Division of Coastal Management

The N.C. Division of Coastal Management works to protect, conserve and manage North Carolina's coastal resources through an integrated program of planning, permitting, education and research.

Presentation to N.C. Legislative Commission on Global Climate Change

March 15, 2010

Tancred Miller

N.C. Division of Coastal Management

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Summary of the N.C. Coastal Resource Commission Science Panel's Sea-Level Rise Assessment Report

Presentation to N.C. Legislative Commission on Global Climate Change
March 15, 2010

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Summary of the N.C. Coastal Resource Commission Science Panel's Sea-Level Rise Assessment Report

Key Sections of the Report:

1. Measuring sea-level rise: globally and regionally
2. Relative sea-level rise along the North Carolina coast
3. Relative sea-level rise projections for North Carolina through 2100
4. Confidence level/margin of error for the reported ranges and rate curves
5. Recommendations for improved sea-level rise monitoring in N.C.
6. Recommendations for updating this report

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Summary of the N.C. Coastal Resource Commission Science Panel's Sea-Level Rise Assessment Report

The Science Panel has prepared this report for the CRC, and has included a recommendation regarding how much SLR the CRC should plan for by 2100.

This report synthesizes the best available science on SLR as it relates specifically to North Carolina.

Intent of this report is to provide state planners and policy makers with a scientific assessment of the amount of SLR likely to occur in this century.

The report **does not** attempt to predict a specific future rate or amount of rise because that level of accuracy is not considered to be attainable at this time.

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Summary of the N.C. Coastal Resource Commission Science Panel's Sea-Level Rise Assessment Report

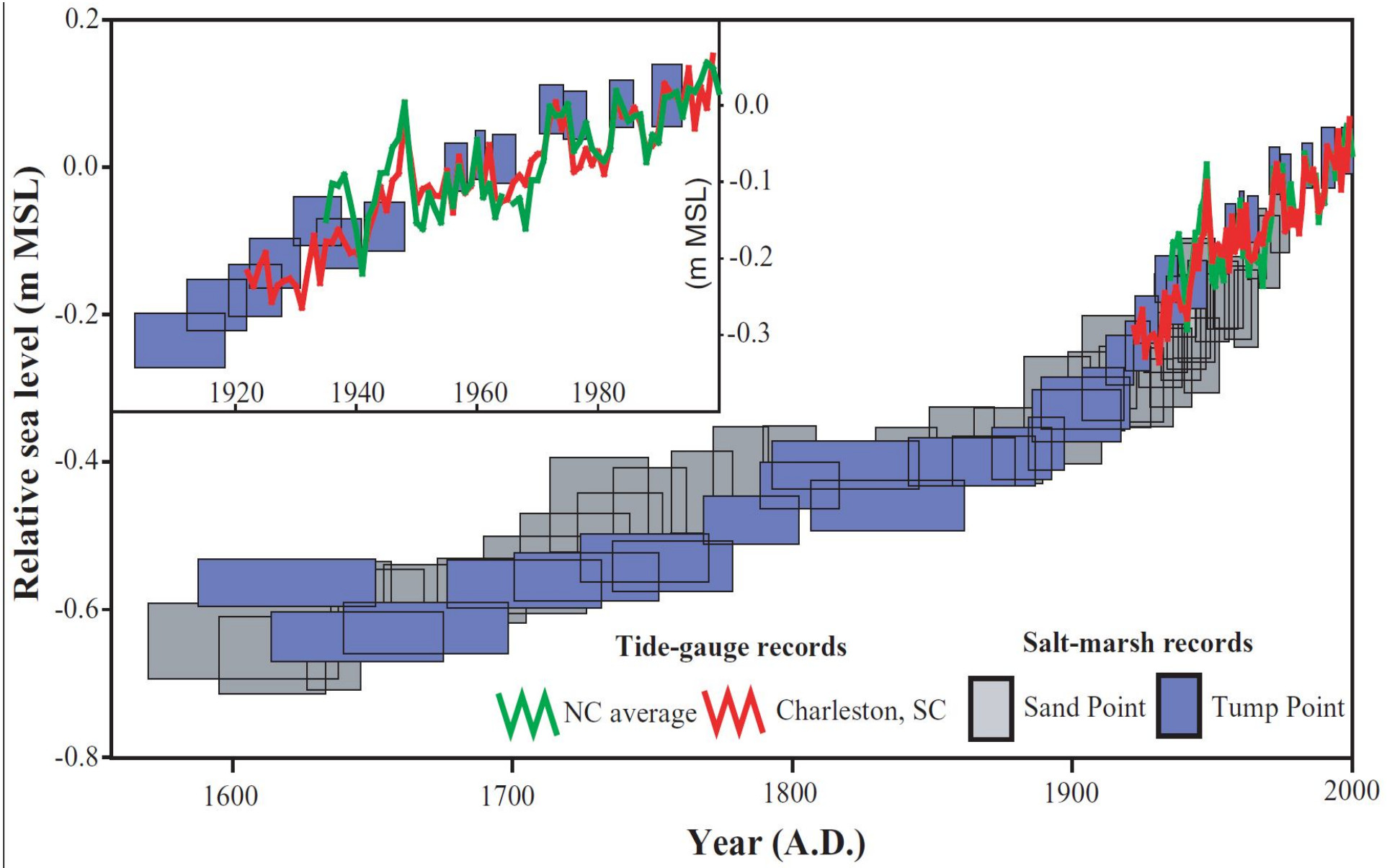
The IPCC Fourth Assessment Report (IPCC, 2007) contains forecasts for global average SLR ranging from 0.18 meters to 0.59 meters (7 to 23 inches) by the year 2100 AD.

