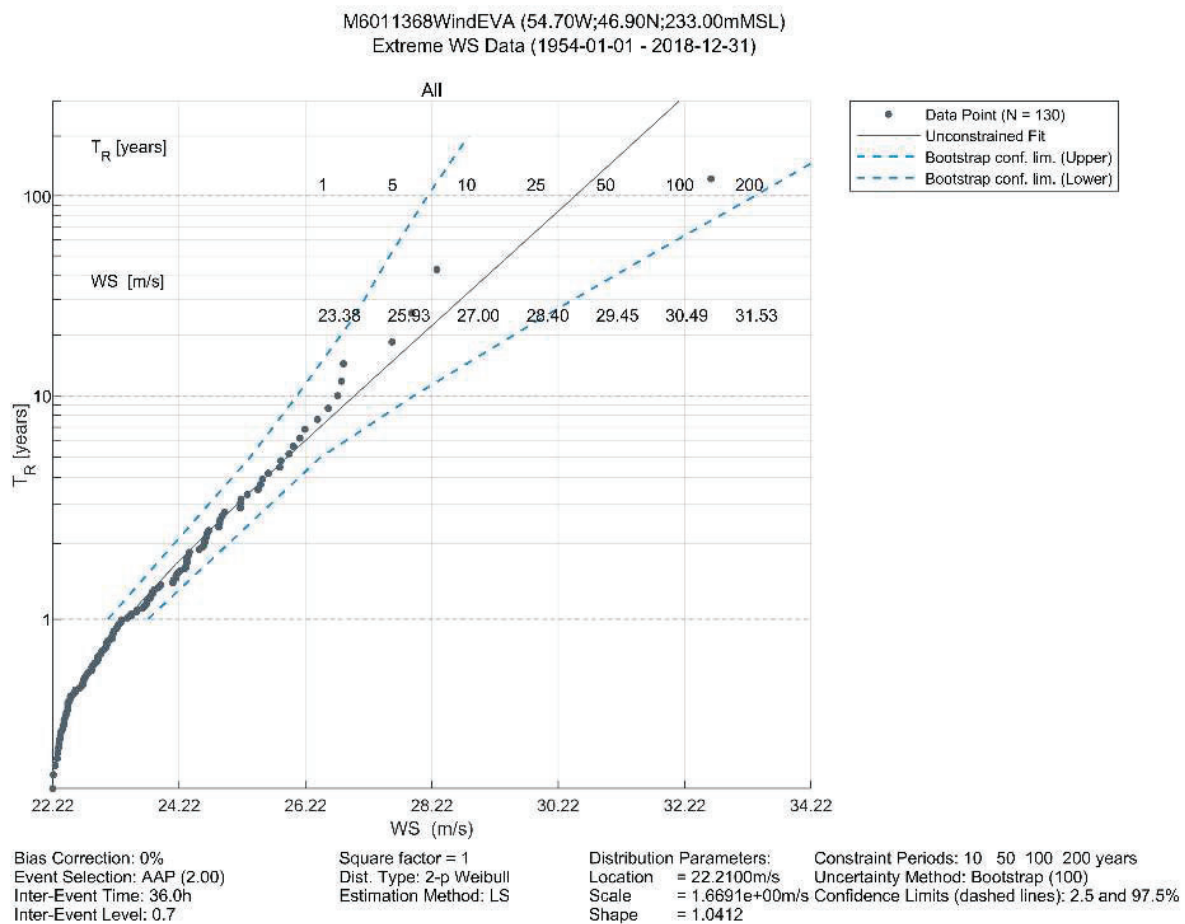
**FIGURE H.8: WIND SPEED (M/S) M6011368 FREQUENCY OF OCCURRENCE PER DIRECTION**

M6011368Wind  
Exceedance (1954-01-01 - 2018-12-31) Data - Directional  
Exceedance [%]

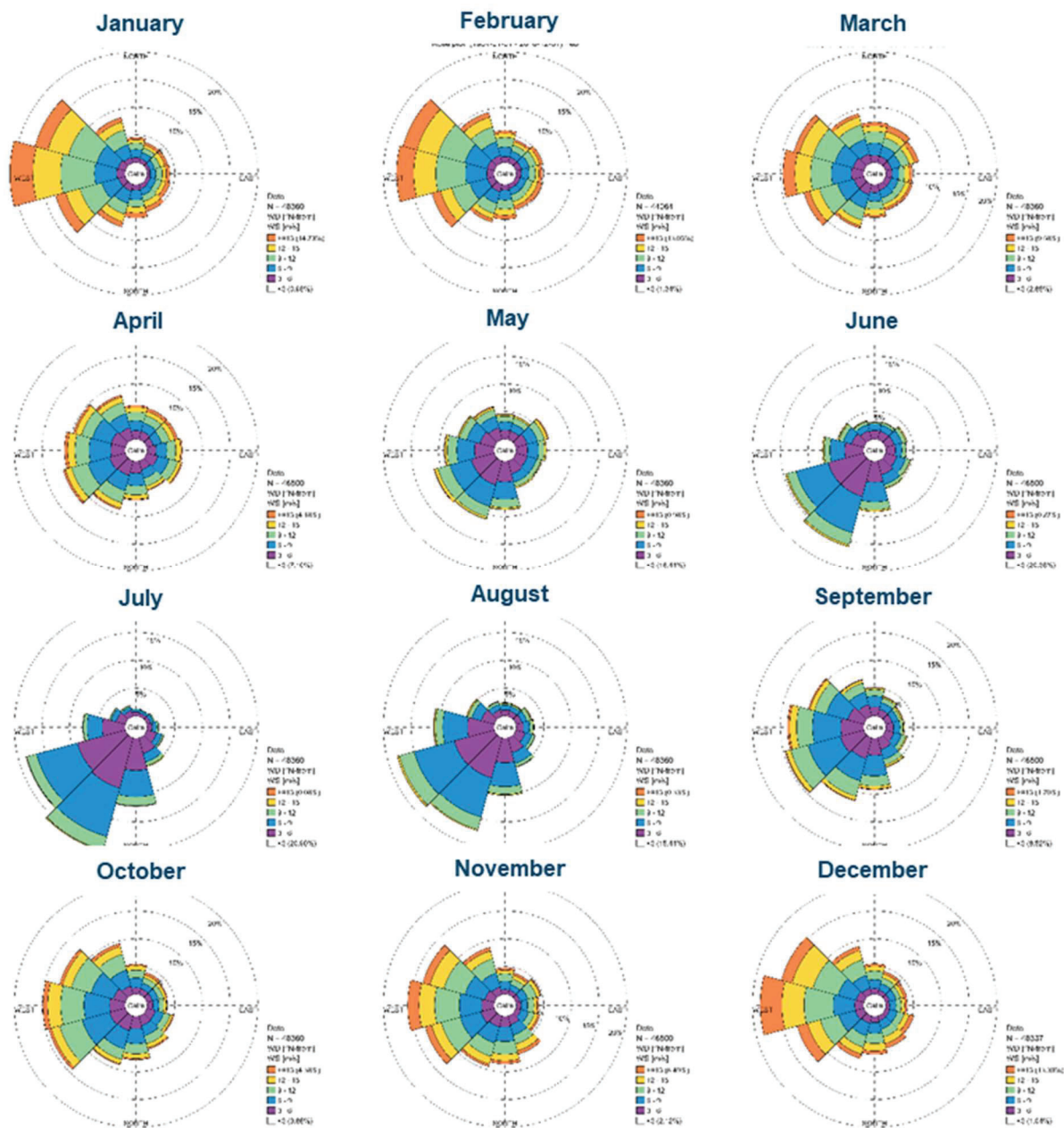
|    | All   | 0   | 30  | 60  | 90  | 120 | 150 | 180 | 210  | 240  | 270  | 300  | 330 |
|----|-------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|-----|
| 0  | 100.0 | 5.1 | 4.4 | 4.7 | 4.6 | 5.3 | 6.3 | 9.1 | 12.5 | 14.9 | 14.3 | 11.3 | 7.5 |
| 3  | 91.5  | 4.6 | 4.0 | 4.3 | 4.1 | 4.7 | 5.5 | 8.2 | 11.3 | 13.7 | 13.4 | 10.6 | 7.0 |
| 6  | 66.8  | 3.4 | 2.9 | 3.2 | 2.9 | 3.2 | 3.7 | 5.5 | 7.6  | 9.9  | 10.6 | 8.5  | 5.4 |
| 9  | 37.7  | 1.9 | 1.7 | 1.9 | 1.6 | 1.8 | 2.1 | 2.7 | 3.4  | 5.1  | 6.7  | 5.5  | 3.3 |
| 12 | 16.7  | 0.8 | 0.8 | 0.9 | 0.7 | 0.8 | 1.0 | 1.0 | 1.1  | 2.0  | 3.5  | 2.6  | 1.4 |
| 15 | 5.9   | 0.3 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3  | 0.7  | 1.4  | 0.9  | 0.4 |
| 18 | 1.5   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1  | 0.2  | 0.4  | 0.2  | 0.1 |
| 21 | 0.3   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.1  | 0.0  | 0.0 |
| 24 | 0.0   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0 |
| 27 | 0.0   | -   | -   | -   | 0.0 | -   | 0.0 | 0.0 | 0.0  | 0.0  | 0.0  | -    | -   |
| 30 | 0.0   | -   | -   | -   | -   | -   | -   | -   | -    | 0.0  | 0.0  | -    | -   |
| 33 | -     | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -   |

**FIGURE H.9: WIND ROSE PLOT (LEFT) AND WIND SPEED (M/S) FREQUENCY OF OCCURRENCE M6011368**



**FIGURE H.9: M6011368 MULTIDIRECTIONAL EXTREME VALUE**

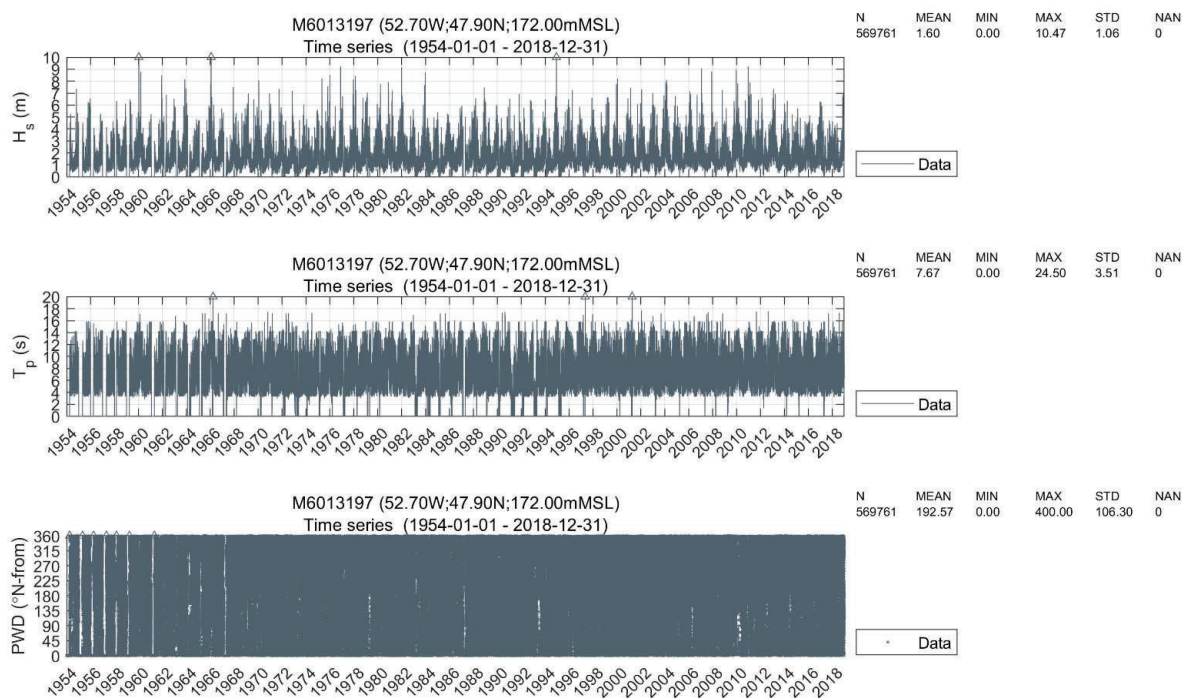
**Government of Newfoundland and Labrador**  
Climate Change Flood Risk Mapping Study for Placentia, Carbonear, Victoria and Salmon Cove – Appendix J





## Conception Bay – MSC50 M6013197, Wave Climate

**FIGURE H.11: M6013197 TIMESERIES (1954-2018), SIGNIFICANT WAVE HEIGHT (TOP), PEAK WAVE PERIOD (MIDDLE), WAVE DIRECTION (BOTTOM)**



**FIGURE H.12: SIGNIFICANT WAVE HEIGHT (HS, M) M6013197 FREQUENCY OF OCCURRENCE PER DIRECTION**

**M6013197 (52.70W;47.90N;172.00mMSL)**  
Frequency of Occurrence [%] (1954-01-01 - 2018-12-31) All

MWD [°N-from] - Data

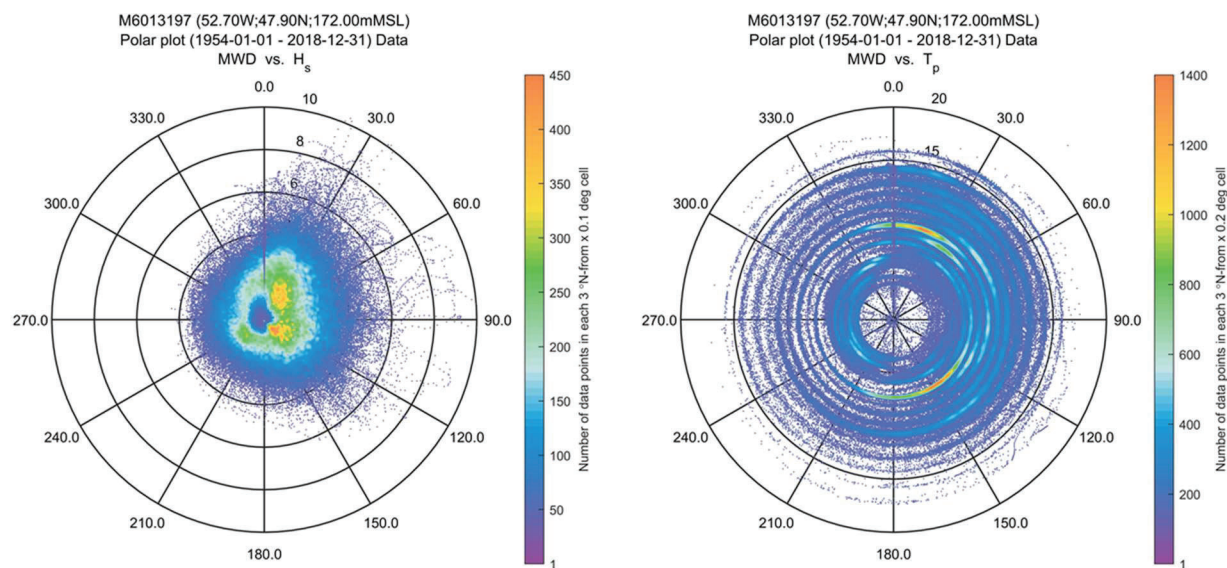
|        | [-15-15[ | [15-45[ | [45-75[ | [75-105[ | [105-135[ | [135-165[ | [165-195[ | [195-225[ | [225-255[ | [255-285[ | [285-315[ | [315-345[ | Total | Accum |
|--------|----------|---------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|
| [9-10[ | -        | 0.0     | 0.0     | 0.0      | 0.0       | -         | -         | -         | -         | -         | -         | -         | 0.0   | 100.0 |
| [8-9[  | 0.0      | 0.0     | 0.0     | 0.0      | 0.0       | -         | -         | -         | -         | -         | -         | -         | 0.0   | 100.0 |
| [7-8[  | 0.0      | 0.0     | 0.0     | 0.0      | 0.0       | 0.0       | -         | -         | -         | -         | -         | -         | 0.1   | 100.0 |
| [6-7[  | 0.0      | 0.1     | 0.0     | 0.0      | 0.0       | 0.0       | -         | -         | -         | -         | -         | -         | 0.2   | 99.9  |
| [5-6[  | 0.1      | 0.2     | 0.1     | 0.1      | 0.1       | 0.0       | 0.0       | -         | -         | -         | -         | 0.0       | 0.6   | 99.7  |
| [4-5[  | 0.3      | 0.6     | 0.3     | 0.3      | 0.2       | 0.1       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 1.9   | 99.0  |
| [3-4[  | 1.1      | 1.7     | 1.0     | 0.8      | 0.7       | 0.5       | 0.1       | 0.1       | 0.1       | 0.1       | 0.1       | 0.2       | 6.5   | 97.1  |
| [2-3[  | 3.0      | 3.7     | 2.3     | 2.1      | 2.1       | 1.5       | 0.7       | 0.5       | 0.6       | 0.7       | 0.8       | 1.3       | 19.5  | 90.6  |
| [1-2[  | 3.4      | 5.7     | 4.4     | 3.9      | 4.6       | 3.6       | 2.6       | 2.8       | 3.1       | 2.3       | 2.3       | 2.9       | 41.5  | 71.1  |
| [0-1[  | 0.8      | 2.1     | 2.4     | 2.4      | 3.6       | 3.7       | 9.5       | 1.4       | 1.2       | 1.0       | 0.9       | 0.6       | 29.6  | 29.6  |
| Total  | 8.7      | 14.3    | 10.6    | 9.6      | 11.4      | 9.4       | 13.0      | 4.8       | 5.1       | 4.1       | 4.1       | 4.9       | 100.0 | -     |
| Accum  | 8.7      | 23.0    | 33.6    | 43.2     | 54.6      | 64.0      | 77.0      | 81.8      | 86.8      | 91.0      | 95.1      | 100.0     | -     | -     |

