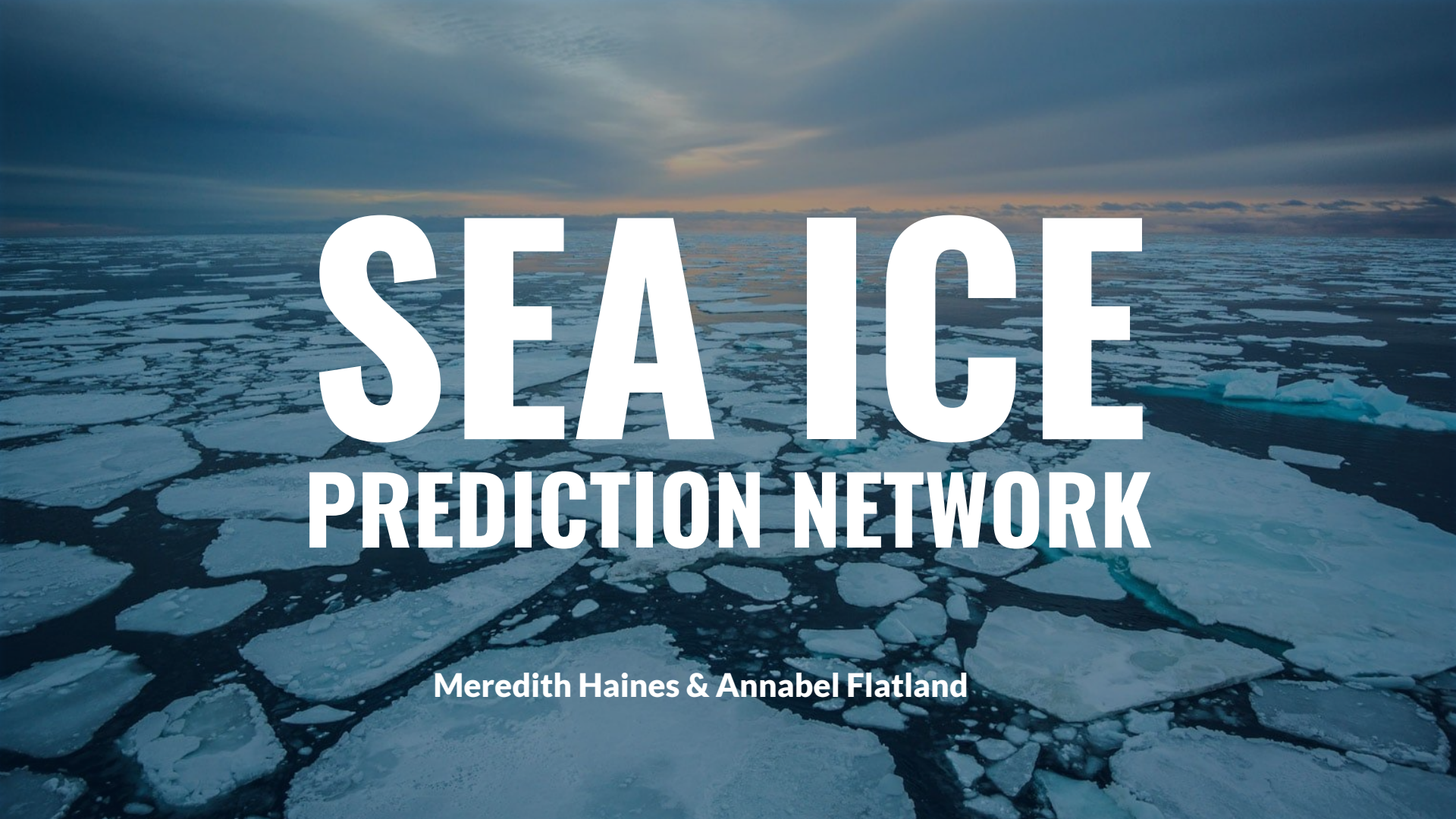


SEA ICE PREDICTION NETWORK

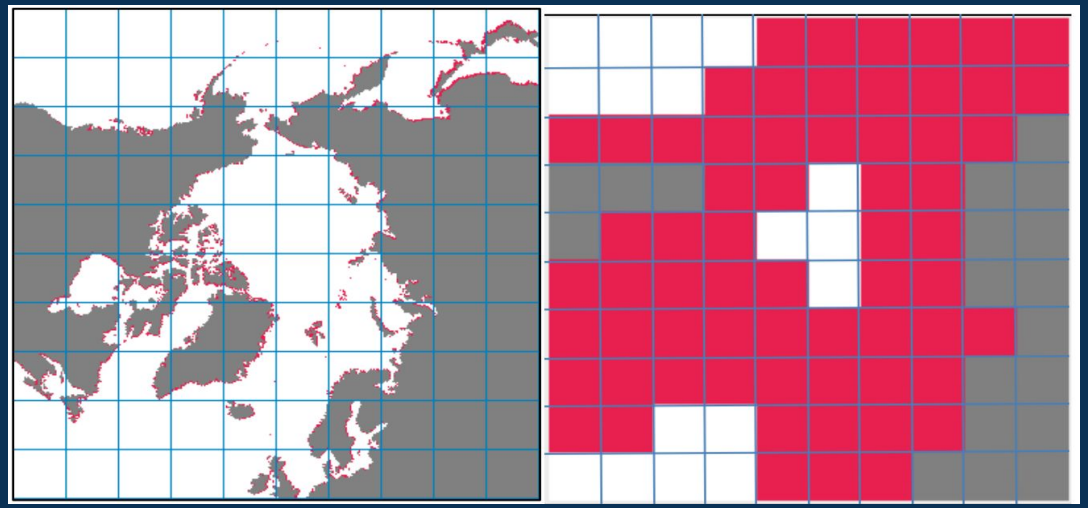
Meredith Haines & Annabel Flatland

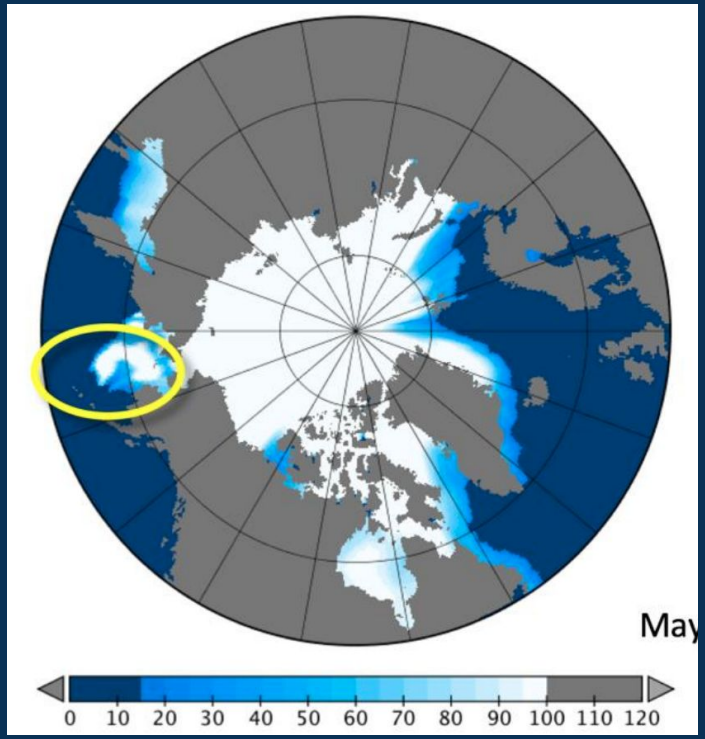
Background

- 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