Study 1: Horton et al. (2009) SL database for N.C. from geological data that cover the past 12,000 years.

Study 2: Kemp (2009 thesis) constructions of SLR in N.C. for the past 2,000 years using geological data.

Study 3: Kemp et al. (2009) noted that 20th century rate of rise of 3.0 to 3.3 mm per year (13 inches/century) in sync with tide gauges.

Study 4: Zervas (2004) documented the MSL trends for eight water level stations in North Carolina.



Reconstructions of RSL at Sand Point and Tump Point, N.C. for the period since AD 1500. Average tide-gauge record from North Carolina (green) and the record from Charleston, South Carolina (red) are also shown.

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Station Number	Station Name	Mean Sea-Level Trend mm/yr	Mean Sea-Level Trend inches/century	Period of Data
8651370	Duck	4.27 ± 0.74	16.8 ± 2.9	1978-2002
8652587	Oregon Inlet Marina	2.55 ± 1.21	10.1 ± 4.8	1977-1880, 1994-2002
8654400	Cape Hatteras	3.46 ± 0.75	13.6 ± 3	1978-2002
8656483	Beaufort	3.20 ± 0.54	12.6 ± 2.2	1973-2002
8656590	Atlantic Beach	2.48 ± 1.99	9.7 ± 7.8	1977-1983, 1998-2000
8658120	Wilmington	2.12 ± 0.23	8.4 ± 0.8	1935-2002
8659084	Southport	2.04 ± 0.25	8 ± 1	1933-1954, 1976-1988
8659182	Yaupon Beach	2.92 + 0.77	11.5 ± 3	1977-1978, 1996-1997

MSL trends for N.C. water-level stations in mm/year

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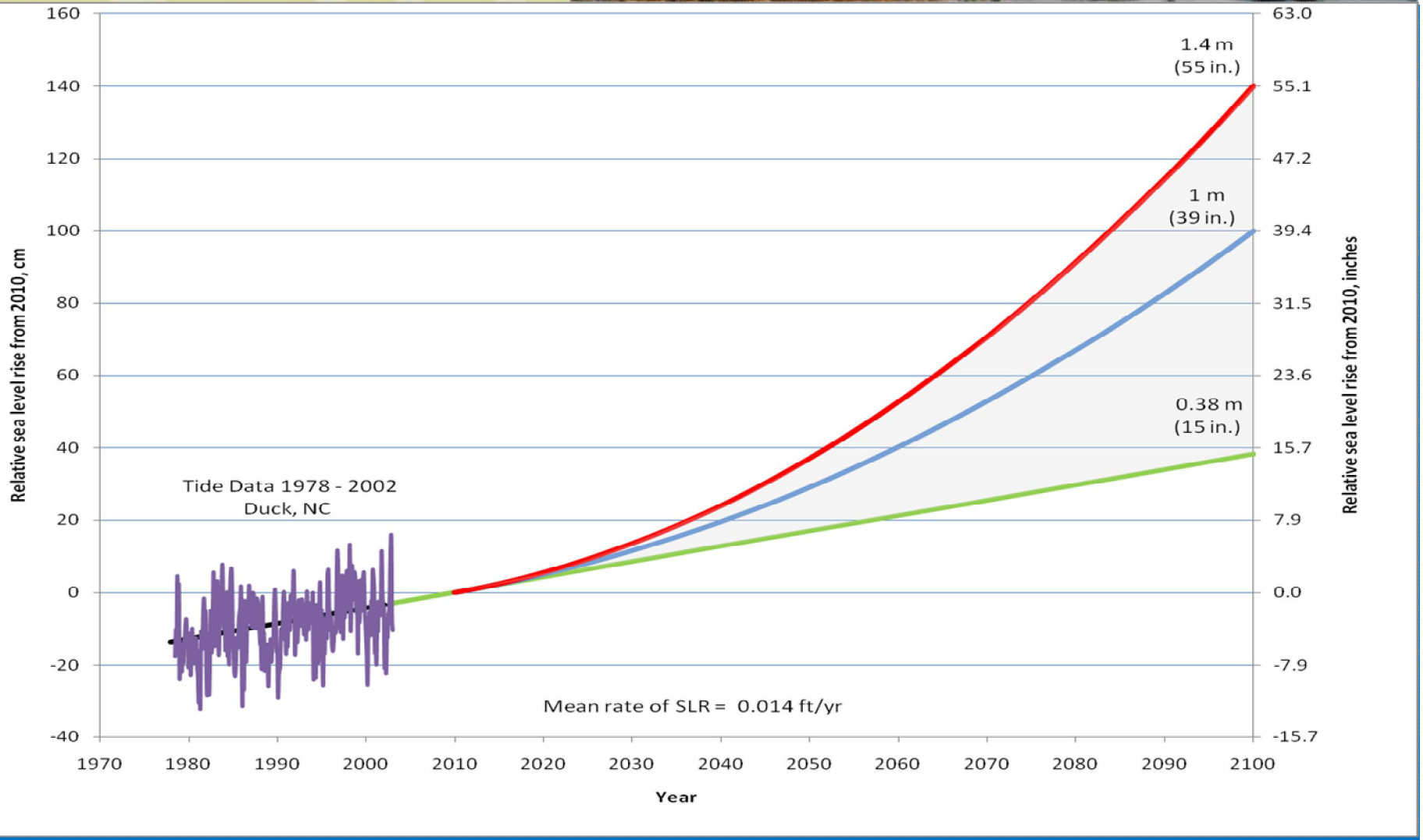

