

Public Preferences for Protecting Working Landscapes



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Public Preferences for Working Lands

- **Heterogeneity**
- **European Union and United States**
- **Maine Case Study**

Working Lands

- lands used for productive, resource-extraction activities



EU and USA

- **agri-environmental programs**
 - **Cooper et al. (2005)**
 - **Baylis et al. (2006)**
 - **Brouwer and Godeschalk (2004)**
 - **Hellerstein et al. (2002)**
 - **Johansson (2006)**

European Council's Landscape Convention

The landscape

has an important public interest role in the **cultural, ecological, environmental and social fields**, and constitutes a **resource favourable to economic activity** and whose protection, management and planning can contribute to job creation ;

contributes to the **formation of local cultures** and is a basic component of the European natural and cultural heritage, contributing to human well-being and consolidation of the European identity ;

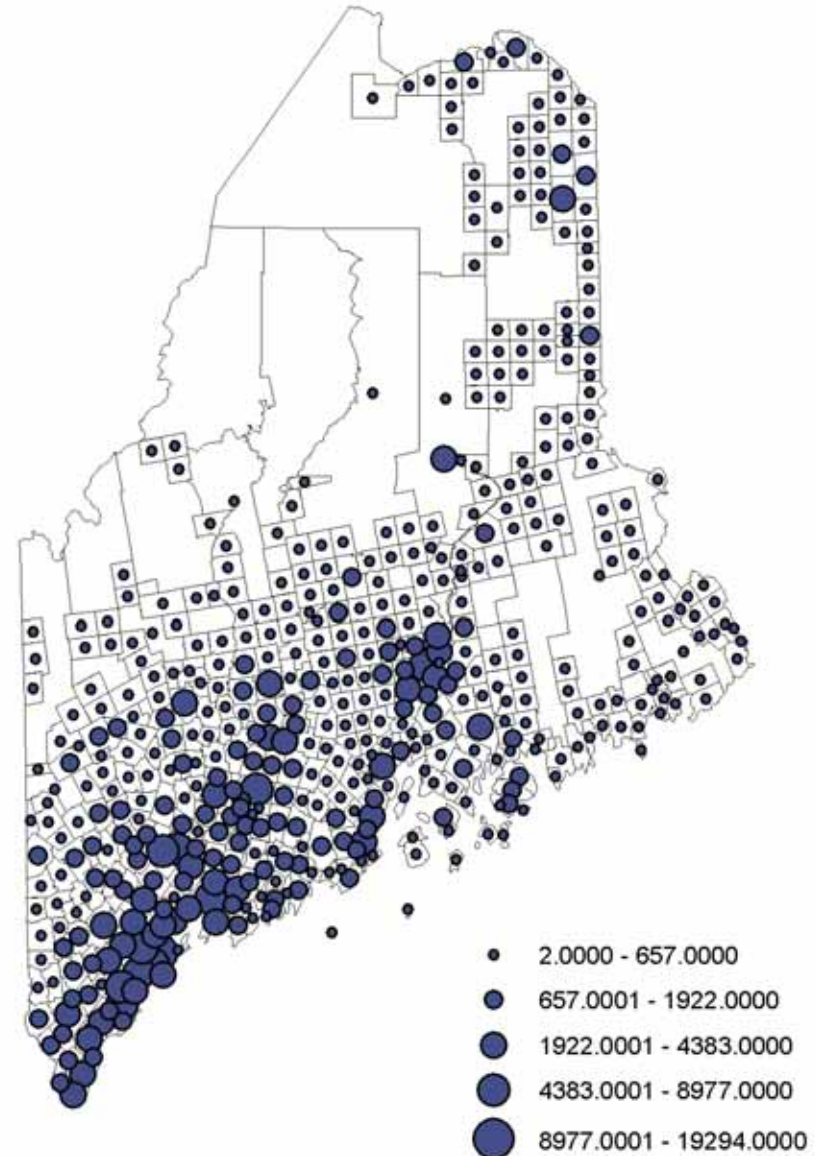
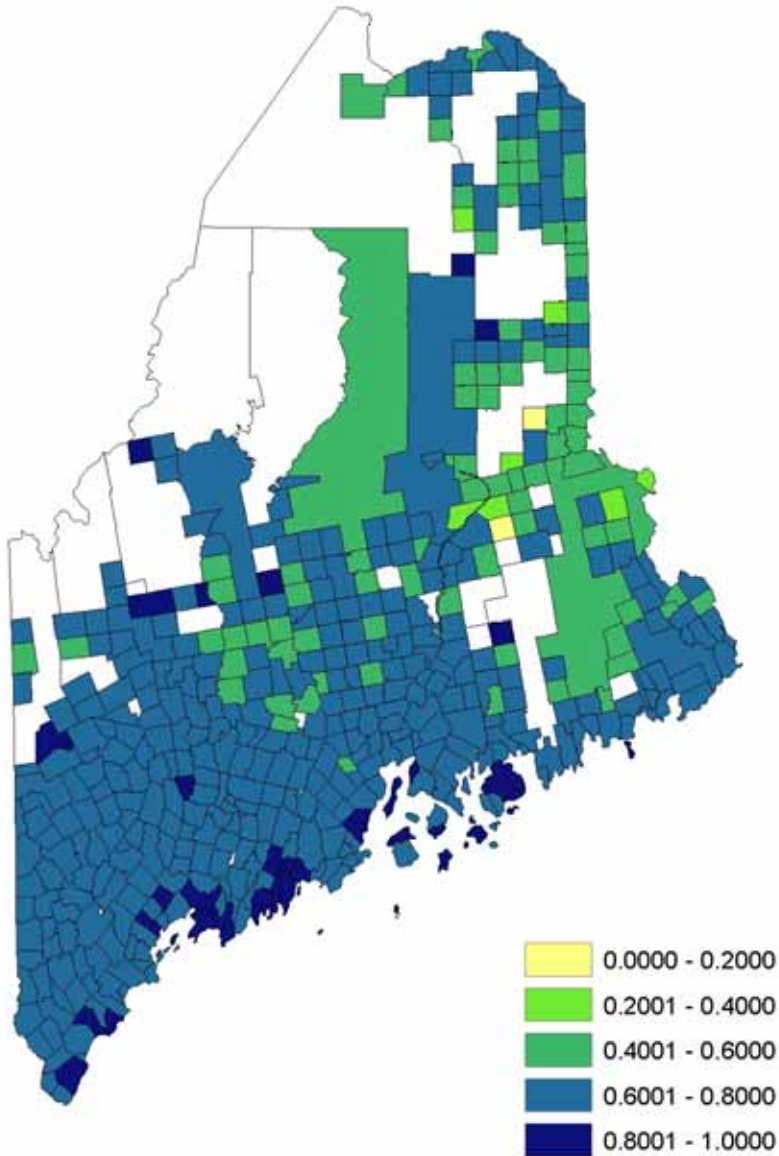
is an important part of the **quality of life for people everywhere**: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognised as being of outstanding beauty as well as everyday areas ;

