Evacuation of Area Surrounding Oyster Creek

Advanced GIS Course ENVL 3303, Instructor: W. Har...

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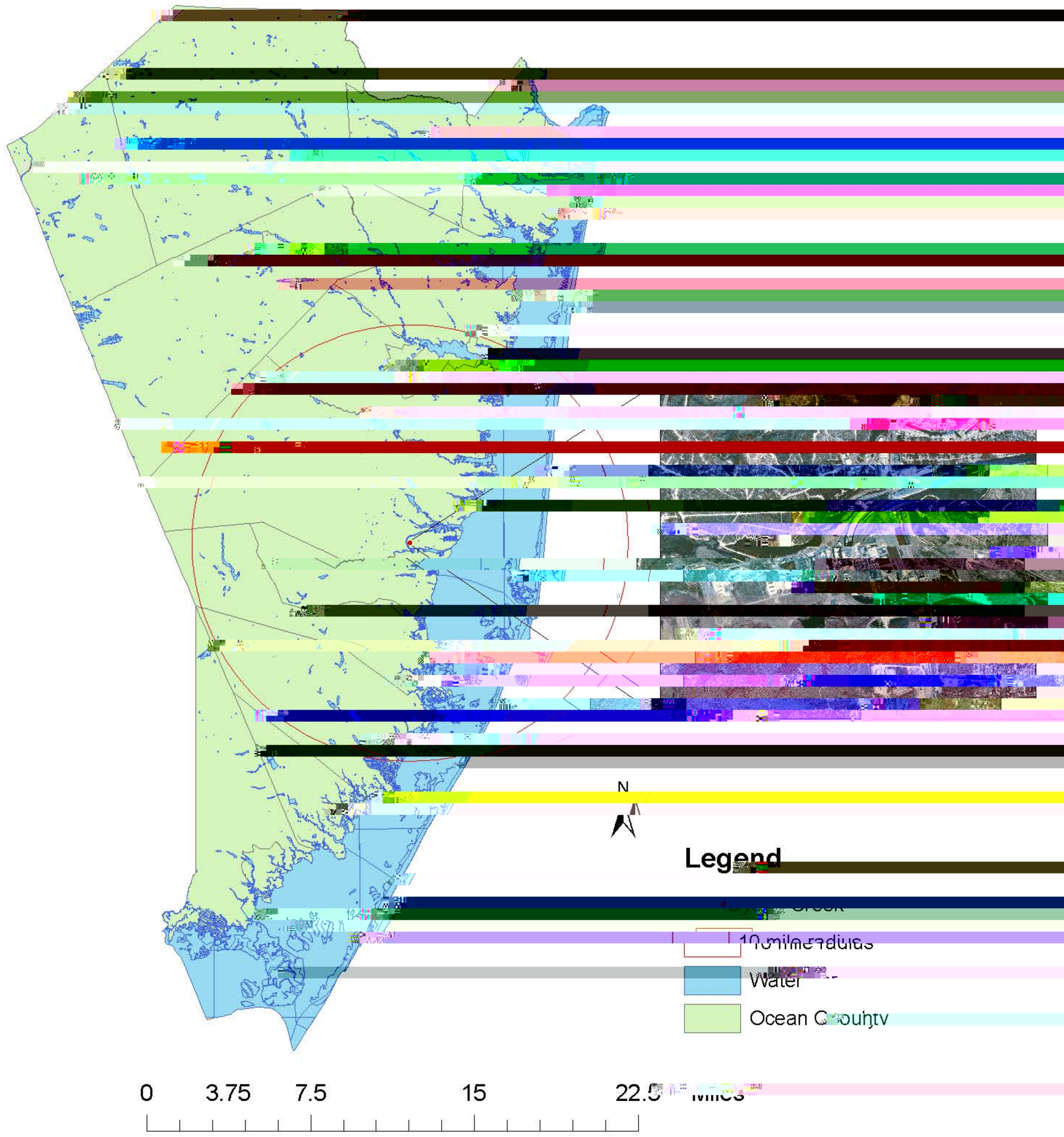
Location of Oyster Creek