Magnitude of SLR resulting from differing scenarios of acceleration. Most likely for 2100 AD is a rise of 0.4 meter to 1.4 meters (15-55 inches) above present.

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Science Panel Recommendations:

Minimum of 0.38 mm (15 in.) will occur if there is no further acceleration.

Maximum of 1.4 m (55 in.) could occur based on expectation of accelerated rise.

Anticipated rise of 1 m (39 in.) should be adopted as a planning target.

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Findings of the Division of Coastal Management's Sea-Level Rise Scoping Survey

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Results

Summary of responses

N. Carolina:	1076 (620 own NC coastal property)
Non-NC:	100 (53 own NC coastal property)
NC Counties:	77 out of 100
CAMA :	18 out of 20
U.S. States:	26 out of 50
Total clean:	1176 (673 own NC coastal property)

"Man made global warming is a total scam and will have ZERO effect on the OBX, except for higher taxes, which will result in fewer tourists. There....aren't you happy now?"

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"Please don't make this a panic issue. Simple education of the facts will suffice."

"Those concerned about the potential sea level rise should move to the mountains or build an ark."

U.S. States Responding

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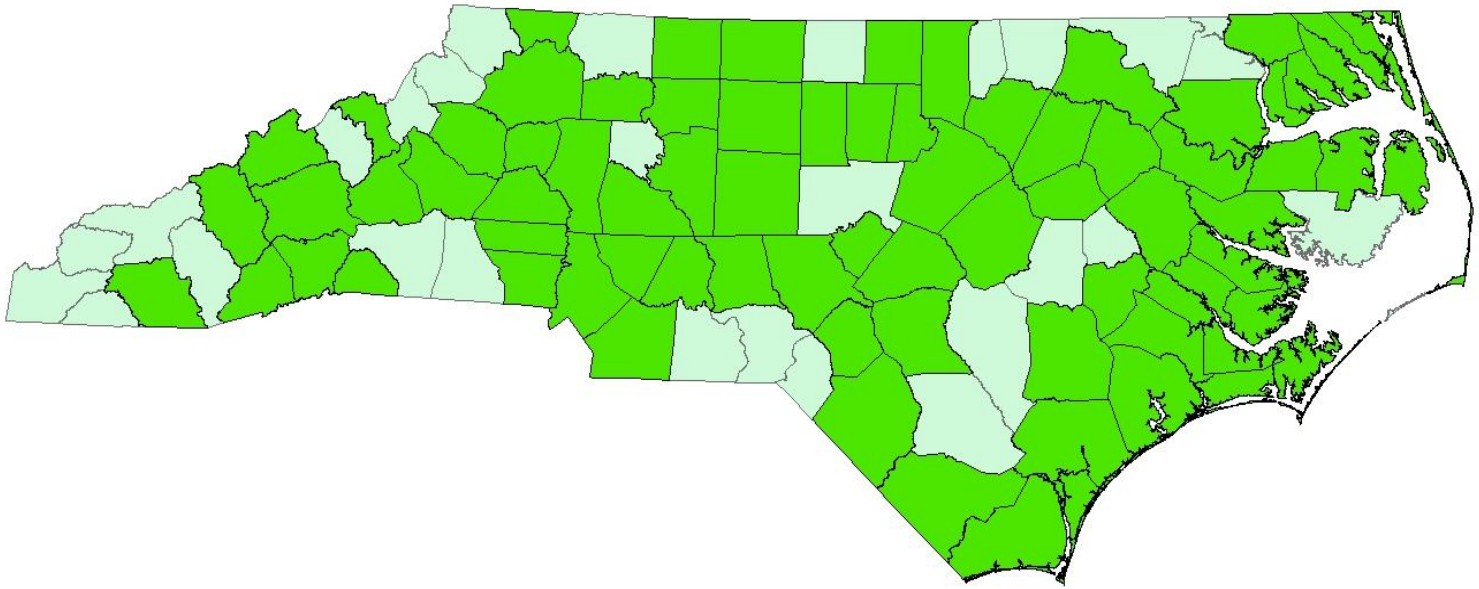
N.C. Counties Responding



"The same tools that can be used to mitigate sea level rise will also pay dividends in hurricane and coastal storm mitigation."

