

Retrieval of Melt Pond Fraction over Arctic Sea Ice during 2000-2019 Using An Ensemble-Based Deep Neural Network

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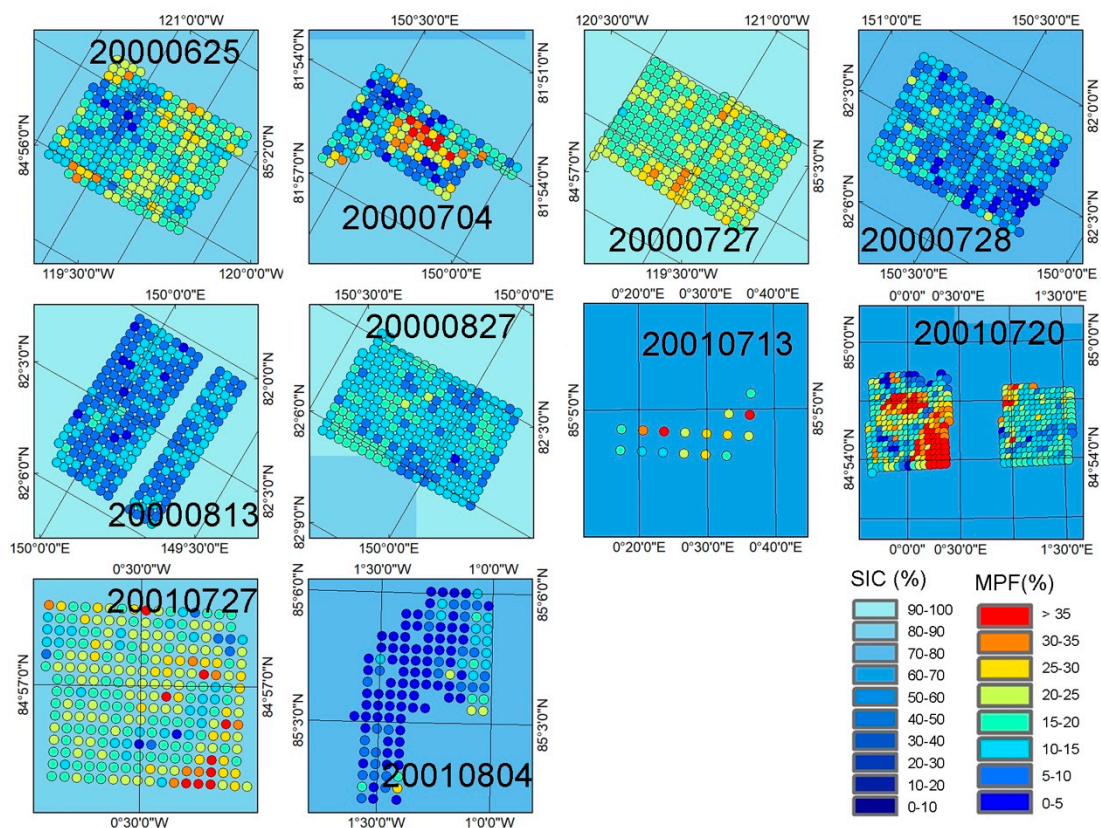


Figure S1. Cases of the observed MPF from NSIDC overlaid on NASA Team SIC.