is a **key element of individual and social well-being** and its protection, management and planning entail rights and responsibilities for everyone

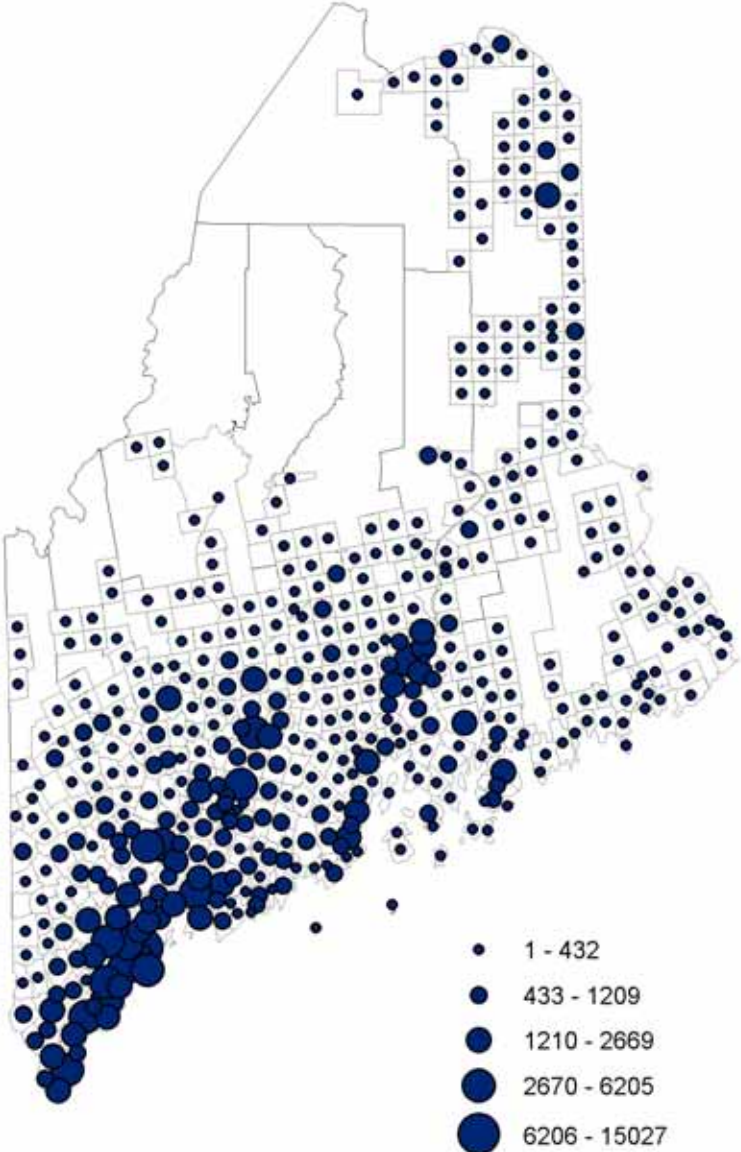
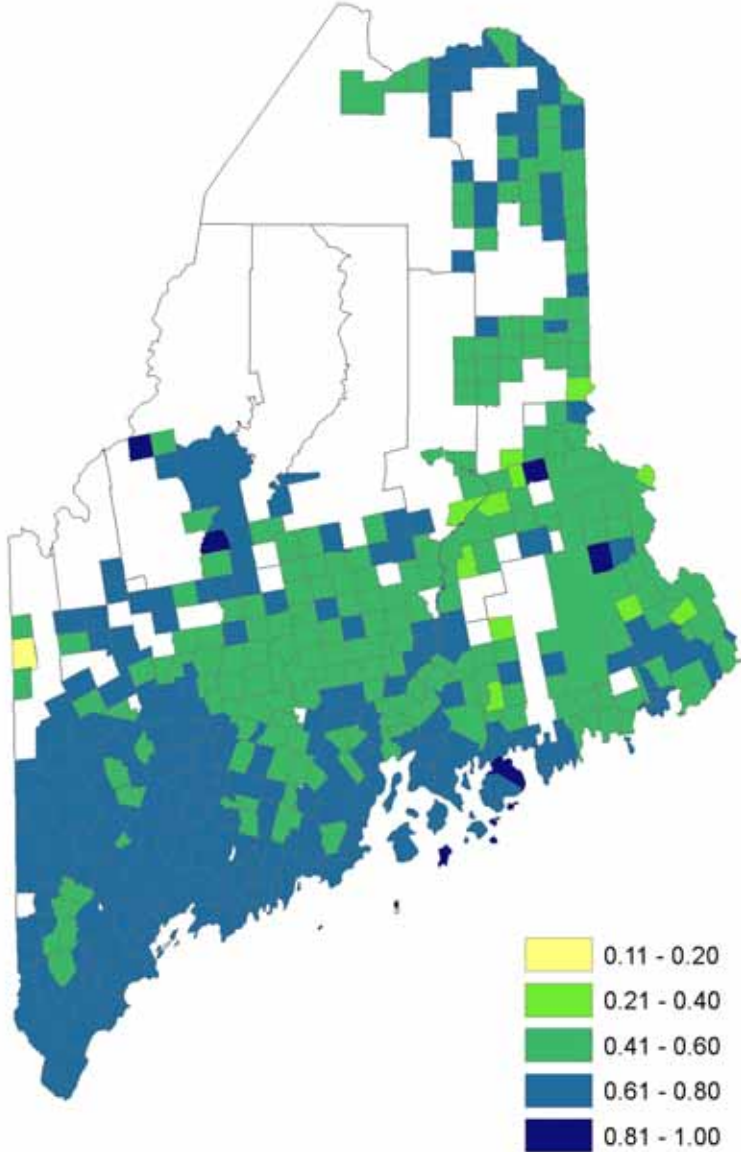
Maine Case Study