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CAMA County Responses

COUNTY	RESPONSES #		COUNTY	RESPONSES #		COUNTY	RESPONSES #
Beaufort	39		Currituck	7		Pamlico	13
Bertie	3		Dare	73		Pasquotank	7
Brunswick	63		Gates	1		Pender	18
Camden	2		Hertford	0		Perquimans	2
Carteret	92		Hyde	0		Tyrrell	1
Chowan	7		New Hanover	114		Washington	3
Craven	25		Onslow	26			

"Sea levels are more affected by ocean temps than ice forming or melting. Oceans have been cooling for the past ten years as the earth cools. Cooler water has more density. This is not fiction. The Arctic ice cap is as large as it has been in 30 years."

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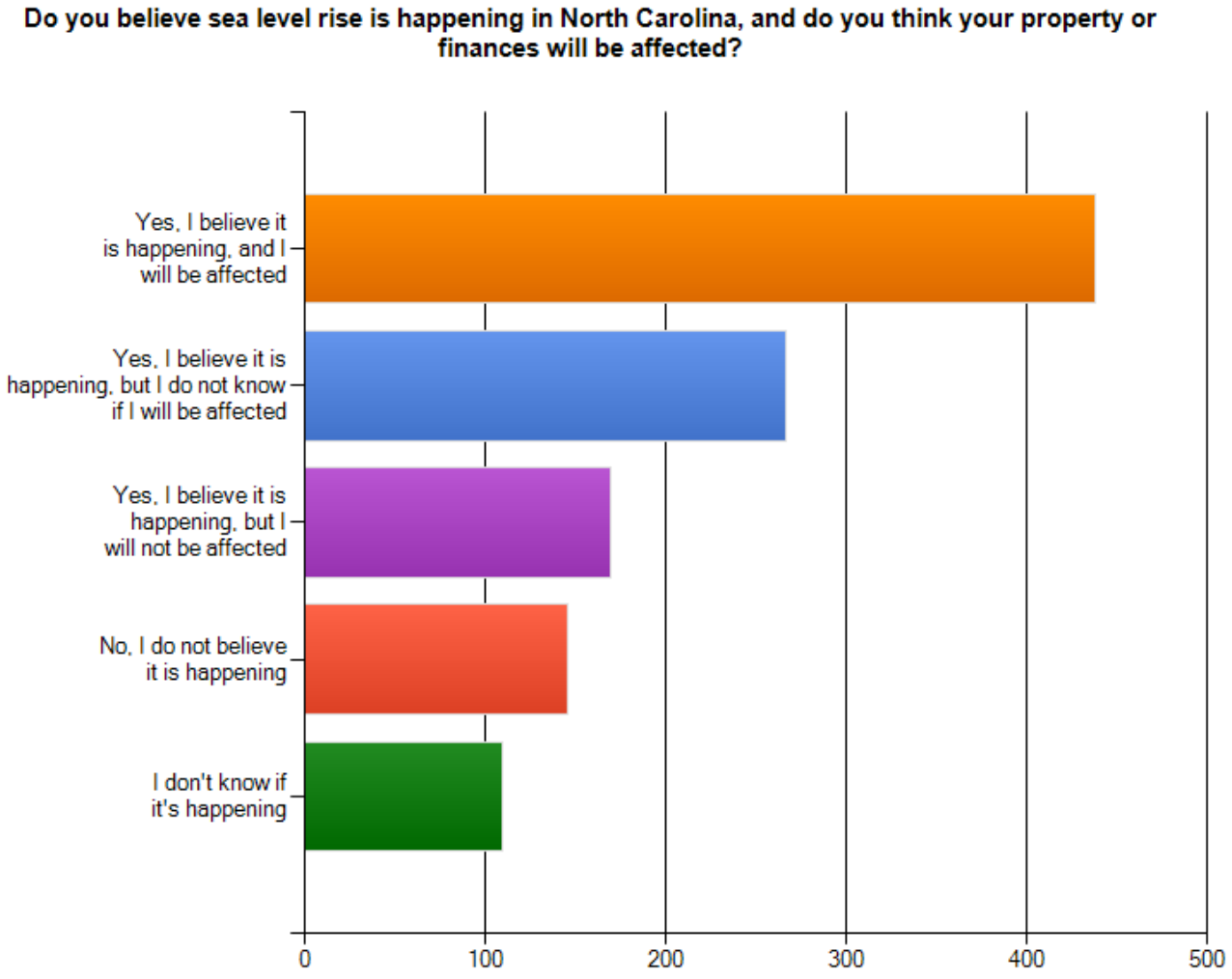
Perceptions – All Respondents



75% believe that sea level rise is occurring, 12% do not, 9% don't know.

38% believe they will be affected, 15% do not, 22% don't know.

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Respondents who believe that sea level rise is occurring.

RISK PERCEPTION CATEGORY	ALL NC RESPONDENTS %	NC RESIDENT PROPERTY OWNERS %
Will be affected	38	51
Will not be affected	15	16
Don’t know if they will be affected	22	33

“I've used the same boat ramp for over 30 years. At mean low water, the water level is where it was 30 years ago. At mean high water, the water level is where it was 30 years ago. If sea level rise is happening at greater and greater rates today, one would think that we would notice it, particularly at a boat ramp that was poured in concrete over 50 years ago.”

