

Sea Ice Assessment within the Northwest Passage for 2008

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Outlook for 2008:

Based on multi-year sea ice (MYI) observations from the Canadian Ice Service since 1970, the current sea ice conditions within Western Parry Channel region of the Northwest Passage (NWP) do not seem to favor its clearing for 2008.

Basis for Outlook:

Figure 1 shows the MYI conditions (pre-breakup) within the Western Parry Channel region of the NWP on May 19, 2008. The Western Parry Channel region of the NWP is part of a “drain-trap” mechanism operating in the western Canadian Arctic Archipelago that has historically been responsible for maintaining heavy MYI conditions within this region of the Northwest Passage. Specifically, the seasonal first-year ice regions melt earlier than the MYI regions and the currents and wind then slowly transport MYI southeastward from the Western Parry Channel. As a result, whenever MYI is removed it always recovers as witnessed by the stable time series of MYI within the region from 1970-2007 (Figure 2). If the low MYI conditions of 2006 and 2007 are a part of this process then we should expect MYI to begin recovery in 2008. Breakup in this region typically begins in late July, providing a short two-month window (August and September) when this region of the NWP will be susceptible to MYI import from the Queen Elizabeth Islands and/or the M’Clure Strait. The historically heavy MYI conditions within this region of the NWP have also been the result of considerable *in situ* MYI formation (Figure 3). This has not occurred since 2004 (Figure 3) and has been linked to longer melt seasons (2005-2007). Should 2008 be a significantly long melt season this will relax ice conditions within the NWP provided MYI dynamic import does not compensate for less MYI grown *in situ*.

Reference:

Howell, S. E. L., A. Tivy, J. J. Yackel, and S. McCourt (2008). Multi-Year Sea Ice Conditions in the Western Canadian Arctic Archipelago Region of the Northwest Passage: 1968-2006. *Atmosphere-Ocean*. Vol. 46, No. 2, 229-242. doi:10.3137/ao.460203

