5. Relative Environmental Exposure Map

#### **IV. Combined Scores by Census Tract**

- 1. Hazard Scores Multiplied by Combined Exposure Scores
  - a. Flood Exposure Scores
  - b. Earthquake Exposure Scores
  - c. Hail Exposure Scores
  - d. Hurricane Exposure Scores
  - e. Snow Exposure Scores
  - f. Combined Exposure Scores
- 2. Exposure Scores Multiplied by Combined Hazard Scores
  - a. Critical Facilities Hazard Scores
  - b. Social Hazard Scores
  - c. Economic Hazard Scores
  - d. Environmental Hazard Scores

#### V. Detailed Hazard/Exposure Combinations by Census Tract

- 1. Schools at Earthquake Risk
- 2. Elderly Population at Snow Risk

#### **APPENDIX C: Hazard, Exposure, and Combined Score Maps**

#### I. Hazard Scores by Census Tract

- 1. Relative Hazard Map Comparison
- 2. Relative Flood Hazard Map
- 3. Relative Hail Hazard Map
- 4. Relative Hurricane Hazard Map
- 5. Relative Earthquake Hazard Map
- 6. Relative Snow Hazard Map
- 7. Relative Temperature Extreme Hazard Map
- 8. Relative Combined Hazard Map

#### **II. Exposure Scores by Census Tract**

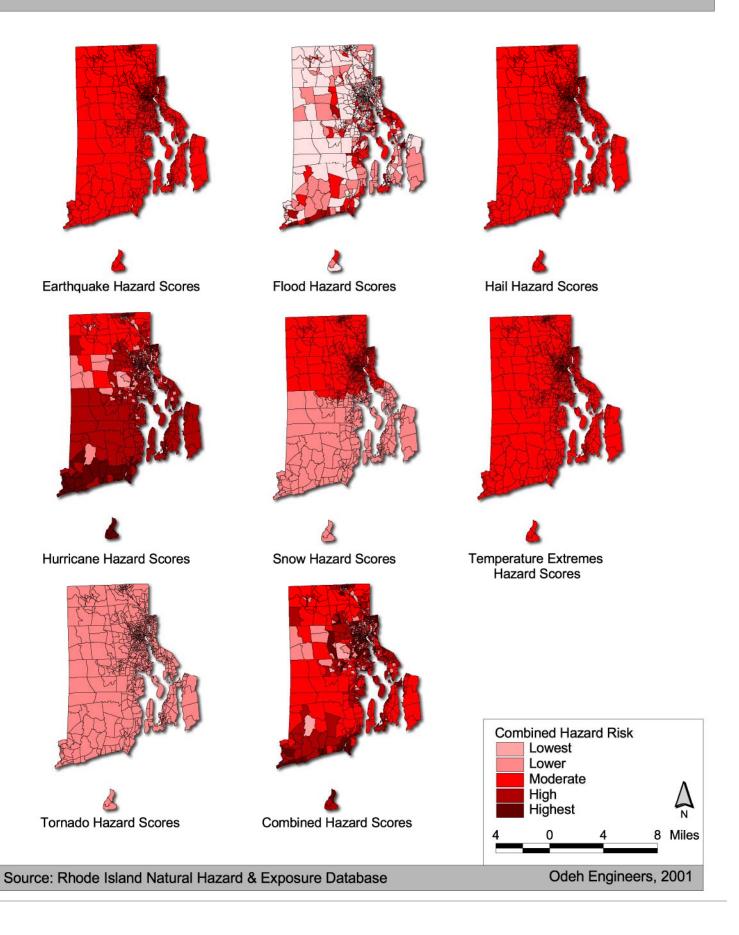
- 1. Combined Relative Exposure Maps
- 2. Relative Critical Facilities Exposure Map
- 3. Relative Social Exposure Map
- 4. Relative Economic Exposure Map
- 5. Relative Environmental Exposure Map
- 6. Relative Combined Exposure Map

#### III. Exposure and Hazard Scores by Community

- 1. Combined Relative Exposure Maps
- 2. Relative Critical Facilities Exposure Map
- 3. Relative Social Exposure Map
- 4. Relative Economic Exposure Map

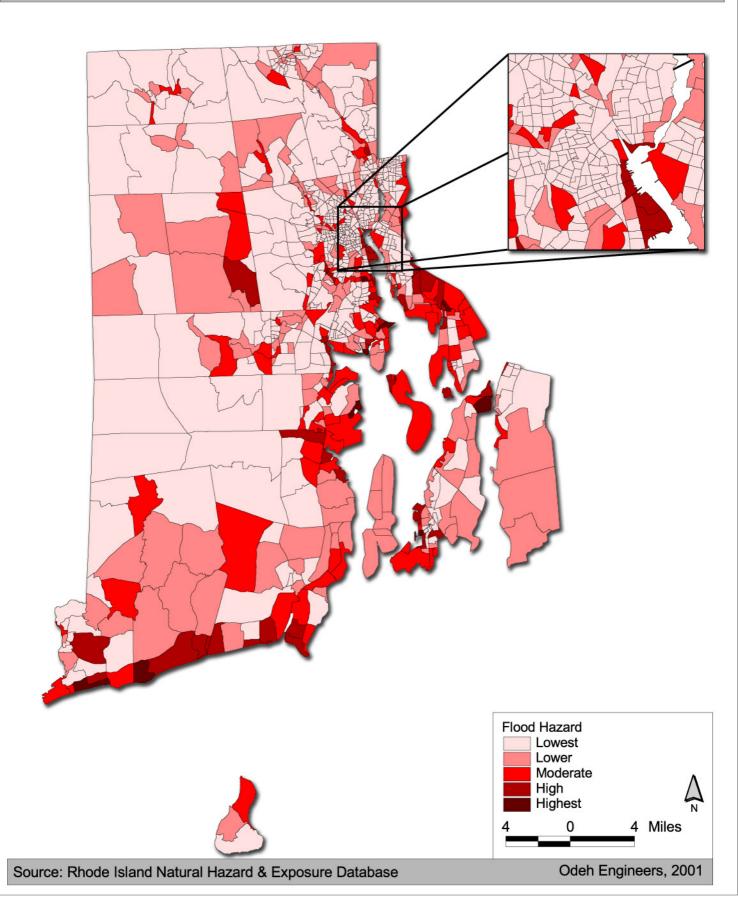
#### Odeh Engineers, Inc.

