

Data Provider: DHI Water & Environment Inc.
Client: Newfoundland and Labrador Water Resources Management Division (WRMD)
Project Name: Newfoundland and Labrador Atlas of Surge and Wave Climate



This table summarizes the datasets and statistical analyses produced for the NL-Atlas of Surge and Wave Climate.
This table is accompanied by a technical report describing the various data sources and methods to derive the project datasets and statistical analysis.

Run	Item	Description	Location	Files
Hindcast (1980-2022)	Timeseries	Hourly time series of storm surge and waves hindcast for the period 1980 to 2022 <u>Variables:</u> - Hm0_Total: Significant Wave Height of Total Wave Spectrum (m) - Tp_Total: Peak Period of Total Wave Spectrum (s) - MWD_Total: Mean Direction of Total Wave Spectrum (degN from) - WL_Res: Residual Water Level - Storm Surge (m) - Ice_Conc: Ice Concentration	5.830 high density output points along the NL coast and offshore	Results provided as .csv files: <u>Timeseries:</u> /NL_ATLAS_TIMESERIES/NL_ATLAS_TIME_SERIES_HINDCAST.zip <u>Output points coordinates:</u> /NL_ATLAS_TIMESERIES/NL_ATLAS_OUTPUT_POINTS_shapefile.zip
	Extreme Value Analysis	<u>Extreme Significant Wave Height of Total Wave Spectrum (Hm0)</u> - Omnidirectional for 1, 2, 5, 10, 25, 50, 100-year return periods - Directional (30° bins) for 1, 2, 5, 10, 25, 50, 100-year return periods <u>Associated Extreme Peak Period of Total Wave Spectrum (Tp)</u> - 5th percentile of wave peak period associated with extreme Hm0 - 50th percentile of wave peak period associated with extreme Hm0 - 95th percentile of wave peak period associated with extreme Hm0 <u>Extreme Residual Water Level - Storm Surge (WL_Res)</u> - For 1, 2, 5, 10, 25, 50, 100-year return periods	78 analysis points near key NL coastal communities.	Results provided as .csv and GeoJSON: <u>EVA output files:</u> ./NL_ATLAS_EVA/NL_ATLAS_EVA.zip <u>EVA output points coordinates:</u> ./NL_ATLAS_EVA/NL_ATLAS_EVA_Analysis_Points_shapefile.zip
	Statistical Maps	Maps of Significant Wave Height of Total Wave Spectrum (m) statistics for the Hindcast run (1980-2022) <u>Variables (full name / short name):</u> - Hm0_Total 50th Percentile / Hm0_50p - Hm0_Total 99th Percentile / Hm0_99p - Hm0_Total Average Annual Maximum / Hm0_AAM	5.830 high density output points along the NL coast and offshore. Statistical results are divided into 12 areas corresponding to the wave model subdomains.	Results provided as .csv and GeoJSON: <u>Statistical maps csvs and shapefiles:</u> /NL_ATLAS_STATISTICS/Hm0_STATS_HINDCAST.zip <u>Output points:</u> /NL_ATLAS_TIMESERIES/NL_ATLAS_OUTPUT_POINTS_shapefile.zip
		Maps of Residual Water Level - Storm Surge (m) statistics for the Hindcast run (1980-2022) <u>Variables:</u> - WL_Res 50th Percentile - WL_Res 99th Percentile - WL_Res Average Annual Maximum	Raster maps along the NL coast and offshore. Statistical maps are divided into 8 raster tiles.	Results provided as raster files: <u>Statistical maps raster files:</u> /NL_ATLAS_STATISTICS/WL_Res_STATS_HINDCAST.zip <u>Raster maps limits:</u> /NL_ATLAS_STATISTICS/WL_Res_STATS_Raster_Domains_shapefile.zip