**FIGURE H.13: PEAK WAVE PERIOD (TP, S) M6013197 FREQUENCY OF OCCURRENCE PER DIRECTION**

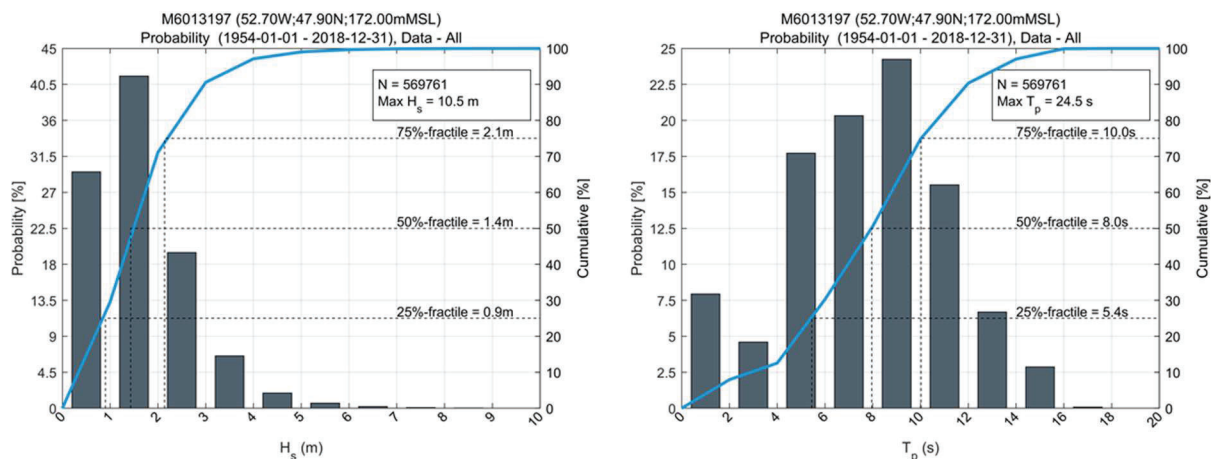
M6013197 (52.70W;47.90N;172.00mMSL)  
Frequency of Occurrence [%] (1954-01-01 - 2018-12-31) All  
MWD [°N-from] - Data

|                           | [-15-15[ | [15-45[ | [45-75[ | [75-105[ | [105-135[ | [135-165[ | [165-195[ | [195-225[ | [225-255[ | [255-285[ | [285-315[ | [315-345[ | Total | Accum |
|---------------------------|----------|---------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|
| T <sub>p</sub> [s] - Data |          |         |         |          |           |           |           |           |           |           |           |           |       |       |
| [18-20[                   | -        | -       | -       | -        | -         | -         | -         | -         | -         | -         | -         | -         | -     | 100.0 |
| [16-18[                   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.1   | 100.0 |
| [14-16[                   | 0.8      | 0.8     | 0.3     | 0.3      | 0.2       | 0.1       | 0.0       | 0.0       | 0.1       | 0.1       | 0.1       | 0.2       | 2.9   | 99.9  |
| [12-14[                   | 1.0      | 1.8     | 1.2     | 0.8      | 0.5       | 0.4       | 0.2       | 0.1       | 0.1       | 0.1       | 0.2       | 0.3       | 6.7   | 97.0  |
| [10-12[                   | 1.1      | 2.6     | 2.2     | 2.0      | 2.3       | 2.2       | 1.2       | 0.7       | 0.4       | 0.3       | 0.3       | 0.4       | 15.5  | 90.4  |
| [8-10[                    | 3.3      | 6.0     | 3.7     | 3.4      | 3.6       | 1.5       | 0.6       | 0.4       | 0.3       | 0.3       | 0.4       | 0.8       | 24.2  | 74.8  |
| [6-8[                     | 1.4      | 2.3     | 2.5     | 2.5      | 3.7       | 3.9       | 1.9       | 0.8       | 0.3       | 0.3       | 0.3       | 0.4       | 20.3  | 50.6  |
| [4-6[                     | 1.0      | 0.6     | 0.6     | 0.6      | 1.1       | 1.2       | 0.8       | 1.9       | 3.0       | 2.2       | 2.1       | 2.6       | 17.7  | 30.3  |
| [2-4[                     | 0.2      | 0.1     | 0.1     | 0.1      | 0.1       | 0.1       | 0.5       | 0.9       | 0.9       | 0.9       | 0.7       | 0.2       | 4.6   | 12.5  |
| [0-2[                     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0       | 0.0       | 7.9       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 7.9   | 7.9   |
| Total                     | 8.7      | 14.3    | 10.6    | 9.6      | 11.4      | 9.4       | 13.0      | 4.8       | 5.1       | 4.1       | 4.1       | 4.9       | 100.0 | -     |
| Accum                     | 8.7      | 23.0    | 33.6    | 43.2     | 54.6      | 64.0      | 77.0      | 81.8      | 86.8      | 91.0      | 95.1      | 100.0     | -     | -     |

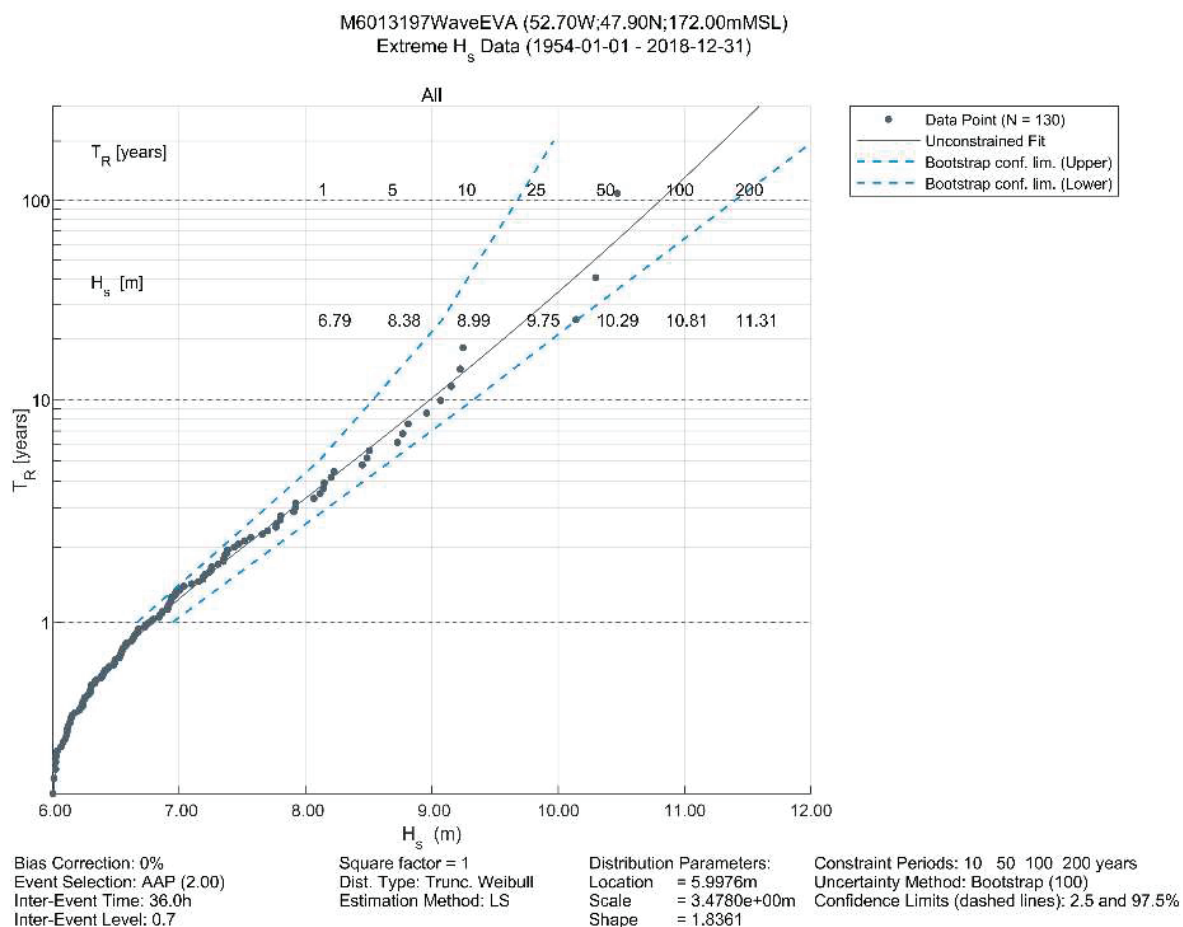
**FIGURE H.14: M6013197 SIGNIFICANT WAVE HEIGHT POLAR PLOT (LEFT), PEAK WAVE PERIOD POLAR PLOT (RIGHT)**



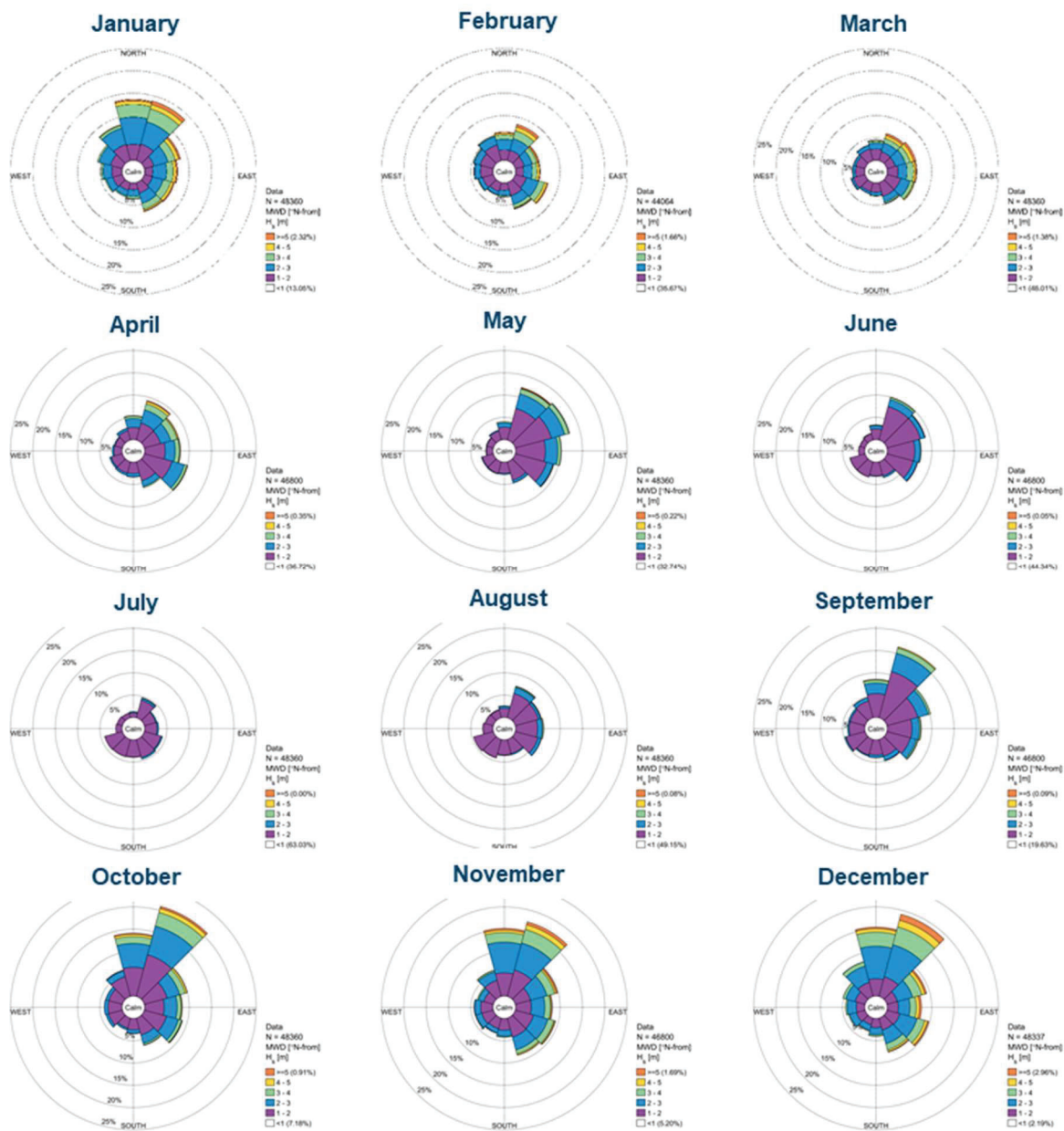
**FIGURE H.15: M6013197 SIGNIFICANT WAVE HEIGHT PROBABILITY OF OCCURRENCE (LEFT), PEAK WAVE PERIOD PROBABILITY OF**



**FIGURE H.16: EXTREME VALUE ANALYSIS, MSC50 M6013197, SIGNIFICANT WAVE HEIGHT (H<sub>S</sub>, M)**



**FIGURE H.17: MONTHLY SIGNIFICANT WAVE HEIGHT ROSES (HS, M) IN THE PERIOD 1954-2018**





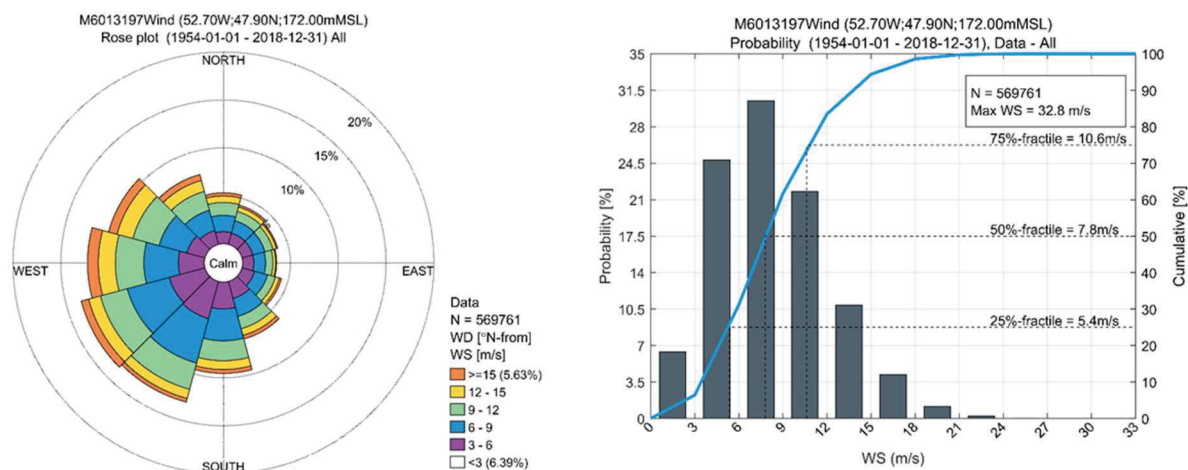
## Conception Bay – MSC50 M6013197, Wind Climate

**FIGURE 4: WIND SPEED (M/S) M6013197 FREQUENCY OF OCCURRENCE PER DIRECTION**

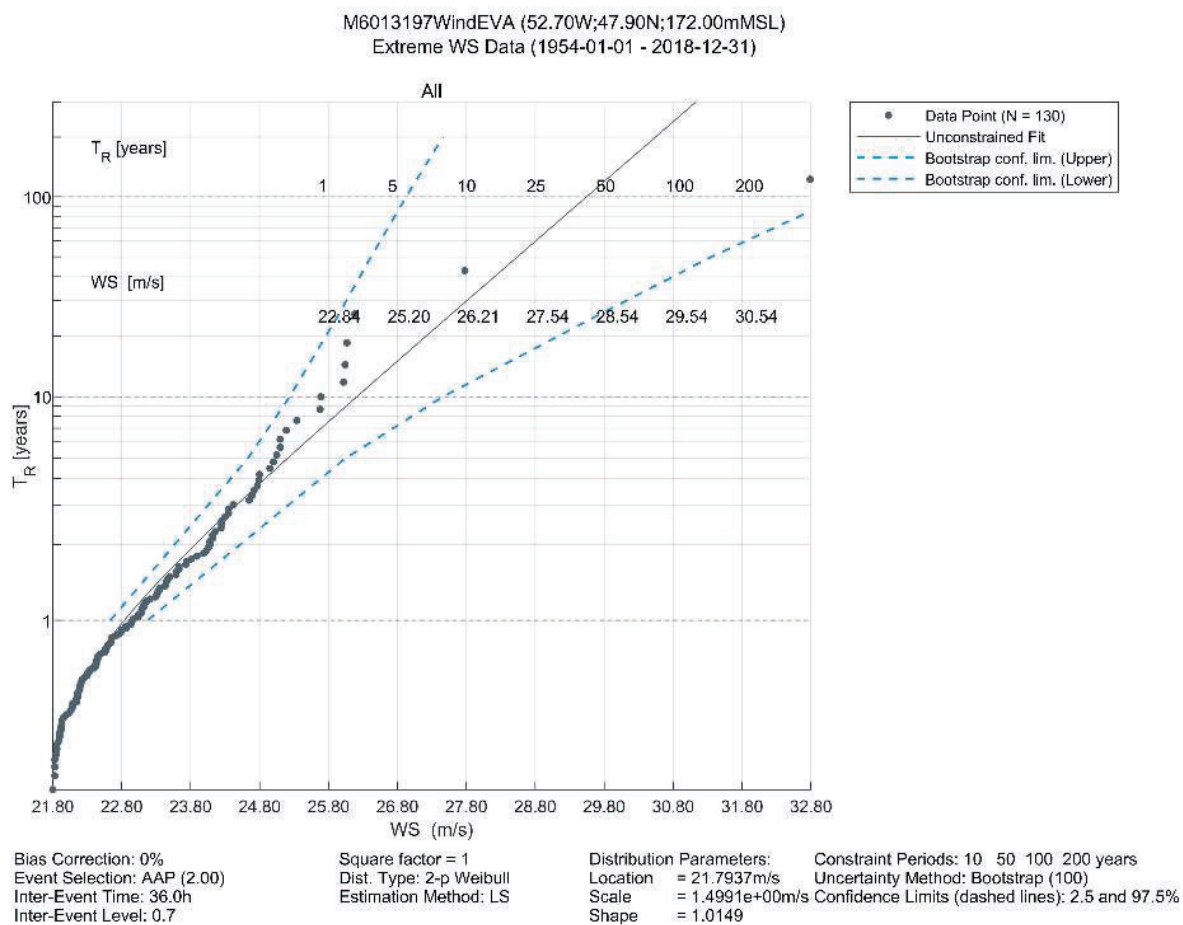
M6013197Wind  
Exceedance (1954-01-01 - 2018-12-31) Data - Directional  
Exceedance [%]