## Relative Hazard Map Comparison Illustrates the Distribution of Relative Hazards Through-Out Rhode Island

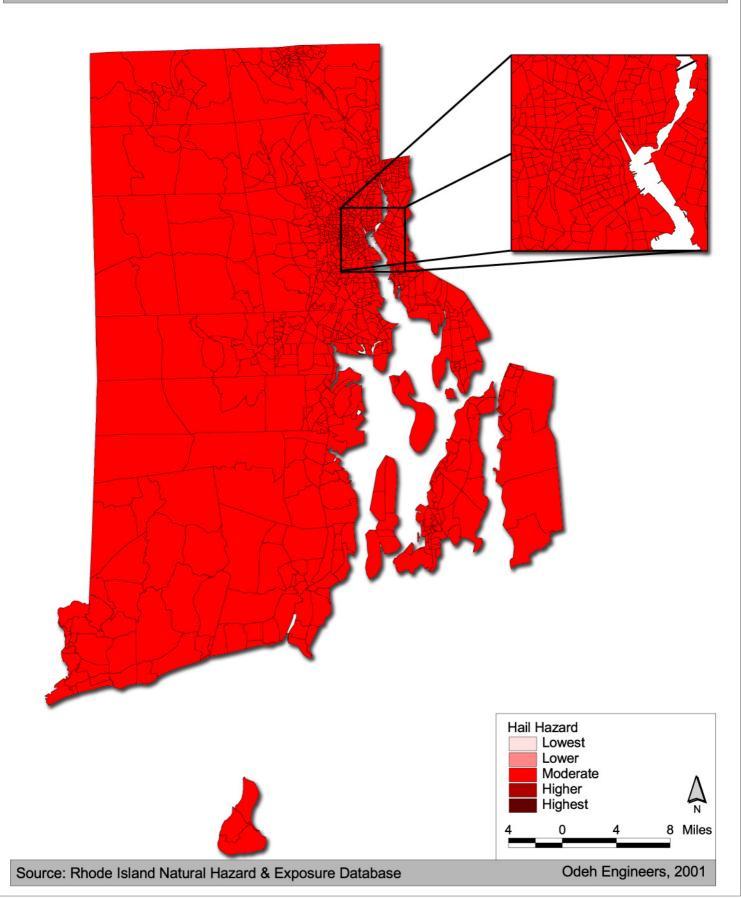


### Relative Flood Hazard Map

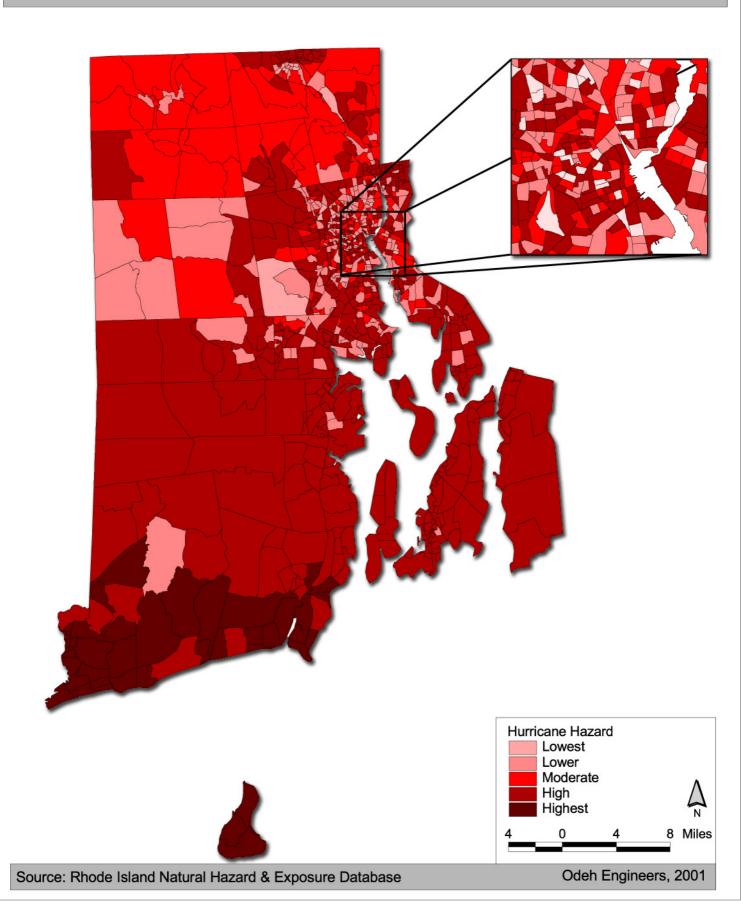
Based on NFIP Flood Zones AE through X500



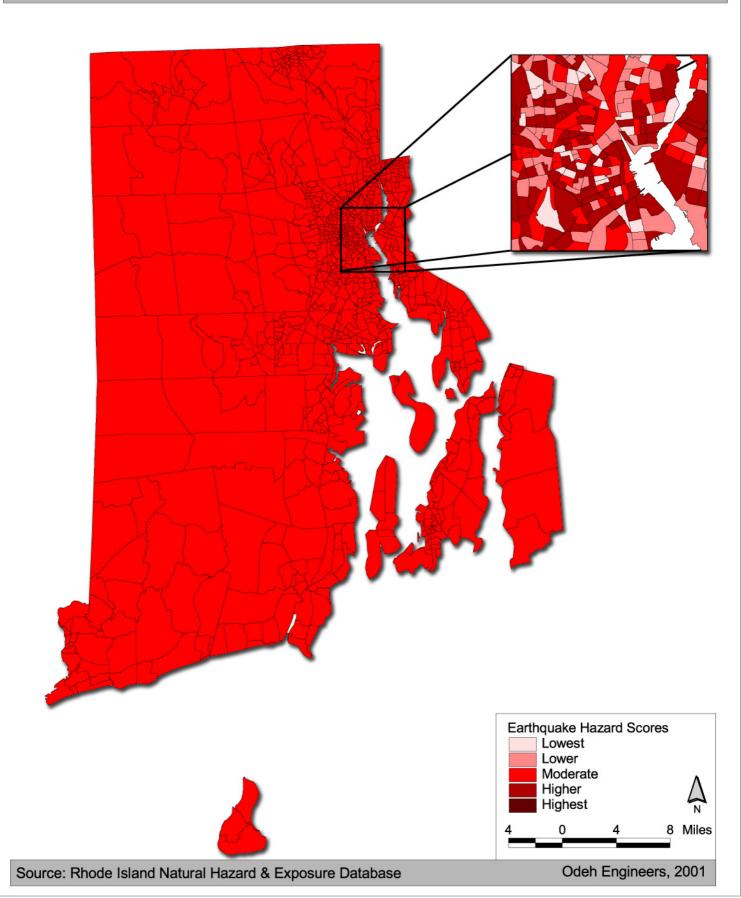
# Relative Hail Hazard Map Based on Particle Size in Inches



