MEMORANDUM

To: International Joint Commission
From: ICM Team 2417262
Subject: GL-PaD: Great Lakes' Predictor-and-Decision maker
Date: Feburary 6, 2024

Dear Leader,

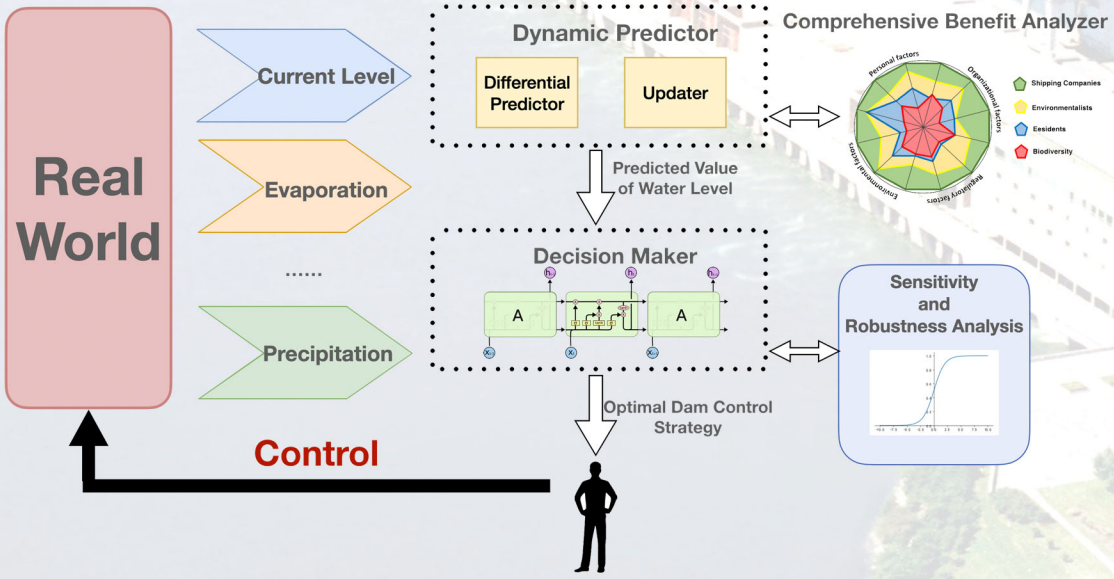
I am pleased to present to you our distinctive and advanced model, adeptly crafted to effectively resolve the water level issues of the Great Lakes. Below, I will detail the principal features of this model.

Additionally, our model has conducted a comprehensive assessment of the interests of all relevant stakeholders. It aims to maximize overall benefits by determining the relative importance of these stakeholders during various periods, thereby calculating the optimal water levels for the Great Lakes at any time of the year.

Moreover, we have developed an algorithm to maintain these optimal water levels. This algorithm revolutionizes traditional decision-making models by dividing them into predictive decision-making joint models and integrating machine learning into the conventional Model Predictive Control (MPC) framework. This significant enhancement has been achieved by training the model with data from 2002 to 2022. We employed the Sobol method to test the model's performance in diverse environments, revealing its high precision and adaptability in maintaining optimal water levels. This has resulted in an approximate 5% increase in overall benefits and a 10% improvement in control capabilities.

I firmly believe that this model will become a valuable asset in managing the water levels of the Great Lakes and strongly advocate for its consideration for implementation.

Thank you for your time and attention.



The Flow Chart of our work