

Uncertainty and Precaution in Environmental Management

Selected Proceedings of the International Symposium on Uncertainty and
Precaution in Environmental Management (UPEM), held in Copenhagen,
Denmark, 7-9 June 2004

Issue editors: M Kraye von Krauss and M Henze

Institute of Environment & Resources, Technical University of Denmark, Bygningstorvet, B115,
DK-2800 Kgs. Lyngby, Denmark

*These proceedings are dedicated to the memory of Professor Paul Harremoes,
who planned the UPEM conference but died before it took place.*



Publishing

Contents

vii	Foreword	
1	Uncertainty and precaution in environmental management	M. Kraye von Krauss, M.B.A. van Asselt, M. Henze, J. Ravetz and M.B. Beck
11	The post-normal sciences of precaution	J. Ravetz
19	Precaution, law and principles of good administration	E. Fisher
25	Late lessons from early warnings: towards precaution and realism in research and policy	D. Gee and M.P. Kraye von Krauss
35	The precautionary principle in times of intermingled uncertainty and risk: some regulatory complexities	M.B.A. van Asselt and E. Vos
43	Globalisation, environmental harm and progress: the role of consensus and liability	H. Zandvoort
51	Recent development in the field of international liability regimes to tackle environmental risks	J. Bally
59	The precautionary principle and international conflict over domestic regulation: mitigating uncertainty and improving adaptive capacity	K.A. Oye
65	Precautionary information-generation in science and the law	C. Cranor
73	Reflections on uncertainty in risk assessment and risk management by the Society of Environmental Toxicology and Chemistry (SETAC) precautionary principle workgroup	H. Sanderson, C.H. Stahl, R. Irwin and M.D. Rogers
81	The optimisation approach of ALARA in nuclear practice: an early application of the Precautionary Principle. Scientific uncertainty versus legal uncertainty	S. Lierman and L. Veuchelen
87	Uncertainty as a monster in the science-policy interface: four coping strategies	Jeroen van der Sluijs
93	Management of environmental uncertainty in maintenance dredging of polluted harbours in Norway	S. Canellas-Bolta, R. Strand and B. Killie
99	Stretched peer-review on unexpected results (GMOs)	Anne Ingeborg Myhr
107	Precaution and Participatory Integrated Assessment of GM crops in Spain	J. David Tabara
115	Integrated management of natural resources: dealing with ambiguous issues, multiple actors and diverging frames	A. Dewulf, M. Craps, R. Bouwen, T. Taillieu and C. Pahl-Wostl
125	A guidance for assessing and communicating uncertainties	P.H.M. Janssen, A.C. Petersen, J.P. van der Sluijs, J.S. Risbey and J.R. Ravetz
135	Experiences with the NUSAP system for multidimensional uncertainty assessment	J. van der Sluijs, M. Craye, S. Funtowicz, P. Klopogge, J. Ravetz and J. Risbey
145	Using the W&H integrated uncertainty analysis framework with non-initiated experts	M.P. Kraye von Krauss and P.H.M. Janssen
153	An integrated methodology for recording uncertainties about environmental data	J.D. Brown, G.B. Heuvelink and J.C. Refsgaard
161	Sources of uncertainty in economic analysis of the Water Framework Directive	J. Mysiak, K. Sigel
167	On the concept of model structural error	K. Beven

- 177 Model uncertainty - parameter uncertainty versus conceptual models**
A.L. Hajberg and J.C. Refsgaard
- 187 Impact of morphological parameters on water quality variables of a regulated lowland river** K.-E. Lindenschmidt, K. Poser and M. Rode
- 195 The case of Lake Balaton: how can we exercise precaution?** L. Somlyódy and M. Honti
- 205 Carbon sequestration, the precautionary approach and the responsibility of scientists** L. Buhi-Mortensen, A. Myhr and S. Welin
- 213 Uncertainty, imprecision and the precautionary principle in climate change assessment** M.E. Borsuk and L. Tomassini
- 227 Uncertainty and precaution in European environmental risk assessment of chemicals** F.A.M. Verdonck, P.A. Van Sprang and P.A. Vanrolleghem
- 235 Resources and uncertainties in evaluation of chemicals: basic methodological developments** P.B. Sørensen, D.B. Lerche and R. Briiggemann