



Collaboration for
Environmental
Evidence

ANNUAL REPORT 2011

*A Global Community for
Evidence Synthesis*

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CONTENTS

Highlights	4
Environmental Evidence Journal	5
Systematic Reviews in Progress	6
A Growing Collaboration	12
- CEE Centres	13
- Call for Trustees	14
- Training & mentoring	15
- Systematic Map Methods Group	16
- Review Groups	17
More about the Collaboration	18
Acknowledgements	19

To access the systematic reviews cited in this report, go to www.environmentalevidence.org and add the review reference, for example /SR10002.html (also cited as CEE 10-002)

HIGHLIGHTS

This was a year of key developments both in the function and reputation of CEE. Amongst other achievements we took a significant step forward in dissemination of CEE systematic reviews. In partnership with BioMed Central, CEE has created an open-access journal to publish CEE systematic reviews and protocols as well as methodological papers (see page 5). It is vitally important that CEE provides a system for publication that supports review teams and forms a focus for the development of an evidence-based approach to environmental management. We think it likely that the journal will achieve high impact.

Organisations seeking evidence to inform their decision making are increasingly turning to CEE to help with the commissioning and conduct of systematic reviews. This year saw another call for systematic reviews by the UK Department for International Development, working alongside AusAID and 3ie. This interdisciplinary call acknowledged the need for systematic review standards appropriate to the subject area and recognised CEE as providing those standards for environmental management alongside the Cochrane Collaboration for health and the Campbell Collaboration for social welfare and education.

CEE systematic reviews are now prominent in some large research projects. This year saw the start of the EU-funded project VECTORS which brings together a consortium of marine scientists in a multidisciplinary large scale integrated European project which aims to improve our understanding of how environmental and man-made factors are impacting on our marine ecosystems. This demonstrates that systematic reviews can form a significant component of research applications and the rigorous approach to establishing the evidence base may be looked upon favourably by funders in the future.

Demand from environmental managers for training in systematic review methodology increased during 2011. Currently 'CEE endorsed' courses, which deliver training to CEE guidelines and standards, are being delivered by one UK-based provider but interest from others suggests that 2012 will see expansion of the availability of training opportunities globally.

The on-going development of systematic review methodology is a focus of CEE and in 2011 our first formal systematic map was accepted for inclusion in the CEE library. This marks an important development in methodology and diversification of CEE products. Systematic maps are important precursors of systematic reviews and will help decision makers and research funders prioritise future efforts toward both evidence synthesis and primary research.

Already, 2012 looks set to be another busy year and we look forward to increasing collaboration on evidence synthesis across our global community.

The CEE Trustees.

ENVIRONMENTAL EVIDENCE JOURNAL



Environmental Evidence is a new journal that will publish CEE systematic reviews and their protocols. It will also publish papers that contribute to the development of systematic review methodology, in its broadest sense, from identifying evidence needs to disseminating and communicating results to decision makers and the general public.

Up to 2011 CEE systematic reviews and protocols have been included in the CEE open-access Library but not formally published. The CEE Library will remain as an archive and we are considering developing a more interactive format to encourage comments and responses on systematic reviews as well as innovative communications of evidence.

We are very pleased to have formed a partnership with BioMed Central, a publisher at the forefront of open-access publishing and with experience in publishing systematic reviews in other disciplines. CEE has brought together a world class Editorial Board to oversee the journal's development. All have either an international reputation for evidence synthesis and/or have direct experience of conducting systematic reviews.

Publication of systematic review protocols is important to provide transparency of the review process and outcomes, in particular to ensure against selective outcome reporting bias and to allow identification of where methodology differs between that planned in the protocol and that reported in the review. Publication of protocols is therefore an important aspect of quality assurance of systematic reviews. CEE has always required that systematic review protocols be subject to peer-review and posting on the CEE website for open consultation and systematic reviews have not been accepted into the CEE Library unless a finalised protocol has been accepted. The importance of prospective registration of systematic reviews has recently been recognised by the healthcare community which has established a database for the prospective registration of systematic reviews of health and healthcare interventions (<http://www.crd.york.ac.uk/prospero/>).



SYSTEMATIC REVIEWS IN PROGRESS

What is a Systematic Review?

It is a 'review' because:

- it compiles existing findings from the primary scientific literature and grey literature (reports, theses...), in order to produce a synthesis of the current knowledge on a specific issue.
- it summarises and draws conclusions from a body of evidence allowing identification of knowledge gaps or methodological problems and thus informs future decisions in terms of research priorities, policy or management practices.