# Relative Hurricane Hazard Map Based on Saffir Simpson hurricane windspeeds

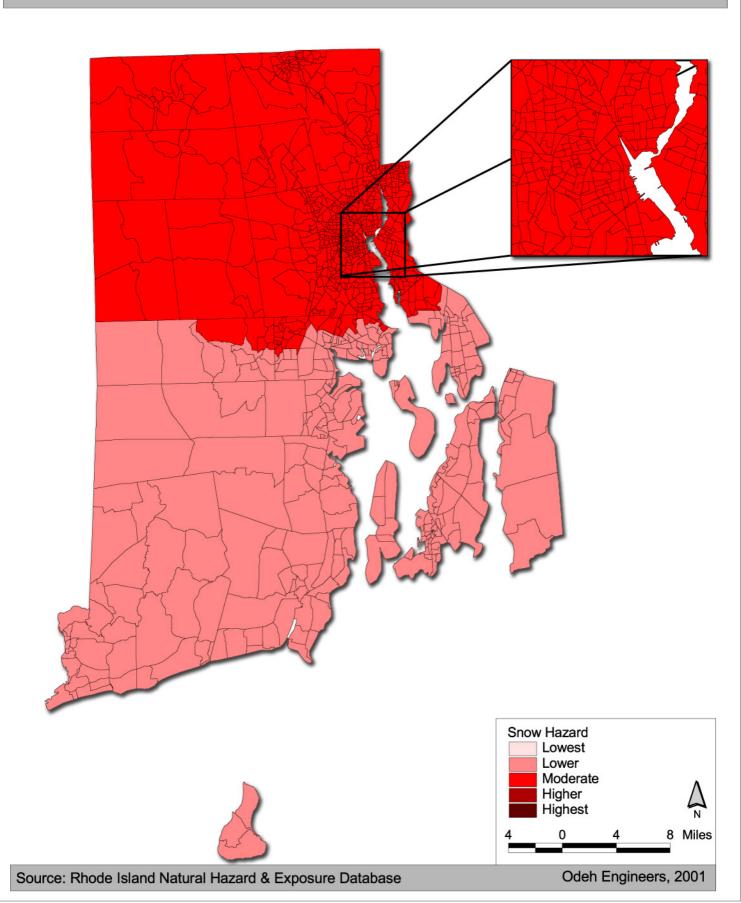


# Relative Earthquake Hazard Map Based on MMI Spectral Acceleration (G-force/1 sec)

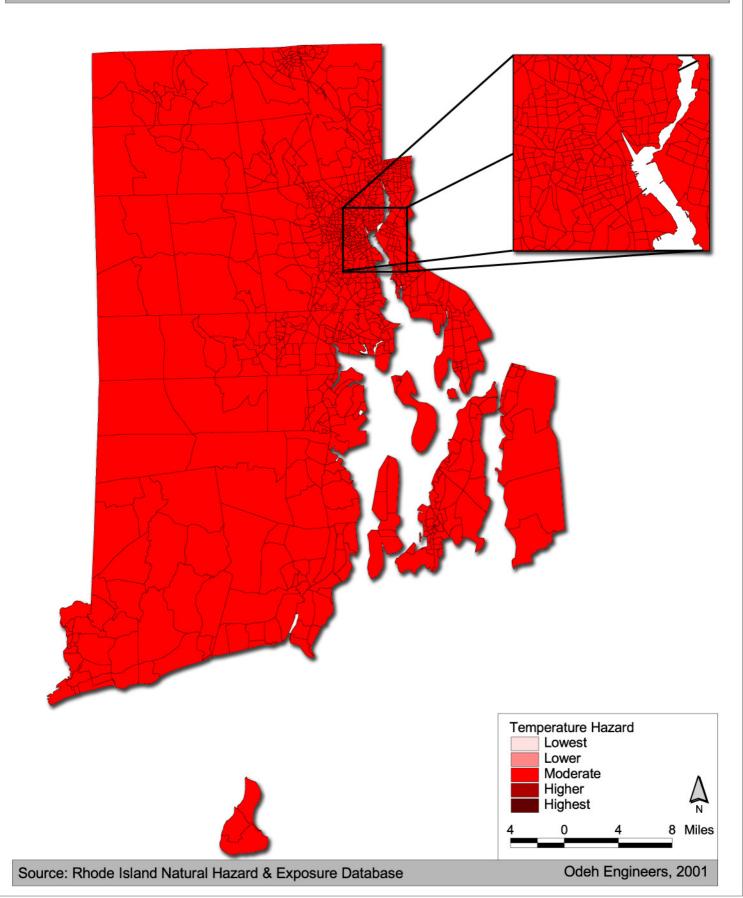


### Relative Snow Hazard Map

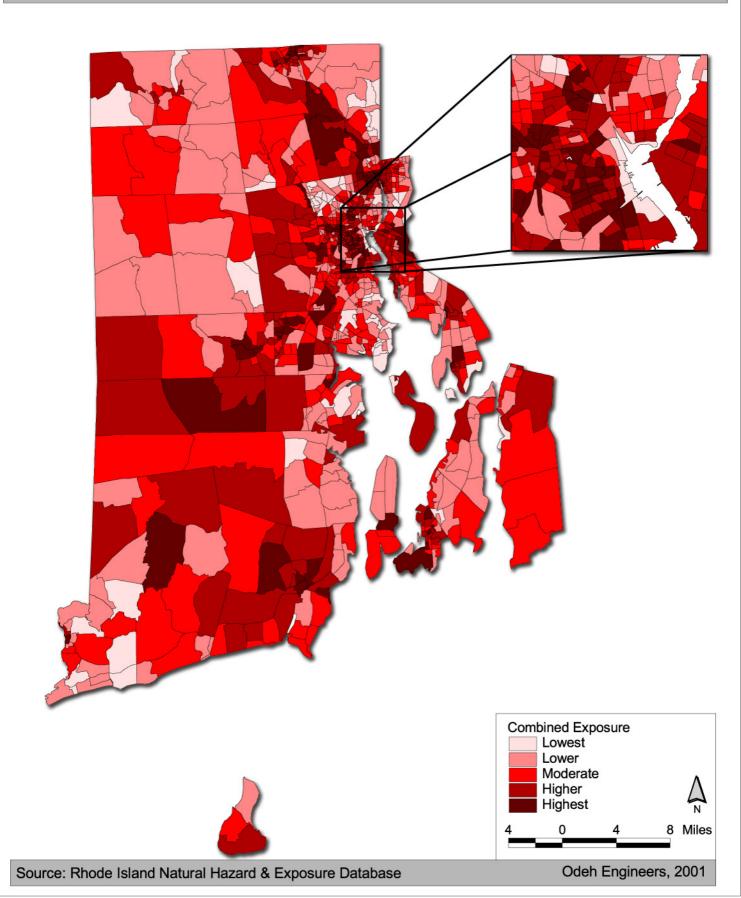
Based on average annual depth in inches



# Relative Temperature Hazard Map Based on heating degree days minus cooling degree days

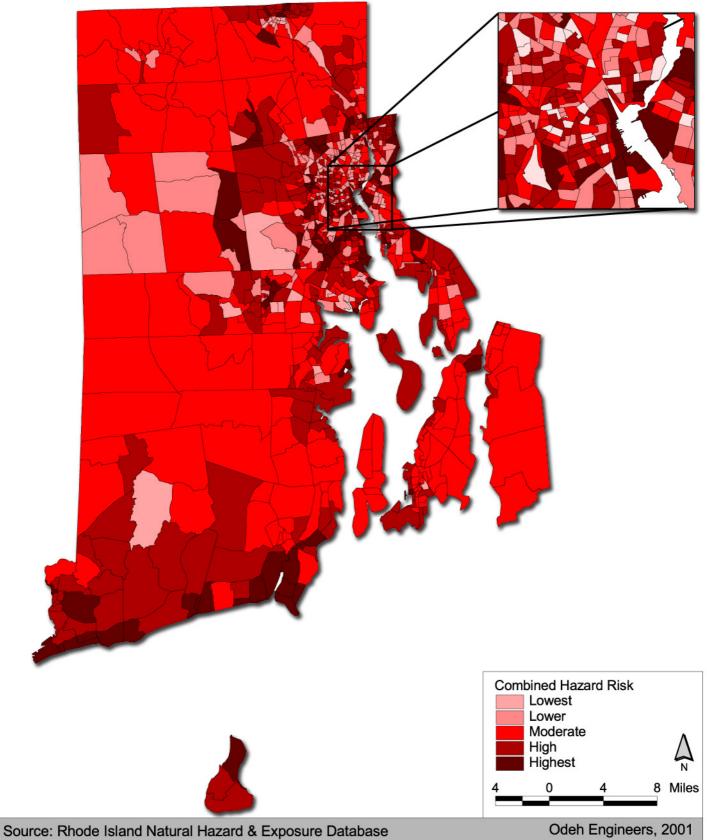


# Combined Relative Exposure Map Based on combined critical facilities, social, environmental, and economic exposure scores.



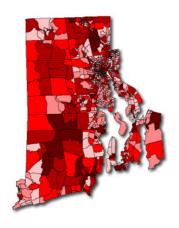
### Combined Relative Hazard Map

Sum of all hazard scores

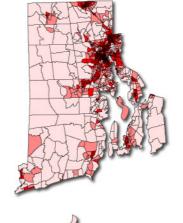


### Combined Relative Exposure Maps

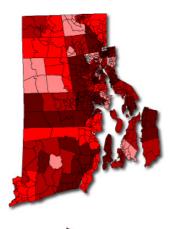
Including Critical Facilities, Social, Economic, Environmental, and Combined Exposure Maps



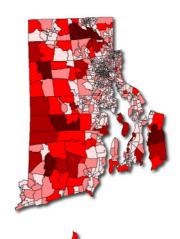




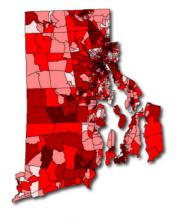
Social Exposure Scores



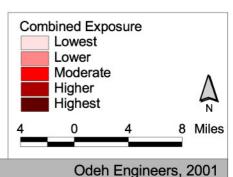
**Economic Exposure Scores** 



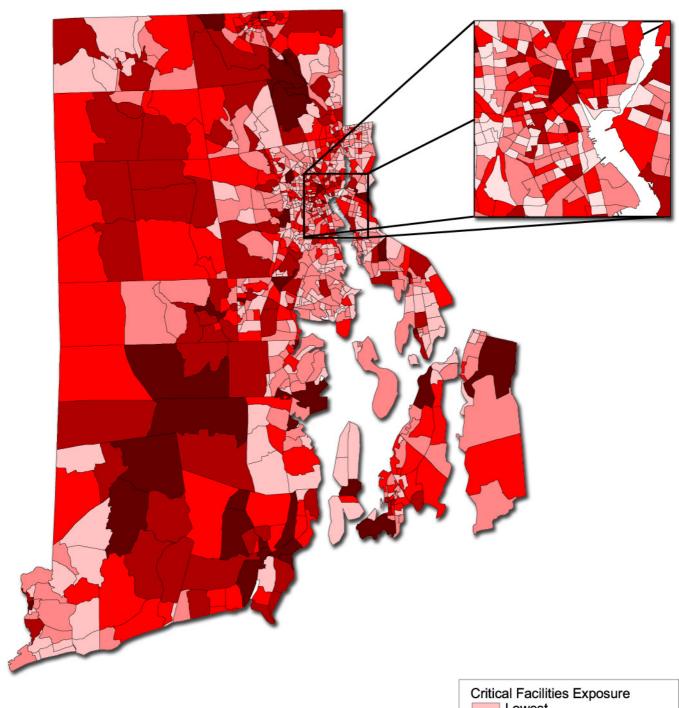
**Environmental Exposure** Scores



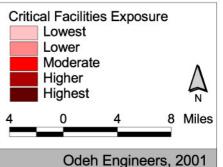
Combined Exposure Scores



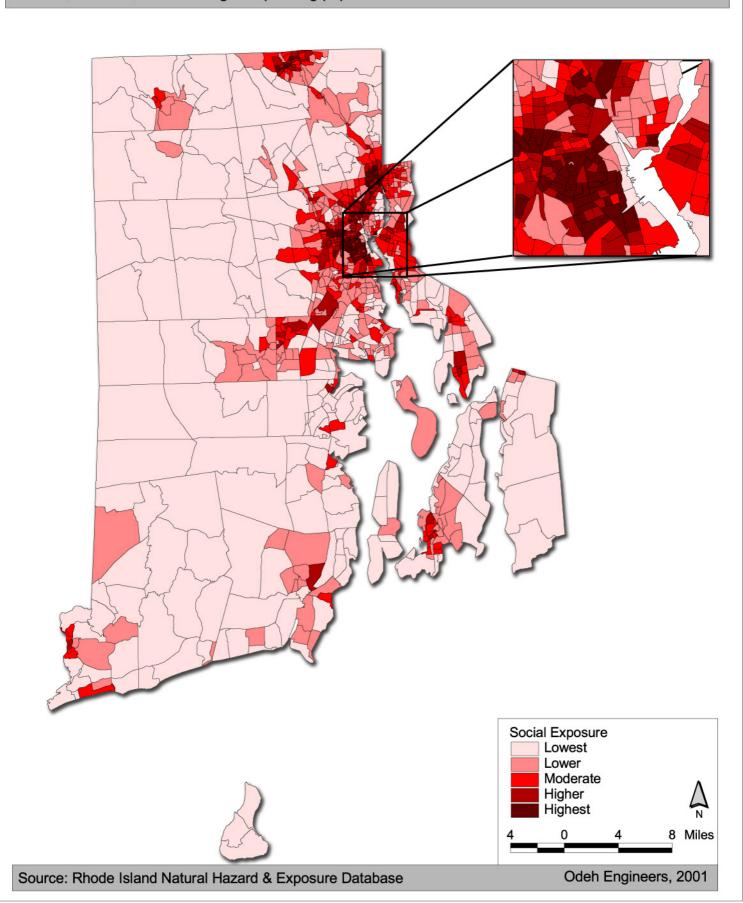
# Relative Critical Facilities Exposure Map Including marinas, fire & rescue stations, police stations, water treatment facilities, railroad & airport depots, and government facilities.