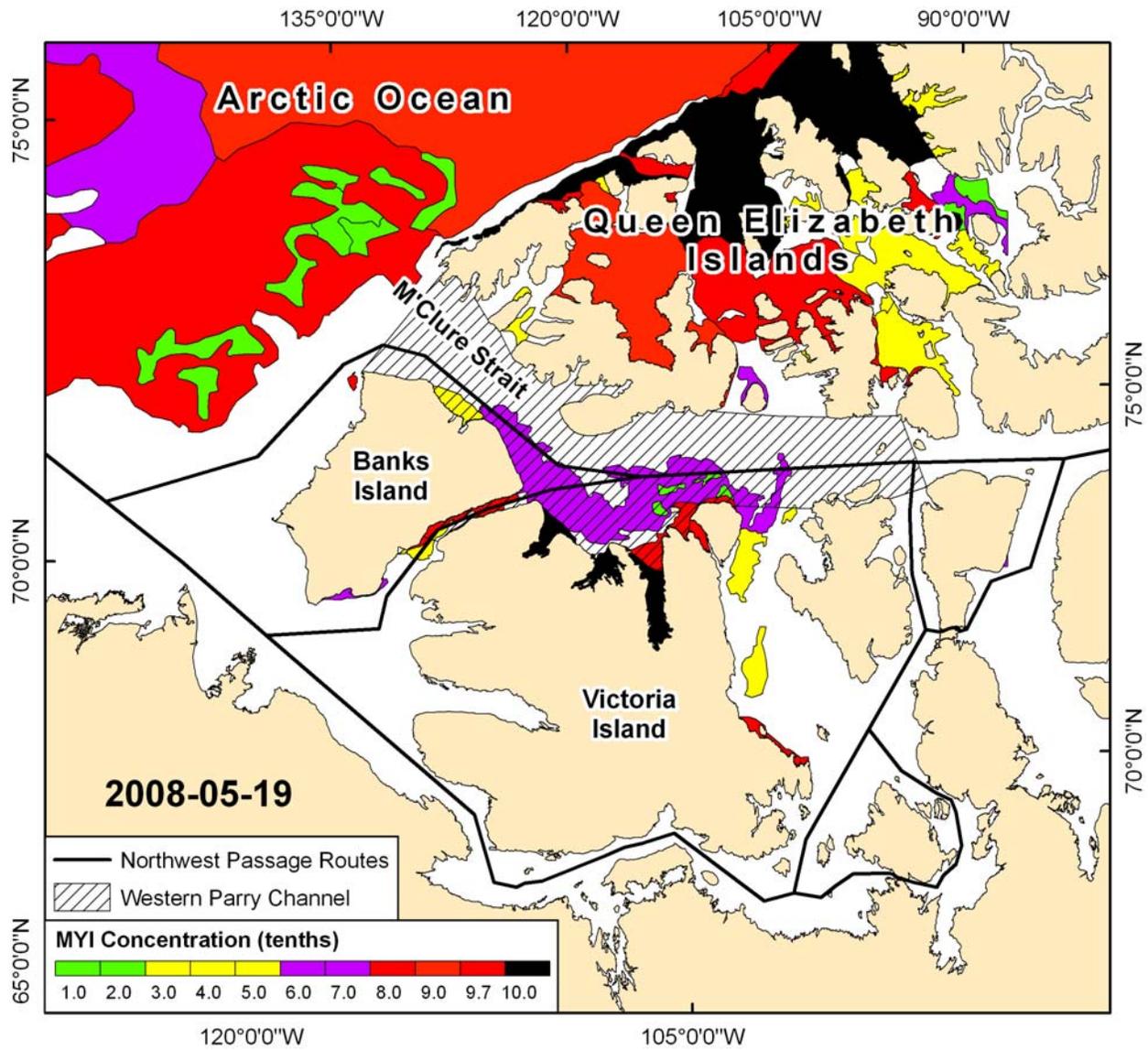


Figure 1. Multi-year ice conditions in the western Canadian Arctic Archipelago on May 19, 2008. The location of the Northwest Passage route through the Western Parry Channel is also shown.