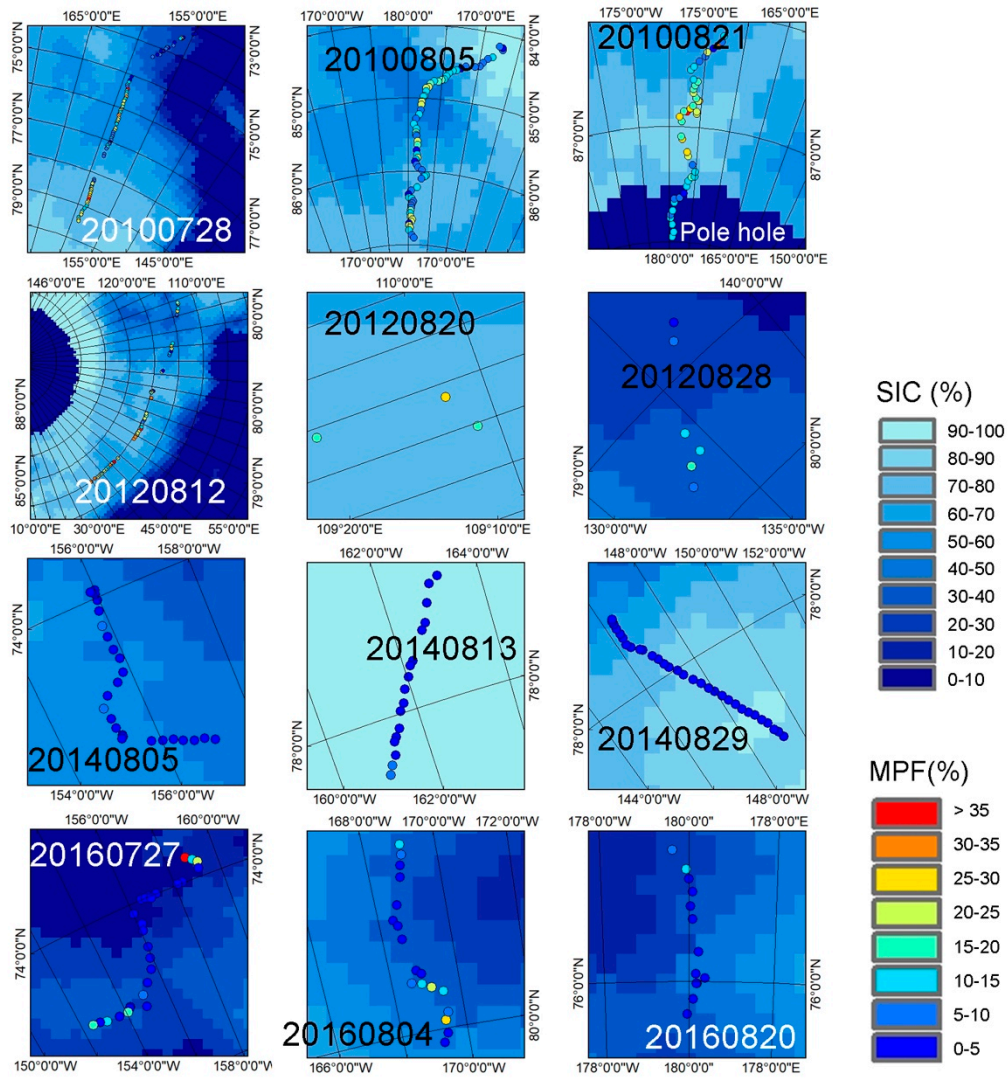


Figure S2. Cases of the observed MPF from PRIC-Lei overlaid on NASA Team SIC.

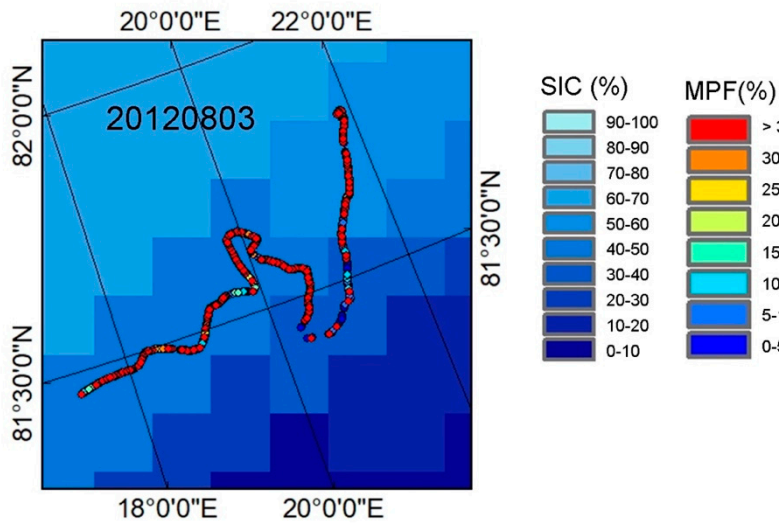


Figure S3. Cases of the observed MPF from NPI overlaid on NASA Team SIC.