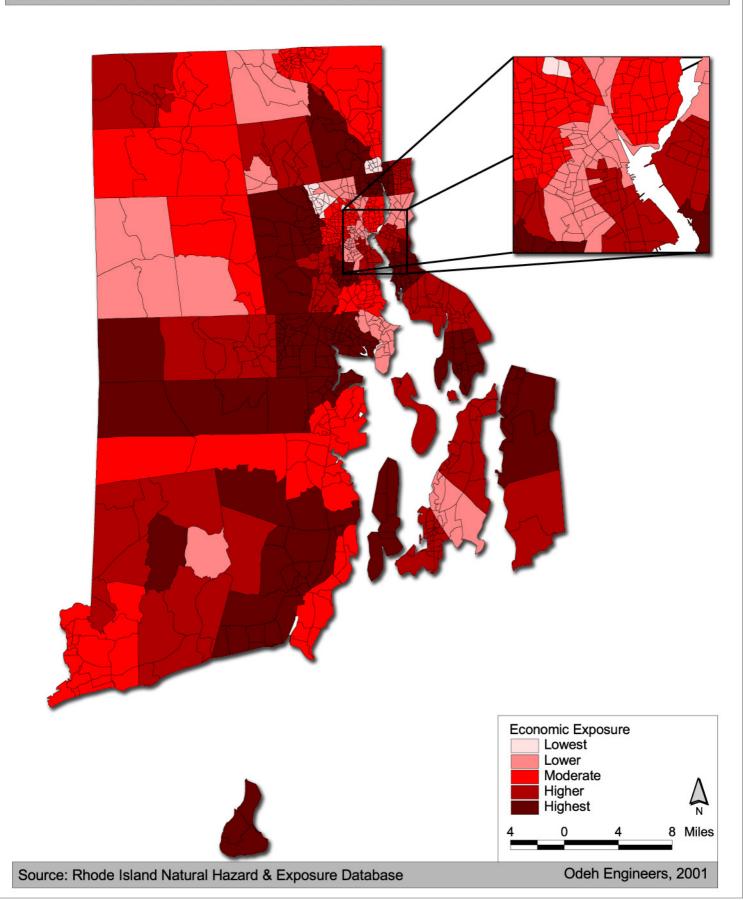




Relative Social Exposure Map Including population density, elderly, no high school education, public assistance, those without vehicles, renters, disabled, and non-english speaking populations.

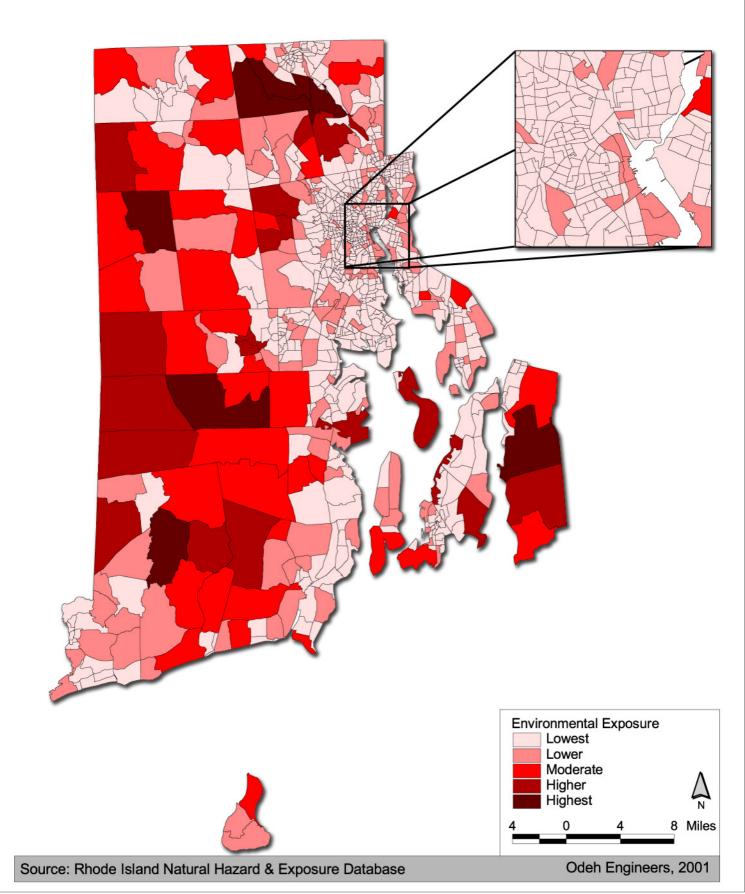


# Relative Economic Exposure Map Including construction, light manufacturing, wholesale, hotels/motels, agriculture, professional/technical services, retail, financial, and domestic property values.

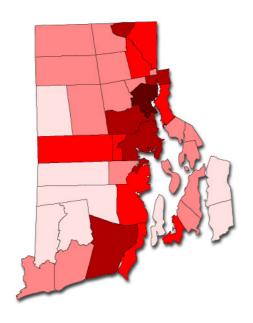


### Relative Environmental Exposure Map

Including CIRCLIS sites, areas of scenic beauty, and rare species habitats

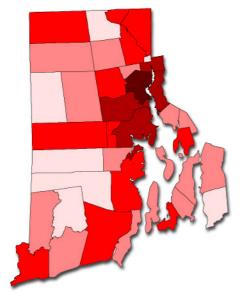


# Combined Community Exposure Maps Including Critical Facilities, Social, Economic, Environmental, and Combined Exposure Maps