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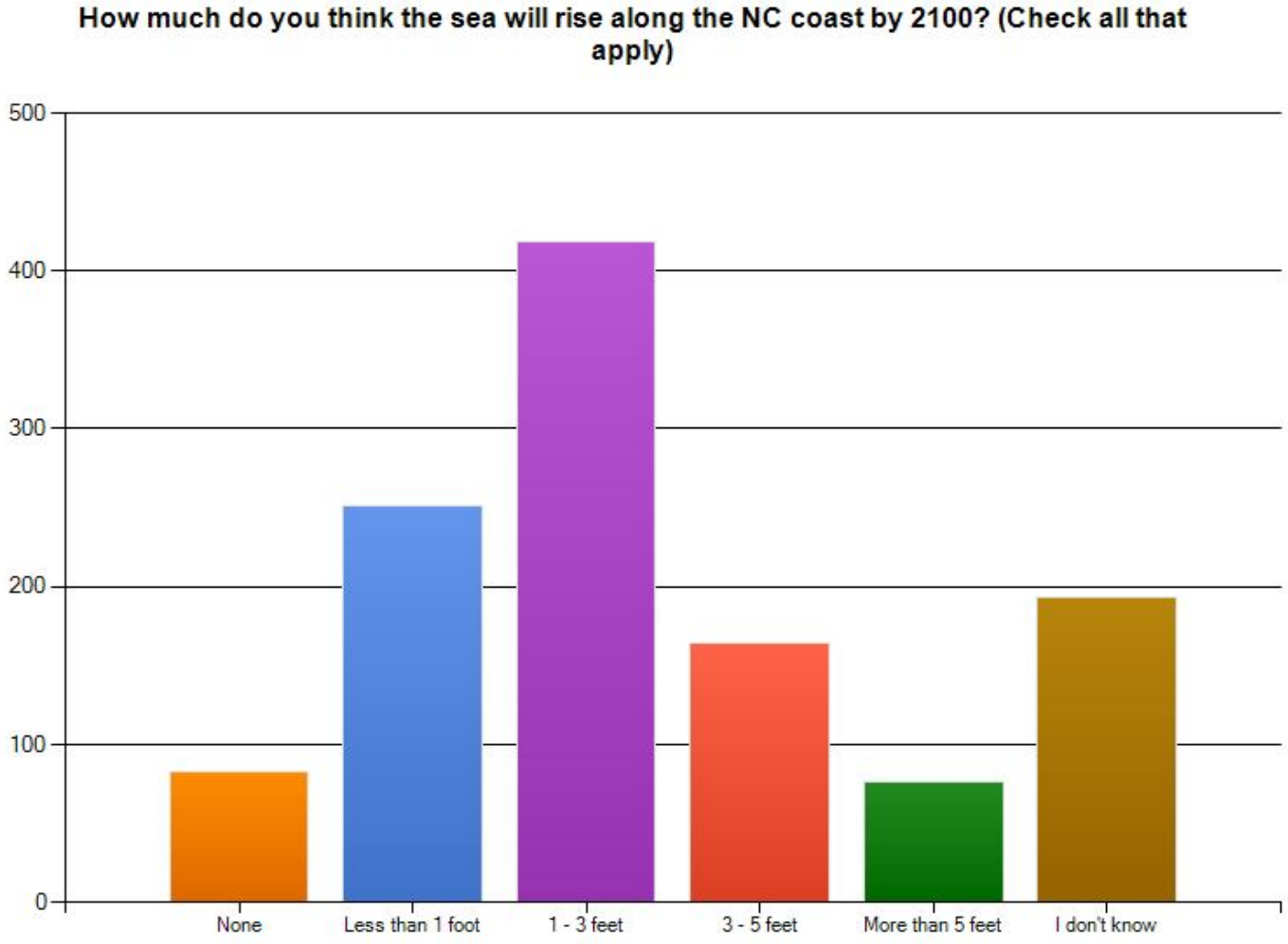
Quantity of Rise



AMOUNT OF RISE	PERCENT (%)
Zero rise	7
Less than 1 foot	21
1-3 feet	36
3-5 feet	14
More than 5 feet	6
Don't know/no opinion	16