|    | All   | 0   | 30  | 60  | 90  | 120 | 150 | 180  | 210  | 240  | 270  | 300  | 330 |
|----|-------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|-----|
| 0  | 100.0 | 5.6 | 4.6 | 4.2 | 3.9 | 4.6 | 6.7 | 10.2 | 14.0 | 14.4 | 13.0 | 11.0 | 7.9 |
| 3  | 93.6  | 5.3 | 4.2 | 3.9 | 3.6 | 4.3 | 6.2 | 9.5  | 13.0 | 13.4 | 12.2 | 10.4 | 7.5 |
| 6  | 68.8  | 4.1 | 3.1 | 2.7 | 2.4 | 2.9 | 4.4 | 6.7  | 9.0  | 9.5  | 9.5  | 8.5  | 6.1 |
| 9  | 38.3  | 2.3 | 1.7 | 1.4 | 1.2 | 1.5 | 2.4 | 3.4  | 4.2  | 5.0  | 5.9  | 5.5  | 3.9 |
| 12 | 16.5  | 1.0 | 0.7 | 0.5 | 0.4 | 0.7 | 1.1 | 1.3  | 1.4  | 2.1  | 2.9  | 2.6  | 1.8 |
| 15 | 5.6   | 0.3 | 0.2 | 0.1 | 0.1 | 0.2 | 0.4 | 0.4  | 0.4  | 0.8  | 1.1  | 0.9  | 0.6 |
| 18 | 1.4   | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1  | 0.1  | 0.2  | 0.3  | 0.2  | 0.2 |
| 21 | 0.3   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.0  | 0.1  | 0.1  | 0.0 |
| 24 | 0.0   | 0.0 | 0.0 | -   | -   | 0.0 | 0.0 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0 |
| 27 | 0.0   | -   | -   | -   | -   | -   | 0.0 | -    | -    | -    | -    | 0.0  | 0.0 |
| 30 | 0.0   | -   | -   | -   | -   | -   | 0.0 | -    | -    | -    | -    | -    | -   |
| 33 | -     | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -   |

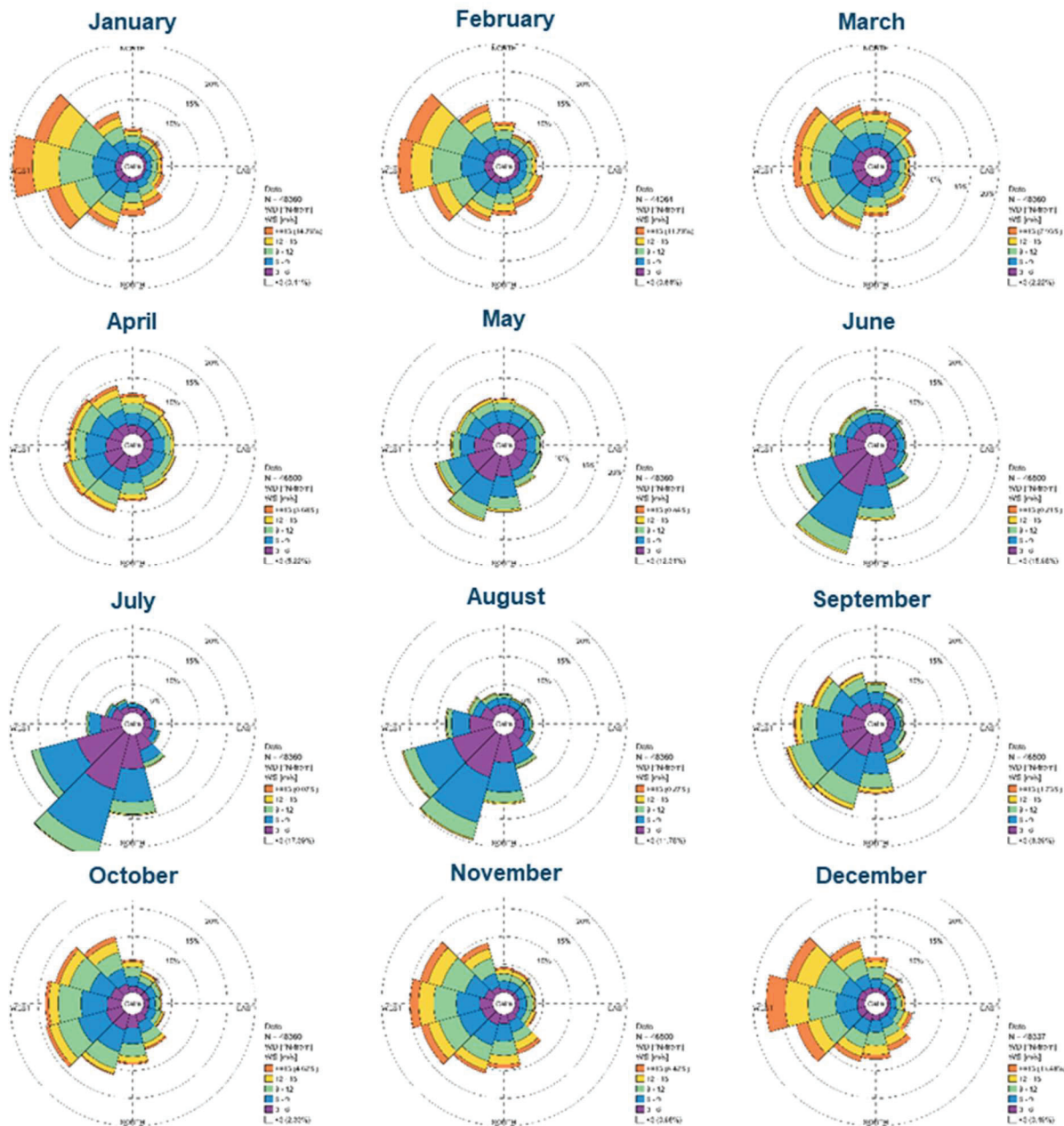
**FIGURE H.19: WIND ROSE PLOT (LEFT) AND WIND SPEED (M/S) FREQUENCY OF OCCURRENCE M6013197**



**FIGURE H.20: M6013197 MULTIDIRECTIONAL EXTREME VALUE ANALYSIS**



**FIGURE H.21: MONTHLY SUSTAINED WINDS (M/S) IN THE PERIOD 1954-2018**



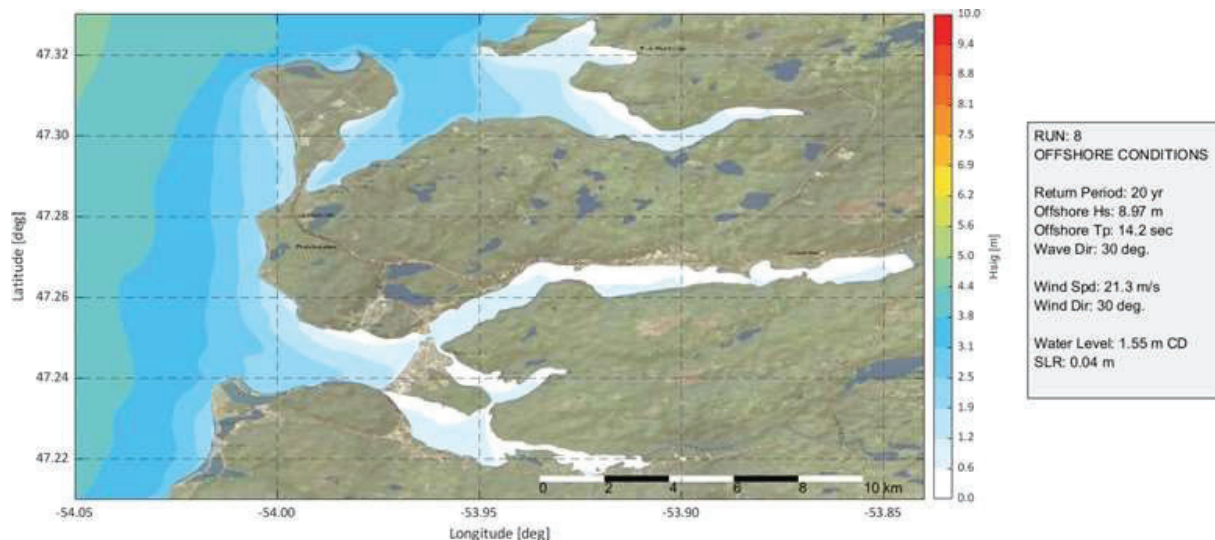
# **APPENDIX K**

Wave Model Outputs



## Placentia Bay – 20-yr Return Period Wave Conditions

**FIGURE I.1: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE H**



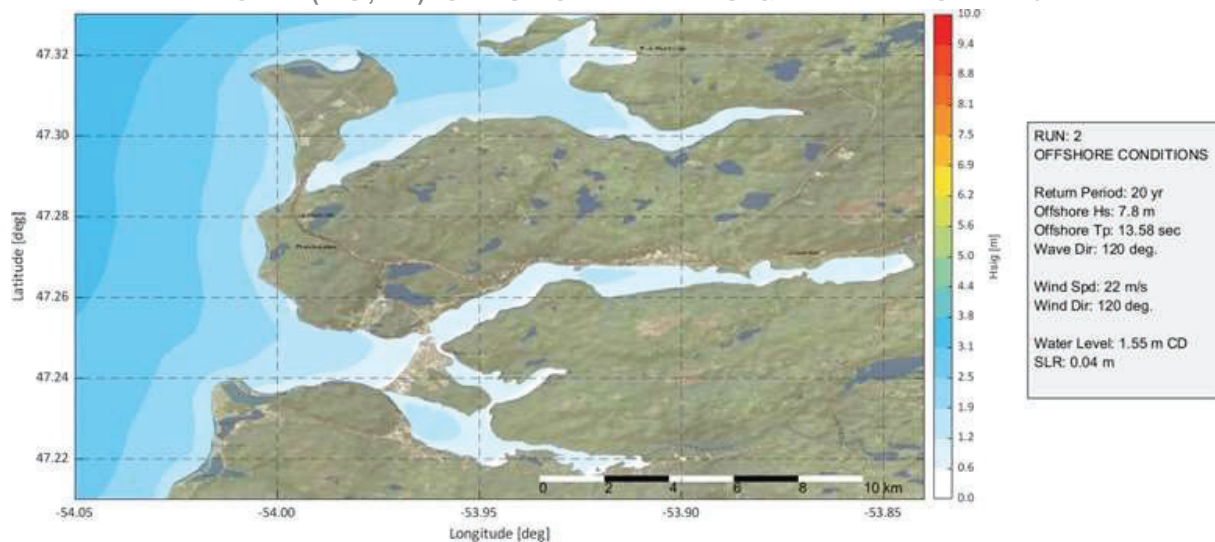
**FIGURE 1: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 60°**



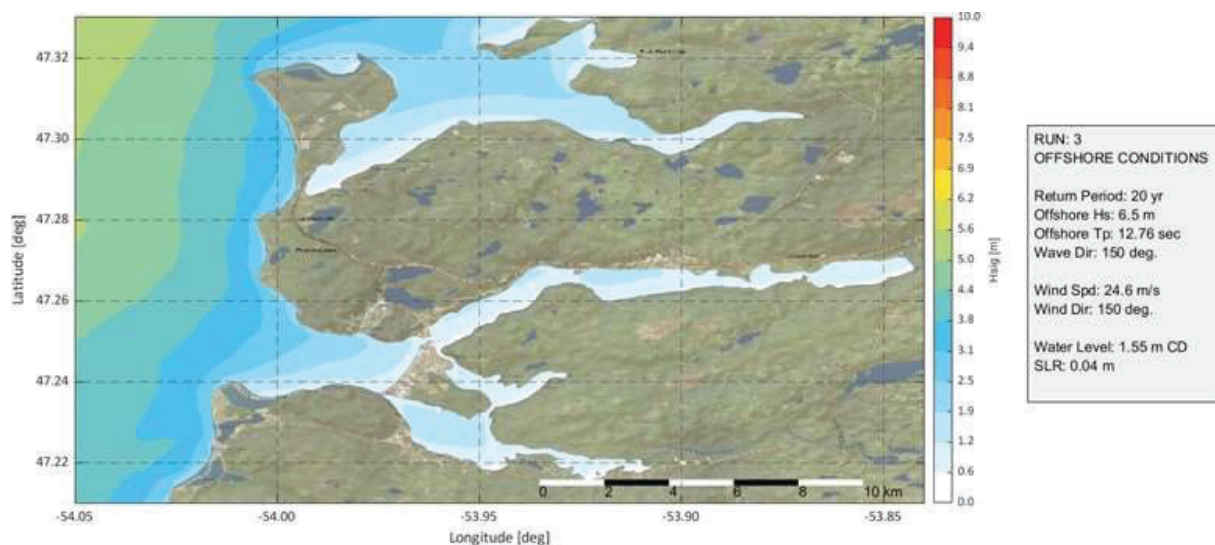
**FIGURE I.3: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 90°**



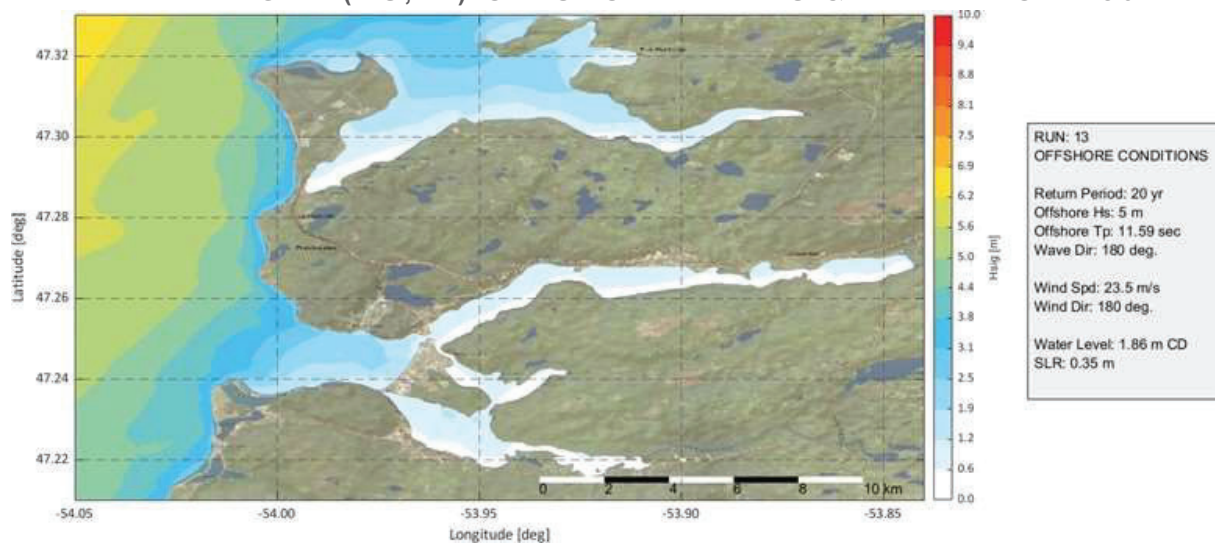
**FIGURE I.4: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 120°**