Run	Item	Description	Location	Files
Climate Change - Historical Baseline (1984-2014) and Future Projections (2015-2100)	Timeseries	<p>3-hourly time series of storm surge and wave bulk parameters for a historical baseline (period of 1984-2014) and for the SSP5-8.5 climate change scenario (period of 2015-2100) forced by two Global Climate Models (EC-EARTH3 and ACCESS-CM2).</p> <p><u>Variables:</u></p> <ul style="list-style-type: none"> - Hm0_Total: Significant Wave Height of Total Wave spectrum (m) - Tp_Total: Peak Period of Total Wave Spectrum (s) - MWD_Total: Mean Direction of Total Wave Spectrum (degN from) - WL_Res: Residual Water Level - Storm Surge (m) - Ice_Conc: Ice Concentration 	5.830 high density output points along the NL coast and offshore	<p>Results provided as .csv files:</p> <p><u>ACCESS-CM2 BASELINE:</u> ./NL_ATLAS_TIMESERIES/NL_ATLAS_TIME SERIES_ACCESS_CM2_HISTORICAL_BASELI NE.zip</p> <p><u>EC-EARTH3 BASELINE:</u> ./NL_ATLAS_TIMESERIES/NL_ATLAS_TIME SERIES_EC- EARTH3_HISTORICAL_BASELINE.zip</p> <p><u>ACCESS-CM2 SSP5-8.5:</u> ./NL_ATLAS_TIMESERIES/NL_ATLAS_TIME SERIES_ACCESS_CM2_SSP585.zip</p> <p><u>EC-EARTH3 SSP5-8.5:</u> ./NL_ATLAS_TIMESERIES/NL_ATLAS_TIME SERIES_EC-EARTH3_SSP585.zip</p> <p><u>Output points coordinates:</u> ./NL_ATLAS_TIMESERIES/NL_ATLAS_OUT PUT_POINTS_shapefile.zip</p>
	Statistical Maps	<p>Maps of projected changes in Significant Wave Height of Total Wave Spectrum (m) statistics relative to the historical baseline for mid- and late-century, considering the SSP5-8.5 climate change scenario and two Global Climate Models (EC-EARTH and ACCESS-CM2).</p> <p><u>Variables (Full Name / Short Name):</u></p> <ul style="list-style-type: none"> - Hm0_Total Mid-Century 50th Percentile Difference (SSP5-8.5 ACCESS-CM2) / dHm0_MC_50p_AC2 - Hm0_Total Mid-Century 99th Percentile Difference (SSP5-8.5 ACCESS-CM2) / dHm0_MC_99p_AC2 - Hm0_Total Mid-Century Avg Annual Max Difference (SSP5-8.5 ACCESS-CM2) / dHm0_MC_AAM_AC2 - Hm0_Total Late-Century 50th Percentile Difference (SSP5-8.5 ACCESS-CM2) / dHm0_LC_50p_AC2 - Hm0_Total Late-Century 99th Percentile Difference (SSP5-8.5 ACCESS-CM2) / dHm0_LC_99p_AC2 - Hm0_Total Late-Century Avg Annual Max Difference (SSP5-8.5 ACCESS-CM2) / dHm0_LC_AAM_AC2 <ul style="list-style-type: none"> - Hm0_Total Mid-Century 50th Percentile Difference (SSP5-8.5 EC-EARTH3) / dHm0_MC_50p_EC3 - Hm0_Total Mid-Century 99th Percentile Difference (SSP5-8.5 EC-EARTH3) / dHm0_MC_99p_EC3 - Hm0_Total Mid-Century Avg Annual Max Difference (SSP5-8.5 EC-EARTH3) / dHm0_MC_AAM_EC3 - Hm0_Total Late-Century 50th Percentile Difference (SSP5-8.5 EC-EARTH3) / dHm0_LC_50p_EC3 - Hm0_Total Late-Century 99th Percentile Difference (SSP5-8.5 EC-EARTH3) / dHm0_LC_99p_EC3 - Hm0_Total Late-Century Avg Annual Max Difference (SSP5-8.5 EC-EARTH3) / dHm0_LC_AAM_EC3 	<p>5.830 high density output points along the NL coast and offshore.</p> <p>Statistical results are divided into 12 areas corresponding to the wave model subdomains.</p>	<p>Results provided as .csv and GeoJSON:</p> <p><u>Hm0_STATISTICS CC PROJECTION CHANGES:</u> ./NL_ATLAS_STATISTICS/Hm0_CC_PROJEC TIONS.zip</p> <p><u>Output points:</u> ./NL_ATLAS_TIMESERIES/NL_ATLAS_OUT PUT_POINTS_shapefile.zip</p>
		<p>Maps of projected changes in Storm Surge Residual Water Level (m) statistics relative to the historical baseline for mid- and late-century, considering the SSP5-8.5 climate change scenario and two Global Climate Models (EC-EARTH and ACCESS-CM2).</p> <p><u>Variables:</u></p> <ul style="list-style-type: none"> - WL_Res Mid-Century 50th Percentile Difference (SSP5-8.5 ACCESS-CM2) - WL_Res Mid-Century 99th Percentile Difference (SSP5-8.5 ACCESS-CM2) - WL_Res Mid-Century Avg Annual Max Difference (SSP5-8.5 ACCESS-CM2) - WL_Res Late-Century 50th Percentile Difference (SSP5-8.5 ACCESS-CM2) - WL_Res Late-Century 99th Percentile Difference (SSP5-8.5 ACCESS-CM2) - WL_Res Late-Century Avg Annual Max Difference (SSP5-8.5 ACCESS-CM2) <ul style="list-style-type: none"> - WL_Res Mid-Century 50th Percentile Difference (SSP5-8.5 EC-EARTH3) - WL_Res Mid-Century 99th Percentile Difference (SSP5-8.5 EC-EARTH3) - WL_Res Mid-Century Avg Annual Max Difference (SSP5-8.5 EC-EARTH3) - WL_Res Late-Century 50th Percentile Difference (SSP5-8.5 EC-EARTH3) - WL_Res Late-Century 99th Percentile Difference (SSP5-8.5 EC-EARTH3) - WL_Res Late-Century Avg Annual Max Difference (SSP5-8.5 EC-EARTH3) 	<p>Raster maps along the NL coast and offshore.</p> <p>Statistical climate change maps are divided into 8 raster tiles.</p>	<p>Results provided as raster files:</p> <p><u>WL STATISTICS CC PROJECTION CHANGES:</u> ./NL_ATLAS_STATISTICS/WL_Res_STATS_C C_PROJECTIONS.zip</p> <p><u>Raster Maps Limits:</u> ./NL_ATLAS_STATISTICS/WL_Res_STATS_R aster_Domains_shapefile.zip</p>