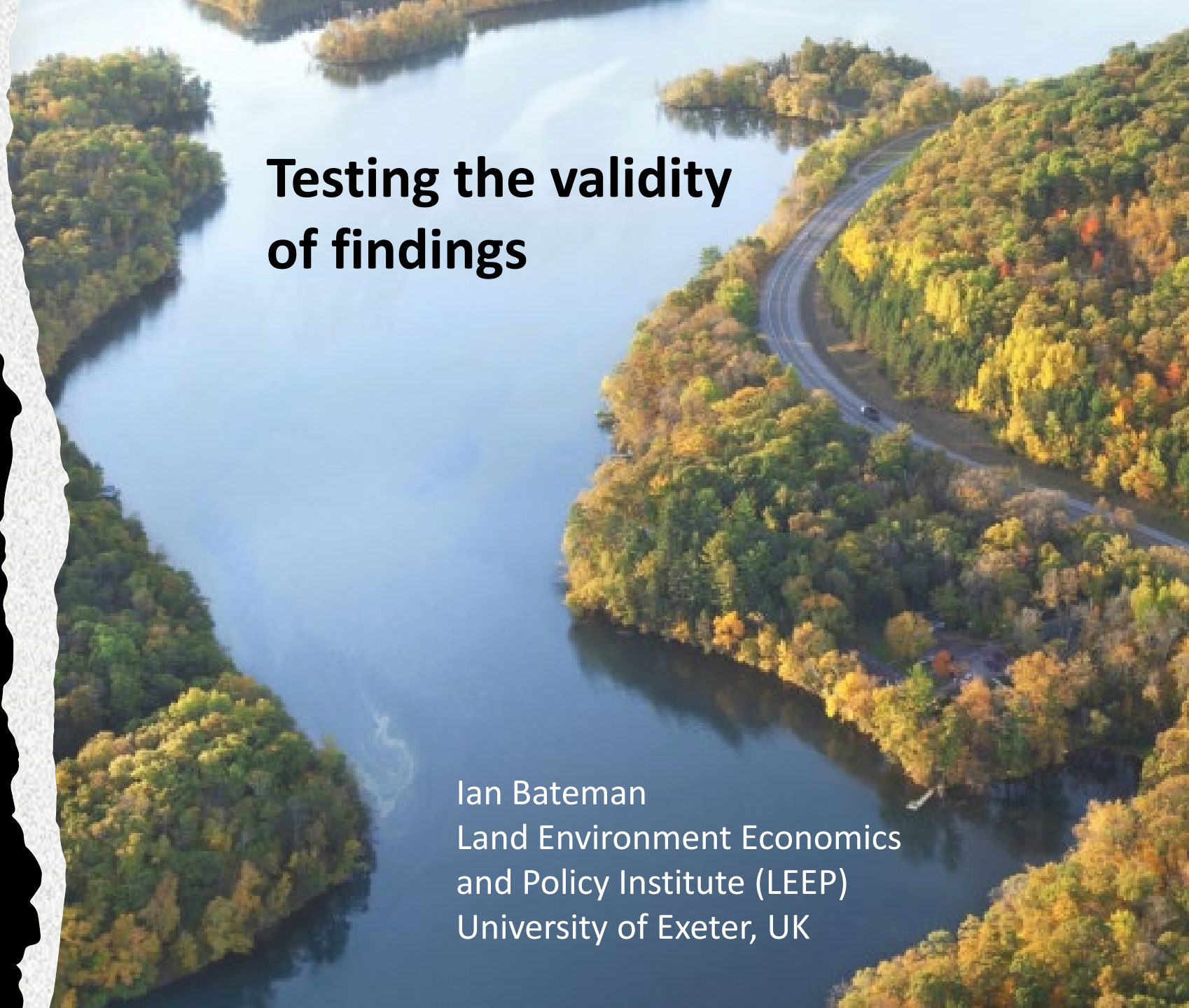
Queen Elizabeth II

1926 - 2022

50th Anniversary of the Clean Water Act:

The Role of Environmental Economics in Improving Regulatory Analysis

Hall of the States
Washington, D.C.
September 7-9, 2022



Testing the validity of findings

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Validity analysis:

Testing for expected relationships

Table S3: Model results comparing 2- and 3-Index with and without demographics.

