Green Infrastructure Effectiveness Database

Purpose of Database

Green infrastructure—defined here as natural and nature-based techniques that maintain ecosystem functions, or that incorporate engineered systems to mimic natural processes—is a promising option for protecting lives, property, and built infrastructure from the damaging impacts of severe weather events, as well as long-term environmental changes. Coastal managers, planners, and decision makers need ready access to information on how, where, and under what conditions to use green infrastructure techniques for improving resilience to coastal hazards.

To help meet this need, NOAA has compiled information from a range of literature sources that report on the effectiveness of green infrastructure to reduce the impacts of coastal hazards, such as inundation and erosion from tropical storms and cyclones, more frequent extreme precipitation events, and sea level rise. The information is organized in an online, searchable database of records that include basic information from each literature source, key findings, identification of characteristics that influence effectiveness, and a link to the original source if it is available. The records will help users discover whether they want to explore the original sources; however, specific information should not be cited from the database records without reading the original literature source. The database can also be used to quickly ascertain the scope of literature, general trends in information, and existing gaps in research and reporting.

Scope of Database

The database does *not* include all the literature NOAA could find related to green infrastructure. The records that are included were selected from literature sources for their **relevance in documenting the use and effectiveness of green infrastructure methods in reducing the impacts of coastal hazards**.

The literature database contains records from a wide range of literature sources, such as peer-reviewed journals, online tools, and gray literature. The database includes information on 32 different coastal green infrastructure types and techniques to cover a full range of approaches to coastal management: natural, nature-based (e.g., low-impact development), structural, and policies. However, there are gaps in coverage in the literature, both for techniques and for some geographies. While most of the records in the database report on effectiveness, some of the literature explores the benefits of green infrastructure more broadly, or are key policy papers or government reports that provide context for using green infrastructure to promote coastal resilience. A few records only cover the effectiveness of hardened structures in mitigating coastal hazards. These were included in the database for users to explore comparisons with green infrastructure.

What to Expect

The database features a main search form with a user-friendly interface for exploring the breadth of literature in the database. A more detailed search function (Advanced Filter) is available to more efficiently narrow or refine records that meet specific criteria of interest.

Each literature record in the database has 19 information fields.

Table 1: Fields Contained in the Green Infrastructure Effectiveness Database

Field Name	Field Description
Author(s)	All author names
Title	Source title
Year	Year the source was published
Source	Journal name or other location where the source was found
Source Type	Source type may be one of the following: book, gray literature, industry publication, legislation, news article, online tool, peer reviewed, presentation, workshop/conference proceedings
Methodological Approaches	Methodological approach may be one or more of the following: design calculations, economic analysis, field observations, geospatial analysis, laboratory testing, meta-analysis, modeling, perspective, statistical analysis
Citation	Reference citation in Chicago Manual of Style format
Link	Link to source website or online journal, if known
Description and Key Findings	General summary of the scope of the work and major findings, based on the author's conclusions and NOAA's interpretation of relevance
Key Words	Key terms and phrases based on author's list and NOAA's interpretation of relevance; some key words re-phrased for consistency throughout the database
Green Infrastructure Type/Technique	Green infrastructure type or technique discussed in the source (32 options); may include more than one

Field Name	Field Description
Hazards	Coastal hazards described in the source may be one or more of the following: erosion, flooding – coastal (storm surge, high tides, sea level rise, inundation), flooding – precipitation (stormwater, riverine inundation), tsunami, wave action (due to storm, hurricane winds)
Measures of Effectiveness	How effectiveness is measured, determined, or qualified for each green infrastructure type or technique
Co-Benefits	Other benefits of each green infrastructure type or technique that is discussed but not measured
Characteristics that Influence Effectiveness	Information about the characteristics that have an impact on the efficacy of a technique, and specifically how that characteristic has an impact
Region	Geographic region in which the study in the source was conducted or applies; tagged to one or more of the following NOAA-defined regions (if applicable): Caribbean, Great Lakes, Gulf Coast, Mid-Atlantic, Northeast, Pacific Islands, Southeast, West Coast, National, International
State	State in which the study in the source was conducted or applies
Scale	Scale at which the study in the source was conducted or applies; may be one or more of the following: site, local (municipality), watershed (landscape), state, regional, national
Policy Gaps or Advances	Policy or permitting information discussed; for example, if study addresses a coastal management question, permitting process, or timing, or relates to specific policy issues in a state

NOAA plans to add new literature records to the database over time; frequency will depend on staff time and resources.

If you would like to suggest a literature source for inclusion in the database, please use the Contact Us link at the bottom of the website, or send an email directly to *coastal.info@noaa.gov*.