**FIGURE I.5: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 150°**

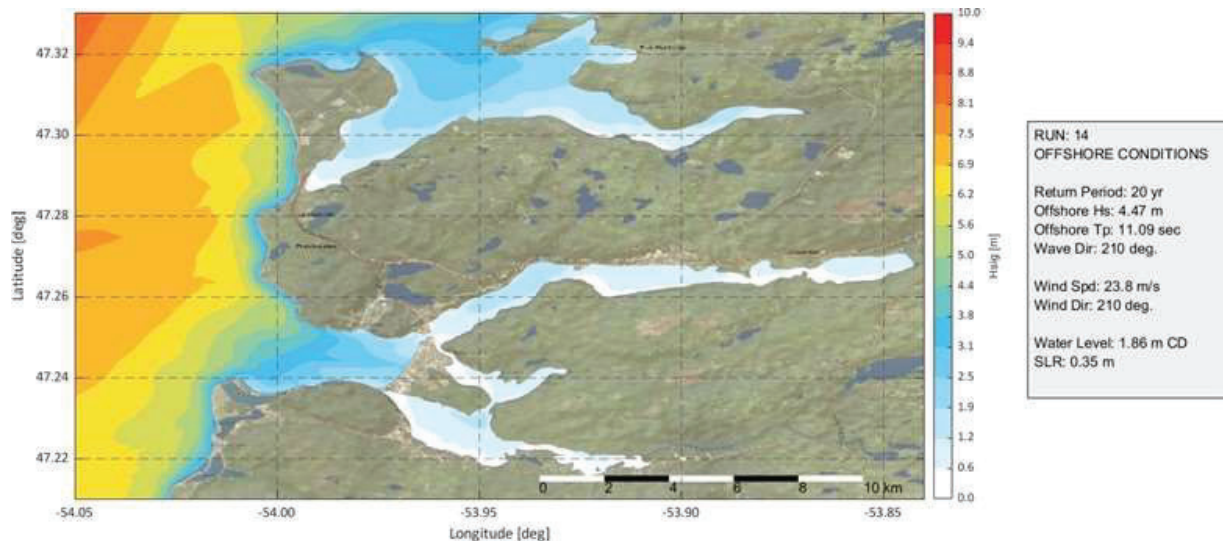


**FIGURE I.6: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 180°**





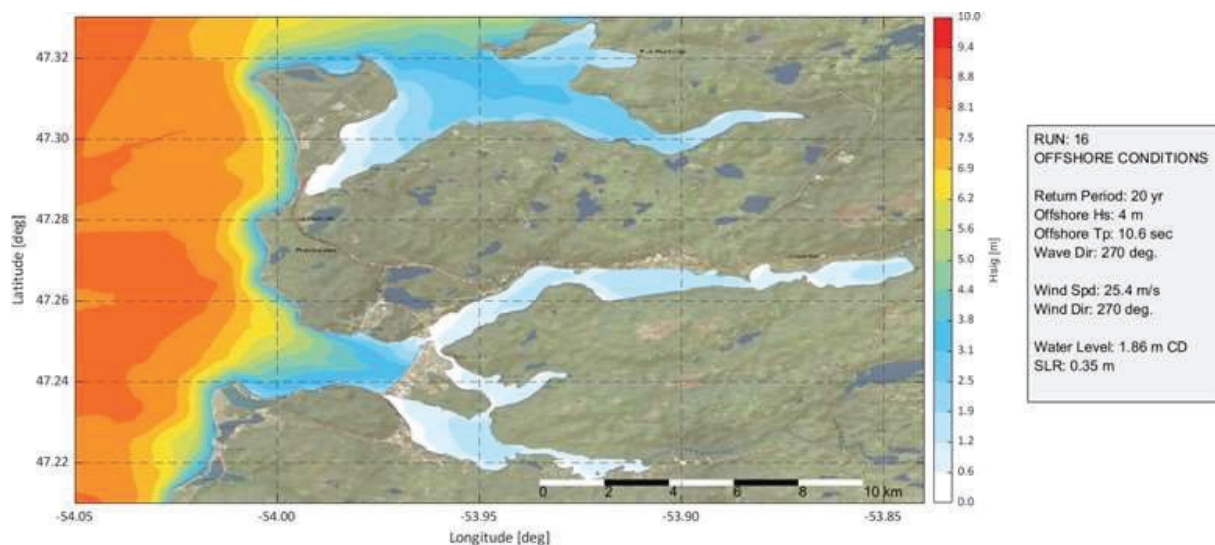
**FIGURE 2: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 210°**



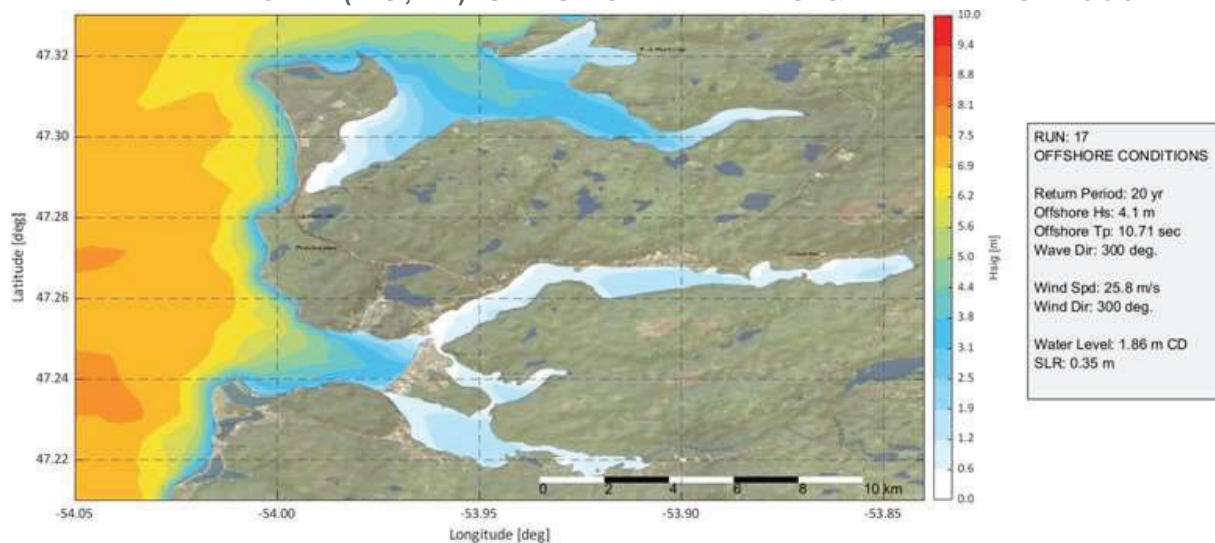
**FIGURE I.8: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 240°**



**FIGURE I.9: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 270°**

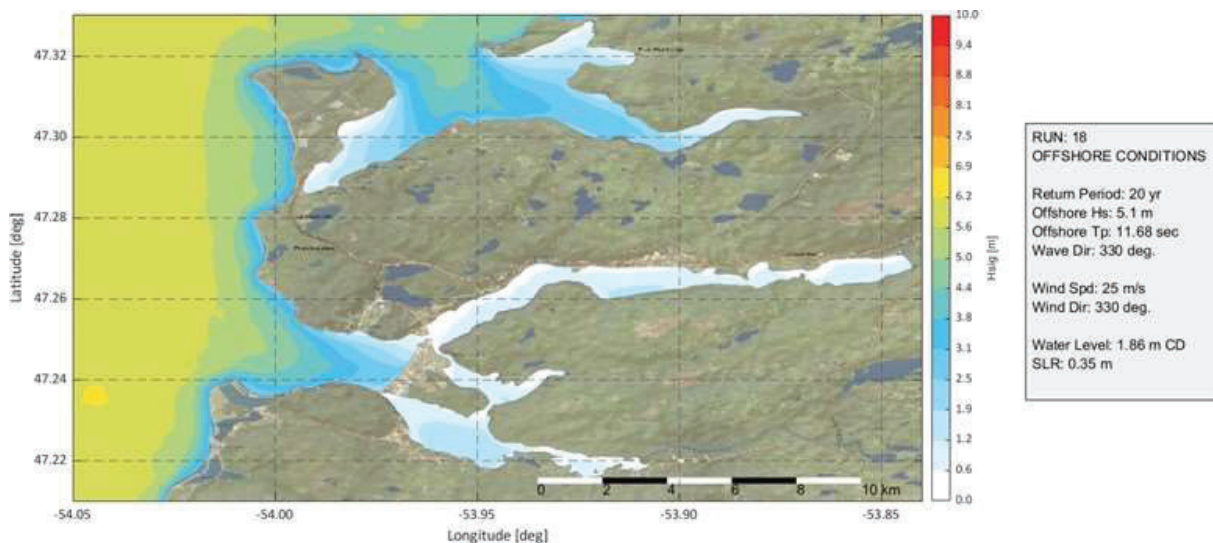


**FIGURE I.10: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 300°**

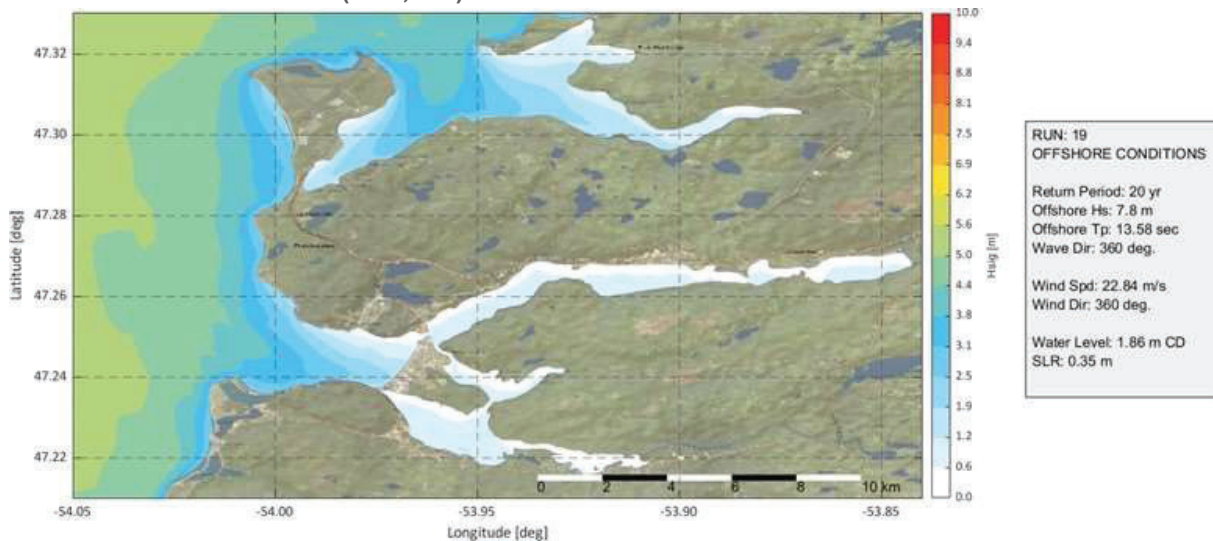




**FIGURE I.11: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 330°**

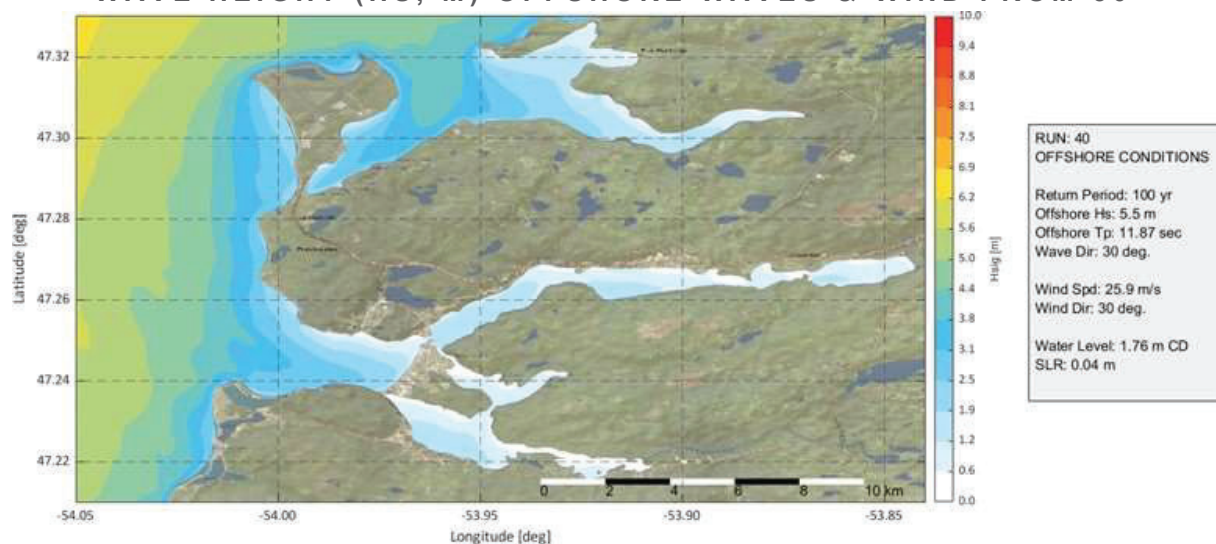


**FIGURE I.12: PLACENTIA BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 360°**



## Placentia Bay – 100-yr Return Period Wave Conditions

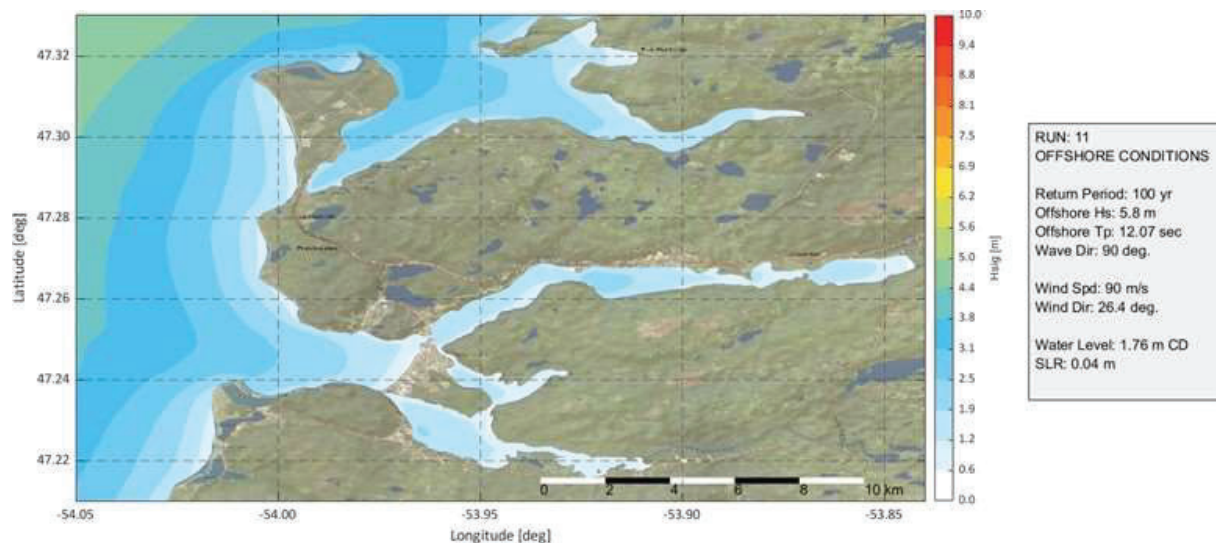
**FIGURE 3: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 30°**



