



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

Thursday,  
December 10, 2015  
  
9:00am  
GMCS 418

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# Sunny Jagadeesh

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

## Abstract

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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 CO<sub>2</sub> as well as CO<sub>2</sub> fluxes in the natural ecosystems. Most recently the group has increasingly added studies on CH<sub>4</sub> 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

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