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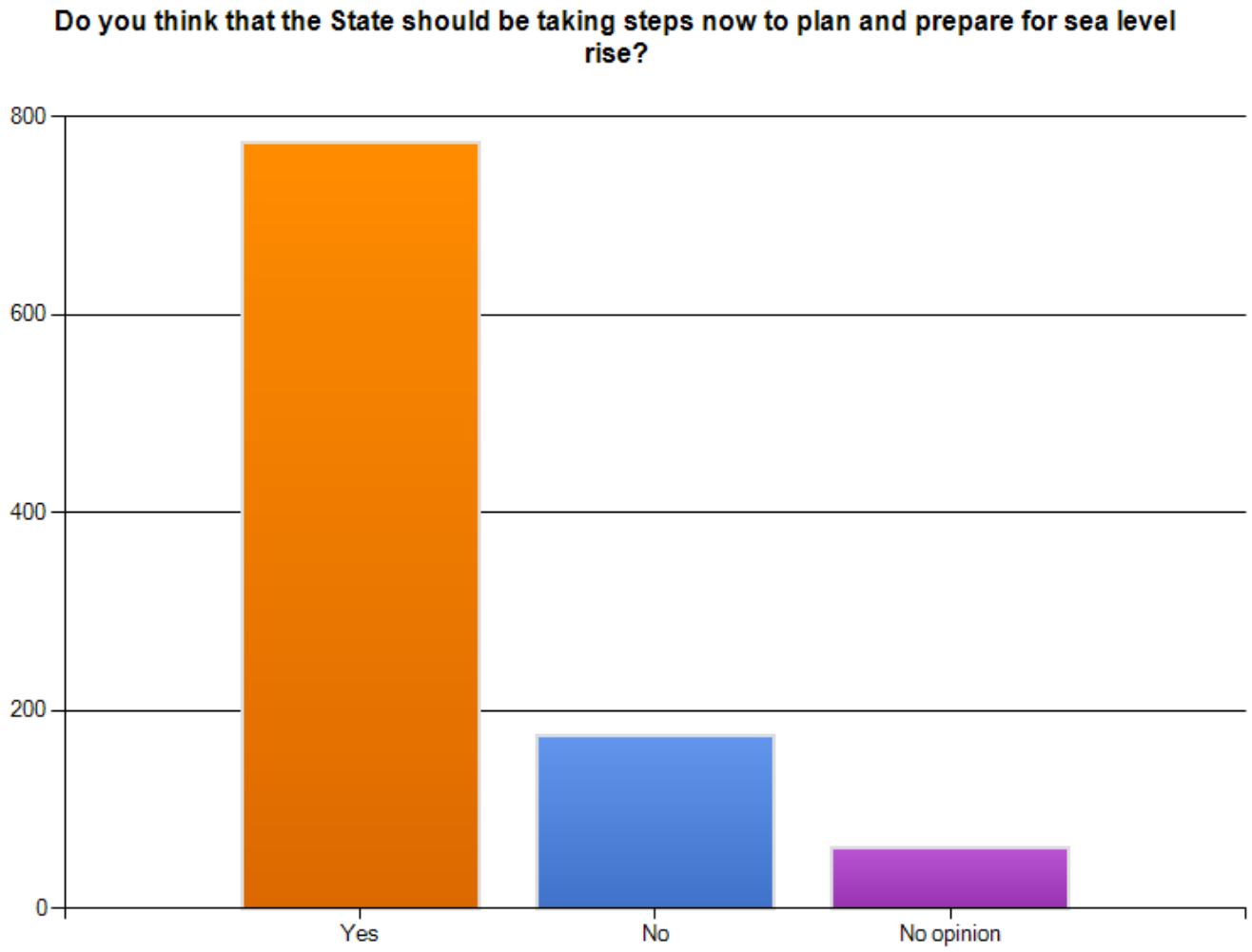
Action



Start planning now?