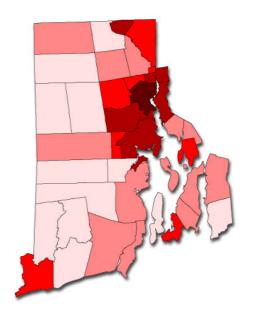




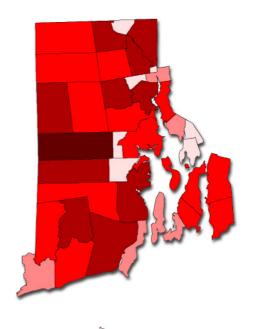
**Critical Facilities** 



**Economic Exposure** 

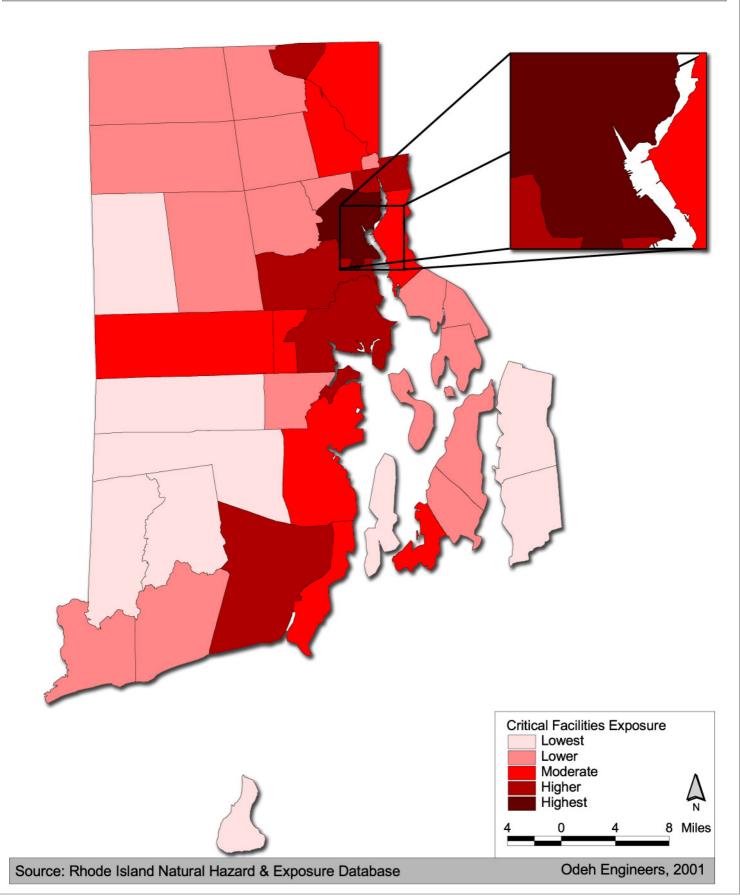


Social Exposure

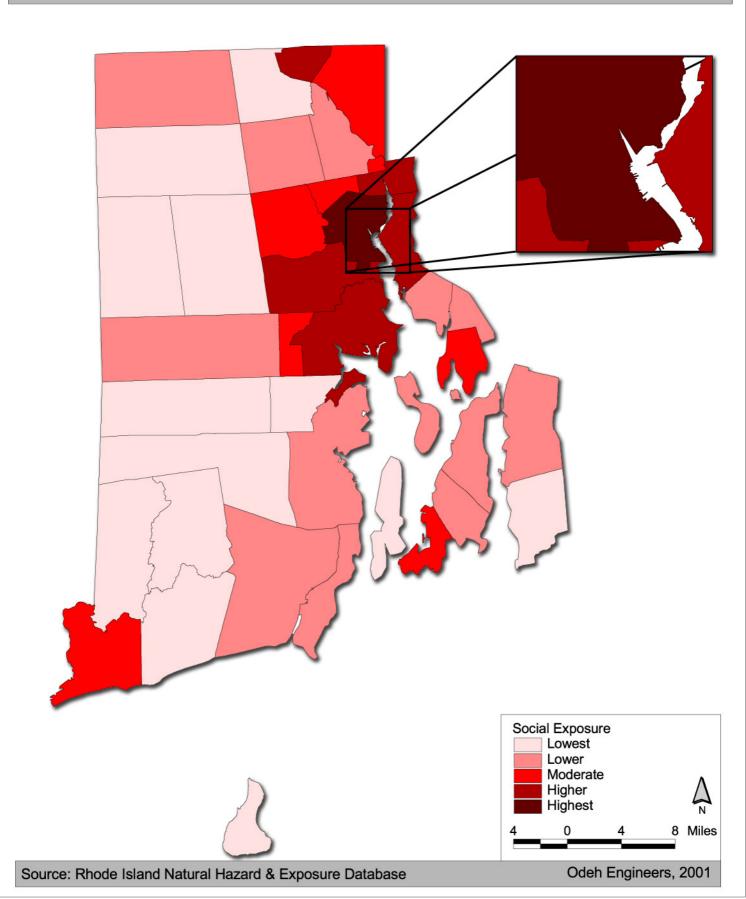


**Environmental Exposure** 

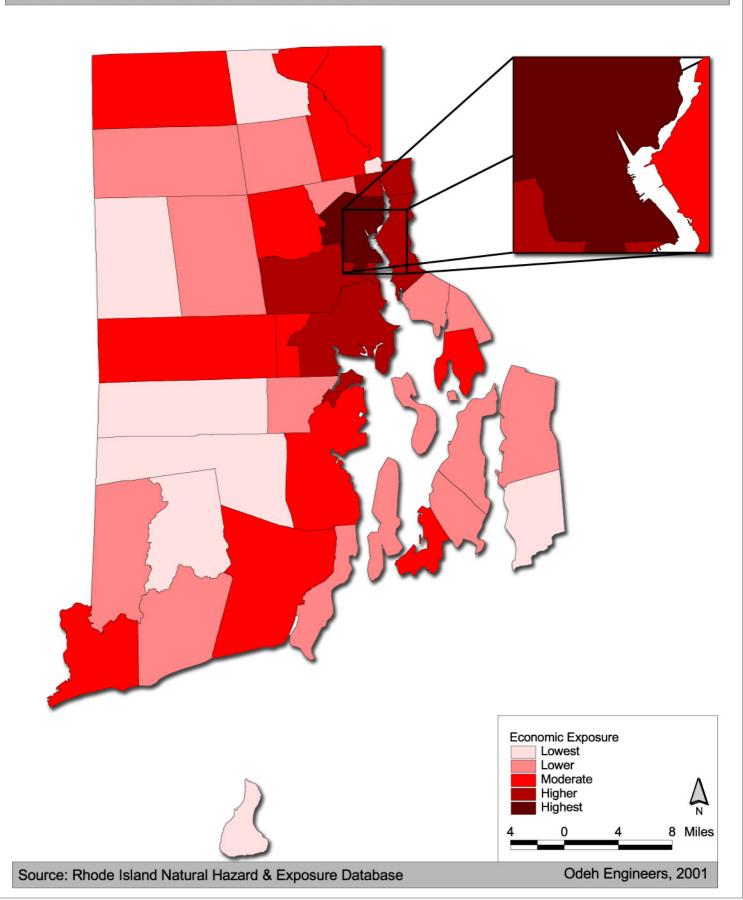
# Community Critical Facilities Exposure Map Including marinas, fire & rescue stations, police stations, water treatment facilities, railroad and airport depots, and government facilities.



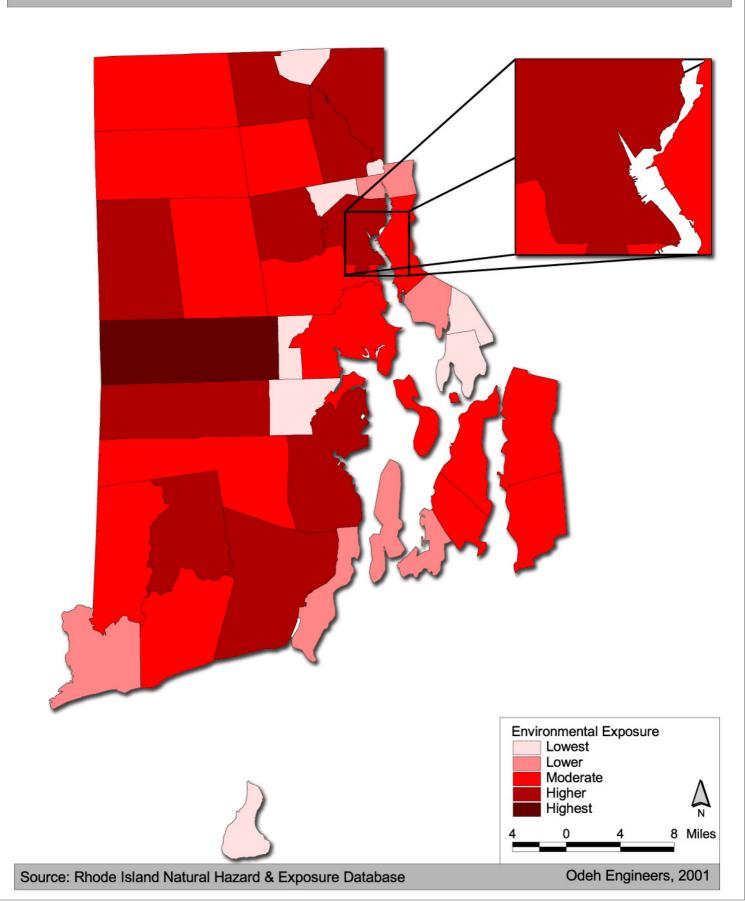
# Community Social Exposure Map Including population density, elderly, no high school education, public assistance, those without vehicles, renters, disabled, and non-english speaking populations.



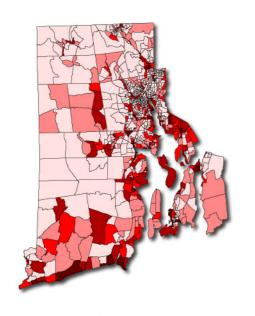
# Community Economic Exposure Map Including construction, light manufacturing, wholesale, hotels/motels, agriculture, professional/technical services, retail, financial, and domestic property values.

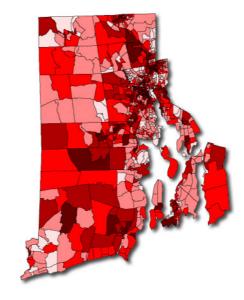


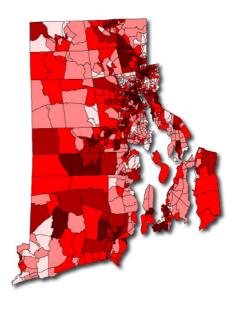
### Community Environmental Exposure Map Including CIRCLIS sites, areas of scenic beauty, and rare species habitats



# Hazard Scores Multiplied by Combined Exposure Scores





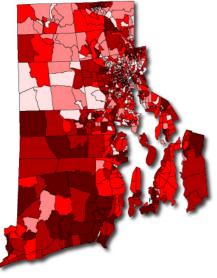


<u>.</u> . . . .

