

An aerial photograph of a vast expanse of sea ice, composed of numerous irregular floes of varying sizes. The ice floes are a pale, milky blue color, contrasting with the darker, open water between them. The horizon is visible in the distance, where the ice meets a sky filled with soft, grey clouds. The overall lighting is diffused, suggesting an overcast day.

SEA ICE PREDICTION NETWORK

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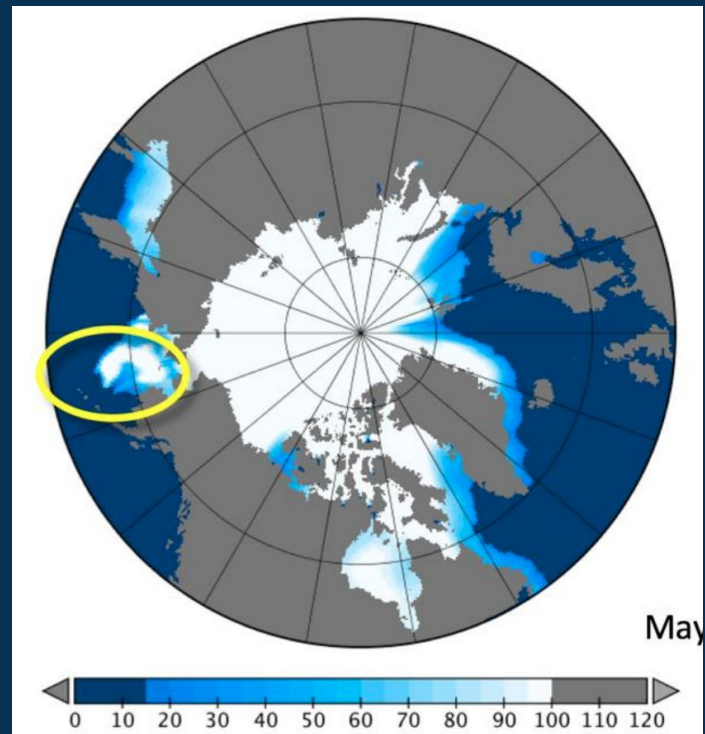
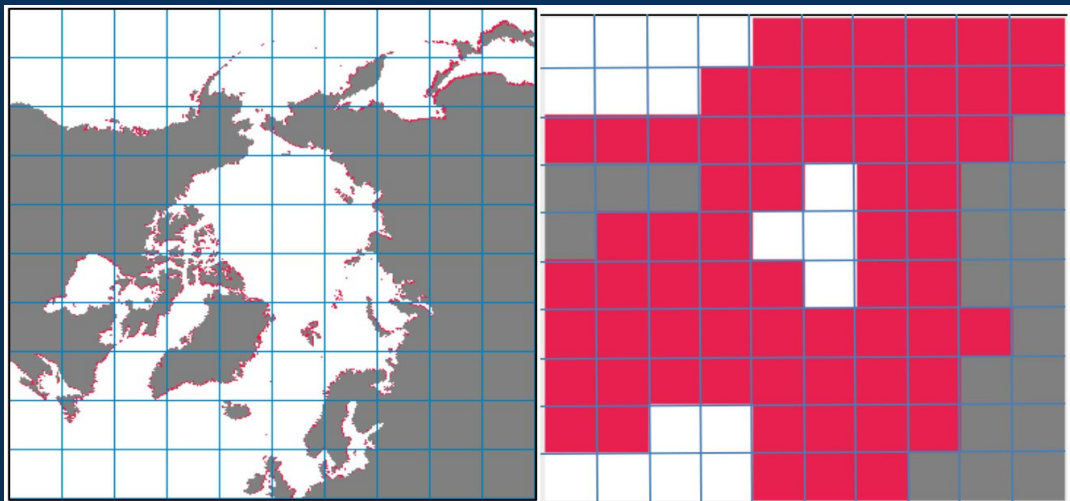
Background

- Climate change→ decrease in sea ice concentration at all times of the year
 - forecasting sea ice extent is becoming increasingly difficult
- Sea ice prediction network based on a CNN
 - binary classification on ice concentration data to forecast sea ice locations in the Arctic



