Natural Hazards, Amenities and Landuse

- Common theme of the economics work: (Kriesel and Ferreira)
  - Investigate working of the real estate markets in coastal areas.
- The GIS work: (Kramer)
  - Online tools for visualization of alternative development and growth scenarios

Logic of the real estate analysis parallels property appraisal

- Comparable sales approach
- Cost of replacement/reproduction
- Net income capitalization approach

Statistical Method

- Multiple regression analysis of how property prices are determined by 3 types of characteristics
  - Home sq. footage, age, lot size, hurricane protection, boat dock, etc.
  - Neighborhood characteristics
  - Amenity factors like marsh proximity and communal space

Data Collection

- Three coastal Georgia counties
- Chatham
- Glynn
- Camden

- Sources of Data
- County Tax Assessor's Office
- Natural Resources Spatial Analysis Laboratory
- U.S. Census Bureau

Research has proceeded in 3 phases

- Past: Do residential subdivision developers have a market incentive to incorporate more open space, smaller lot sizes?

- Current: Did the incentives change during the housing bust?

- Future: What are the benefits of elevation retrofitting houses for flood resilience?

Past long story - short

- All but 2 of 16 independent variables statistically significant
- All variables had predicted direction of influence.
- R-square ranged around 75%

Simulation scenarios

- Status quo: 20 ha, 100 homes, 5% Commons, 15% impervious surface, $300,000/home, $30 mil revenue
- Conventional design: more Commons, less impervious surface, same lot size, 90 salable lots
- Conservation design: more Commons, less impervious surface, smaller lot size, 100 salable lots
- **How is the gross revenue of $30 mil affected?**

Summary Subdivision Design Simulations

Change from base gross revenue of $30,000,000

	10 % Commons 10% Impervious	15% Commons 5% Impervious
Constant lot size	Chatham -$317,000 Glynn -$898,000 Camden -$474,585	Chatham -$1,036,000 Glynn -$2,265,000 Camden -$1,664,000
Variable lot size	Chatham $1,075,000 Glynn $818,000 Camden $317,000	Chatham $1,820,024 Glynn $1,207,000 Camden -$117,000

Main Conclusions

- Residential subdivision developers have a market incentive for planning:
  - Higher density developments
  - Developments with more open/communal space
  - Developments with less impervious surface

- Effect is strongest in urbanized market areas

Current: Did Homebuyers' Preferences Change during the housing bust ?

- Research in Nashville and Knoxville indicates natural amenities lost their relative value.
  - Buyers with uncertain employment may seek out basic shelter
  - Sellers facing foreclosure may discount the property's natural amenity

4 tests of the null hypothesis: market valuation of the amenity did not decrease

1. side-by-side comparison of marginal WTP
2. pooled data with interactions
3. pooled data with D-I-D
4. pooled data with D-I-D and repeated sales

Analyzed Chatham and Camden

- None of the tests could reject the null hypothesis

Future: what are the benefits of elevation retrofitting homes?

1. More freeboard reduces the flood insurance premium,

   benefit= discounted stream of savings

2. Elevating the first floor:
   - Home appears safer, more substantial
   - Creates useful storage space
   - Better curb appeal

- Estimate these with real estate analysis

Preliminary analysis for Camden County

- The average house built on a slab is worth about $14,000 less than one that is not.

- The average house built on a slab and located inside SFHA is worth about $17,000 less than one that is not.

- Benefits from getting a flood-prone house off a slab potentially $31,000.