It is 'systematic' because:

- it follows a pre-defined methodology for the review process (set out in a 'protocol') that minimizes susceptibility to bias (e.g. publication bias or selection bias).
- it follows a pre-defined search strategy that attempts to identify all available evidence.
- it follows pre-defined inclusion criteria so that decisions on relevance and validity of evidence are transparent and repeatable.
- the conclusions of the review are informed and moderated by a systematic critical appraisal of the reliability of the designs of the primary studies included in the review.
- where possible, an objective statistical weighting of studies is utilised in a quantitative synthesis to derive a combined effect size or measure of impact.

Are systematic reviews in environmental management different from other systematic reviews?

Systematic reviews form the basis of decision-making in the Health sector and are also used to inform Social Care and Education. Whether using research from clinical trials, social science or field studies, systematic reviews face challenges particular to the type of primary research methods being used, or the nature of the subject, intervention, outcomes or context. Systematic reviews in environmental management face specific challenges as the number of factors affecting an observation or measurement can be large, especially in field studies. Randomised Controlled Trials, considered a 'gold-standard' in healthcare research of effectiveness of interventions, are not often conducted in environmental research. As a consequence, systematic reviews in environmental management face specific challenges related to the reliability of data and the variability of results. The critical appraisal stage of systematic review is therefore very important. Synthesis of data from studies with very different study designs, measurement tools and outcomes, can be challenging. CEE Methods Groups aim to develop CEE systematic review methodology in order to meet some of these challenges. If you are interested in contributing to methodology development then contact us via info@environmentalevidence.org.

What is the evidence about glacier melt across the Himalayas?

(Miller et al. CEE 10-008)

This systematic review aimed to provide greater transparency and objectivity in interpretation of the evidence for glacier shrinkage across the Himalayas than has hitherto been the case. Following a comprehensive search of the literature, 52 studies were included in the review which describes the predominant pattern observed, the extent of inter-annual variation which can exist and explores regional variation. The review highlights the immediate need for systematic measurement and reporting of glacial change.

[SR10008.html](#)

The UK Department for International Development (www.dfid.gov.uk) continues its policy of commissioning many systematic reviews each year. The questions addressed by a small proportion of them lie at the interface between environment and human wellbeing and fall under the scope of CEE and its guidelines. In 2011, DFID and funding partners asked the CEE to oversee the conduct of four systematic reviews (see next page), 'mentoring' the review teams from the beginning of the process, with the aim of ensuring that the reviews met the best possible standards. This has proven to be a fruitful collaboration.

Two reviews commissioned by DFID in 2010 have also reached completion and their main results are reported here.

What is the evidence that scarcity and shocks in freshwater resources and cause conflict instead of promoting collaboration?

(Johnson et al. CEE 10-010)

The large and diverse literature on this topic has been organised into a systematic map. Research into the impact of freshwater scarcity and conflict/collaboration is growing, however, there is little consensus on the impact of scarcity on social interactions at multiple levels and this is true across all three spatial scales examined (interstate, national-level, micro-level). The research in this field is still at the formative stage, and is limited by data availability, confusing definition of some terms, and heterogeneity of research designs. Recommendations are provided for ideal research designs and future topics for research.

[SR10010.html](#)

What are the major barriers to increased use of modern energy services among the world's poorest people and are interventions to overcome these effective?

(Watson et al. CEE 11-004)

A lack of access to modern energy services among the world's poor is widely recognised to have negative impacts on their health, education and quality of life, further deepening and entrenching their poverty. This review "neutrally collects, critically appraises and synthesises" the evidence on barriers to the use of modern energy services among the world's poorest people, and interventions to remove those barriers.

[SR11004.html](#)

What factors determine the performance of institutional mechanisms for water resources management in developing countries in terms of delivering pro-poor outcomes, and supporting sustainable economic growth?

(Hepworth et al. CEE 11-006)

This review aims to provide a systematic map of the available evidence on water resource management institutions, and to objectively appraise the quality of the evidence base for a range of factors, their relative significance and the co-variables which determine their performance.

[SR11006.html](#)

Are interventions to reduce the impact of arsenic contamination of groundwater on human health and crop productivity in developing countries effective?

(Pearson CEE 11-005)

Chronic arsenic pollution is now recognised as a worldwide problem, with 21 countries experiencing arsenic groundwater contamination. This review addresses the effectiveness of interventions implemented in many developing countries to reduce the impact of arsenic contamination of groundwater on human health and crop productivity. It also examines what factors enable or constrain the use of these effective interventions.