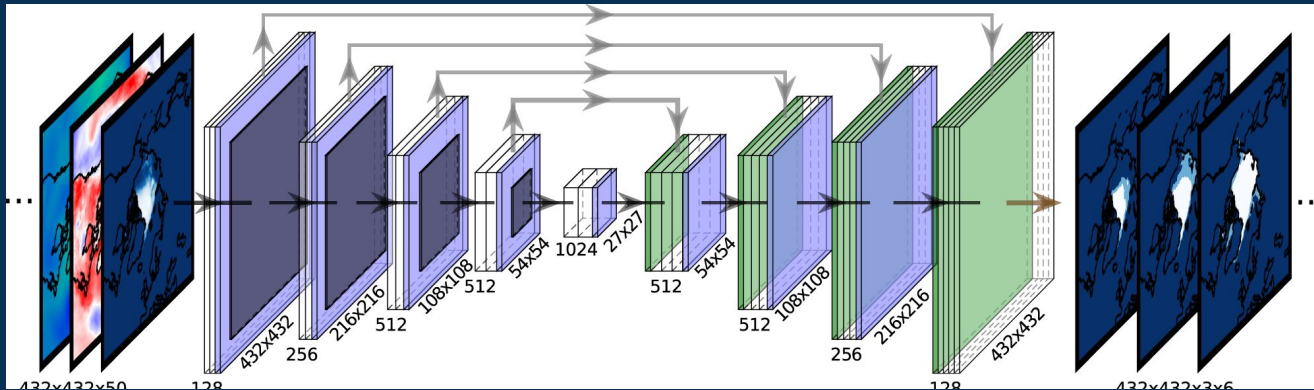
Dataset

- Sea ice concentration data and satellite imagery 1997-2007
- 240 x 1140 grid of the Arctic- pixels between 0-100
 - Concentration ≥ 15 = sea ice
 - Concentration < 15 = open water



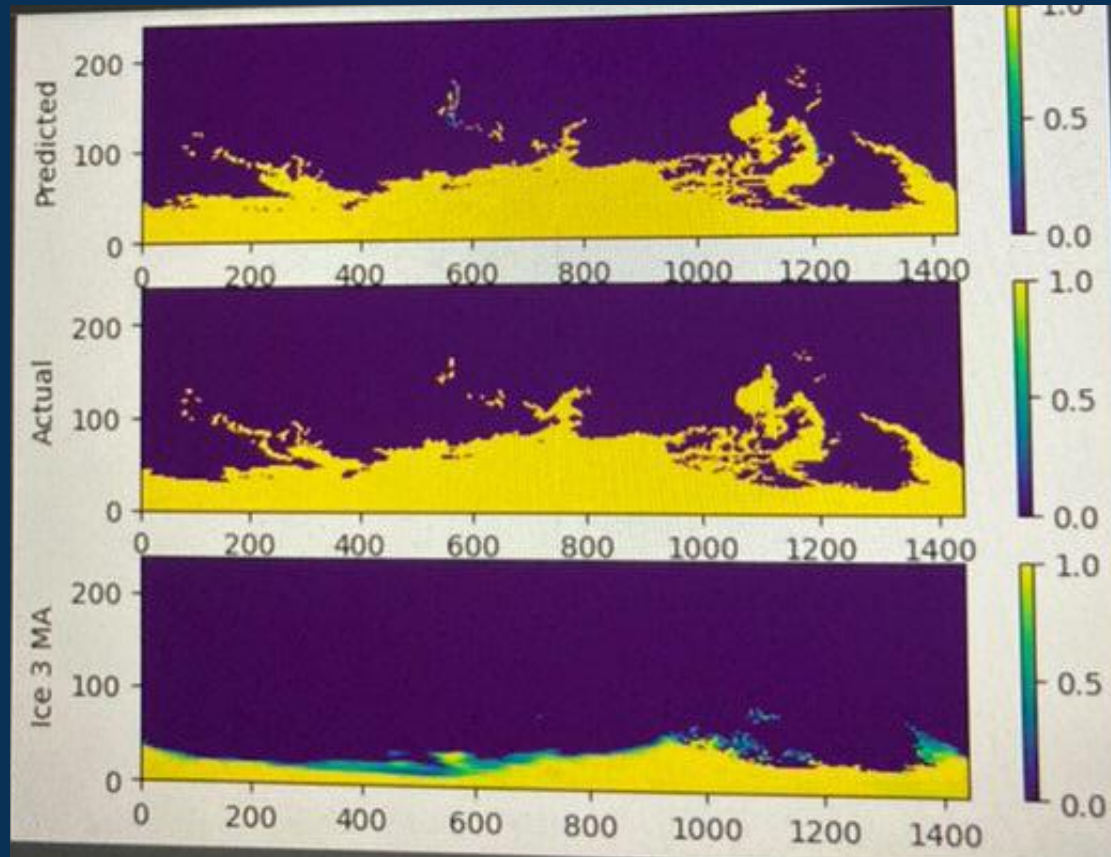
Method

- CNN trained on dataset
 - Learns the spatial and temporal patterns of sea ice movement and concentration
 - Makes accurate predictions
- Evaluation Metrics: Accuracy, Precision, Recall, and F1 Score
 - Predicted ice locations compared with actual locations in test dataset



Results

- The CNN achieved an accuracy of 98% in predicting sea ice locations



Impact

- Feasibility of utilizing CNN-based approaches for improving sea ice prediction capabilities
 - Further research required to enhance the accuracy and performance
- CNN aids in Arctic weather forecasting, climate modeling, and resource management
 - better understanding of the Arctic environment