- **Empirical analysis of voting results on 2 public programs**
 - Working Waterfront
 - Land for Maine's Future
- **Community-scale analysis (n=495)**

Working Waterfront (2005) – YES votes by community (proportional and absolute)



Land for Maine's Future (2005) – YES votes by community (proportional and absolute)



Related Literature – Economics of Voting Behavior and Natural Resources

- **Single ballot initiative(s) within a defined region**
 - Deacon and Shapiro (1975); Kline and Wichelns (1994); Romer and Rosenthal (1982); Rothstein (1994); Kahn and Matsusaka (1997); Kline (2001); Vossler et al. (2003); Solecki et al. (2004); Schlapfer et al. (2004); Schlapfer and Hanely (2006)
- **Multiple and distinct ballot initiatives across regions**
 - Bell and Irwin (2001); Kotchen and Powers (2006); Banzhaf et al. (2006)

Theoretical Framework (Deacon and Shapiro (1975); Schlapfer and Hanley (2006))

- Individual ($V^i_1 > V^i_0$)

$$\underset{z^i}{Max} U^i(z^i, G_k, G_k^i) + \lambda(I_k^i - T_k^i - p_k z^i) = V_k^i(G_k, G_k^i, p_k, I_k^i - T_k^i)$$

Heterogeneity in Voter Support

- ΔI_i – costs /losses in income
- ΔG_i – “accessible” benefits
- Hypothesis - both changes can be linked with landscape attributes
 - human
 - physical

Data Sources

- **2005 Election Results**
 - Maine Bureau of Corporations, Elections, and Commissions
- **Human Landscape**
 - US Census of Population and Housing (1990, 2000)
 - InforME (ME DIFW)
 - Maine Audubon
- **Physical Landscape Characteristics**
 - Land cover (NLCD; 1992 and 2001)
 - Conservation Lands (Maine OGIS)

Empirical Model

- **Proportion of "YES" voters in a community is a function of:**
 - **human landscape characteristics**
 - **population density (LNPOPDEN)**
 - **distance to Portland (LNPORT)**
 - **median income (LNMEDINC)**
 - **republican voting (REPUB)**
 - **hunting and fishing and boating licenses (HFISH and BOAT)**
 - **wildlife organization membership (AUDUB)**
 - **agriculture, forest, and fishing employment (NREMP and CHNREMP)**

Empirical Model (continued)

- **physical landscape characteristics**
 - **Working Waterfront**
 - distance to the coast (LNDCOAST)
 - coastal median housing value (CMEDVAL)
 - **Land for Maine's Future (LMF)**
 - distance to conservation land (LNDCLAND)
 - proportion of agricultural cover (AG_PR, AG_C)
 - proportion of forest cover (FOR_PR, FOR_C)
 - changes from 1992 to 2001 (CHAG; CHFOR)

Results – Support for Working Waterfront Program

- **Positive, significant relationship**
 - Median income
 - Median housing value (coastal)
 - Audubon membership
 - Distance to Portland
- **Negative, significant relationship**
 - Distance to the coastline
 - Natural resource employment
 - Change in natural resource employment
 - Republican

Results – Support for Land for Maine's Future Program

- **Positive, significant relationship**
 - **Median income**
 - **Conserved forest cover**
 - **Reduction in agricultural and forest cover**
 - **Audubon membership**
 - **Natural resource employment**

Results – Support for Land for Maine's Future Program

- **Negative, significant relationship**
 - **Agricultural land cover**
 - **Distance from conservation land**
 - **Distance from Portland**
 - **Republican**
 - **Hunting and fishing licenses**