[SR11005.html](#)

What is the impact of infrastructural investments in road, electricity and irrigation on agricultural productivity?

(Knox et al. CEE 11-007)

Investment in basic infrastructure needs such as suitable transportation (road and rail networks), affordable communications and reliable power generation are prerequisites for a successful agricultural driven economy. This review addresses the impact of rural road investments on access to agricultural markets by farmers, the impact on electricity supply on crop storage and processing, and the consequences of irrigation on crop diversity, yield, quality and resilience to drought.

[SR11007.html](#)

The Natural Environment Research Council (www.nerc.ac.uk) continues to fund CEE systematic reviews through its knowledge exchange programme. This year has seen systematic reviews conducted by the Centre for Evidence-Based Conservation (a CEE Centre) at Bangor University in partnership with the Environment Agency Wales, and by a consortium led by the Royal Botanic Gardens Edinburgh and including the Universities of Sheffield and Bangor. This latter project aims to synthesise evidence on conservation genetics and has a stakeholder group comprising a range of UK conservation organisations.

Is liming of streams and rivers an effective intervention for restoring water quality to support fish and invertebrate populations ?
(Mant et al. CEE 09-015)

This review shows that liming is generally correlated with an increase in fish abundance, but there is no evidence of changes in the number of fish species. Liming generally increases the abundance and taxonomic richness of acid sensitive invertebrates but effects are variable and for all invertebrate taxa combined liming may decrease abundance. There is a need for more studies with replication, control sites and better measurement of confounding factors.

[SR76.html](#)

What is the impact of 'liming' lakes on the abundance and diversity of lake biota? (Mant et al. CEE 11-003)

This review is complementary to the above, this time addressing the effect of liming on invertebrates, fish, diatoms and macrophytes in lakes.

[SR11003.html](#)

How do species' characteristics influence the cost of inbreeding?
(Whitlock et al. CEE 10-014)

This review is examining the relationships between species isolation and inbreeding, and further, by collecting data from a wide range of species, looking at the influence species' characteristics have on that fundamental relationship.

[SR10014.html](#)

How do species' characteristics and population size influence the effect of population isolation on genetic diversity?

(Whitlock et al. CEE 10-015)

This related review examines how the well established relationship between population isolation and genetic diversity is modified by species and population characteristics. The results of the synthesis should help practitioners predict when population isolation may lead to problems of inbreeding depression.

[SR10015.html](#)

The Scientific and Technical Advisory Panel of the Global Environment Facility has commissioned its second CEE systematic review to inform its global funding policy.

The UK Department of Environment, Food and Rural Affairs has commissioned a CEE systematic review to inform its research programme on peatland management.

**Human well-being impacts of terrestrial protected areas ?
(Pullin et al. CEE 11-009)**

Considering the significant proportion of global biodiversity funding that is devoted to PAs, the question of their impact on human wellbeing and the lessons to be learnt for future interventions, based on the best available evidence, is highly relevant for international governmental and non-governmental organisations. This review started in 2011 and will also address secondary questions such as “how are costs and benefits distributed among and within communities (by socio-economic status, gender, age etc)?” and “how do costs and benefits vary with governance, resource tenure arrangements and site characteristics?”

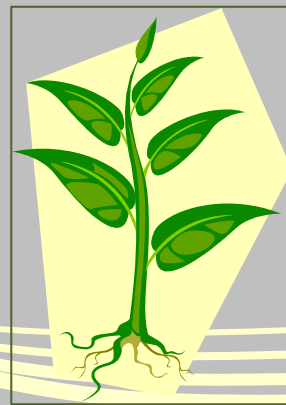
[SR11009.html](#)

**Evaluating effects of management on greenhouse gas fluxes and carbon balances in boreo-temperate lowland peatland systems
(Pullin et al. CEE 11-010)**

To date, most measurements of Carbon (C) and greenhouse gas (GHG) fluxes from UK peatlands have been made within upland blanket bogs, and it is doubtful whether the data obtained from these studies can be extrapolated to lowland systems. Because of their importance for a wide range of ecosystem services (provisioning services, cultural services such as access to natural environments, and regulating services such as flood control), the role of lowland peats in climate regulation must be weighed against these other ecosystem services to enable appropriate management decisions. The systematic review will provide a meta-analysis of the magnitude of each component of the C and GHG budget (i.e. CO₂ exchange, CH₄ emission, N₂O emission, dissolved and particulate C loss) as a function of peat type and management.