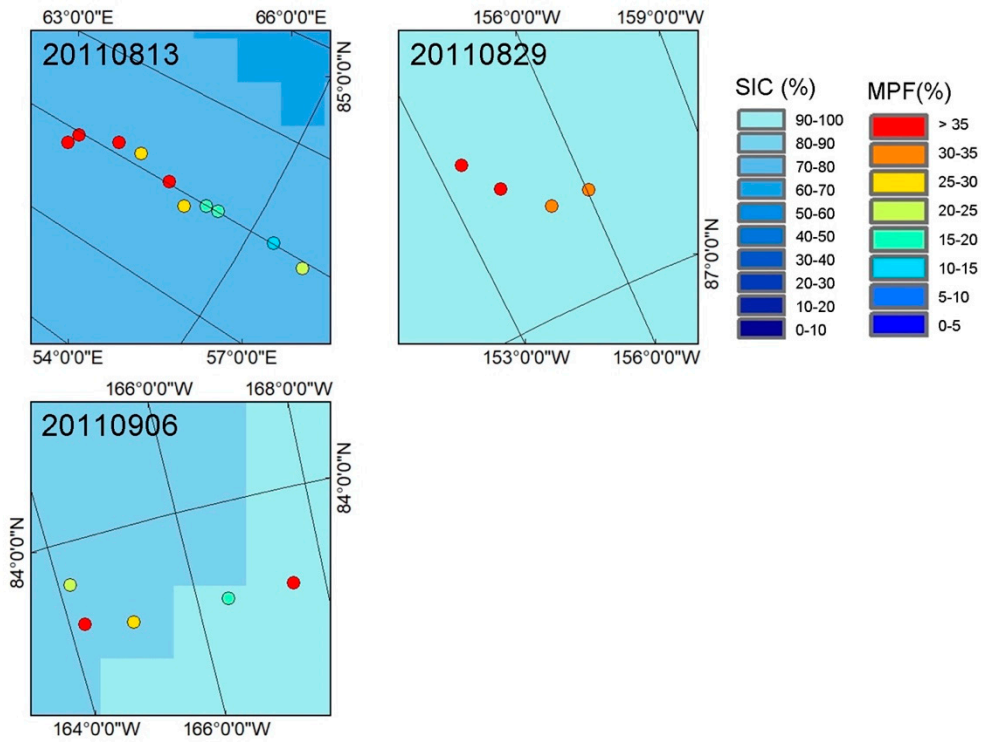


Figure S4. Cases of the observed MPF from TransArc overlaid on NASA Team SIC.