All respondents: 66% yes, 14% no

CAMA counties: 59% yes, 21% no

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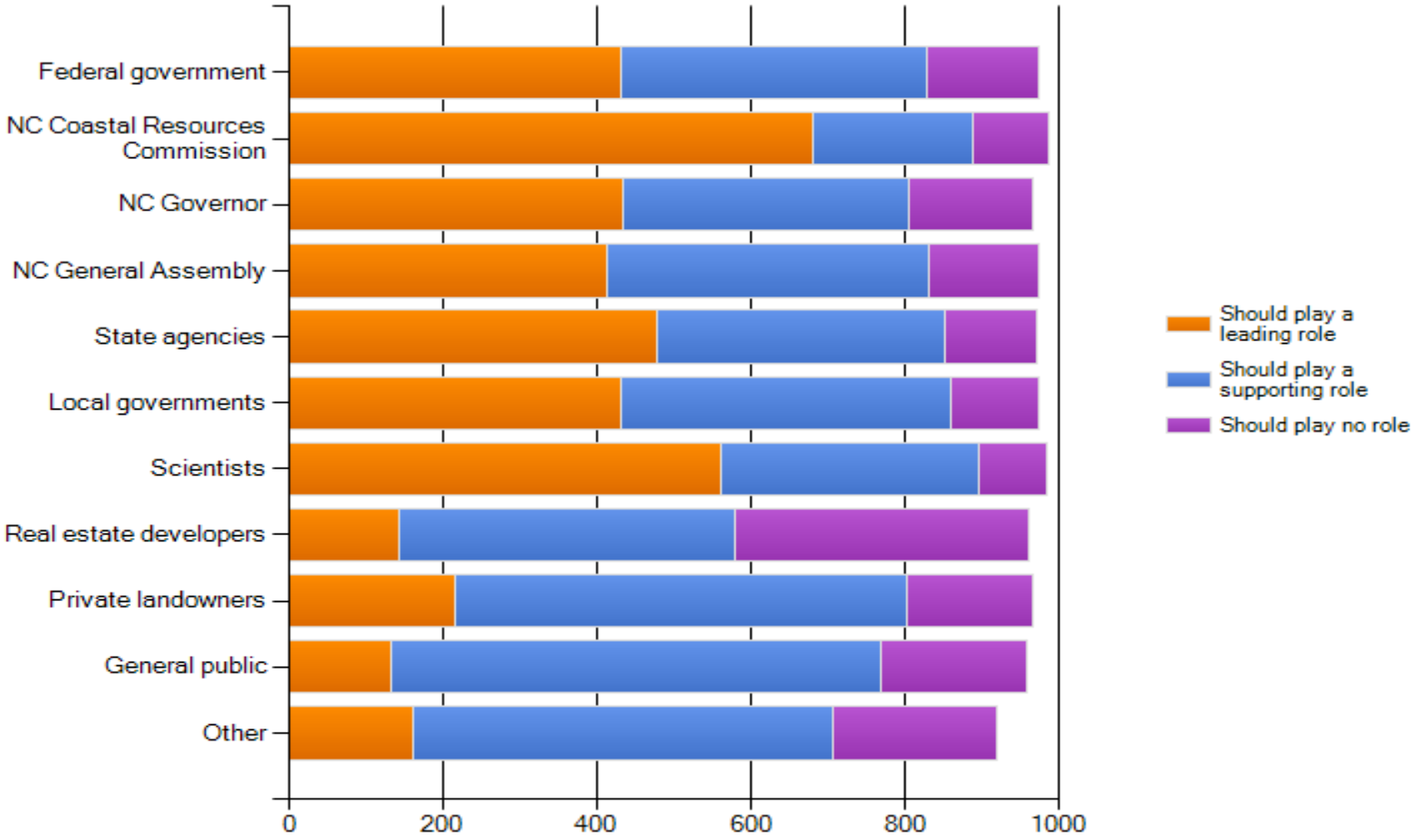
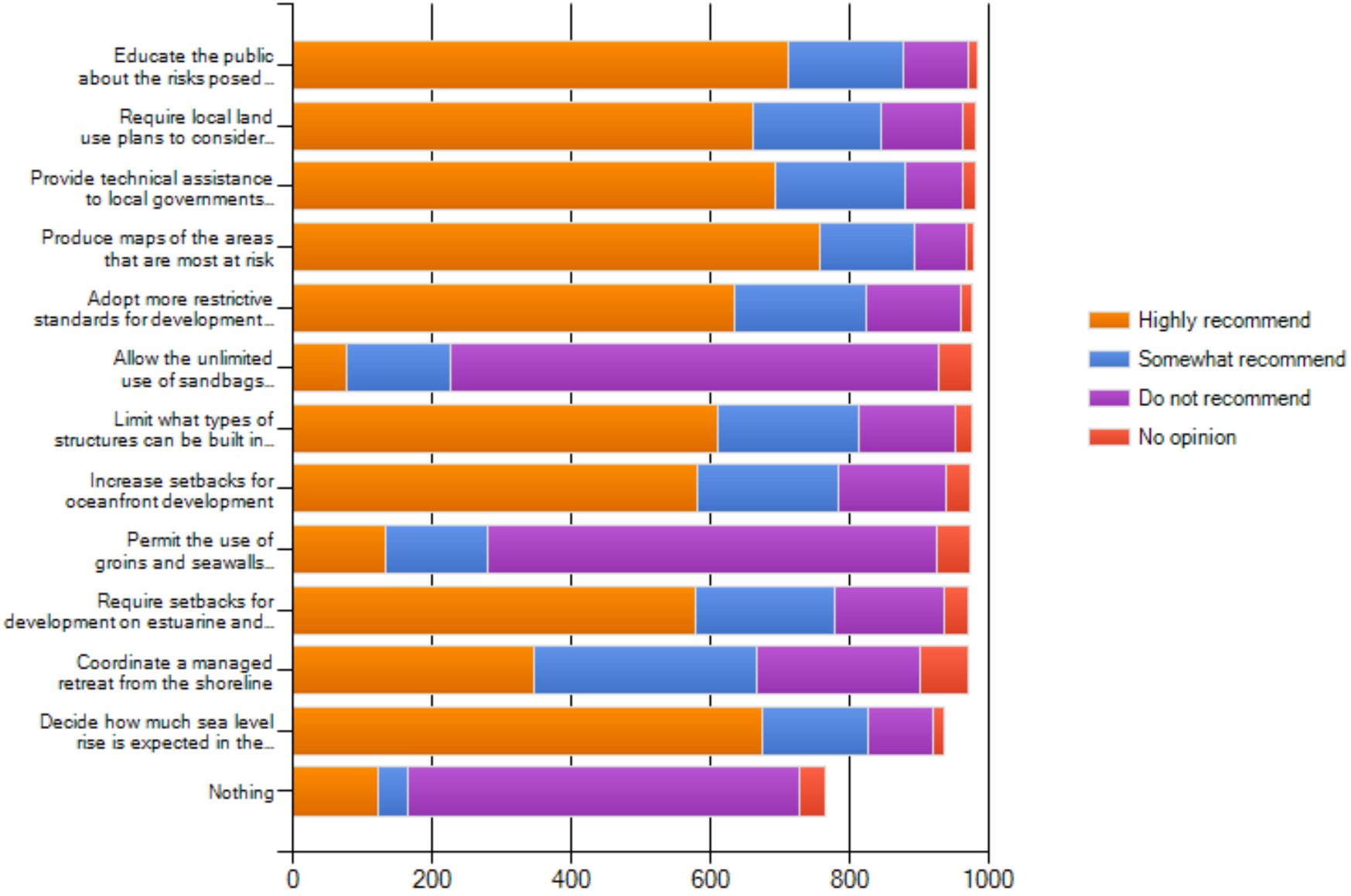
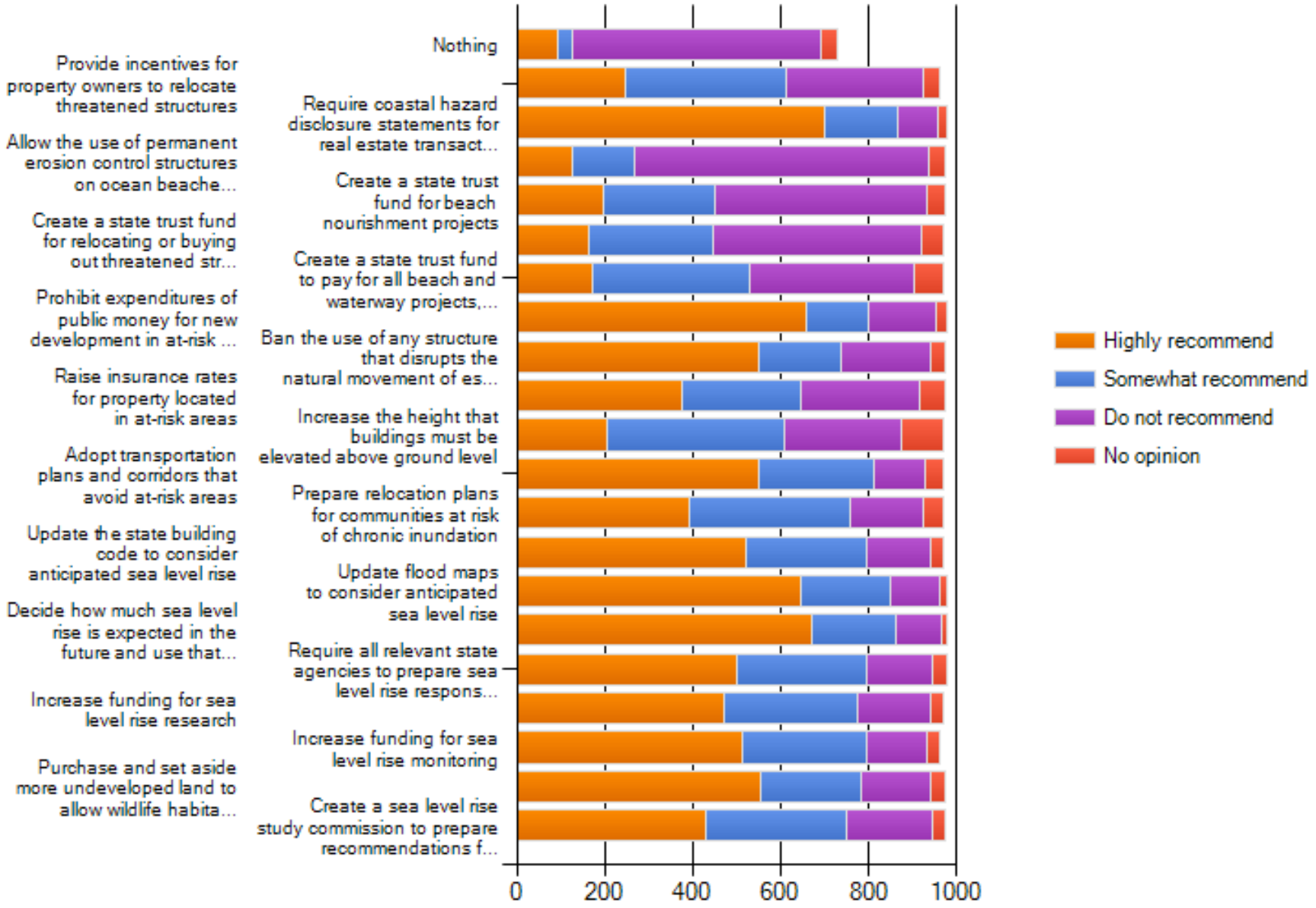
Who do you think should be taking action on sea level rise in North Carolina, and in what roles? (Check any that apply)



What measures would you recommend the Coastal Resources Commission and Division of Coastal Management take to address sea level rise.



Please describe what else you think should be done in North Carolina to address sea level rise.



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Thank You.

The Science Panel's report and the full survey report are available online at www.nccoastalmanagement.net

"The CRC was the result of North Carolina taking a leadership role in coastal management many decades ago. We as a state staked our future on a natural and accessible coast. It has served us well. We need a new era of bold leadership that maintains those values in the face of great pressures to do otherwise."