

## SEA ICE PREDICTION NETWORK (SIPN)

### Template for Pan-Arctic Sea Ice Outlook Core Contributions June Report (Using May Data)

*\*Required*

1. Gavin Cawley

2. \*Type of Outlook projection: statistical

3. \*September monthly average projection (in million square kilometers)

4.271925 (+/- 1.129063)

4. \*Short explanation of Outlook method (1-3 sentences)

A Gaussian Process Regression model is used, with a squared exponential covariance function (the hyper-parameters are tuned via maximization of the marginal likelihood), using the GPML toolbox for MATLAB. This is used to model the September average sea ice from previous years and extrapolate this into the future. A nice feature is that it provides error bars on the projections that increase in width the further the projection extrapolates away from the observations.

5. Projection uncertainty/probability estimate (only required if available with the method you are using) +/- 1.129063 (to give a 95% credible interval)

6. Short explanation/assessment of basis for the uncertainty estimate in #5 (1-2 sentences) This is just the credible interval provided by the Bayesian analysis of the Gaussian process regression method.

7. \* "Executive summary" about your Outlook contribution

1-3 sentences, to be used in Outlook summary: say in a few sentences what your Outlook contribution is and why. To the extent possible, use non-technical language.

This is essentially just a Bayesian non-parametric method used to extrapolate the trends in the observations of September sea ice in previous years, and incorporates no expert knowledge whatsoever. It is a purely statistical projection.