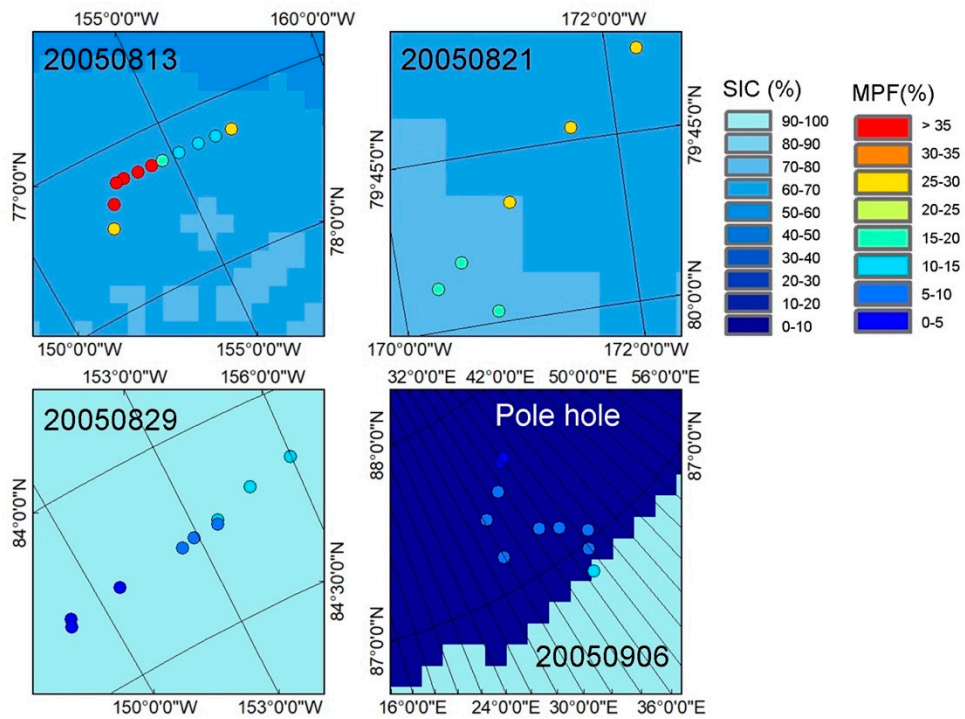


Figure S5. Cases of the observed MPF from HOTRAX overlaid on NASA Team SIC.

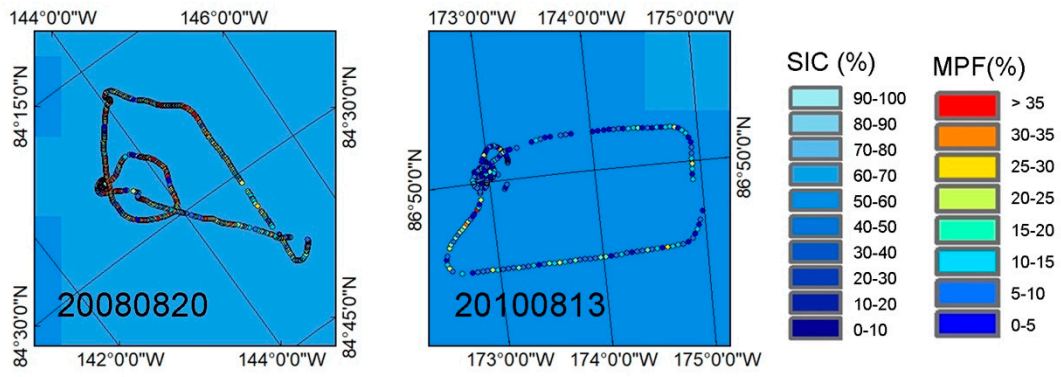


Figure S6. Cases of the observed MPF from DLUT overlaid on NASA Team SIC.

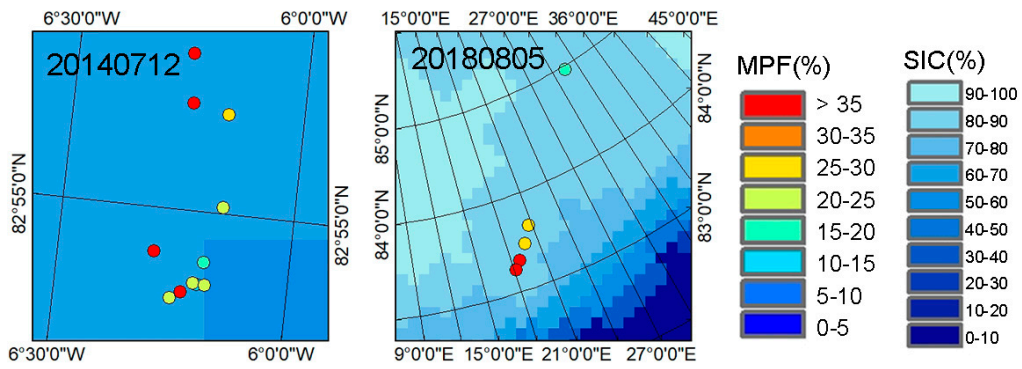


Figure S7. Cases of the observed MPF from IceWatch overlaid on NASA Team SIC.