**FIGURE I.14: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 60°**



**FIGURE 4: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 90°**

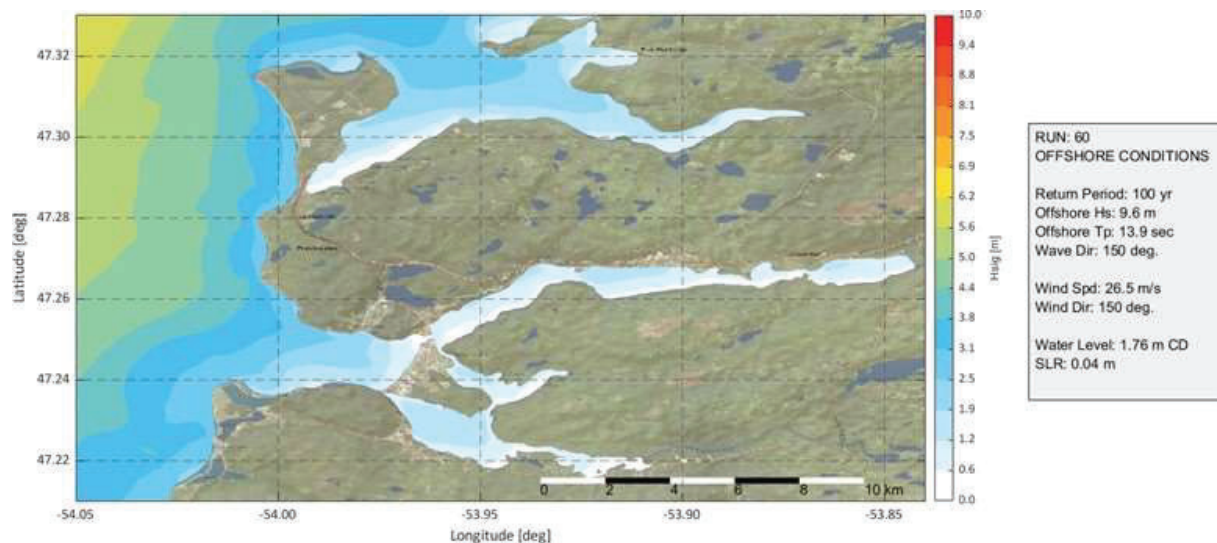


**FIGURE I.16: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 120°**

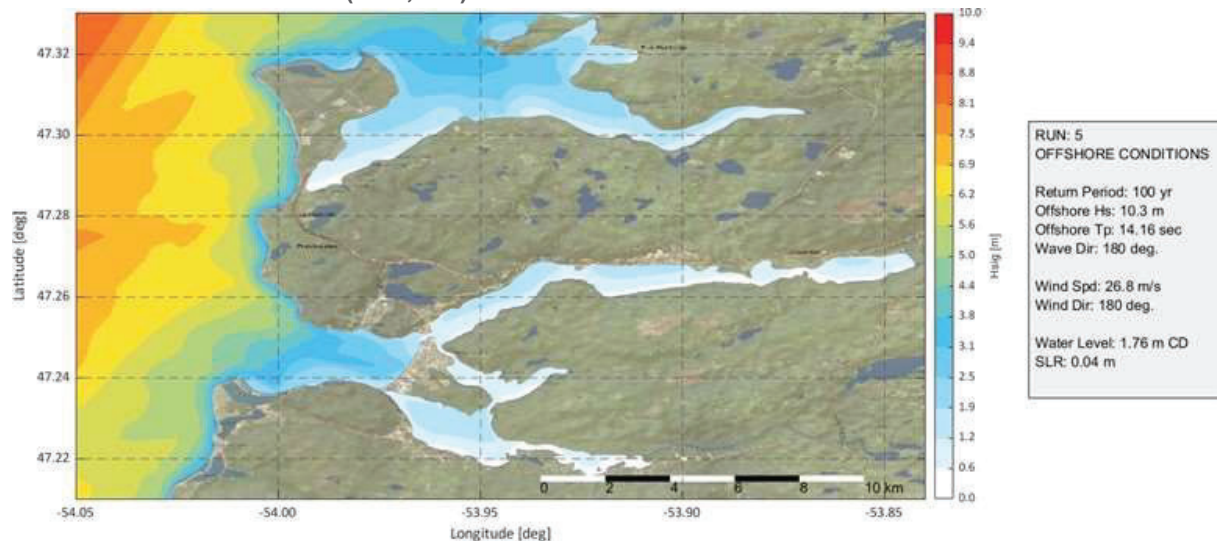




**FIGURE I.17: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 150°**

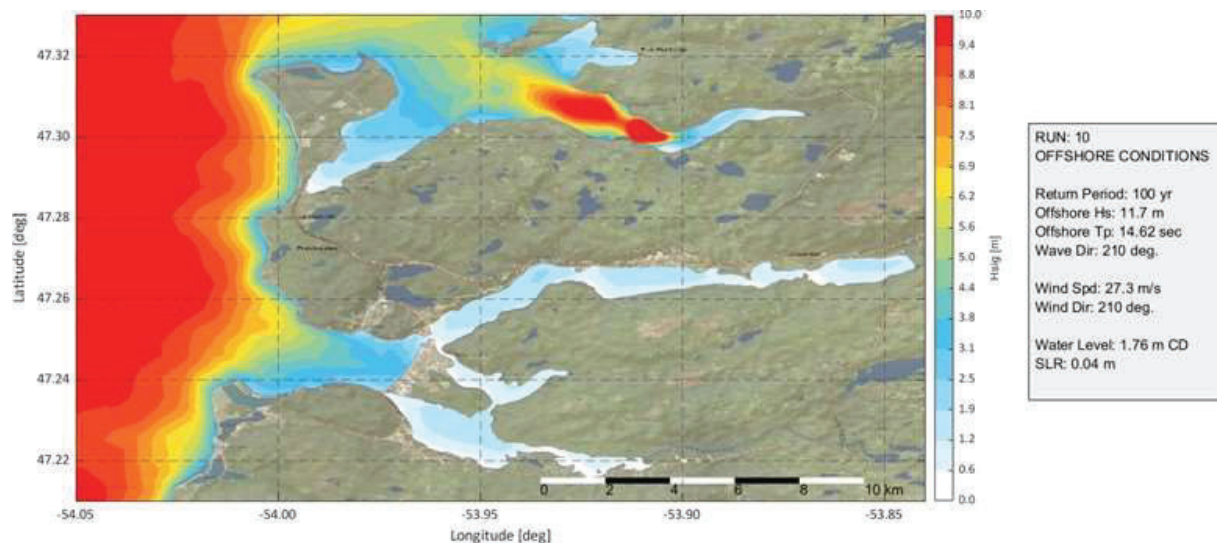


**FIGURE I.18: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 180°**

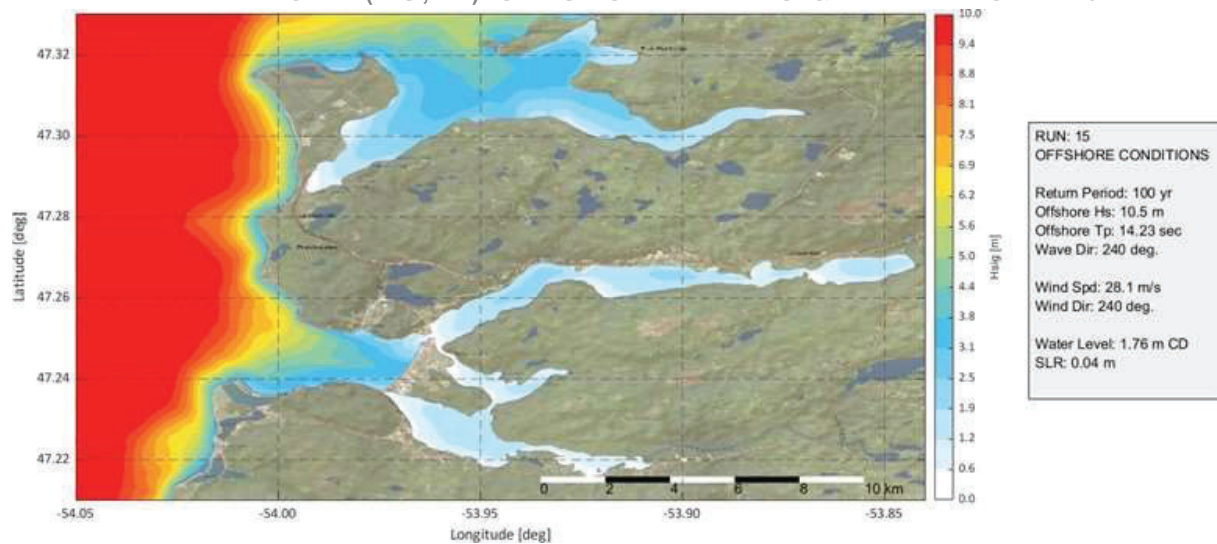




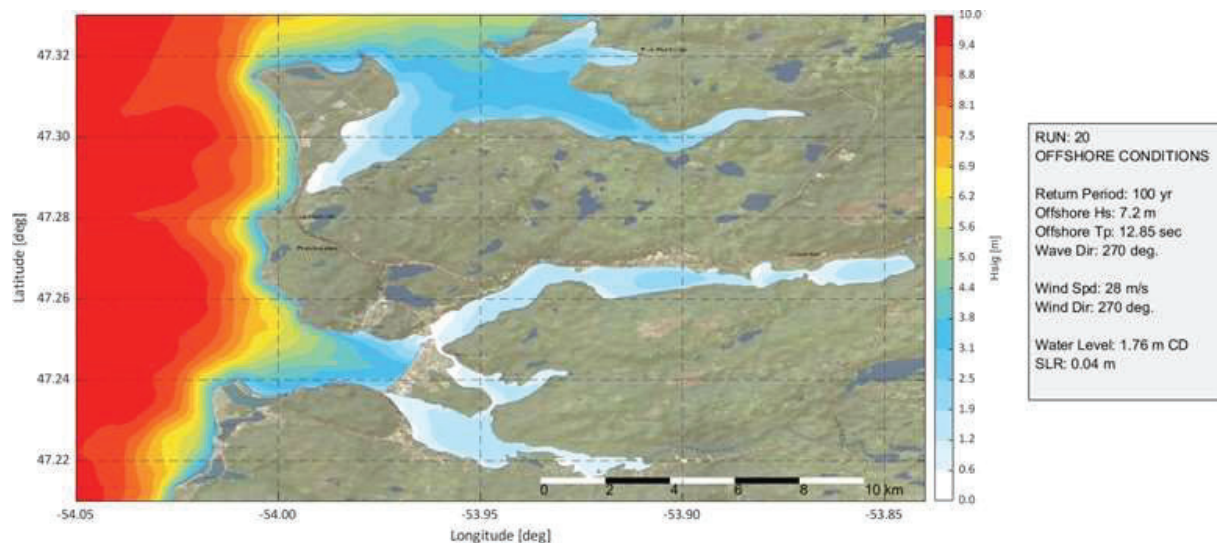
**FIGURE I.19: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 210°**



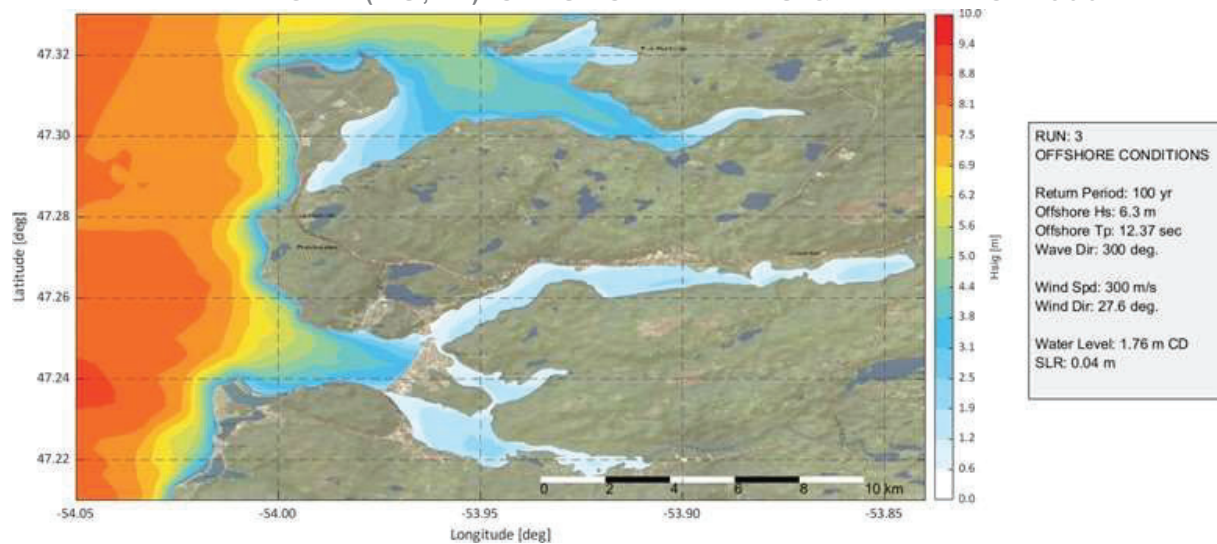
**FIGURE I.20: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 240°**



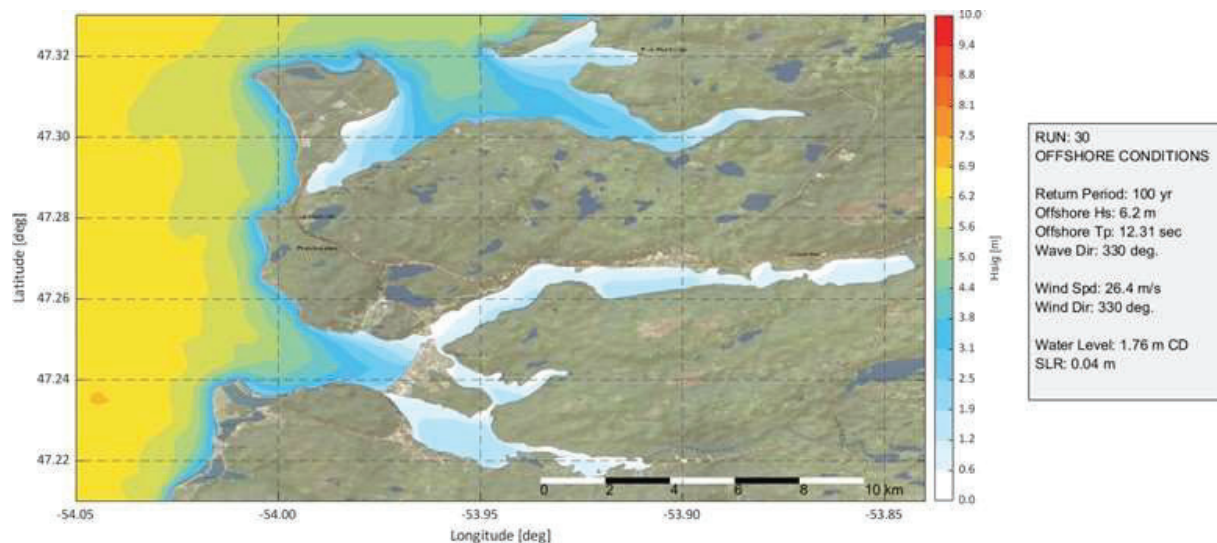
**FIGURE I.21: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 270°**



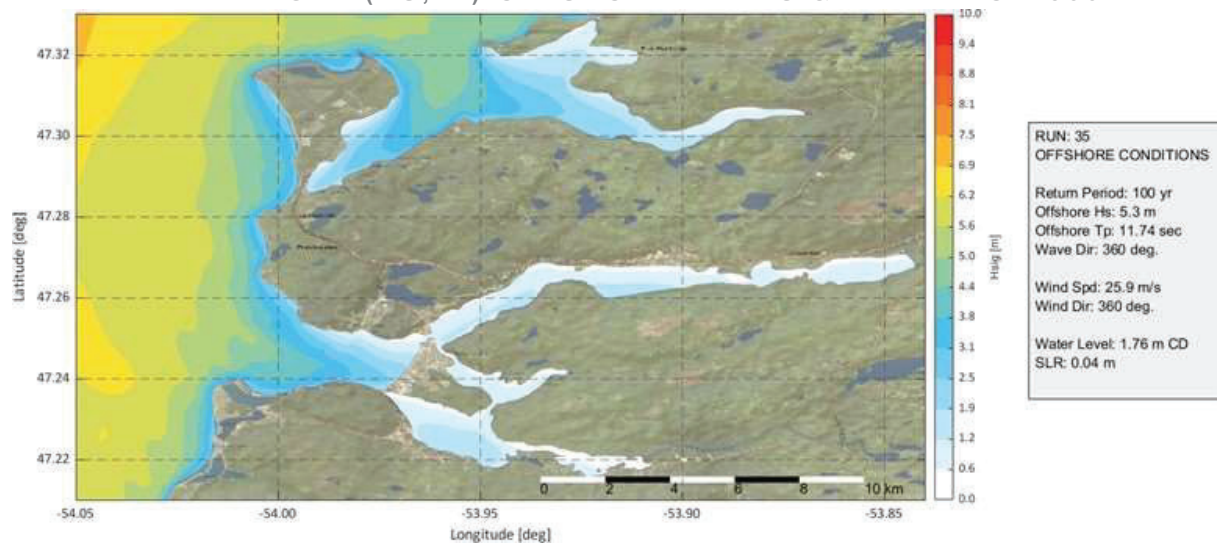
**FIGURE I.22: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 300°**



**FIGURE I.23: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 330°**



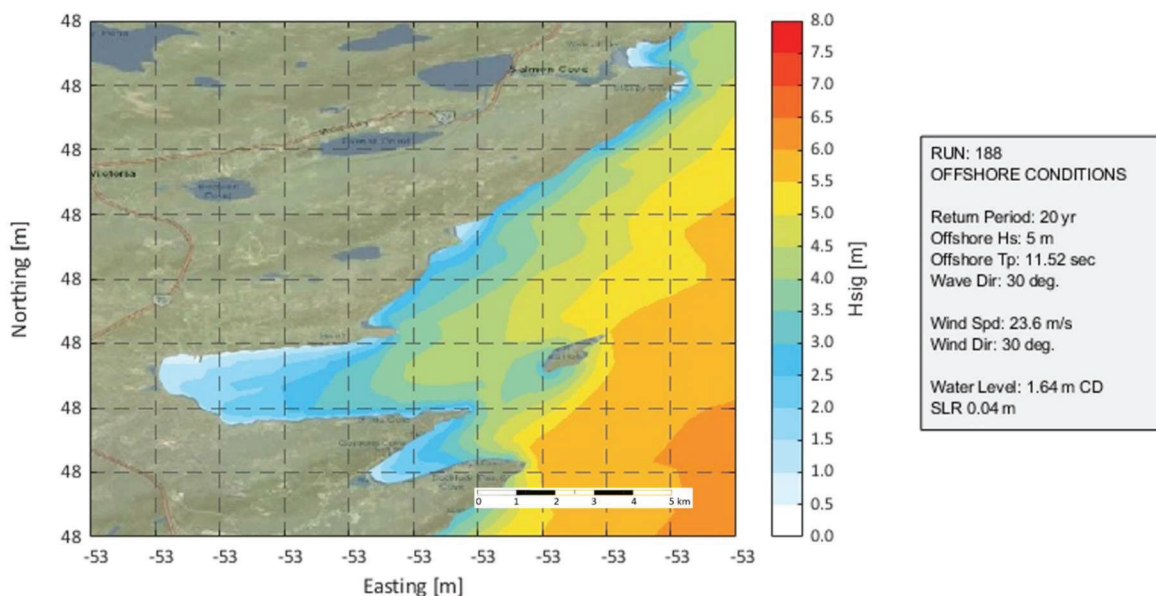
**FIGURE I.24: PLACENTIA BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 360°**



