Hyperspectral remote sensing in Canada - the early years (1975-1990)

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ABSTRACT

We describe the early developments of hyperspectral technology in Canada, as an example of transfer of technology between disciplines, evolution of technology and the importance of long term government science, procurement and support for industry.

We begin with the IOS spectrometer, a linear array device built by UBC in 1975 for DFO, and which led to the discovery of solar stimulated fluorescence by phytoplankton chlorophyll. Experience with the spectrometer in international science campaigns and in airborne oceanography programs carried out commercially demonstrated the importance of remote sensing of fluorescence. When two dimensional Charge Couple Devices became available in the early 1980s, DFO contracted to Moniteq and Itres to build the Fluorescence Line Imager (FLI). The FLI was one of the earliest imaging spectrometers, and experience with it in Canada, the US and Europe led to MERIS, fluorescence bands on MODIS and to the Compact Airborne Spectrographic Imager (CASI) introduced by Itres in 1990. Borstad Associates Ltd obtained the first CASI and flew it on more than 150 missions over 25 years. Itres has sold more than 60 CASI instruments since 1990 and has developed a family of hyperspectral devices operating in many spectral ranges.