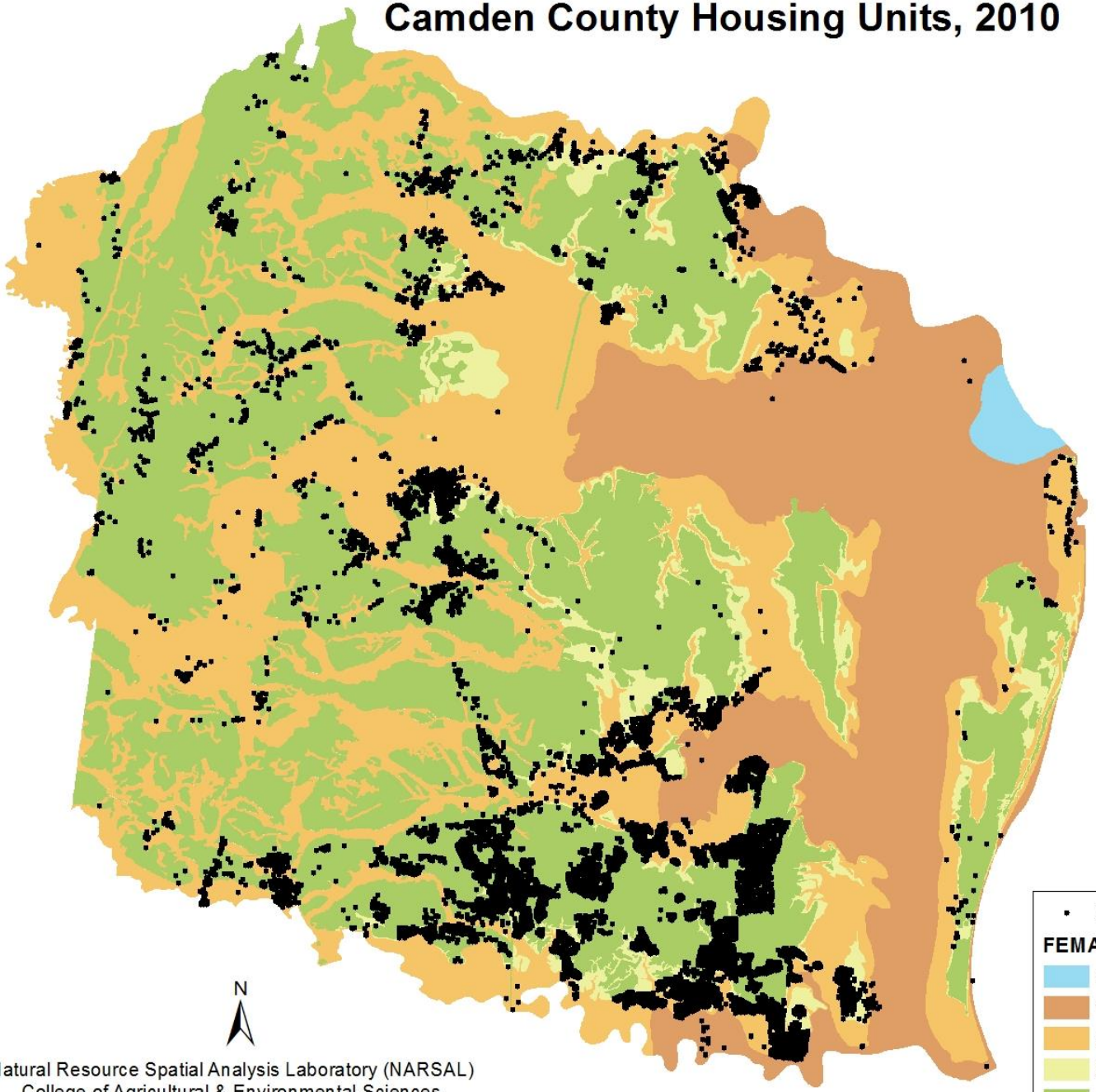
Better data is needed to measure freeboard

- 1. LIDAR – resolution is too low
- 2. Google street view –
  - Measurement error
  - Time consuming
- 3. Obtain info from elevation certificates.

GIS and Visualization (Kramer)

- completed the modeling of the Camden county land use change for 2050.
- developed a new methodology that integrates population projections with land use change predictions.
- developed a series of data layers that link future housing stock changes with hazards
- developed scenarios of future housing distributions based upon 3 scenarios of development.

