



SDSU
presents
a thesis defense for
Master of Science
degree in
Computer Science

Monday,
February 29, 2016

2:00pm
GMCS 418

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A Real Time Graphic and Data Interface for Carbon and Energy Exchange from the Arctic to the Deserts of North America

Abstract

This thesis is related to the Global Change Research Group (GCRG) in San Diego State University which primarily works on tundra and chaparral vegetation, but the focus since 1989 has been to examine plant and ecosystem responses to elevated CO₂ as well as CO₂ fluxes in the natural ecosystems. Most recently the group has increasingly added studies on CH₄ fluxes and the controls on these fluxes, including in the Arctic and the mangroves of BCS, MX. The goal of this thesis project is to automate the process of gathering raw data collected in the binary format of TOB1 from various towers (currently only Atqasuk, Alaska) and converting them to human readable format. The data is sent from the towers to GCRG server and reduced to half hourly averages, currently processing is done manually by the GCRG staff. The parameter values are measured by the sensors at a high frequency of 10Hz to calculate the fluxes which are stored in binary (TOB1) format. The process involves converting this binary (TOB1) data to CSV (comma separated values) data using EddyPro software. Finally the processed data is uploaded to a MySQL database and these values are then displayed in a graphical format in AngularJS. This helps students interpret the changes in various atmospheric parameters at these towers.

Thesis Committee

Carl Eckberg, Thesis Chair, Department of Computer Science
William Root, Department of Computer Science
Walter C. Oechel, Department of Biology