Summary of Findings

- **Landscape Attributes**

- **Human**

- **Median income**
 - **Audubon membership**
 - **Republican**

- **Physical**

- **Distance-decay (coast; conservation land)**

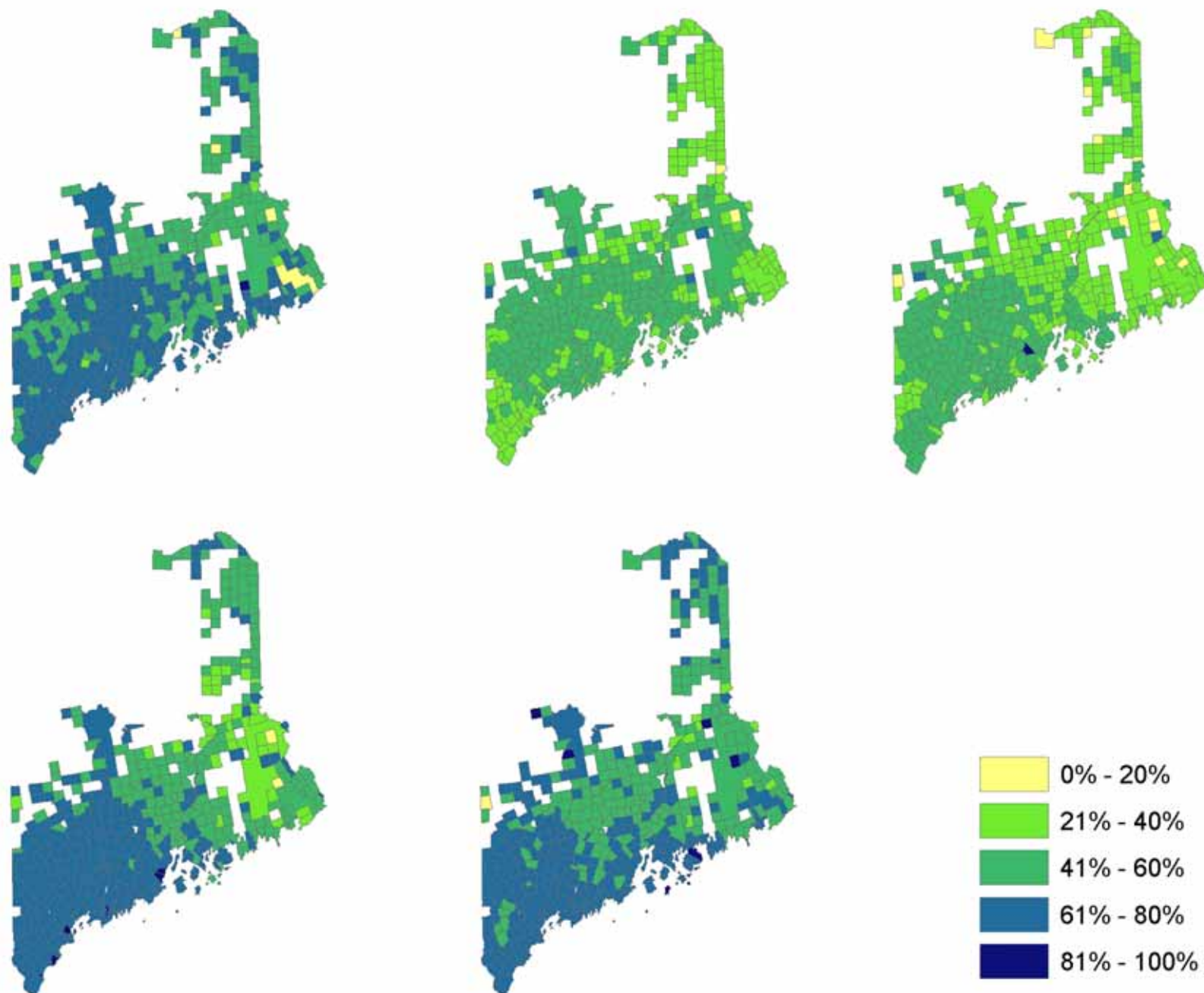
Issues and Future Work

- **Econometrics**
 - Heteroskedasticity
 - Spatial dependence – error terms
- **Endogeneity**
 - Sorting over space
- **Opportunities for comparative, transatlantic research**

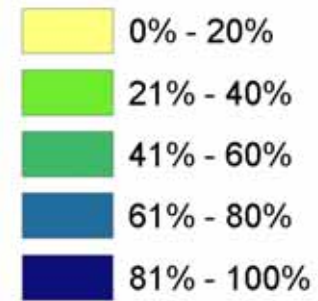
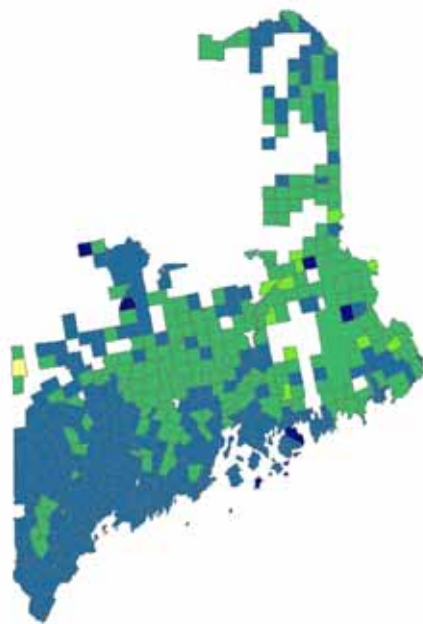
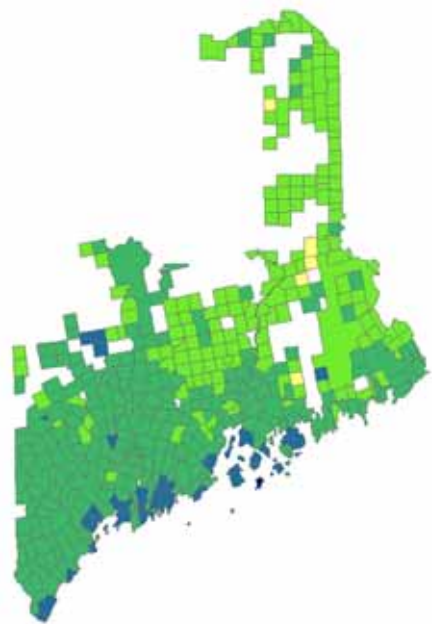
Variable	Mean	Standard Deviation
PYES_WWF	0.6764	0.0979
PYES_LMF	0.6074	0.0977
LNPOPDEN	3.3564	1.5431
LNPORT	11.6951	0.9997
AUDUB	0.4898	0.7703
HFISH	37.0113	25.8315
BOAT	12.7568	14.9438
RE PUB	49.1961	10.5826
LN MED INC	3.5148	0.2475
NREMP	6.7664	8.0994
CHNREMP	21.3740	71.4612
CMEDVAL	0.8180	1.8046