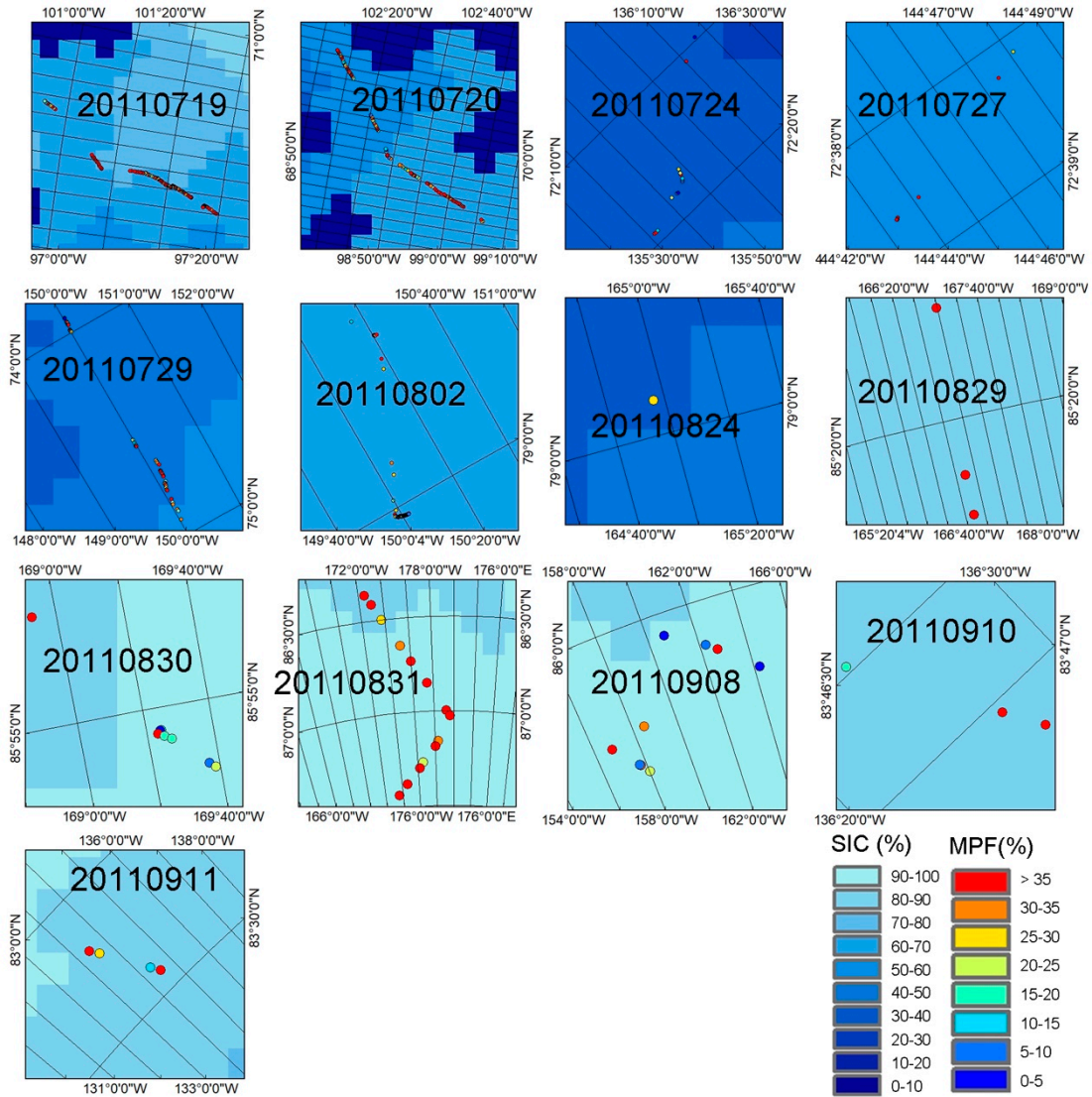


Figure S8. Cases of the observed MPF from JOIS overlaid on NASA Team SIC.

