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Potential for sea ice modulation of Antarctic coastal heat flux: implications for ice shelf stability

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Monthly coastal turbulent heat flux grids near the Weddell Sea, Antarctic derived from the ARCSyM mesoscale atmospheric model at a horizontal resolution of 200km^{2}were used to compare variability of average zonal sea ice concentration with coastal sensible and latent flux between1987-1997. Results indicate positive (toward surface) annual latent heat flux over the entire time series with seasonal variations ranging between 0.3-12 W/m^2. Sensible heat flux were negative during the winter and positive in summer with fluxes ranging between -30 to 3 W/m^2. Turbulent coastal fluxes tend to track zonal mean sea ice concentration with lower fluxes at higher mean ice concentration and higher fluxes during periods of lower mean ice concentrations. Transition from winter to spring demonstrate rapid increases in turbulent fluxes out of phase by a month and a half, yet the magnitude of fluxes are correlated with minimum summer mean ice concentrations. Correlations between maximum increase in coastal summer latent heat flux and minimum mean sea ice concentration during the time series were approximately 0.5 with the summers of 1988 and 89 appearing as outliers. A correlation of 0.7 was computed with the two outlier years removed.