Variable	Mean	Standard Deviation
LNDCOAST	7.6150	4.9480
LNCLAND	7.8070	1.6662
AG_PR	6.6293	7.9989
FOR_PR	65.0430	15.6229
AG_C	0.0360	0.1160
FOR_C	2.9955	7.2246
CHAG	1.4052	3.1584
CHFOR	6.0030	6.1721
NREMP*LNDCOAST	50.3483	75.1327
CHNREMP*LNDCOAST	133.4730	746.8076
AG_PR*NREMP	36.1153	77.9899
FOR_PR*NREMP	436.6333	531.4719

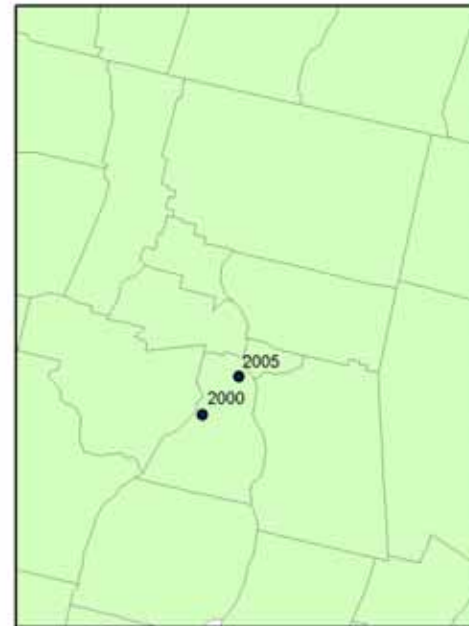
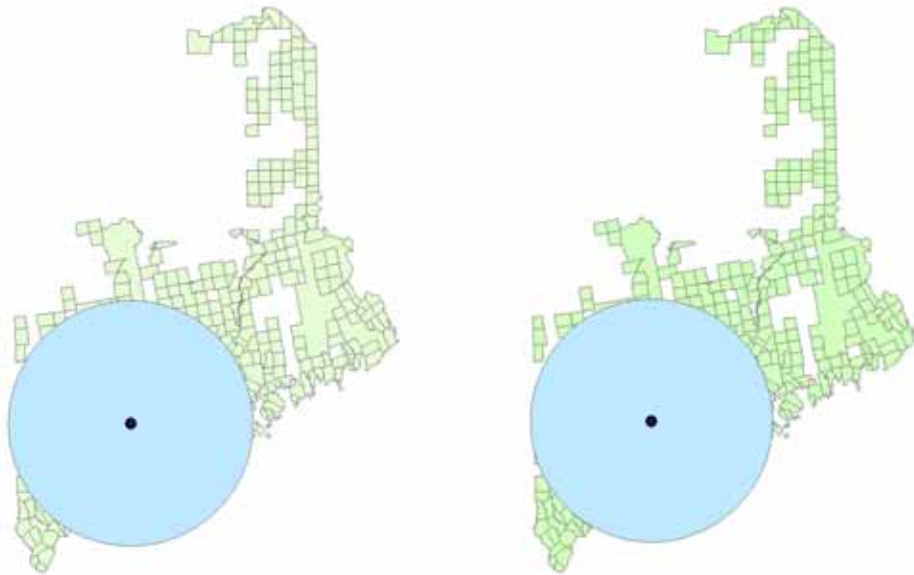
Land for Maine's Future



Working Waterfront

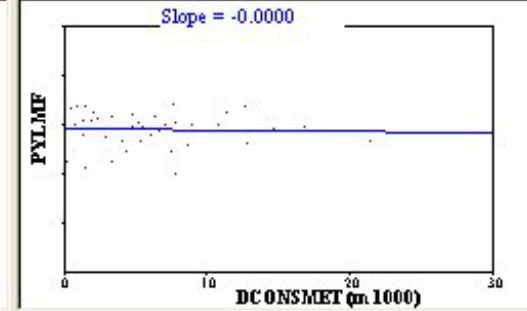
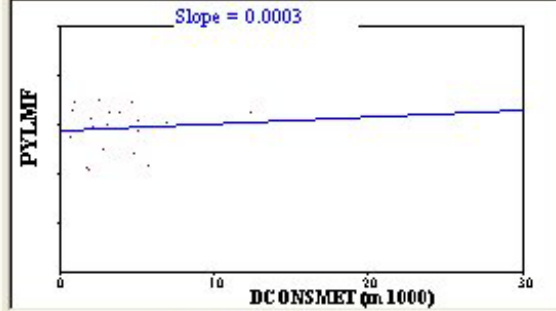
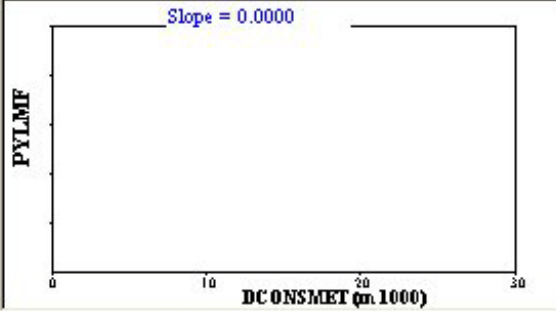