Abstract

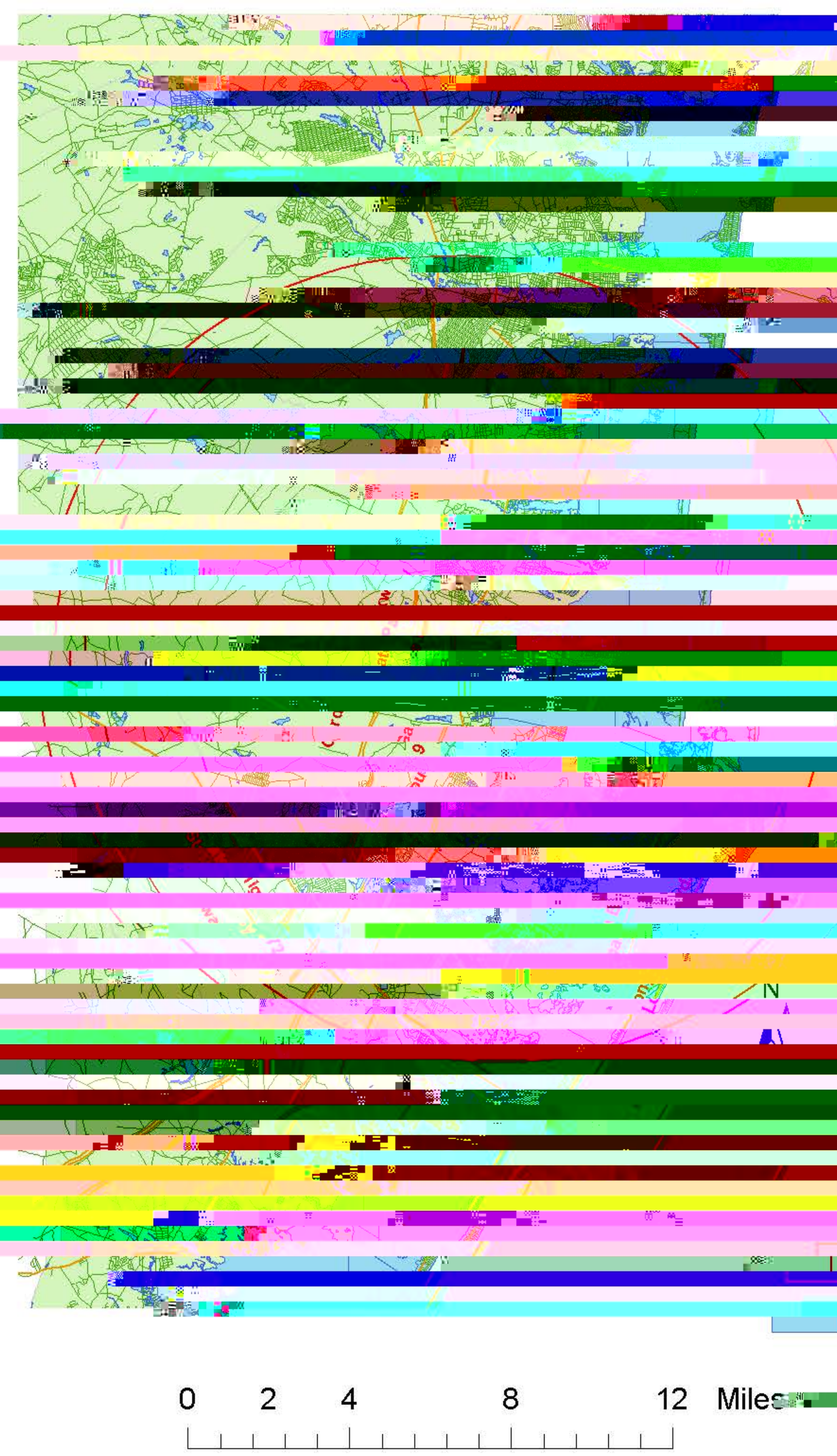
The F.B.I. has identified nuclear power facilities as possible targets of terrorism. Oyster Creek is a well-known nuclear power plant in southern New Jersey. The objective of this project is to identify the critical area surrounding the power plant ... residents in the event of a terrorist attack. Through the use of Geographic Information Systems I have found that it would take a minimum of one hour and ten minutes to successfully evacuate the entire population living within 10 miles of the power plant.

Since the tragic events of September 11th, the possibility of further terrorist attacks has haunted the minds of Americans. The Federal Bureau of Investigation has identified nuclear power fac... power plants: Hope Creek, Oyster Creek, Salem 1 and 2. The focus of the Oyster Creek plant located in Forked River. Oyster Creek is owned by GPU Nuclear Corporation and began operation in 1969. Originally licensed for thirty-five years of operation, Oyster Creek recently applied and received an extension to operate until ...009. The radius of 10 miles has been identified by ... nuclear power ... live within 10 ... of Oyster Creek.

Objective

Identify the best r...
Estimate amount of time needed to evacuate entire population living inside 10-mile radius.
Finally, find suitable facilities to be used as shelters for evacuated residents.

Evacuation routes



Methodology

The location of Oyster Creek was found using aerial photography. Once ... was located, a point coverage was made by placing a point in the center of the facility. The 10-mile buffer was created using the buffer wizard found in the "tools" menu bar. The estimated population was found using the coverage "njbg2000". All of the population blocks within the 10-mile radius were selected and added up to get a total of about 135,000 people. The coverage "siroads" was used to locate all of the roads found in the 10-mile radius ... Feature Class Code ... primary roads were identified and ... The calculation for this selection was "all roads not = A41". From there ... roads were identified as the best routes for evacuation ... roads were: Garden State Parkway, Route 9, State Highway 72 and Long Beach blvd. The next step was to find the traffic volume of these roads. Since that information was not available, a calculation was done to find the estimate ... The calculation was as follows: Average car = 15ft., optimal traffic conditions = 6 car lengths. Each car takes up 90ft. of highway. Speed limit * 5280 = distance car will go in one hour (ft.). That total was then divided by 90 (ft.) to get the number of cars that can fit on the road at one time. If the road had 2 lanes the number was doubled. If there were two exits out of the ten-mile radius the total was doubled. For example: Garden State Parkway ... 65 miles per hour ... cars per hour 3,813 * 2 lanes * 2 exits = 15,253 cars per hour. The total from each road was then combined to get the total number of cars that can leave the ... mile radius in one hour ... of ... people per car was used to find the amount of people that ... evacuated per hour. Estimated population divided by the total number of people that can be evacuated in one hour equals the amount of time it would take to evacuate the entire population inside the 10-mile radius. The next step was to find suitable shelters for evacuated residents. The coverage "...schools..." was used to find all of the schools near but not inside the 10-mile radius. Five schools were selected: Ocean County College, Toms River East middle school, Toms River North high school, Manchester school and Toms River East high school. Finally, Ocean County was selected out of the coverage "stco" and used as the background on all three of the maps in the layout.

Possible shelters

Results

... that can be evacuated in one hour was 28,452 cars. The amount of ... people ... could evacuate in one hour was found to be ... people. ... It would take one hour and ten minutes, during optimal conditions, to safely ...

Conclusion

... miles of the Oyster Creek nuclear power facility. Though I thought it would take ... I believe that this time is unacceptable. In the event of a terrorist att... ...y designat... ...te evacuation plan to all residents living within ten miles of the ...

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