Variables	(1) 2-Index Linear	(2) 3-Index Linear	(3) 2-Index w/ Demographics	(4) 3-Index w/ Demographics
Cost	-0.0014***	-0.0017***	-0.0015***	-0.0017***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔWLS	0.0320***	0.0148**	0.0315***	0.0143**
	(0.007)	(0.007)	(0.007)	(0.007)
Δ*WQI*	0.0374***		0.0400***	
	(0.012)		(0.012)	
Δ*WCS*		0.0537***		0.0545***
		(0.009)		(0.009)
Δ*FBS*		0.0184***		0.0191***
		(0.007)		(0.007)
Constant	0.4787***	0.3947***	-0.7505***	-0.0572
	(0.143)	(0.144)	(0.287)	(0.278)
Income (thousands)			0.0065***	0.0042**
			(0.002)	(0.002)
male			0.0136	-0.1706
			(0.175)	(0.168)
college			0.4318**	0.1809
			(0.190)	(0.178)
job			0.3577**	0.2247
			(0.152)	(0.151)
Adults#			0.1594*	-0.004
			(0.091)	(0.090)
Fish license			0.2475	0.1723
			(0.196)	(0.187)
N	861	857	861	857
LogL	-545.024	-539.291	-523.3	-531.589
# of vars.	4	5	10	11
chi2	64.357	83.434	107.805	98.839
p-value	<0.000	<0.000	<0.000	<0.000
AIC	1098.049	1088.582	1066.601	1085.178
BIC	1117.081	1112.35	1114.182	1137.466

Note: ***, ** and * are 1%, 5% and 10* significance levels. Standard errors in parentheses.

Source: Frank Lupi, Joseph A. Herriges, Hyunjung Kim and R. Jan Stevenson "Getting off the Ladder: Disentangling Water Quality Indices to Enhance the Valuation of Divergent Ecosystem Services"

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Table 33: Model results comparing 2- and 3-Index with and without demographics.

Variables	(1) 2-Index Linear	(2) 3-Index Linear	(3) 2-Index w/ Demographics	(4) 3-Index w/ Demographics
Cost	-0.0014***	-0.0017***	-0.0015***	-0.0017***
	(0.000)	(0.000)	(0.000)	(0.000)
△ Wildlife score	0.0320***	0.0148**	0.0315***	0.0143**
	(0.007)	(0.007)	(0.007)	(0.007)
△ Water quality index	0.0374***		0.0400***	
	(0.012)		(0.012)	
△ Water contact score		0.0537***		0.0545***
		(0.009)		(0.009)
△ Fish biomass score		0.0184***		0.0191***
		(0.007)		(0.007)
Income (thousands)			0.0065***	0.0042**
			(0.002)	(0.002)

Note: ***, ** and * are 1%, 5% and 10* significance levels. Standard errors in parentheses.

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on the Ladder: Disentangling Water Quality Indices to Enhance the Valuation of Divergent Ecosystem Services" Source: Lupi et al.

Variables	(1) 2-Index Linear	(2) 3-Index Linear	(3) 2-Index w/ Demographics	(4) 3-Index w/ Demographics
Cost	-0.0014***	-0.0017***	-0.0015***	-0.0017***
	(0.000)	(0.000)	(0.000)	(0.000)
△ Wildlife score	0.0320***	0.0148**	0.0315***	0.0143**
	(0.007)	(0.007)	(0.007)	(0.007)
△ Water quality index	0.0374***		0.0400***	
	(0.012)		(0.012)	
△ Water contact score		0.0537***		0.0545***
		(0.009)		(0.009)
△ Fish biomass score		0.0184***		0.0191***
		(0.007)		(0.007)
Income (thousands)			0.0065***	0.0042**
			(0.002)	(0.002)

Source: Lupi et al.

Spatial distribution of willingness to pay for a water quality improvement in a single watershed

($ per household, annual payment for five years)

Variation in WTP across five States for a water quality improvement in this single watershed

"Estimates range from $295 for out of state and non-locally affected households to over $600 for largely in-state, locally impacted households."

Source:

Christian A. Vossler, Christine L. Dolph , Jacques C. Finlay, David A. Keiser, Catherine L. Kling and Daniel Phaneuf.

"Valuing improvements in ecological integrity in local and regional watersheds: the Biological Condition Gradient Ladder"

Testing the validity of findings

Summary

Tests reveal responsiveness to:

- **Water quality**
- **Costs**
- **Income**
- **Scope and distance decay**

Together these studies define a new high water mark for stated preference valuations