

## Senior Design Project in Electrical & Computer Engineering



# DGPS Signal Coverage Software

Cadet 1/c Charles S. Novak

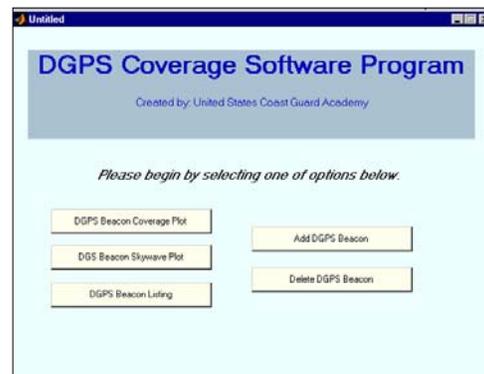
Advisors: Dr. Gross, Dr. McKaughan, LT Czerwonka, LT Nasitka

Sponsors: NAVCEN and C2CEN

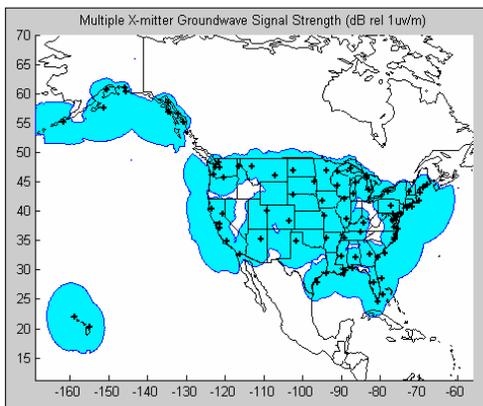
### Project Background

Differential Global Positioning System (DGPS) coverage software enables users to predict coverage of individual transmitters (beacons) throughout the United States. The software is MATLAB® based and uses Millington's Method to calculate and predict propagation patterns using elements of distance, frequency, power, and conductivity of the Earth's surface.

The Coast Guard currently uses a similar program, COAST, to predict DGPS Coverage areas. COAST is difficult to maintain because its is obsolete. New software that is compatible with today's computers is desperately needed.



Main Menu for DGPS Software Program



DGPS Coverage of North America

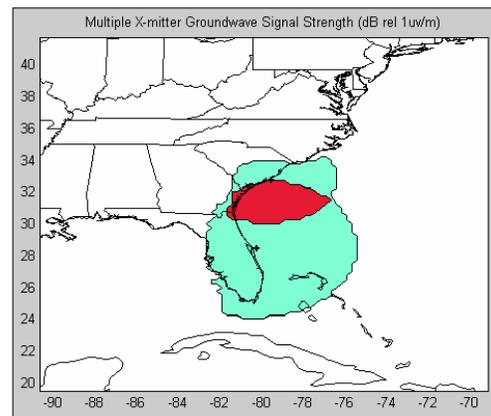
### Project Work

The first half of this year was spent getting familiar with the existing software. During this time, the Graphical User Interfaces were finished and debugged to provide a fully functional system. The later part of this year has been devoted to re-writing sections of the code, allowing the software to run more efficiently. Overall accuracy of the software has also been examined using COAST data and gathered data provided by NAVCEN. Packaged signal coverage software should be delivered to the customer in May 2003.

### Project Deliverables

During January and February of this year, 1/c Novak visited with the customer, NAVCEN, to demonstrate the project and compare the new software to COAST. From this meeting, a work list of minor improvements was generated providing new goals and deliverables set forth to increase the effectiveness and ease of use with the new software. Some of these improvements include the ability to:

- differentiate between 50, 100, and 200 baud signal strength requirements
- alter colors displaying coverage areas, land masses, and bodies of water
- obtain latitude and longitude of coverage areas via mouse click
- select different types of titles when displaying coverage areas



Double Coverage Plot of Charleston, SC and Cape Canaveral, FL