the United States. The discussion on delineation is so brief it
does little more than direct readers to the 1987 manual.

In summary, the third edition of *Wetlands* is a large improve-
ment over its predecessors. I believe it should be on the shelf
of anyone interested in the subject. It is filled with references,
has an excellent glossary, is well illustrated, and is comprehen-
sive. Soil scientists will find it to be a valuable resource, despite
its shortcomings in the areas of hydrology, discussion of the
HGM classification, and wetland delineation. Readers should
be able to fill any gaps in understanding by consulting the
numerous references given for any subject.

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**Ecological Indicators for the Nation**


Indicators are designed to inform us quickly and easily
about the present conditions, and over time the changes and
trends, of something of interest. A large number of ecological
indicators have been developed and used but often they are
intended to inform decision makers about the status and trends
of a few species or a particular ecosystem. These indicators
typically do not provide a basis for evaluating the condition
of ecosystems and how they are changing at the national scale.
National-scale indicators are important because many envi-
nronmental policies are formulated at the national scale. Na-
tional-scale ecological indicators are difficult to develop and
apply for a country as large and diverse as the USA.

This book is the report of the Committee to Evaluate Indi-
cators for Monitoring Aquatic and Terrestrial Environments,
which was established at the behest of the USEPA. The book
consists of an executive summary, five chapters, a list of refer-
ences, and three appendixes. The executive summary provides
an effective and succinct overview of the report contents,
and presents the recommended national-scale indicators and
describes their selection, including discussions about scale and
applicability, criteria for evaluating indicators, the conceptual
models underlying each indicator, policy perspectives, timing
and cost of implementation, care and handling of data, and
research needed to enhance the present indicators as well as
develop new indicators.

The five chapters provide further details and support of the
recommended indicators. The introductory chapter discusses
why ecological indicators are needed, including a brief history
of prior indicator development efforts. The present study is
discussed briefly, including the origin of the committee, the
task with limitations, and the goals of the report. Briefly, the
goals are to identify sources of data needed for indicator design
and computation, suggest criteria for indicator selection, pro-
vide methods for integrating complex ecological information
into indicators, propose indicators, and offer guidance for
collecting, storing, interpreting, and communicating informa-
tion for ecological monitoring. The key ecological processes
and products that people value are discussed, the need to
establish baselines so that trends can be evaluated is estab-
lished, and indicator value and realistic expectations about
indicator value are discussed.

The second chapter discusses the scientific underpinnings
of indicators and how data used to construct the indicators
are obtained. Useful data sources include data collected from
the environment, both from the present and the past, experi-
ments, and predictions from models that can be solved analyti-
cally and from computer simulations. Useful present environ-
mental information sources include remote sensing from
satellites and aircraft and ground-based measurements. The
Committee points out that indicators are most likely to be
useful to policy makers if they are understandable, quantifi-
able, and broadly applicable.

The third chapter provides a framework for indicator selec-
tion. The criteria for evaluating indicators are general impor-
tance, conceptual basis, reliability and temporal and spatial scales
of applicability, statistical properties, data requirements in-
cluding skills needed to collect the data, robustness, interna-
tional compatibility, costs, benefits, and cost effectiveness.
Information handling is discussed including data quality con-

control, archiving, and assignment of responsibilities.

The fourth chapter provides details about the recom-
ended indicators, including the major category of ecological
information that each indicator addresses. The categories se-
lected that are judged to encompass the nation’s most impor-
tant ecological issues are the extent and status of land cover
and land use types, ecological capital, and ecosystem function
and how it is changing with time for various ecosystems. Some
indicators such as soil organic matter and land use are espe-
cially important because they are relevant to more than one
ecological category.

The final chapter discusses application of the framework
used for selection of national-scale indicators to the develop-
ment of local and regional-scale indicators. Although the pri-
mary charge of the Committee was to develop national-scale
indicators, indicators are needed that inform us about eco-

logical status and trends at a range of spatial and temporal scales.
Forests, as an example of an ecosystem type for which eco-

logical indicators are needed, and species diversity, as an example
of an indicator that can be usefully applied at a range of spatial
scales, are discussed in detail.

The approximately 350 cited references appear to be highly
relevant and of high quality and should provide interested
readers access to much greater detail about the need for eco-


logical indicators and the information used to select the recom-

mended indicators. The first two appendixes provide useful
and interesting discussions about some statistical and mathe-
matical aspects of indicators and the final appendix lists the
Committee members and provides detail about their profes-
sional backgrounds.

This book should be of interest to students and professionals
in fields such as ecology, ecosystem management, and public
policy. Further, the book can be read online for free at the
National Academy Press website (http://books.nap.edu/books/
0309068452/html/index.html), making it easily accessible to
anyone.

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**Aquatic Effects of Acidic Deposition**


We first became aware of acid rain in the USA in the early 1970s. Growing concern through the decade over the