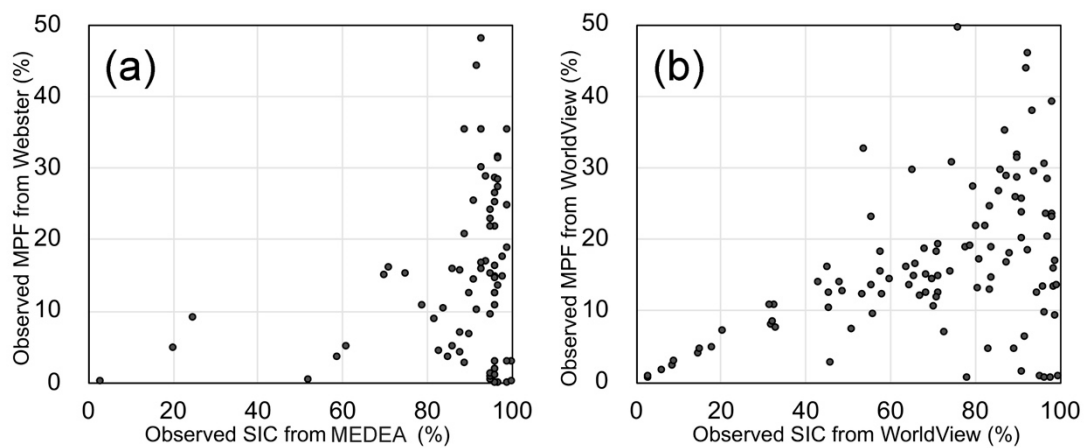


Figure S9. Observed MPF from (a) MEDEA and (b) WorldView against the Observed SIC.

Table S1. Correlation coefficients and RMSE in total, training, validation and test dataset for each observation in 500 m grid.

Source	Total		Training		Validation		Test	
	R	RMSE	R	RMSE	R	RMSE	R	RMSE
NSIDC	0.70	0.066	0.70	0.066	0.70	0.066	0.70	0.067
PRIC-Lei	0.39	0.086	0.39	0.086	0.39	0.084	0.38	0.086
NPI	0.03	0.092	0.03	0.092	0.03	0.093	0.02	0.092
TransArc	-0.39	0.078	-0.40	0.078				
HOTRAX	0.35	0.079	0.39	0.077	0.36	0.079	0.32	0.079
DLUT	0.43	0.074	0.43	0.074	0.43	0.074	0.41	0.075
IceWatch	0.20	0.149	0.22	0.145	0.19	0.149	0.19	0.149
JOIS	0.28	0.171	0.28	0.170	0.27	0.171	0.26	0.172

Table S2. RMS of the observed MPF and RMSE of the DNN_MPF against the observed MPF.

Source	500 m grid cell		12.5 km grid cell	
	RMS	RMSE	RMS	RMSE
NSIDC	0.097	0.066	0.078	0.048
PRIC-Lei	0.108	0.086	0.088	0.057
NPI	0.111	0.092	0.041	0.025
TransArc	0.151	0.078	0.087	0.079
HOTRAX	0.092	0.079	0.083	0.069
DLUT	0.122	0.074	0.067	0.058
IceWatch	0.169	0.149	0.136	0.121
JOIS	0.183	0.171	0.116	0.099
TransArc independent			0.197	0.182
IceWatch independent			0.106	0.094
MEDEA independent			0.103	0.085
WorldView independent			0.093	0.084