Camden County Housing Units, 2010



Housing Unit

FEMA Flood Zones

- OPEN WATER
- VE
- A; AE
- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- X

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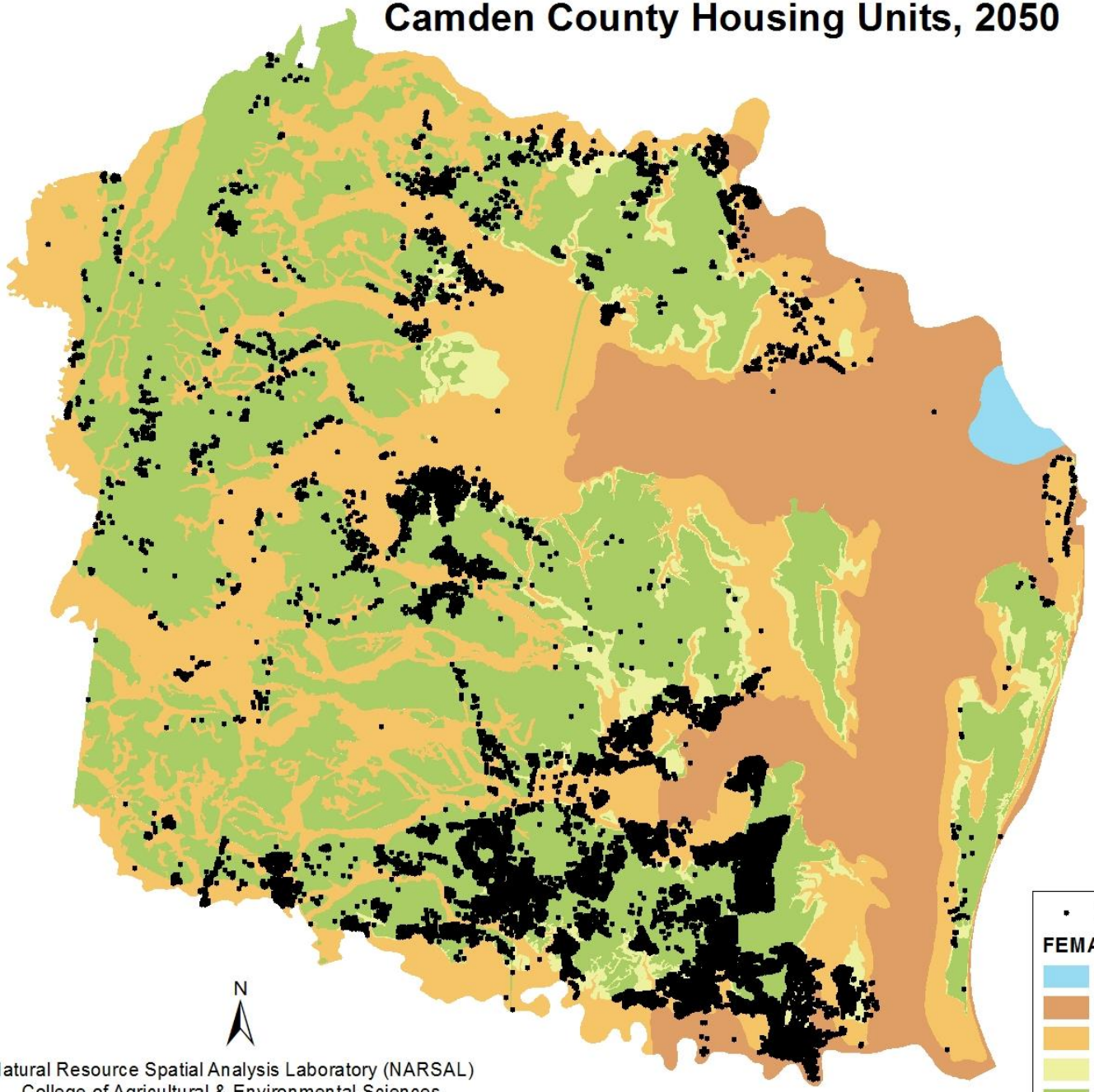
College of Agricultural & Environmental Sciences
University of Georgia

Camden County Housing Units, 2050



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Housing Unit

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Value of property improvements at risk of flooding damage under base development scenario ($2010)

	Parcels in 100-year Zone		Parcels in 100 and 500-year Zone	
Year	Value, $ Million	As % of County's Total	Value, $ Million	As % of County's Total
2010	514	30.34238	835	49.29162
2020	638	30.58485	926	44.39118
2030	691	30.32032	996	43.70338
2040	783	30.71793	1,086	42.60494
2050	911	31.68696	1,649	57.35652