

Project #: F0734

Title: Update of freshwater discharge model for Gulf of Alaska

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Contract Period and Amount of Funding:

6/01/07 – 10/31/07 \$8187

Report Period: (e.g., July 1 to December 31, 2003)

January 1, 2007 – June 30, 2007

Report Date: July 25, 2007

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Project Summary: The freshwater discharge into the Gulf of Alaska from the coastal drainages is very poorly measured because there are very few stream or river flow gauges. A simple hydrology model was developed by Royer and published in 1982 that uses precipitation measurements and drainage areas to determine the rate of freshwater discharge entering the coastal Gulf of Alaska. It allows for storage and ablation of the mountain glaciers in this region but does not allow any net changes in those glaciers from the beginning of the record in 1930 to 1982. Recent volume measurements of those glaciers now allow net ablation or accumulation of ice and snow. These types of changes and the addition of major river runoff and freshwater discharge along the British Columbia coast can now be added to the model. We are rewriting the model from Quickbasic into Matlab, a more commonly used computer coding today. We will update the input data through 2006 and include the new sources of freshwater discharge along the Southeast, Southcoast Alaska and British Columbia coasts. We expect that the new discharge estimates will be at least twice the average rate of freshwater discharge of the Mississippi River. Climate changes will probably also increase this rate.

Progress Summary:

We began work on this program with the updating of the temperature and precipitation records for Southeast and Southcoast Alaska. We are entering, verifying and extended these data through 2006. The QuickBasic files were given to Carl Pucci along with the data sets. He has been reviewing the 1982 paper and the computer programs to understand the problem better and to develop a work plan for the conversion of the software into MATLAB (C++ programming language). He is in the midst of carrying out the conversion of the software. Some delays were encountered with the move of CCPO to the new building and the installation of the computers and networking in that building. An abstract is being prepared and will be submitted for the presentation of this model and its results for the 16<sup>th</sup> Annual PICES meeting in Victoria, BC this fall. This is an initial report since the project began in late May 2007.