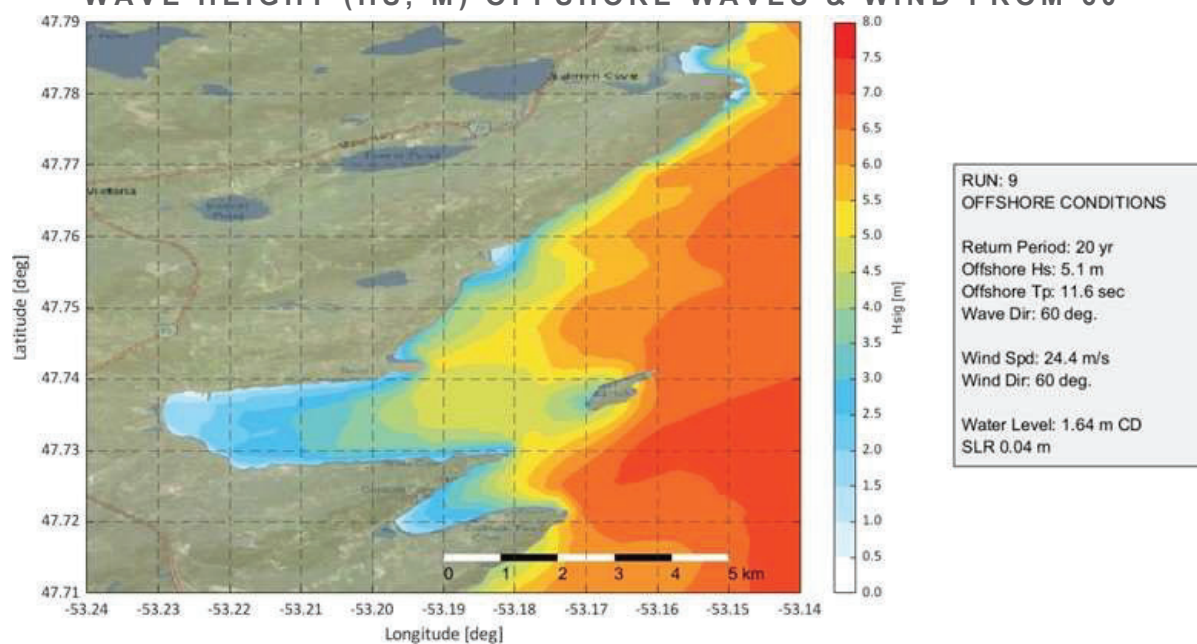


## Conception Bay – 20-yr Return Period Wave Conditions

**FIGURE 5: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 30°**

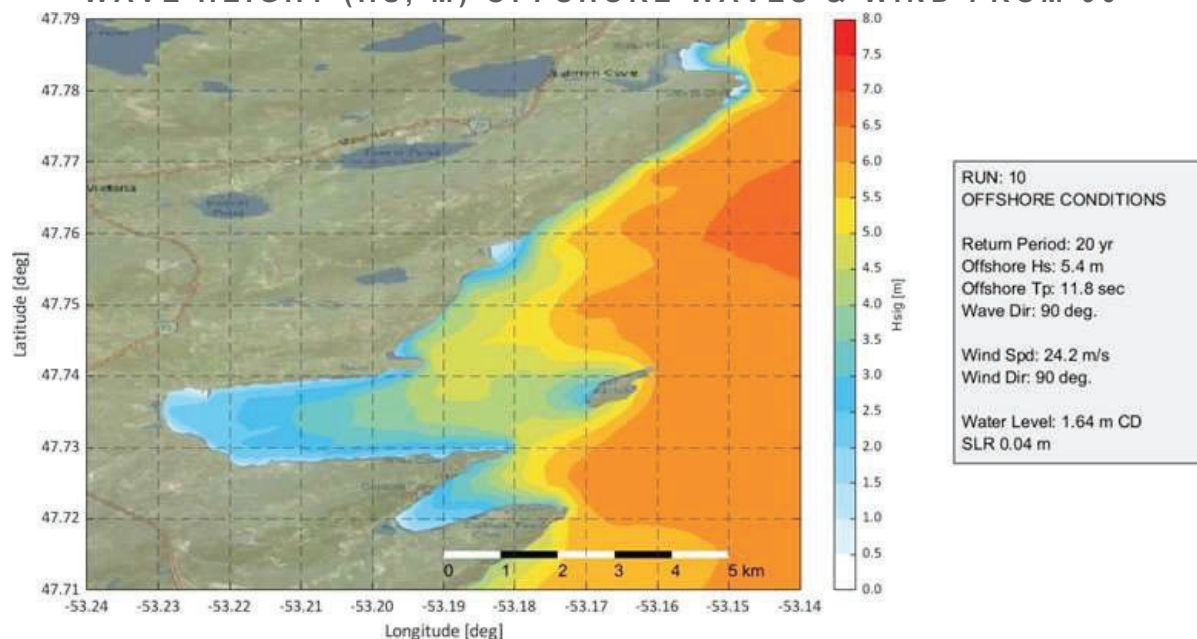


**FIGURE I.26: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 60°**

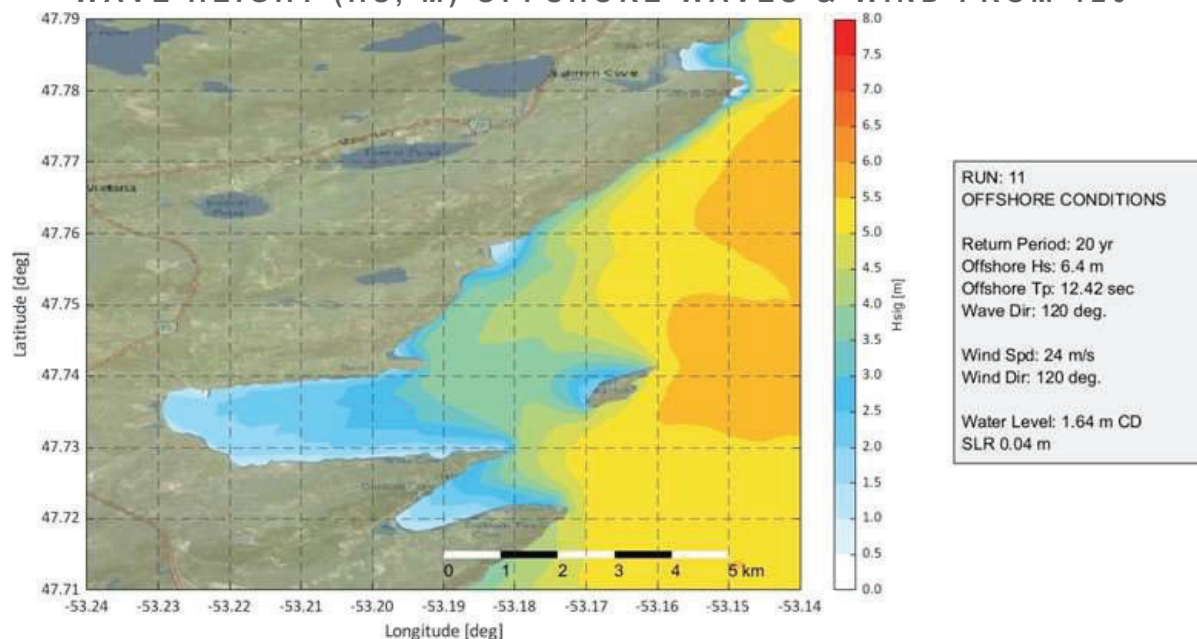




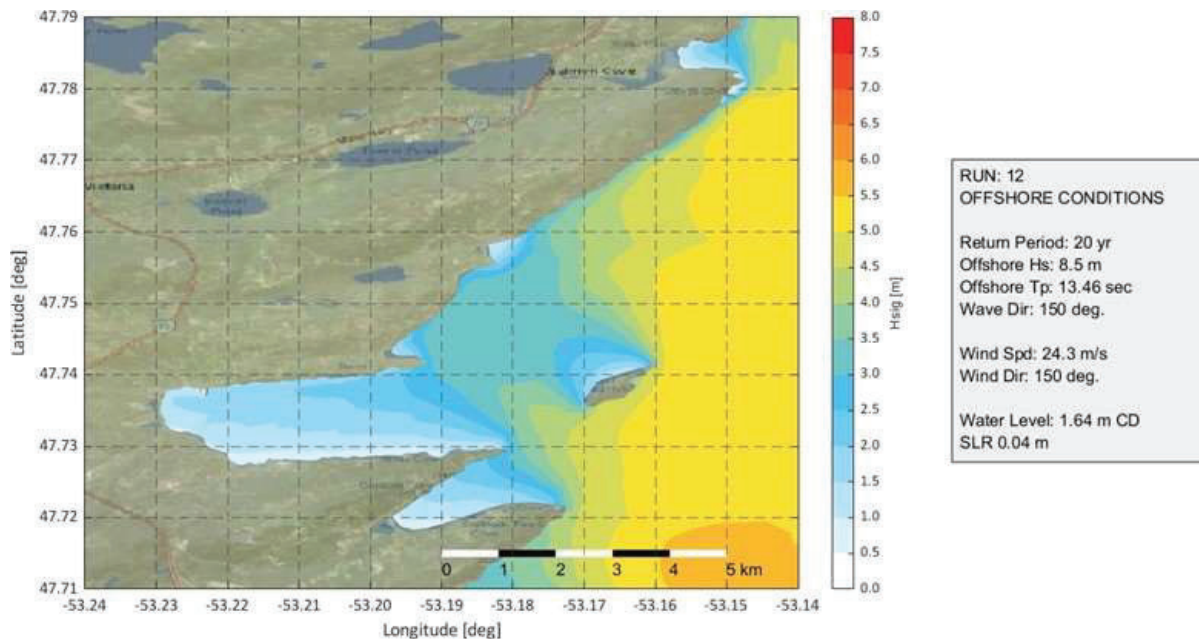
**FIGURE 6: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 90°**



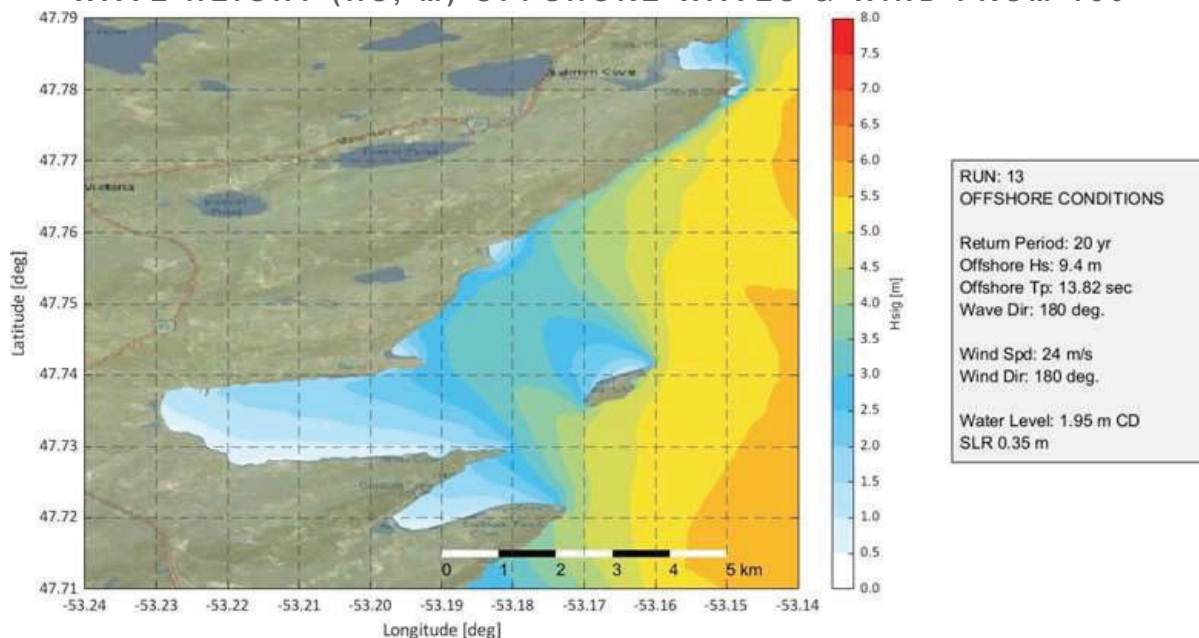
**FIGURE I.28: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 120°**



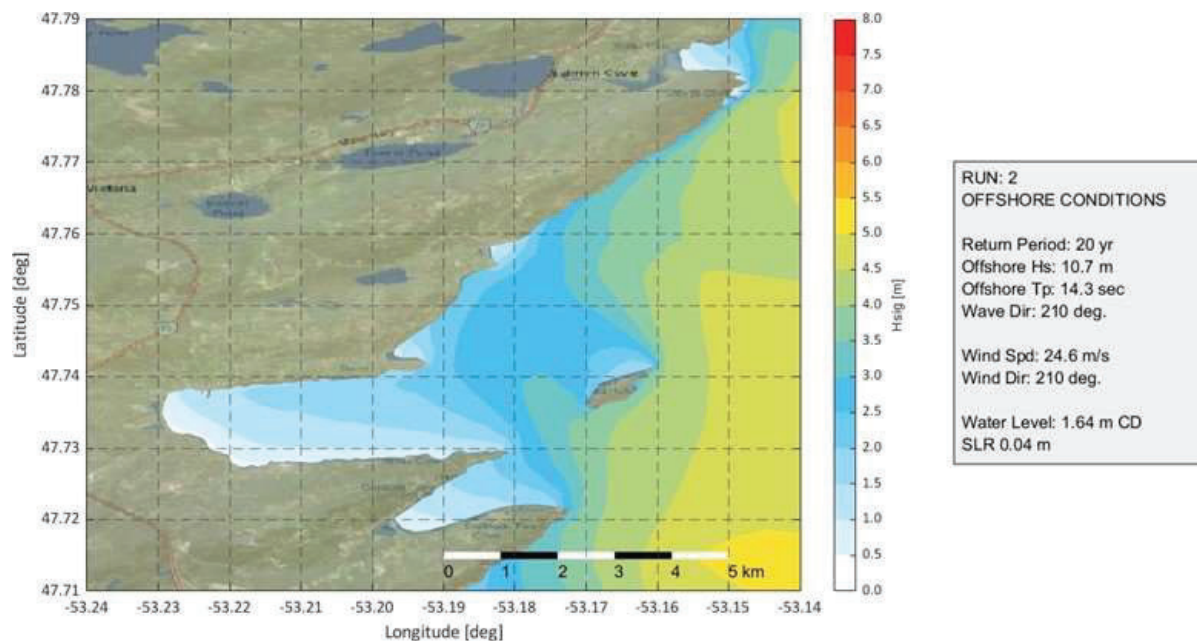
**FIGURE I.29: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 150°**



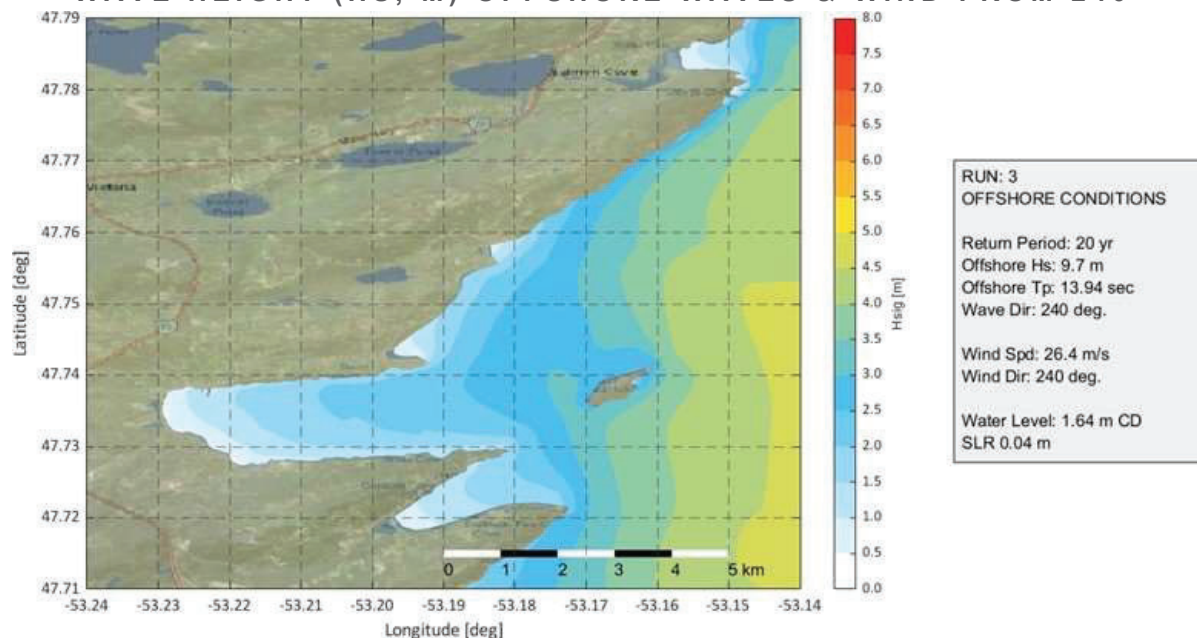
**FIGURE I.30: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 180°**