Working Waterfront

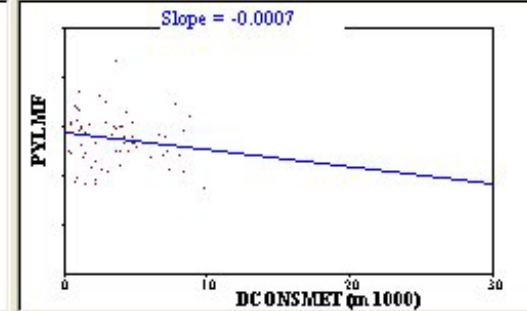
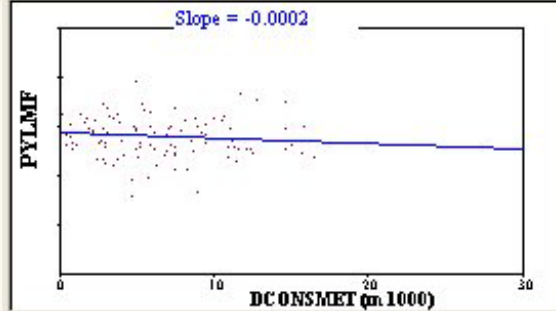
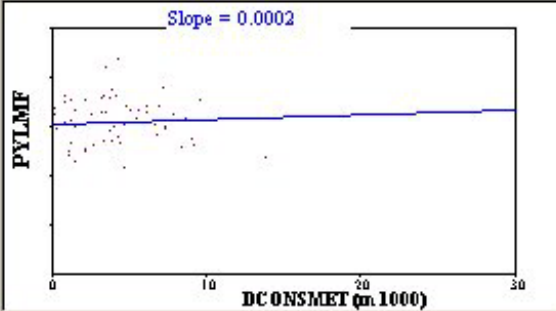


LMF (2005)

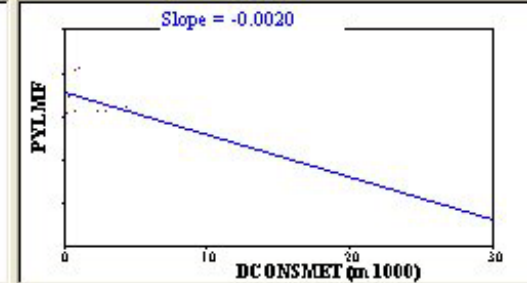
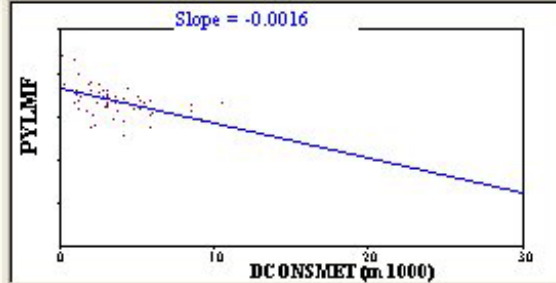
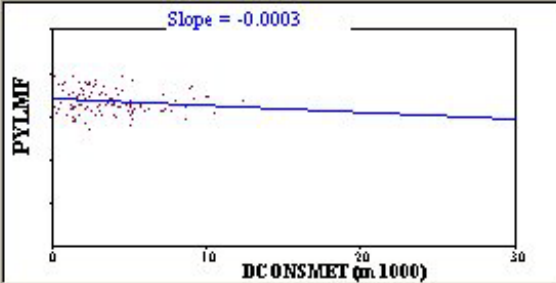
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YCOO

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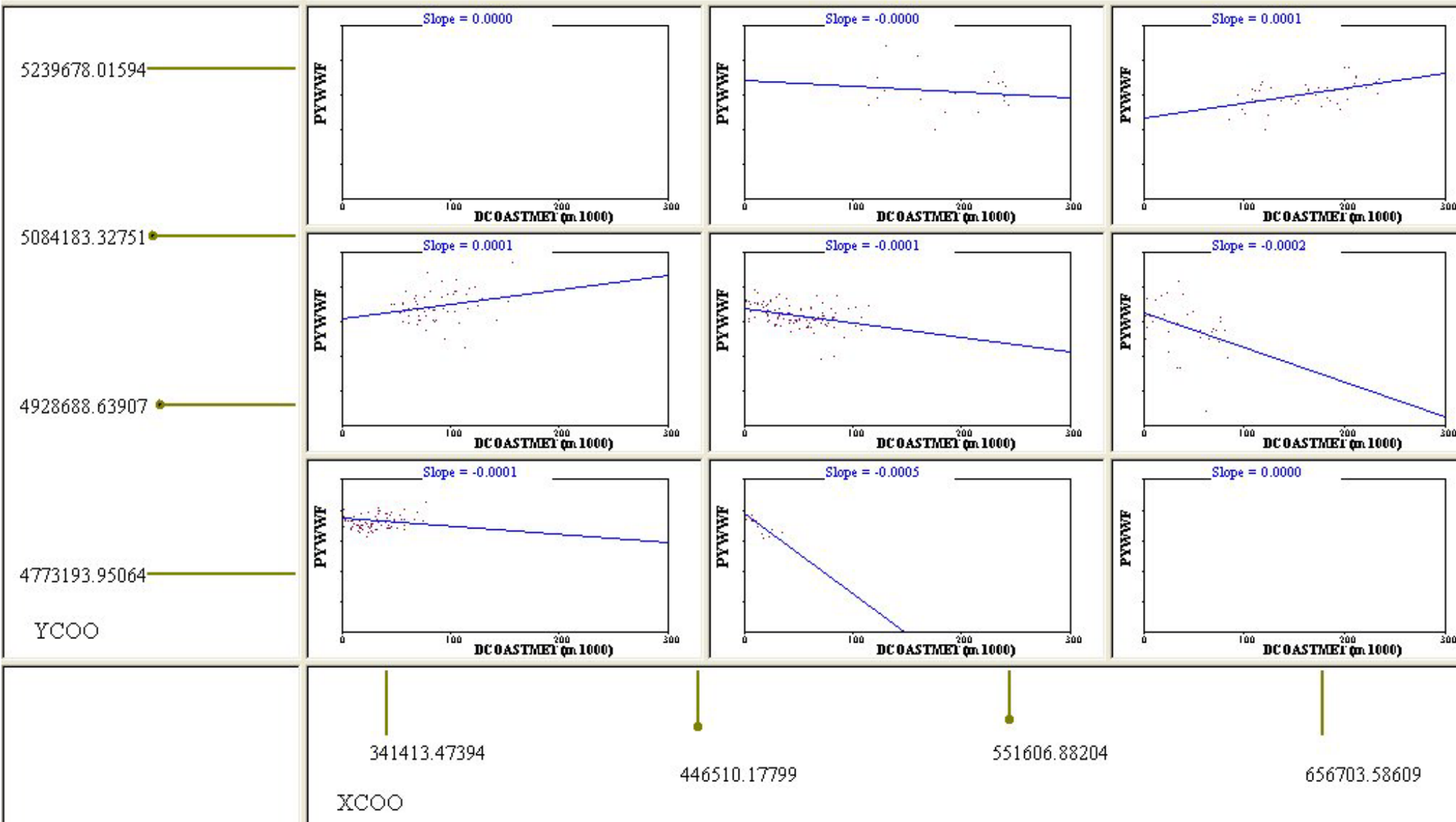
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Working Waterfront