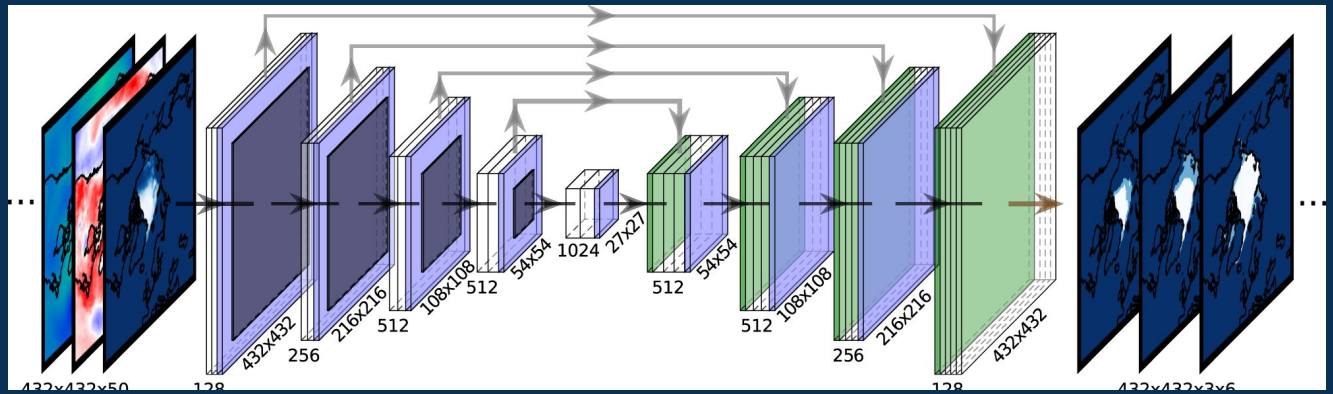
- NSIDC- Sea ice concentration data and satellite imagery 1979-2017
- 240 x 1140 grid of the Arctic- pixels between 0-100
  - Concentration ≥ 15 = sea ice
  - Concentration < 15 = open water