**FIGURE 7: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 210°**

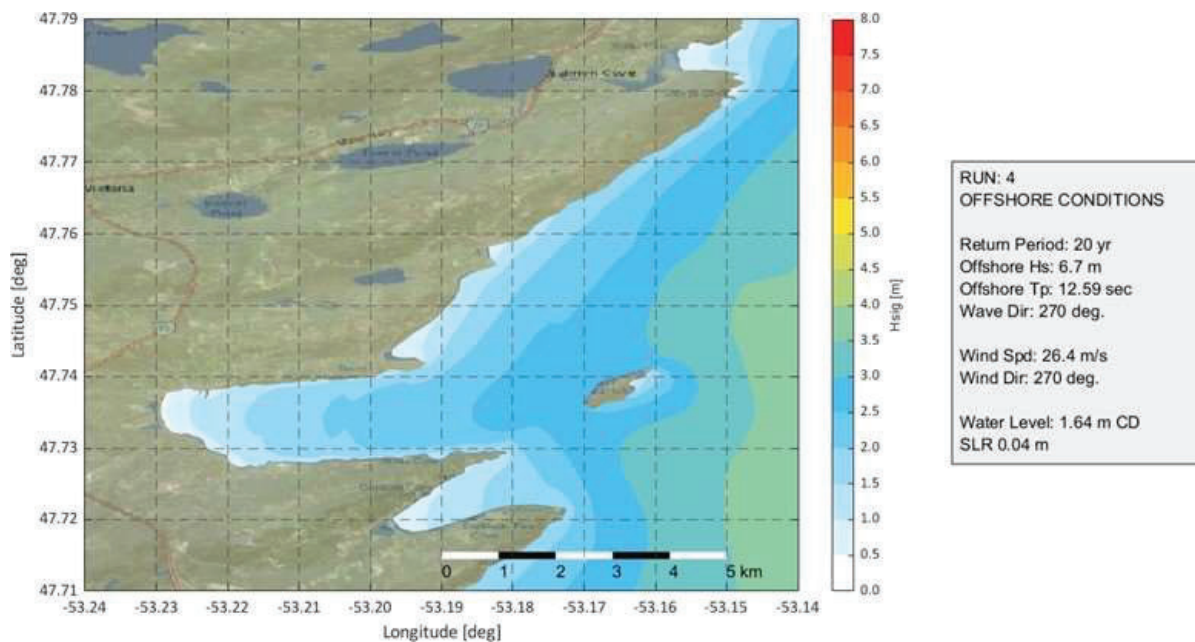


**FIGURE I.32: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 240°**

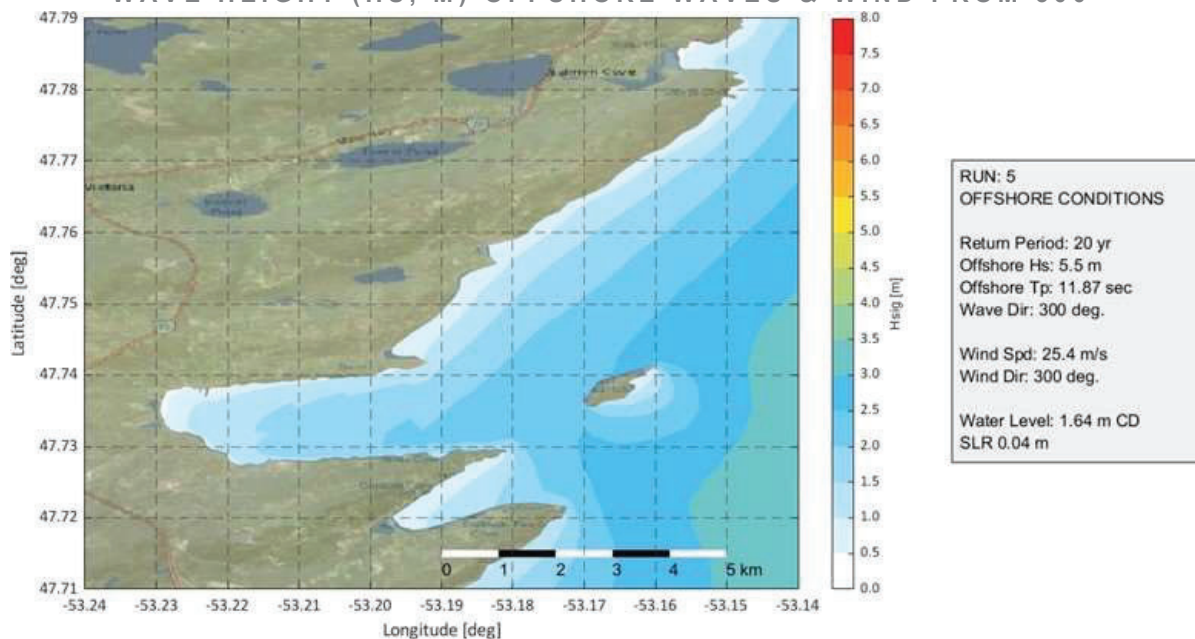




**FIGURE I.33: CONCEPTION BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 270°**

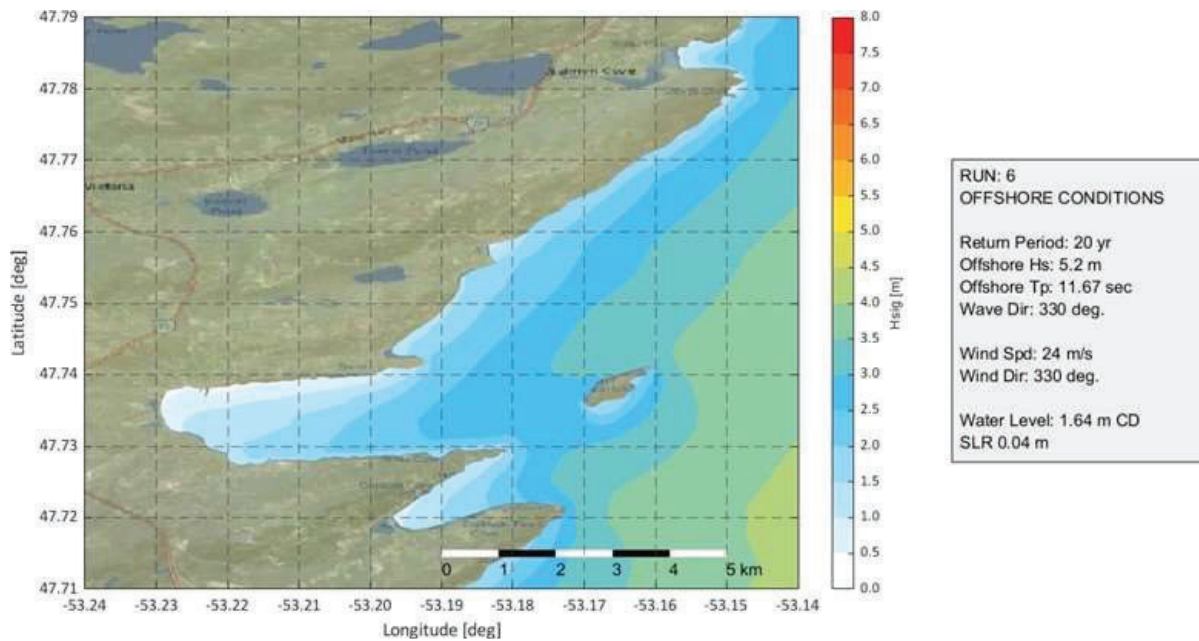


**FIGURE I.34: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 300°**

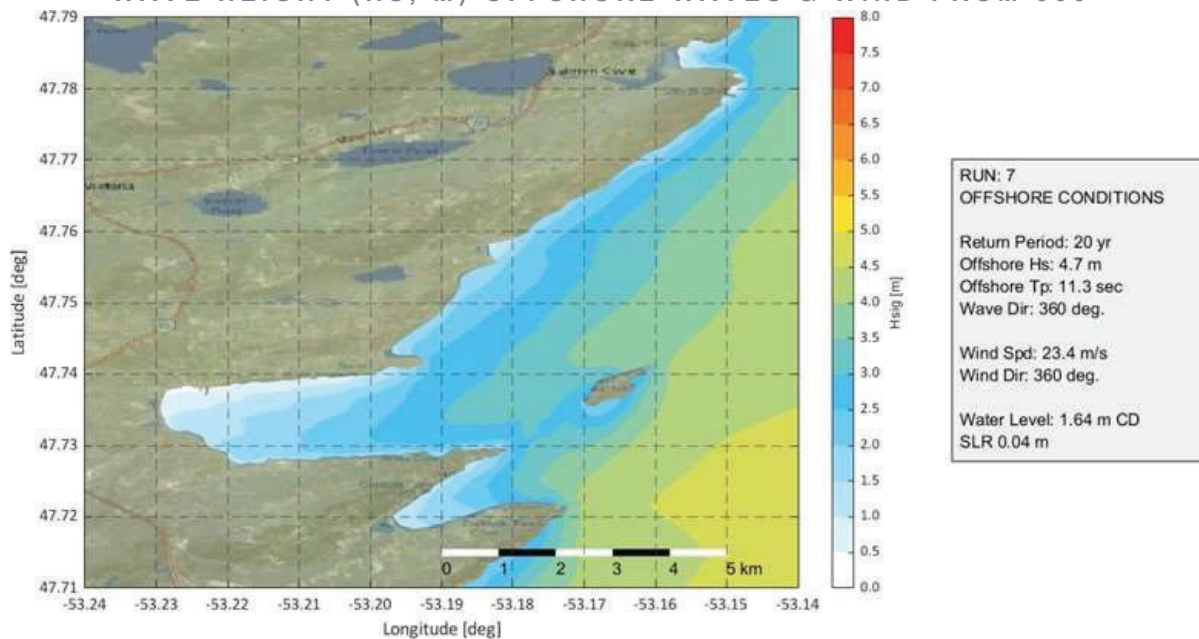




**FIGURE I.35: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 330°**

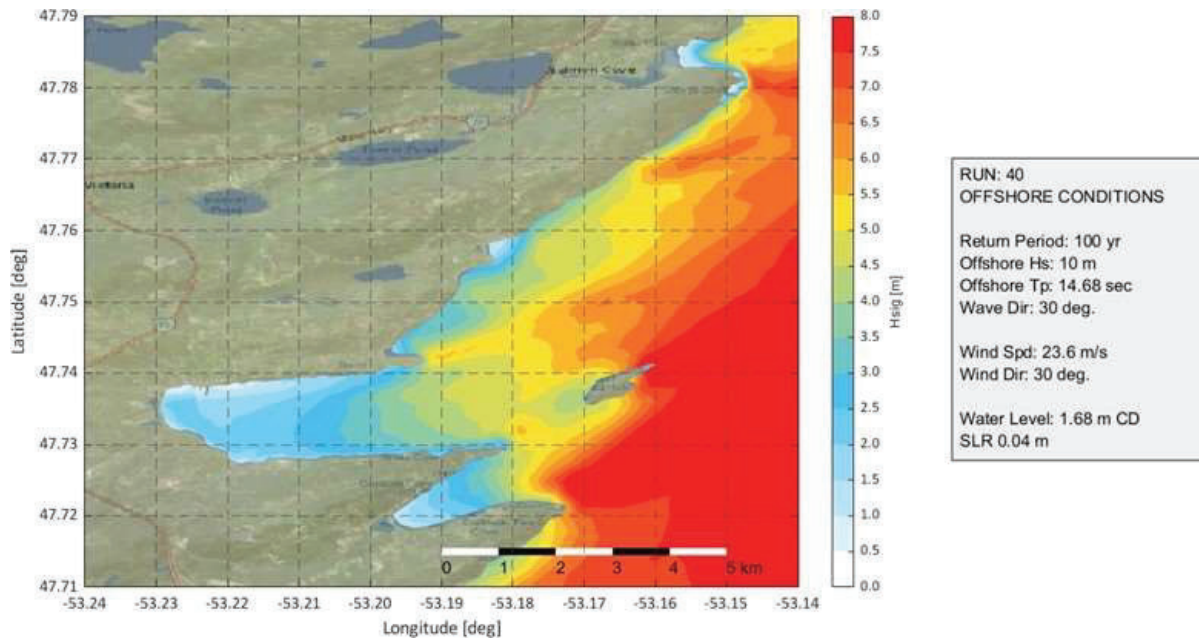


**FIGURE I.36: CONCEPTION BAY – 20-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 360°**

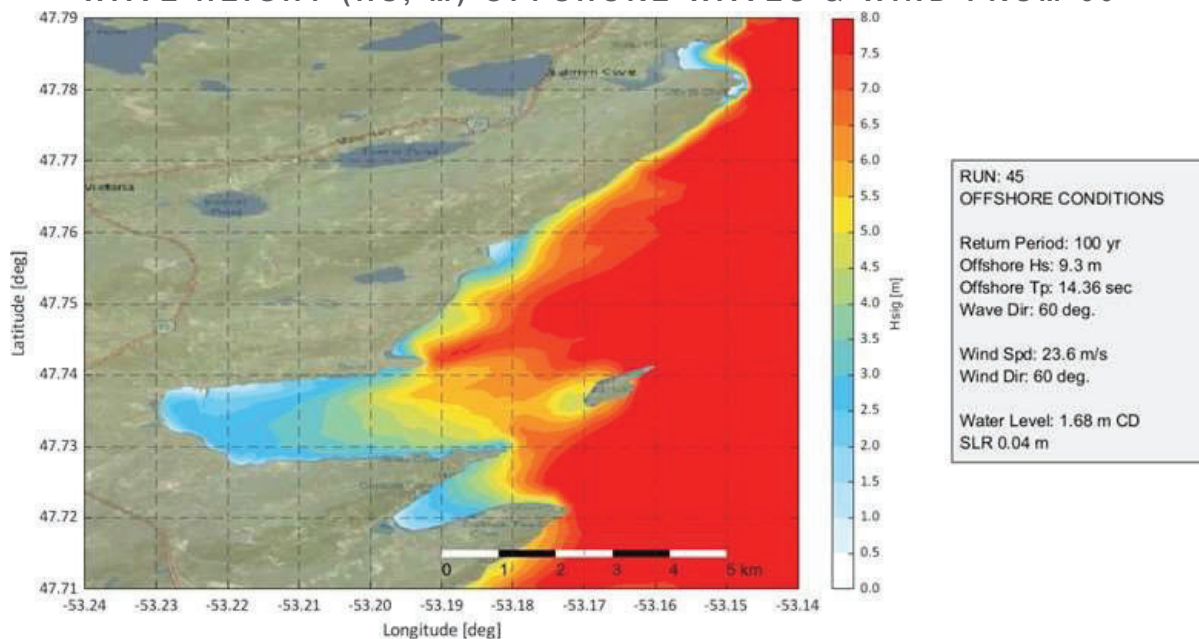


## Conception Bay – 100-yr Return Period Wave Conditions

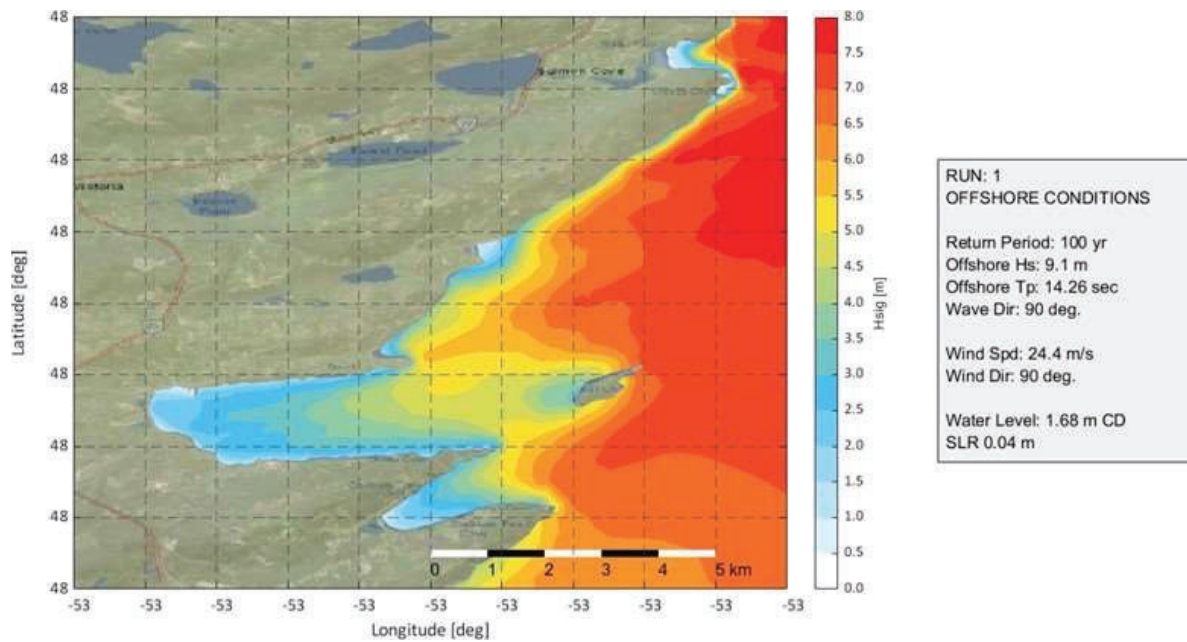
**FIGURE I.37: CONCEPTION BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 30°**



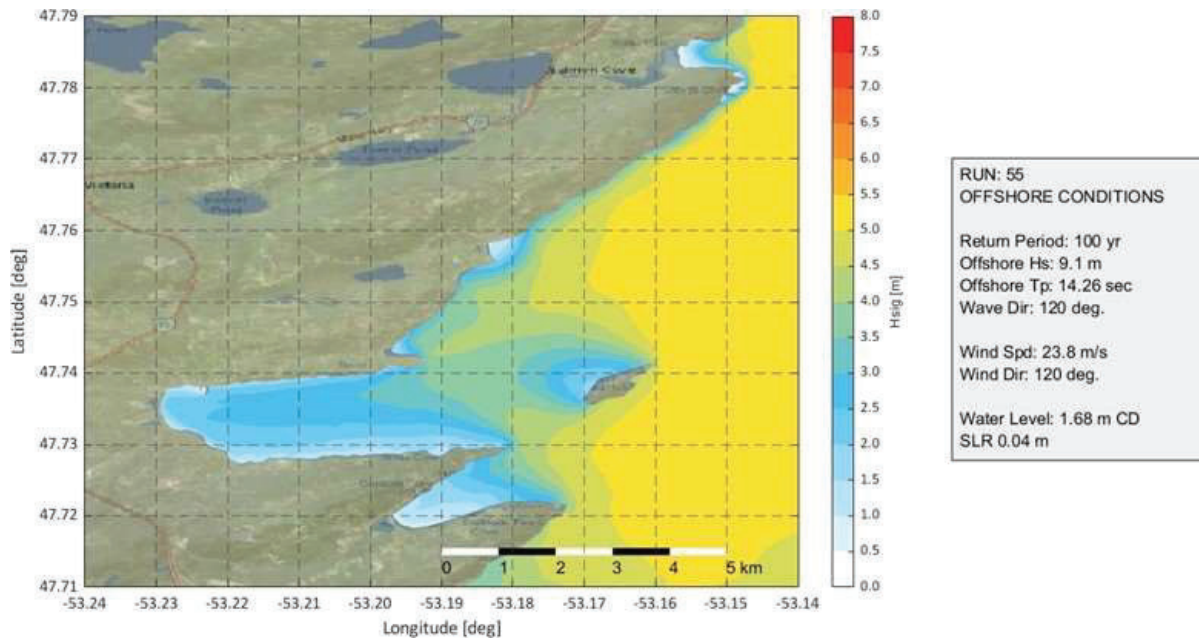
**FIGURE 8: CONCEPTION BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 60°**