[SR11010.html](#)

A GROWING COLLABORATION



ELEMENTS

CEE Centres: The CEE is a global collaboration and as we grow our activity will need support from a number of regional Centres. This last year has seen considerable interest in establishing CEE Centres in different countries. These Centres will contribute to the work of the CEE and encourage evidence-based practice and systematic review activity within their region.

Some specific functions of CEE Centres are:

- To develop expertise in systematic review methodology
- To encourage systematic review activity in a defined geographical area – advice on forming review teams, formulating questions and preparing review protocols
- To work with practitioners and policy formers to identify need for systematic review
- To work with potential review teams to identify funding and other resources for reviews
- To run training courses in systematic review methodology
- To provide advice and initial contact for review teams in a defined geographical area
- To liaise with other Centres to develop systematic review methodology
- To liaise and integrate activities with other Centres to develop the CEE library and maintain a common database of systematic reviews in progress

The Trustees have been conducting talks with a number of groups with a view to establishing new Centres in 2012.

Joiners: The CEE is an open collaboration and its activity and impact is dependent upon a motivated community who support the key mission of developing an evidence-base to enable more effective environmental management. There is no 'membership' as such but any-one can 'join' the Collaboration either by being an author of a review, offering to be a peer-reviewer, joining a Methods Group to contribute to methodology development or simply to be part of a growing network of people with similar interests. Simply by 'joining' the Collaboration (for free) you can be added to the network and receive communications as and when items of interest arise. In 2011, 96 new 'joiners' enriched the CEE network, coming from a variety of background and affiliations, from PhD students to professors, managers and consultants.

CALL FOR TRUSTEES

New Trustees are sought to join the CEE Board.

Up to three new Trustees are sought to join with the Board of Trustees to help guide CEE towards achieving its mission through implementation of the Strategic Plan. As the collaboration grows the demands placed on CEE governance and coordination are increasing. A key role for new Trustees will be to help seek resources to enable CEE to establish a paid staff to support the Board, CEE Centres, Review Groups and Methods Groups. Trustees need to be able to devote the necessary time, have strategic vision, independent judgement, an ability to think creatively and a willingness to take an active role. We are particularly seeking Trustees with skills and experience in one or more of the following areas:

- fund-raising/resource investigation
- charity management and regulation
- accountancy, with experience of the charity sector

Trustees are unpaid but involvement as a Trustee can offer significant personal development opportunities. Trustees are expected to contribute roughly 6-12 days per year to CEE business and to attend up to three meetings per year (most of these may be conducted using telephone or video conferencing).

The Trustees role description and application form are available via CEE's website (<http://www.environmentalevidence.org/Board.html>), the CEE Constitution and other information is available at <http://www.environmentalevidence.org/Resources.html>. For an informal discussion about the role of Trustee, contact the Chair, Professor A.S. Pullin (info@environmentalevidence.org).

TRAINING & MENTORING

Rather than delivering training directly, CEE endorses courses delivered by others, which conform to CEE guidelines for systematic review. During the year, three training courses were delivered by the Centre for Evidence-based Conservation (Bangor University) in London, Bangor and Berlin.

One-day 'Introduction to Systematic Review' courses provide an overview of the review process from identifying suitable questions with stakeholders, through searching, inclusion, critical appraisal and data extraction to synthesis and dissemination. These courses are not intended to equip participants with the skills and knowledge required to undertake a systematic review, rather, to provide an understanding of what systematic review has to offer, how it differs from other forms of literature review, the demands of the process and the uses of systematic review in policy and practice. The 'Introduction' courses are targeted at both commissioners and users of systematic review as well as potential authors.