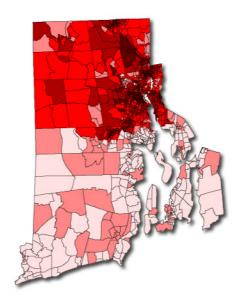
Flood Exposure Scores

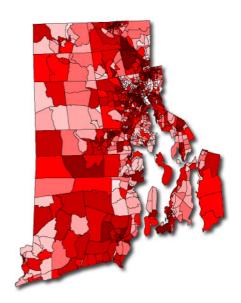
Earthquake Exposure Scores

Hail Exposure Scores







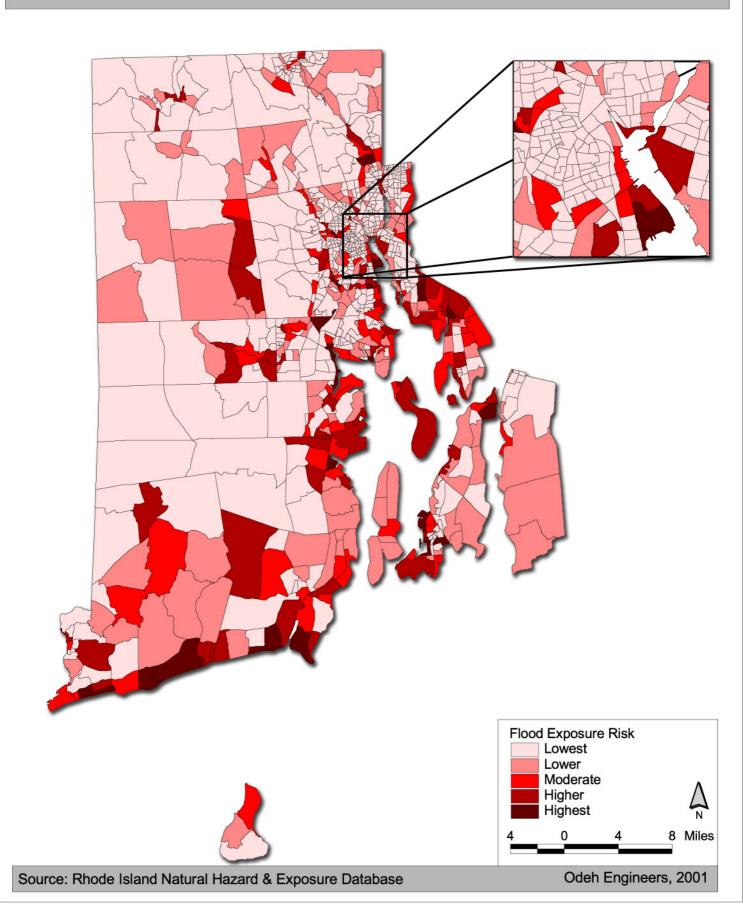


Hurricane Exposure Scores

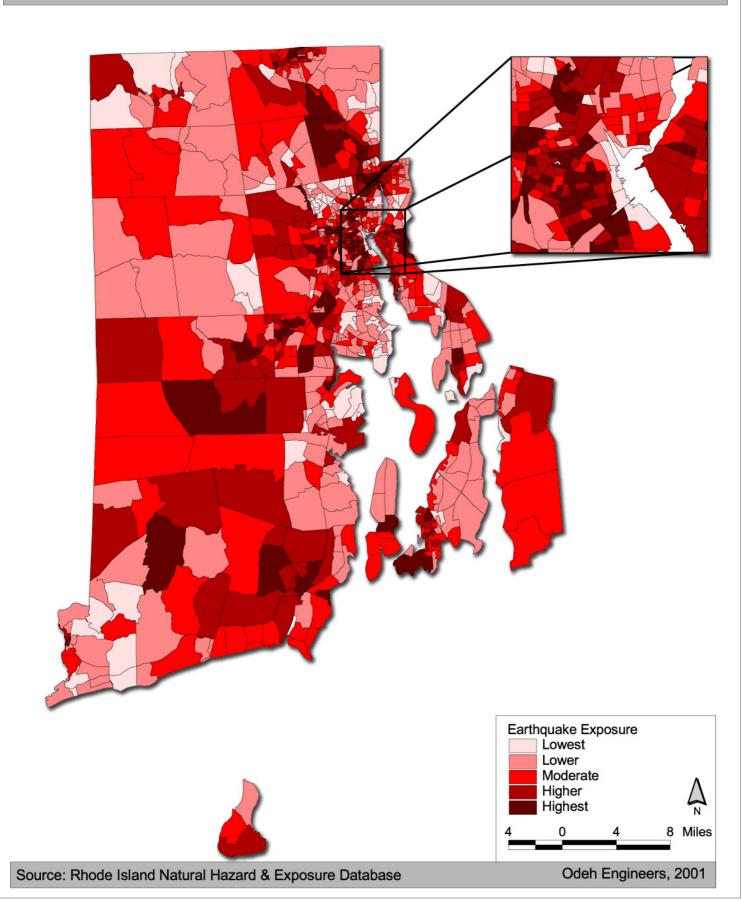


Combined Hazard Times
Combined Exposure

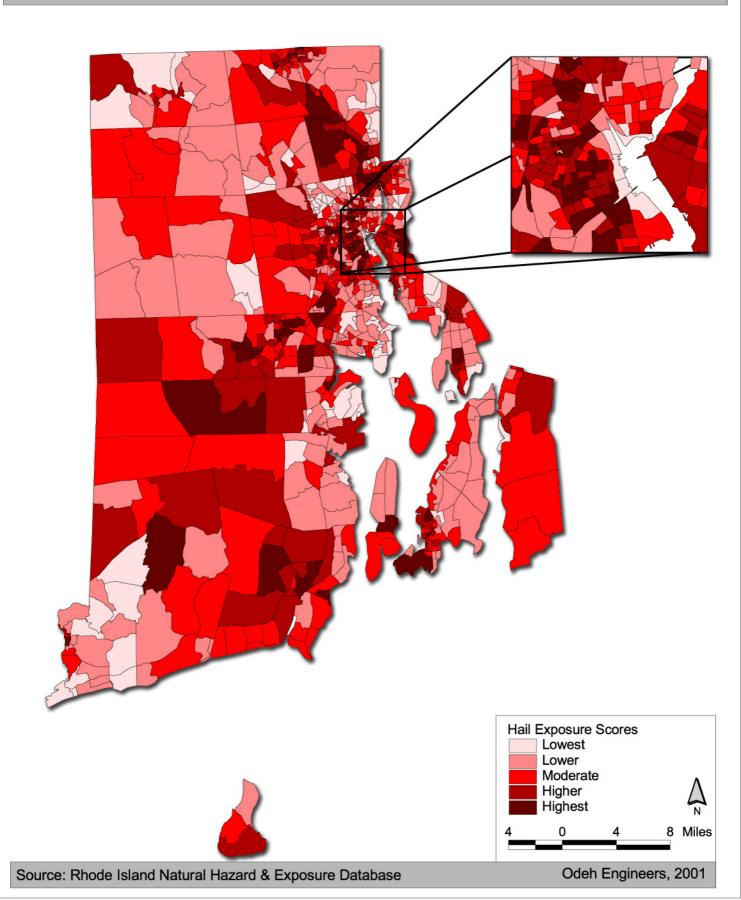
# Flood Exposure Map Derived by multiplying flood hazard scores with combined exposure scores



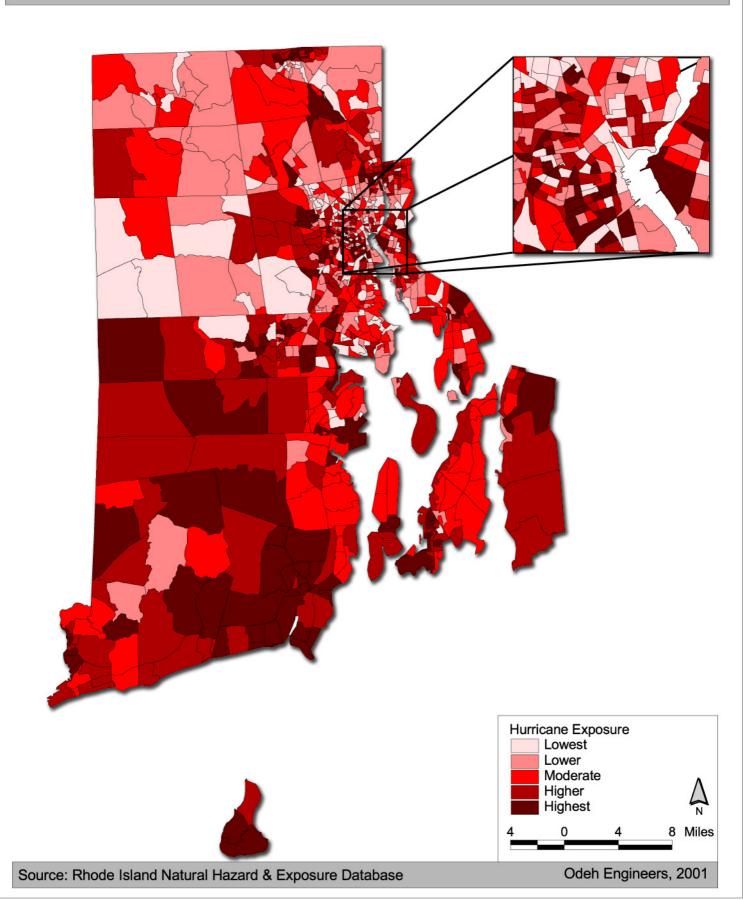
# Earthquake Exposure Map Derived by multiplying earthquake hazard scores with combined exposure scores.