**FIGURE I.39: CONCEPTION BAY – 100-YR RETURN PERIOD  
SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM  
90°**

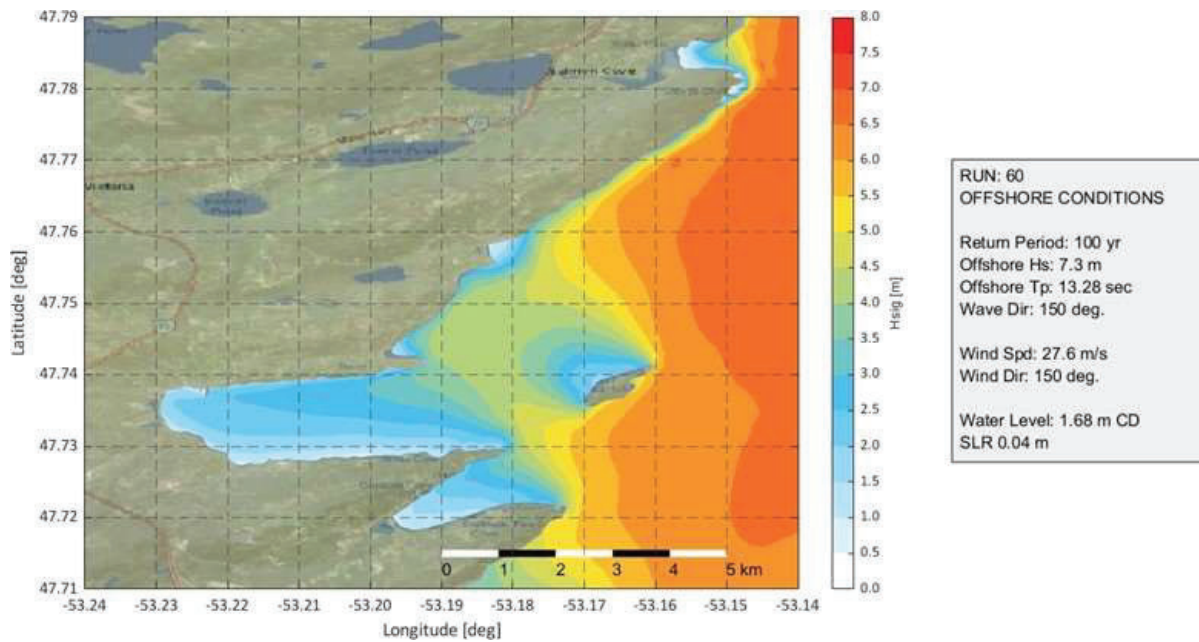


**FIGURE I.40: CONCEPTION BAY – 100-YR RETURN PERIOD  
SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM  
120°**

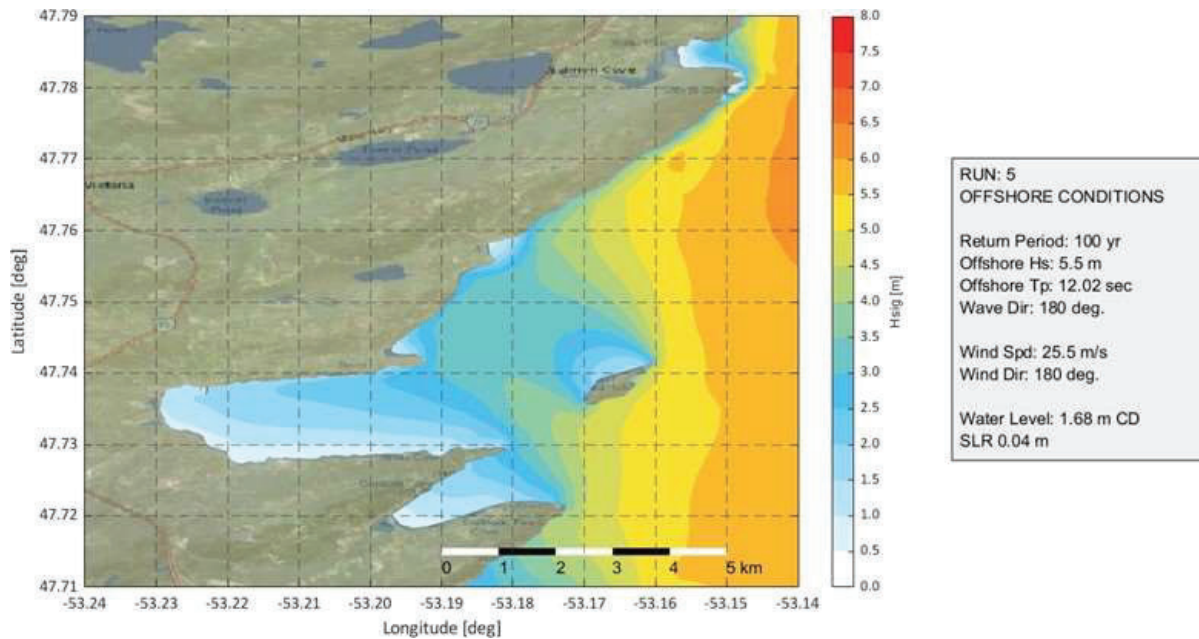




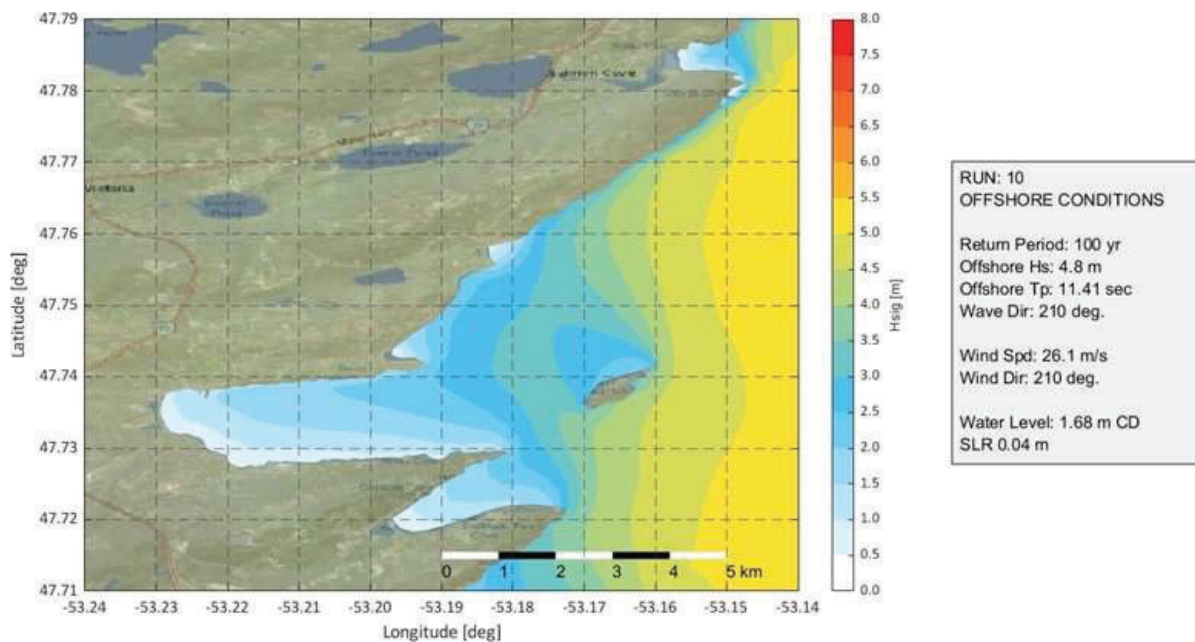
**FIGURE I.41: CONCEPTION BAY – 100-YR RETURN PERIOD  
SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM  
150°**



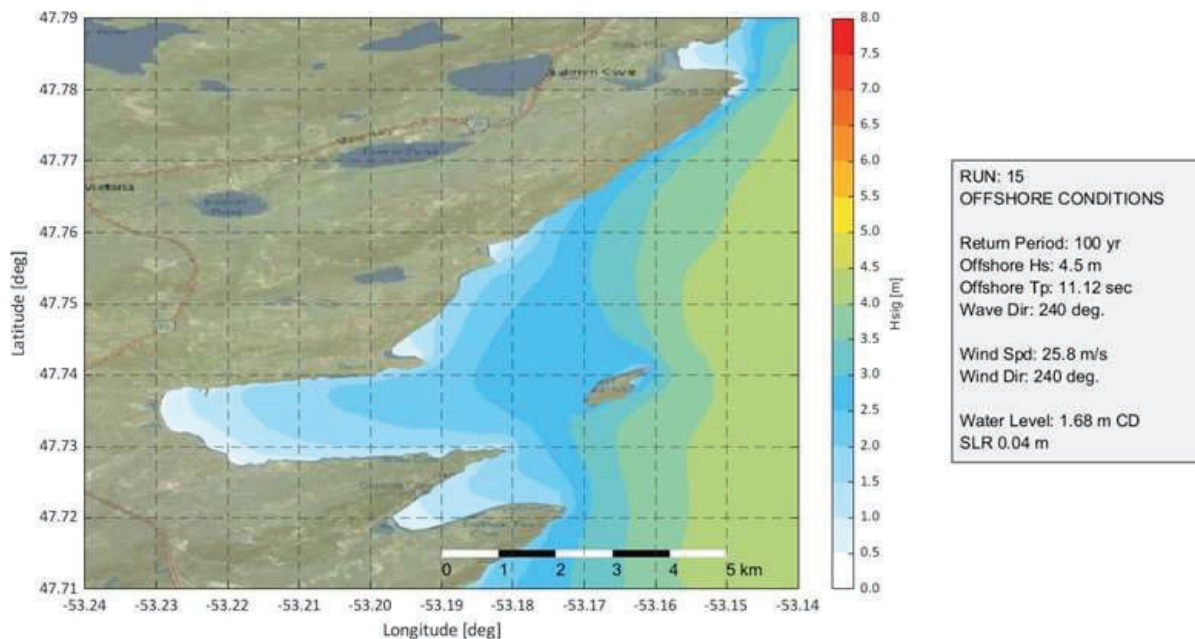
**FIGURE I.42: CONCEPTION BAY – 100-YR RETURN PERIOD  
SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM  
180°**



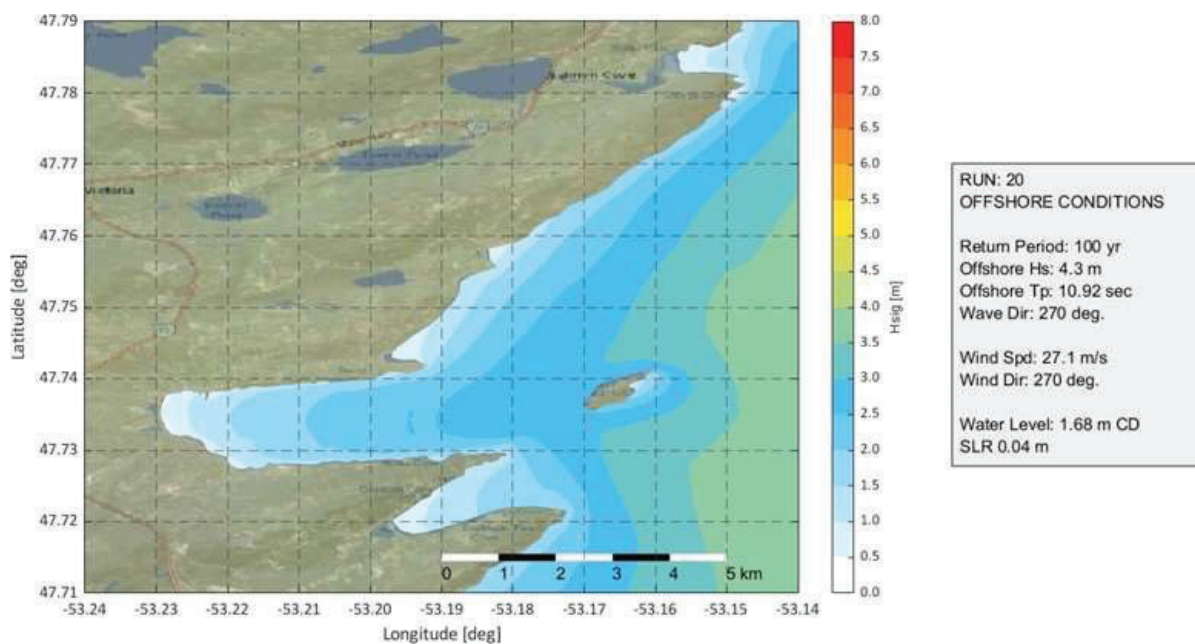
**FIGURE I.43: CONCEPTION BAY – 100-YR RETURN PERIOD  
SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM  
210°**



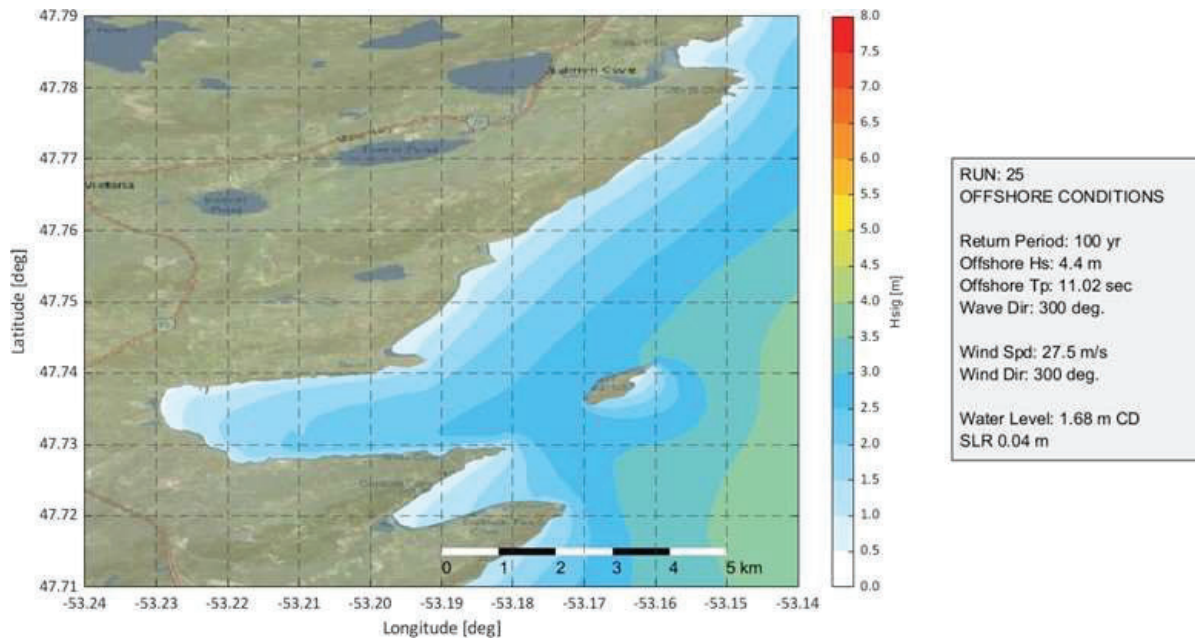
**FIGURE I.44: CONCEPTION BAY – 100-YR RETURN PERIOD  
SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM  
240°**



**FIGURE I.45: CONCEPTION BAY – 100-YR RETURN PERIOD  
SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM  
270°**

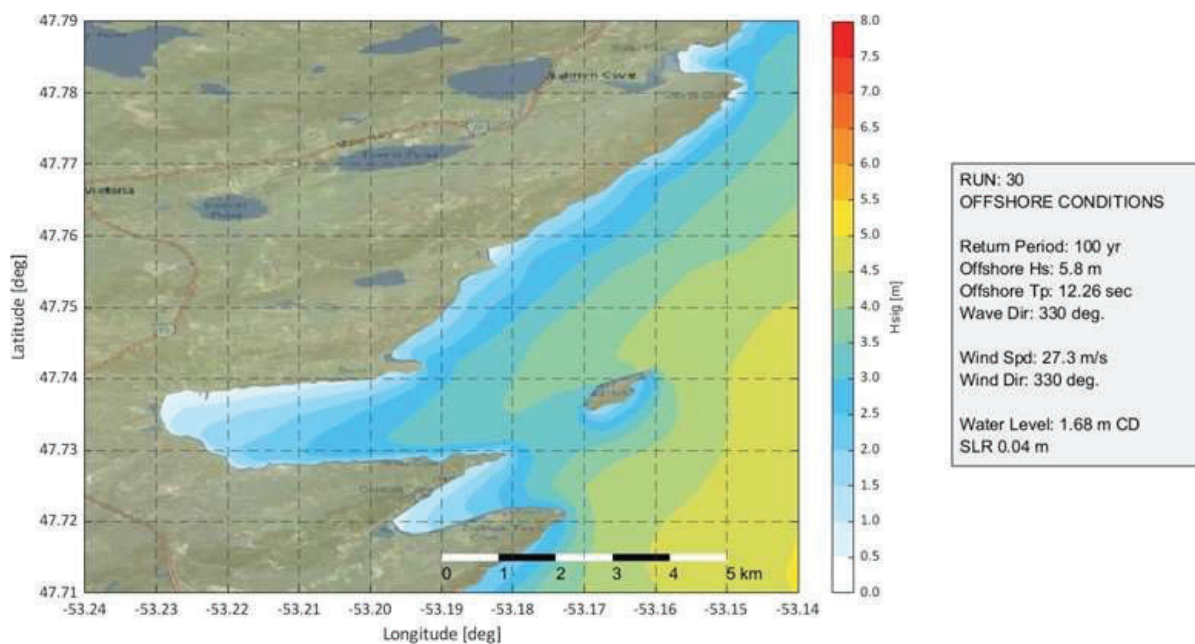


**FIGURE I.46: CONCEPTION BAY – 100-YR RETURN PERIOD  
SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM  
300°**





**FIGURE I.47: CONCEPTION BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 330°**



**FIGURE I.48: CONCEPTION BAY – 100-YR RETURN PERIOD SIGNIFICANT WAVE HEIGHT (HS, M) OFFSHORE WAVES & WIND FROM 360°**