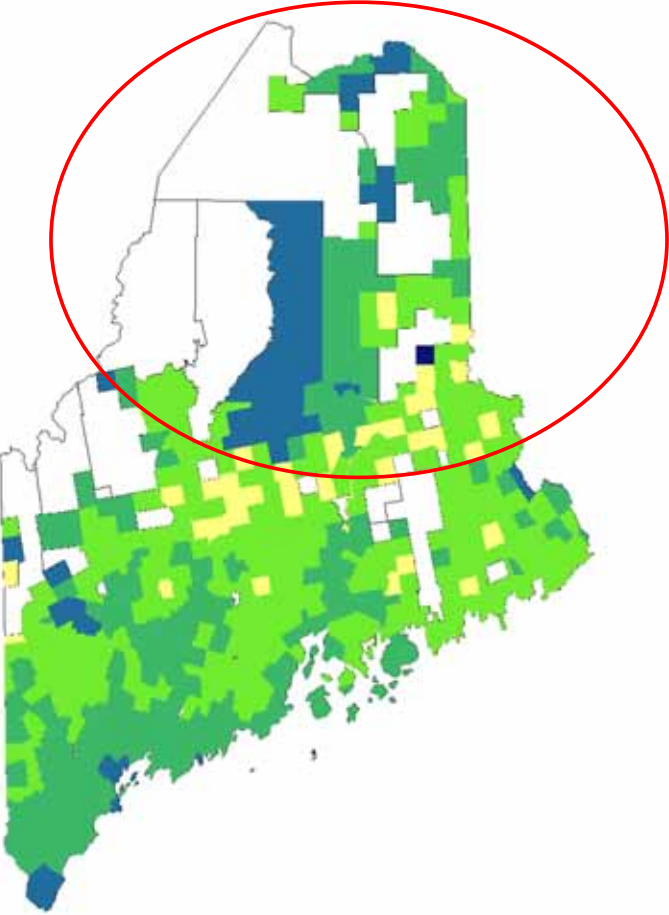
Current Use Taxation

- **2005 Working Waterfront - Constitutional Amendment**
 - **Do you favor amending the Constitution of Maine to permit the Legislature to authorize waterfront land used for commercial fishing activities to be assessed based on the land's current use in a manner similar to treatment now available for farms, open space and forestland? (276,116 YES (72% of voters))**

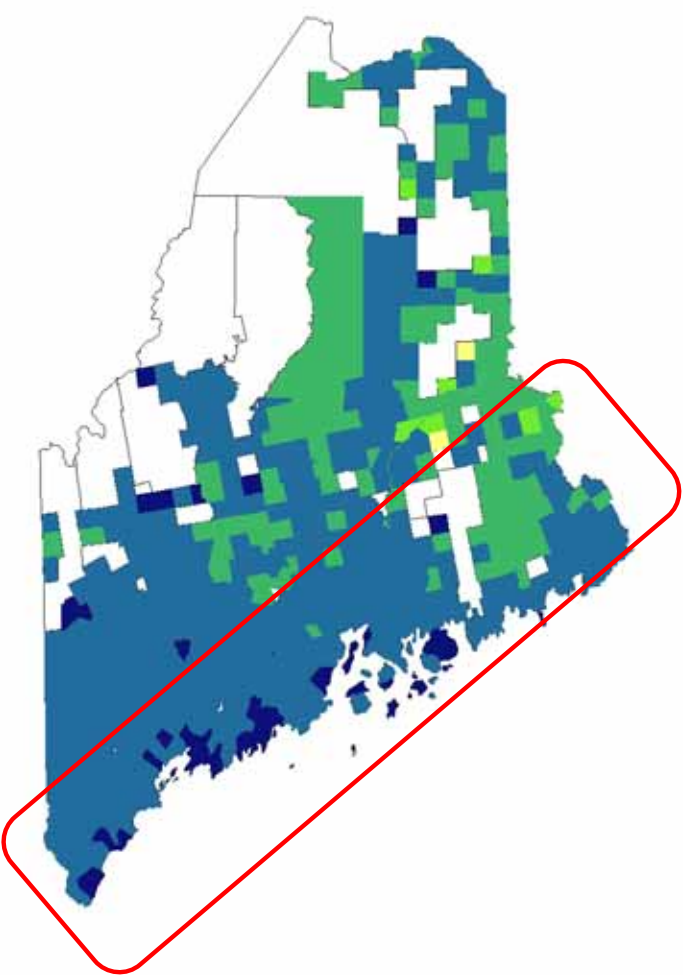
Land for Maine's Future

- **2005 LMF Bond Initiative**
 - **Do you favor a \$12,000,000 bond issue to purchase land and conservation easements statewide from willing sellers for conservation, water access, wildlife and fish habitat, outdoor recreation, including hunting and fishing, farmland preservation and working waterfront preservation to be matched by at least \$7,000,000 in private and public contributions? (259, 475 YES (65% of voters))**

