Project Charter

Part I: Project Overview

Project Name	MIC - Smart Beach: Wave and Beach Security Analysis		
Project Charter Author	Cassandra Forlani		
Creation Date	November 9th, 2022	**Last Revision Date**	December 5th, 2022
Project Requestor	Chris Houser, Becky Smith, Alex Smith		
Proposed Project Start	November 30th, 2022		
Proposed Project End	April 6th, 2023		

Part II: Stakeholders

Sponsor	Municipal Innovation Council (MIC)
Client	Chris Houser, Becky Smith, Alex Smith
Project Team	Cassandra Forlani – Team lead, Yi-Chen Hsiao – Analyst, Ruwindhu Dilanga Chandraratne Hettige Don - Developer

Part III: Project Details

Project Description	Beaches around Lake Huron are popular tourist destinations. However, there are some potential risks such as quick underwater rip currents. Local community organizations are seeking solutions to educate and maintain beach safety. This project is part of the three-year Smart Beach project administered by the Municipal Innovation Council (MIC). It aims to use innovative technologies to improve beach safety. Launched at Station Beach in Kincardine on May 25, 2022, the research team of the Smart Beach project has collected weather and wave data using a RAEON (Real-time Aquatic Ecosystem Observation Network) buoy in Lake Huron from Spring to Autumn in 2022. This project aims to utilize the collected buoy data and the publicly available Environmental Canada and NOAA data to examine if the inshore water movement (wave conditions and currents) and drowning incidents can be predicted by the offshore buoy data and weather conditions. The results of machine learning models are expected to support the Smart Beach project further to develop a real-time beach security information system for beachgoers and improve safety at Kincardine's Station Beach.
Project Objective	• Examine if the inshore water movement and drowning incidents can be predicted by the offshore buoy data and weather conditions to support the Smart Beach project's next steps for improving beach safety. • If inshore water movement and drowning incidents can be predicted by predictive models, identify the best predictive modeling to support the Smart Beach project's work in developing the real-time beach safety information system and education programs.

Project Requirements	• Must acquire the following data in order to perform predict modeling: (1) inshore water movement (wave, current) and weather/wave data from NDBC buoys in Lake Huron collected by the Smart Beach project research team; (2) historical weather and wave data from NOAA and Environment Canada that match the location and period data collected by the Smart Beach project research team; (3) drowning and rescue history records at Kincardine and along the Huron shore of Bruce County. • Must have at least one team member proficient at machine learning/predict modeling and coding to perform predictive analysis. • Need to manage project timeline and ensure project output progress meets client's need.
Project Outcomes or Benefits	<u>Expected outcome</u> • A summary about the predict modeling effectiveness evaluation • Predictive models regarding inshore water movement. • Predictive models regarding past drownings and rescues at Kincardine and along the Huron shore of Bruce County. • The recommended predictive models. <u>Expected benefits</u> • If the predictive modeling is effective, analysis result would be beneficial to the Smart Beach project's next steps. • The beach safety for beaches around Lake Huron is expected to increase when the Smart Beach team utilizes the predictive models to develop real-time beach security information system and education programs.
Project Scope	<u>In scope</u> • Examine if inshore water movements can be predicted by the weather/wave data from NDBC buoys, NOAA and Environment Canada. • If inshore water movement can be predicted by predictive models, identify the best predictive models. • Utilize the above model to predict the wave, current and temperature conditions for past drownings and rescues at Kincardine and along the Huron shore of Bruce County. <u>Out scope</u> • Deploying the predictive model on the client's website. • Build a real-time interactive dashboard. • Make educational content for beach safety. • Conduct in-field observations.
Project Deliverables	• Finalized report. • The predictive model. • Python program code and scripts.
Constraints/Risks	• Incomplete/inaccurate data from NDBC buoys which can affect the ability to accurately predict specific variables[1] • Finding insufficient/precise data to do a prediction model solely with public data from Environment Canada and NOAA • The prediction model not being able to identify with accuracy specific variables[1]

	• The Smart Beach project needs changed • Scheduling conflicts which can defer input meetings Note[1]: variables = wave height, wave period, wave direction, current speed, and/or temperature
Assumptions	• MIC has compiled wave and weather data from NDBC buoys • The amount of data records acquired from MIC would be enough to conduct predict modelling.
Key Dependencies	• Acquiring datasets from MIC and public sources. • Conducting pre-analysis procedures • Complete predict model testing and evaluation

Part IV: Communications

Stakeholder	Message	Method	Frequency
Sponsor	Client Meetings	MS Teams	Weekly/Monthly
	Risks and Issues	Email	As needed
	Project Status Reports	Email	Weekly
	Closing Presentation	MS Teams	
Project Manager	Client Meeting	MS Teams	Weekly
	Team Meetings	MS Team	Regularly/Weekly
	Risks and Issues	Email	As needed
	Project Status Reports	Email (creator)	Weekly
	Closing Presentation	MS Teams	
Team Members	Client Meeting	MS Teams	Weekly
	Team Meetings	MS Teams	Regularly/Weekly
	Risks and Issues	Email	As needed
	Project Status Reports	Email (contributor)	Weekly
	Closing Presentation	MS Teams	

Part V: Project Timeline

Project Timeline	Activity	Complete By
	Acceptance of the Project Charter	December 7th, 2022
	Requirements Phase	January 12th, 2023
	Data Cleaning and Analysis Phase	January 26th, 2023
	Development and Testing Phase	March 23rd, 2023
	Release Phase	March 30th, 2023
	Client Presentation	April 3rd, 2023
	Project Close-Out Phase	April 5th, 2023

Approval Signatures

Client's Full Legal Name

Georgian College,
Department of Research and Innovation
Big Data Analytics Program

Sponsor Name and Title

Originator and Role

Approval Date: