



## Senior Design Project in Electrical & Computer Engineering



# Investigating Coast Guard DGPS Antenna Issues

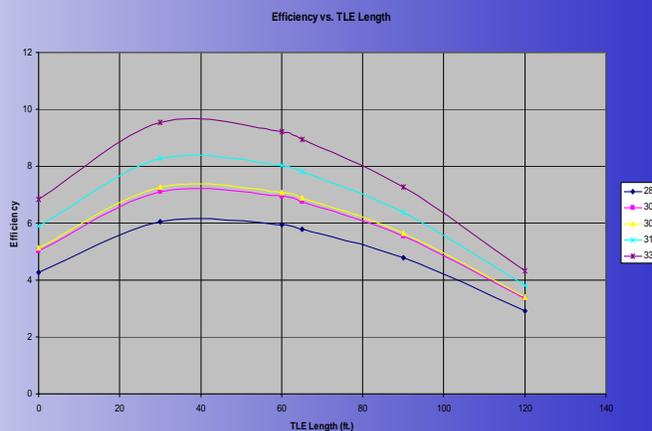
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Sponsors: C2CEN, LSU

## Project Background

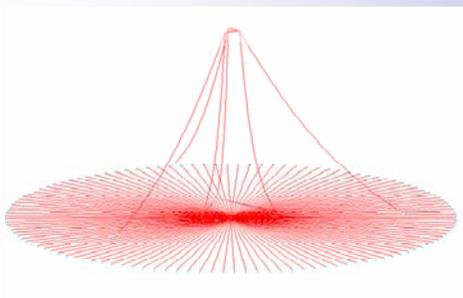
The Coast Guard is responsible for the transmitting site of the Differential Global Positioning System. These antenna sites transmit corrections for the Global Positioning System. These corrections increase the precision of GPS. The DGPS system is mandated by Congress to transmit a useable signal 99.7% of the time. Many of the current DGPS antenna sites are inefficient, and frequently go offline in inclement weather. The Coast Guard must also construct new sites in order to meet Congressional criteria for double DGPS coverage throughout the U.S.



Graph of different antenna efficiencies

## Project Goals

The goal of this project is to find the optimal DGPS antenna that will be efficient and provide the coverage and availability mandated by Congress. We are currently working on two different configurations to meet this goal. One involves the reconfiguring of existing towers. The other approach looks at how to combine DGPS and LORAN antenna sites.



Model of collocation tower

## Results

We constructed a scaled model antenna to measure the bandwidth of the antenna and its effects on antenna performance. We found that the bandwidth of the antenna is limited by a coupler. A coupler is part of the antenna system enables a transmitter to transmit on an antenna on a shorter than optimal antenna. Changing the specifications of the antenna coupler will allow us to change the antenna bandwidth.

## Project Plan

Now we are mainly concerned with the efficiency of different antenna configurations. We are modeling numerous configurations to find the most stable and optimal antenna for both existing and collocated towers.