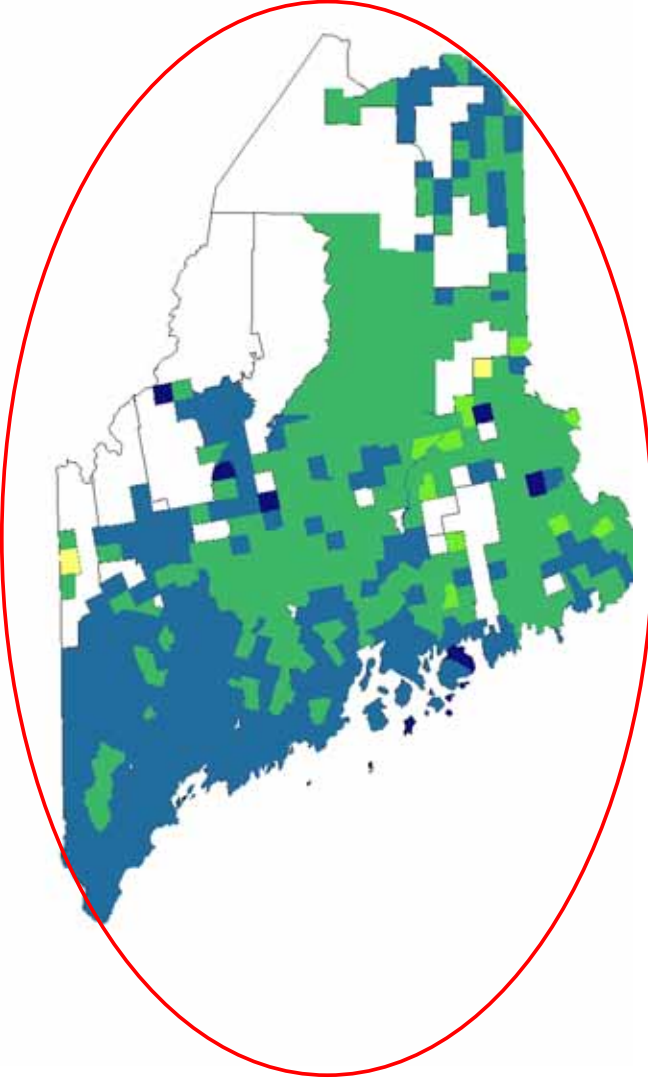
**Forest Compact
(1997)**



**Working Waterfront
(2005)**



**Land for Maine's Future
(2005)**



Empirical Estimation - ML

$$\ln L = \sum_{i=1}^n n_i \{P_i \ln F(x_i' \beta) + (1 - P_i) \ln[1 - F(x_i' \beta)]\}$$

Working Waterfront

	Estimate	Pr > ChiSq	Estimate	Pr > ChiSq
Intercept	-0.6427	<0.0001	-0.5945	<0.0001
LNDCOAST	-0.0171	<0.0001	-0.0103	<0.0001
LNPOPDEN	0.00562	0.2525	-0.00754	0.1395
LNPORT	0.0136	<0.0001	0.0062	0.0016
LNMEDINC	0.5523	<0.0001	0.5707	<0.0001
CMEDVAL	0.0108	<0.0001	0.0130	<0.0001
NREMP	-0.0008	0.6020	0.0111	<0.0001
CHNREMP	-0.0003	0.0007	-0.0010	<0.0001
REPUB	-0.0128	<0.0001	-0.0120	<0.0001
BOAT	0.00351	<0.0001	0.0004	0.6443
AUDUB	0.0626	<0.0001	0.0681	<0.0001
LNDCOAST*CHNREMP			0.0007	<0.0001
LNDCOAST*NREMP			-0.0029	<0.0001

LMF

		Pr >		Pr >
	Estimate	ChiSq	Estimate	ChiSq
Intercept	-0.1883	0.0289	-0.1805	0.0385
AG_PR	-0.0029	<0.0001	-0.0034	<0.0001
FOR_PR	-0.0002	0.6021	0.0006	0.1947
AG_C	-0.1241	0.0148	-0.1161	<0.0001
FOR_C	0.0080	<0.0001	0.0079	<0.0001
CHAG	0.0069	<0.0001	0.0061	<0.0001
CHFOR	0.0044	<0.0001	0.0037	<0.0001
LNDCLAND	-0.0082	0.0037	-0.0072	0.0114
LNPOPDEN	-0.0093	0.1156	-0.0064	0.2924
LNPORT	-0.0033	0.1039	-0.0054	0.0113
LNMEDINC	0.5182	<0.0001	0.5045	<0.0001

LMF - continued

		Pr >		Pr >
	Estimate	ChiSq	Estimate	ChiSq
NREMP	0.0041	0.0036	0.0167	<0.0001
CHNREMP	0.0001	0.0811	0.0001	0.1735
REPUB	-0.0195	<0.0001	-0.0194	<0.0001
HFISH	-0.0044	<0.0001	-0.0043	<0.0001
AUDUB	0.0386	<0.0001	0.0389	<0.0001
AG_PR*NREMP			0.00007	0.5822
FOR_PR*NREMP			-0.0002	<0.0001