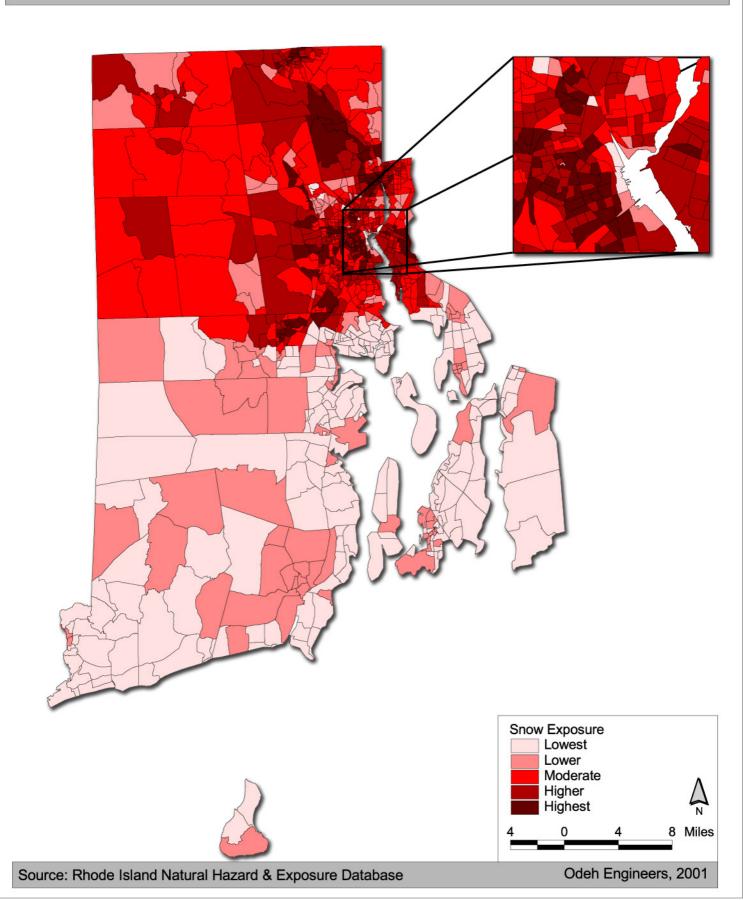
# Hail Exposure Map Derived by multiplying hail hazard scores with combined exposure scores



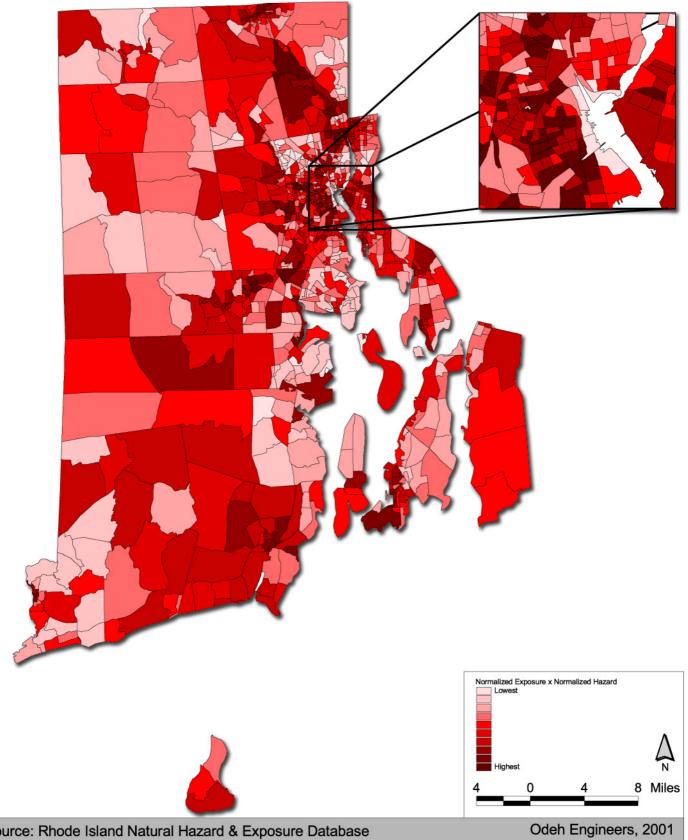
# Hurricane Exposure Map Derived by multiplying hurricane hazard scores with combined exposure scores



# Snow Exposure Map Derived by multiplying snow hazard scores with combined exposure scores

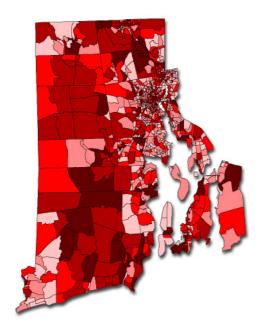


# Hazard Times Exposure Derived by multiplying combined hazard scores with combined exposure scores



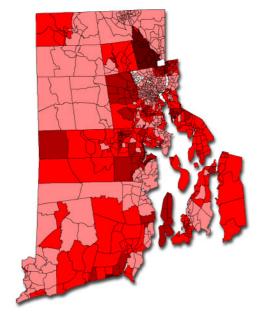
Source: Rhode Island Natural Hazard & Exposure Database

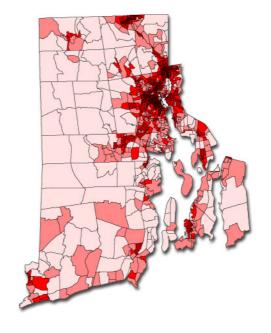
# Exposure Categories Multiplied by Combined Hazard Categories





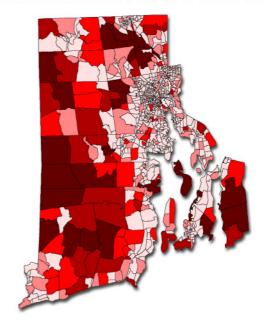
Critical Facilities Hazard Scores
Economic Hazard Scores







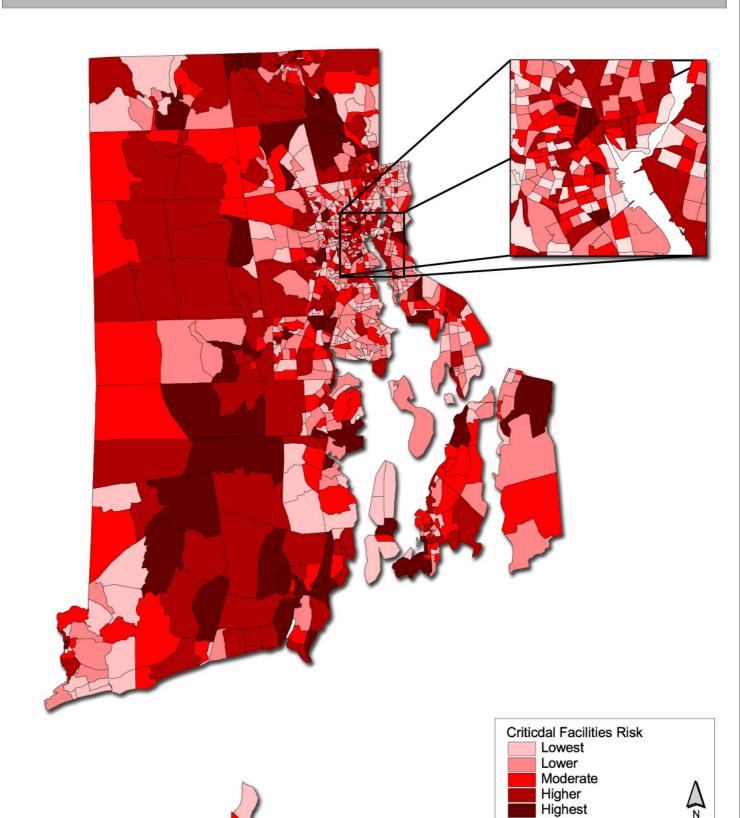
Social Hazard Scores
Environmental Hazard Scores





#### Combined Hazard to Critical Facilitities

Derived by multiplying critical facilities exposure scores by combined hazard score.