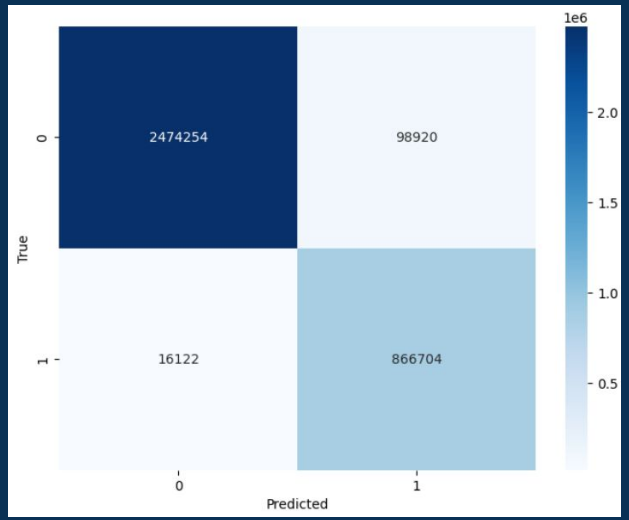
Method

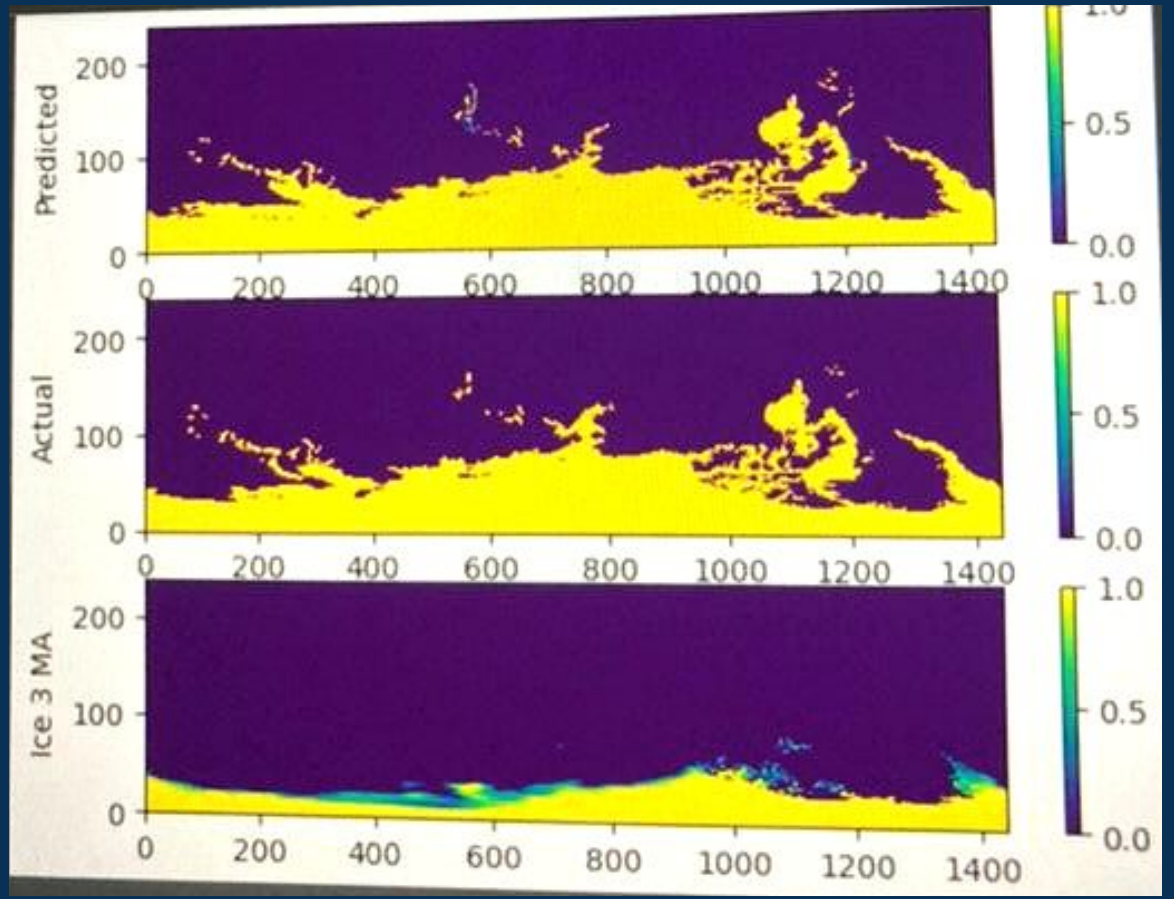
- CNN trained on dataset
  - Computer vision problem
  - Train = sea ice concentration 3 months earlier, predictions = current sea ice concentration
  - Randomized years
- Evaluation Metrics: Accuracy, Precision, Recall, and F1



Results

- Validation Loss: 0.132
- Accuracy in predicting sea ice locations: 98%





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