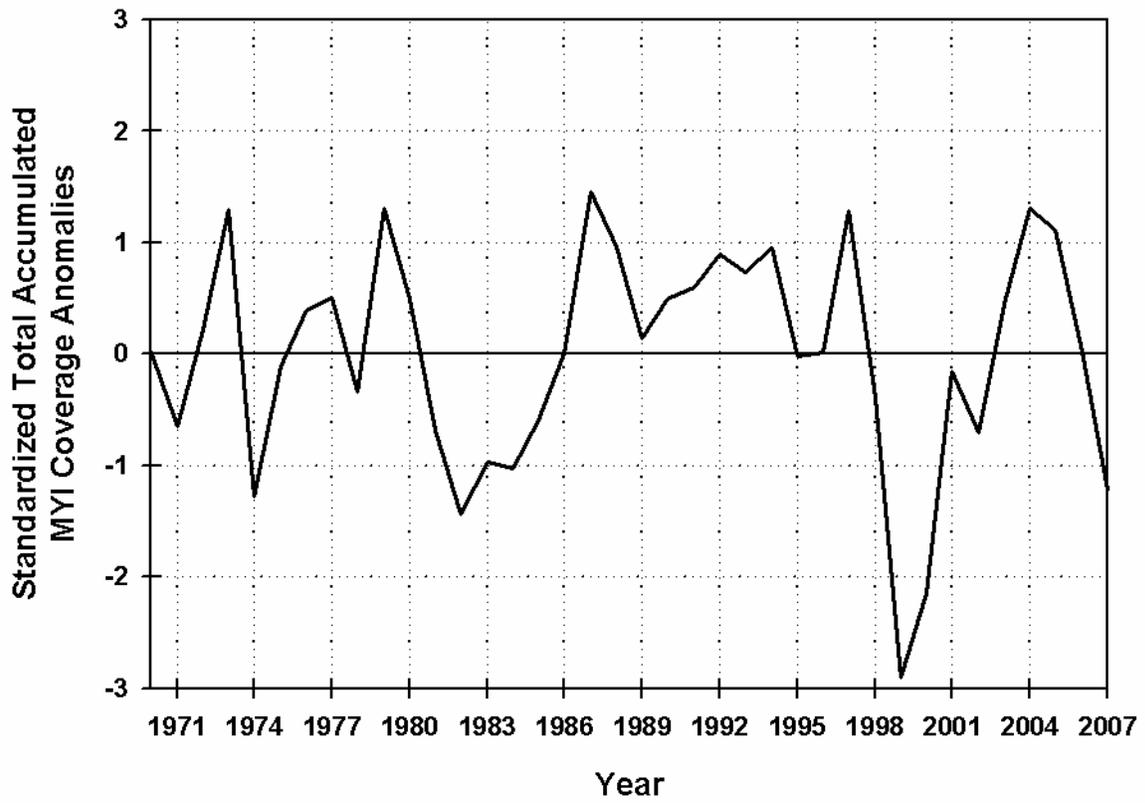


Figure 2. Standardized anomalies of the Total Accumulated Multi-Year Ice Coverage (km^2) from June 25th to October 15th in the Western Parry Channel region of the Northwest Passage, 1970 to 2007.

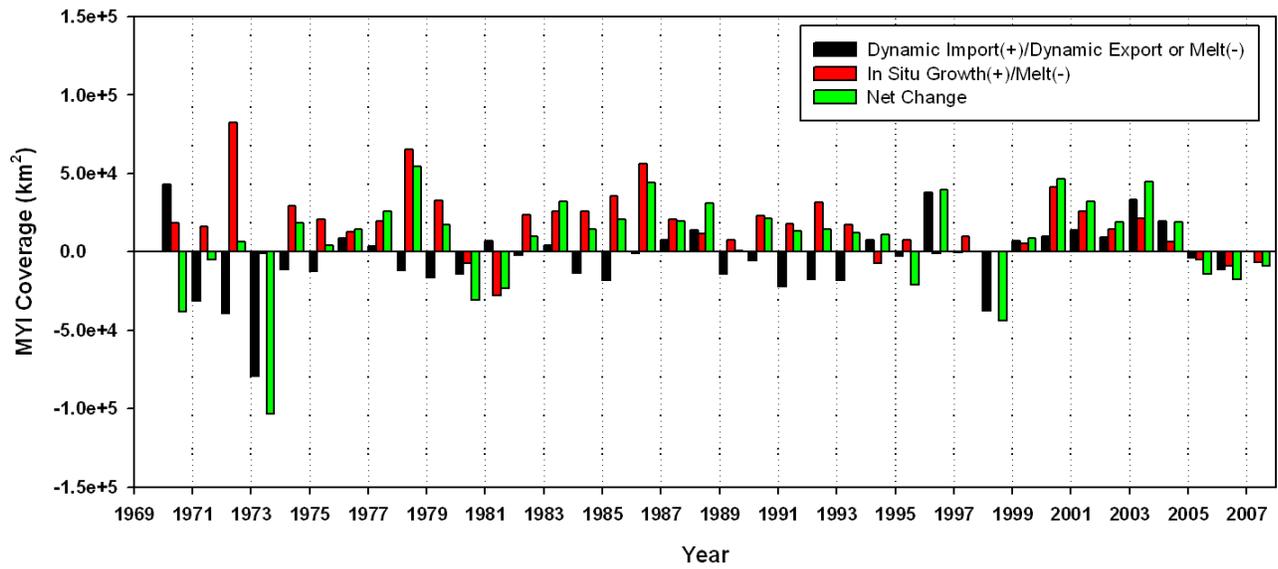


Figure 3. Time series of dynamic and thermodynamic multi-year ice contributions within the Western Parry Channel region of the Northwest Passage from 1970 to 2007.