For more in-depth coverage of the systematic review process, aimed at those who wish to acquire the skills and knowledge needed to undertake a review, 3- or 4-day 'methodology' courses are recommended. These are generally 'bespoke' courses designed and delivered for a specific organisation or group. Demand for training in CEE systematic review methodology increased during 2011 and there were enquiries from groups based outside of the UK about becoming CEE 'endorsed' centres for training. If you are interested either in receiving training in CEE systematic review methodology or becoming a provider of training, then please contact us at info@environmentalevidence.org.

www.environmentalevidence.org/Training.html

SYSTEMATIC MAP METHODS GROUP

A systematic mapping methods group was established in 2011 in order to evaluate the use of systematic mapping methodology as part of the evidence-based framework for environmental evidence. Systematic mapping is a robust, repeatable and transparent scientific method used to identify, categorise and map available literature relevant to a topic. Like systematic reviews, systematic maps use established searching protocols, and have rigorous inclusion criteria, but unlike systematic reviews, they do not attempt to answer a specific question of effectiveness or impact. Systematic maps can be integrated into the systematic review process or be produced as discrete pieces of work. The methodology was developed for use in social science and education but offers a useful tool for environmental evidence, where a topic is too broad for systematic review, or where the evidence is too disparate or unsuitable for quantitative analysis. The first systematic maps in environmental evidence were carried out in 2011, but the methodologies and outputs between studies differ. The systematic mapping group aims to develop and establish standardised methodology for environment management systematic maps, and ensure that systematic mapping offers the greatest value possible to the evidence base. One of the main questions currently under consideration by the systematic mapping methods group, is how best to design systematic maps in order to facilitate critical appraisal of the included studies. Questions surrounding the types of evidence to be included in systematic maps are also of high importance. In Spring 2012, the first systematic mapping methods meeting will be held to discuss these questions, and to consider formulation of guidance for systematic map authors.

For more information on systematic mapping, or if you would like to join the Methods Group, please contact the Chair, Nicola Randall: nrandall@harper-adams.ac.uk and visit www.environmentalevidence.org/MGroups_maps.html.



REVIEW GROUPS

As policy interest in the human well-being benefits of ecosystem services increases, a growing number of systematic reviews are being commissioned which address the human health and welfare impacts of environmental management. These reviews cut across both disciplinary (environment and public health) and methodological (drawing from qualitative and quantitative research) boundaries. There is a need to ensure that resources are directed at the most important questions and for coordination of this 'cross-over' area of review activity. CEE therefore plans to launch an **'Ecosystem Services and Human Health and Well-being' Review Group** which will offer the opportunity for more coordination of activity and of seeking funding for reviews. Organisations planning to commission or undertake systematic reviews which fit this brief are invited to get in touch with us via email to cee.administration@environmentalevidence.org.



More about the Collaboration

The Collaboration for Environmental Evidence was established in 2007 and is registered for charitable purposes within the UK. In line with legal requirements, the endeavors of CEE satisfy three ‘charitable purposes’:

- the advancement and improvement of environmental protection
- the advancement of science
- the advancement of education

and the two ‘public benefit principles’: the general public will benefit from more effective environment management and conservation action because those working in the environmental sector will be able to more easily access information to help them improve the effectiveness of their work. The CEE places no restrictions on who can benefit.

The CEE Constitution sets out how the CEE will operate within Charity Law. The CEE operates as a ‘not-for-profit’ organisation and has a Board of Trustees responsible for proper governance of the CEE, probity, adherence to regulations for ‘not for profit’ organisations and charity law. An Advisory Group, composed of representatives of CEE constituencies and stakeholders (e.g. voluntary or employed lay and professional practitioners, government policy makers, NGOs, industry, scientists, educators) oversees function, helping to ensure that the activities of the CEE are, as far as possible, unbiased and objective and that they remain relevant to these stakeholders. Maintenance of the CEE website, coordination of collaborative activity and general administration are functions currently provided by the Centre for Evidence-based Conservation, based at Bangor University, UK, which acts as the UK CEE Centre. As CEE activity increases through greater engagement in systematic reviews, Review Groups and Methods Groups and the establishment of CEE Centres outside of the UK, the demands placed the CEE infrastructure are also increasing. The CEE is open to all who wish to contribute to the conduct, or use, of systematic reviews and who are committed to the principle of evidence-based practice. The continued success of this ‘open-access’ strategy is dependent on adequate and sustainable funding of the core infrastructure. Many funding streams, such as research grants, do not fund infrastructure costs and CEE therefore seeks donations to enable it to continue to support and coordinate environmental management systematic review activity worldwide.

**Potential donors are encouraged to contact us at:
info@environmentalevidence.org.**

THANK YOU!

The existence and growth of the CEE is due in no small part to a wide range of individuals and organisations who have actively supported its vision and aims, either through funding, giving it visibility in key arenas, through giving their time to key CEE activity, or through active involvement in systematic reviews. Particular thanks in 2011 are due to:

The Trustees

The Advisory Board

Dr Barbara Livoreil and staff of the Centre for Evidence-based Conservation
Bangor University

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