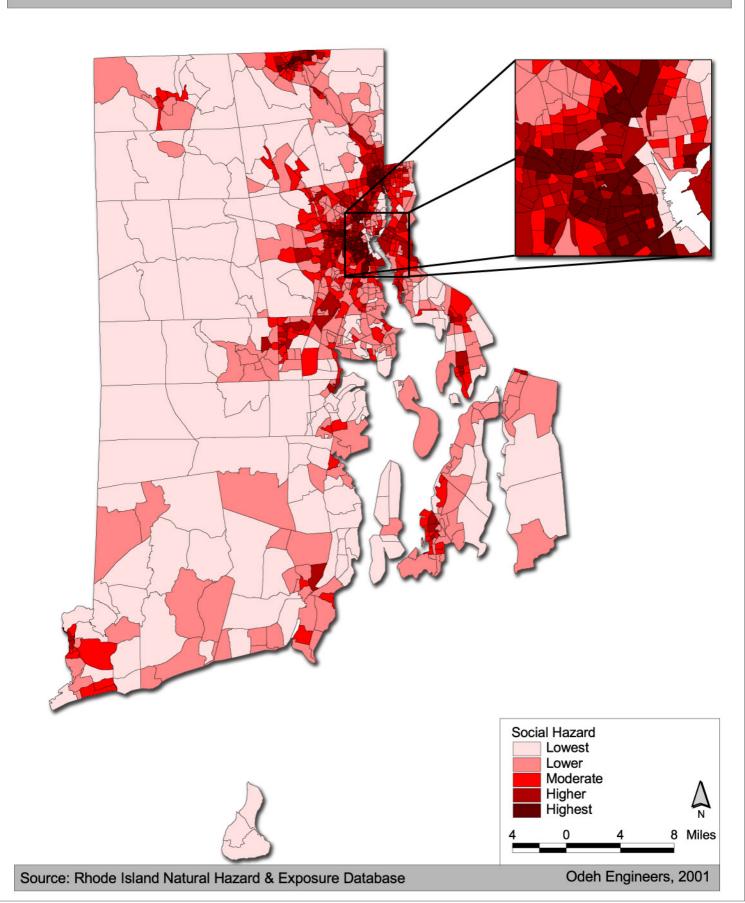
Source: Rhode Island Natural Hazard & Exposure Database

Odeh Engineers, 2001

Miles

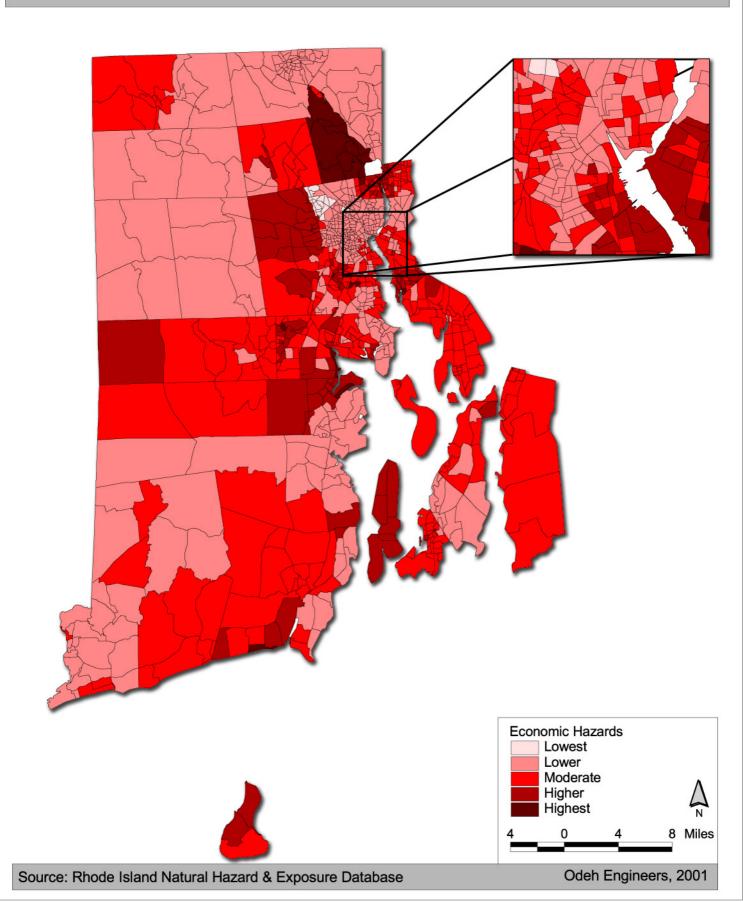
### Social Hazard Map

Derived by multiplying social exposure scores with combined hazard scores



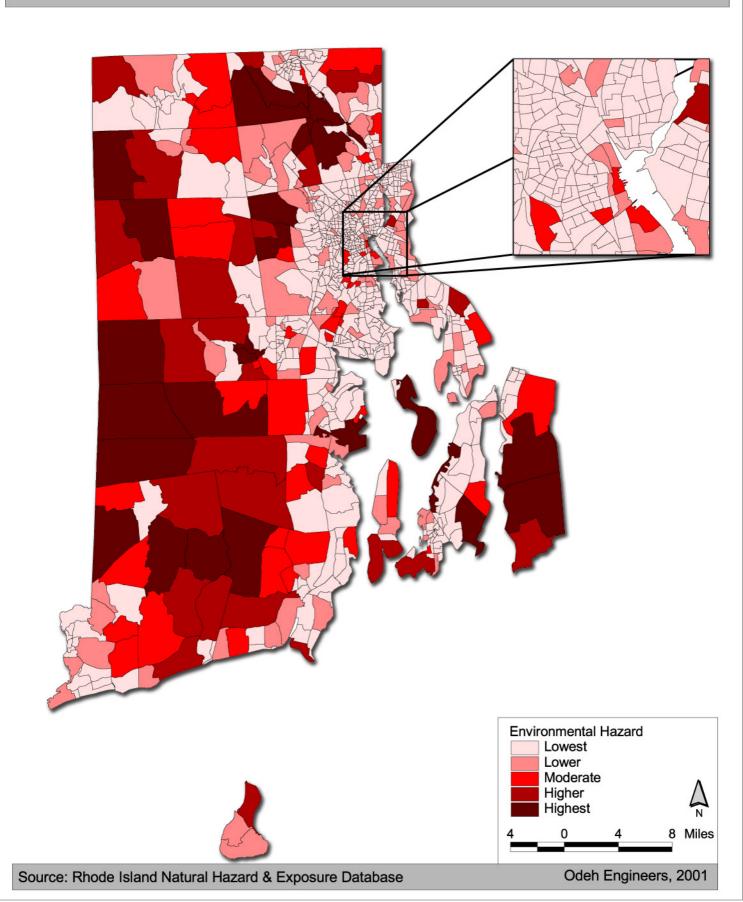
### **Economic Hazard Map**

Derived by multiplying economic exposure scores with combined hazard scores

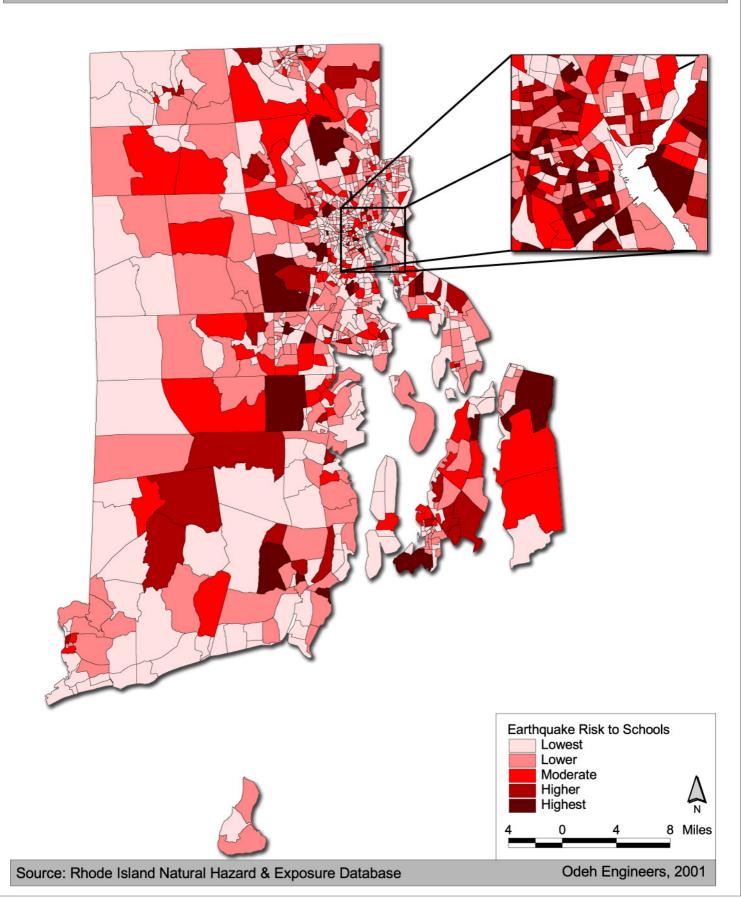


### **Environmental Hazard Map**

Derived by multiplying environmental exposure scores with combined hazard scores



## Schools at Earthquake Risk Derived by multiplying critical facilities school exposure scores by combined hazard scores



## Elderly Populations at Snow Risk Derived by multiplying elderly population exposure scores with snow hazard scores

