Building Collections Using Greenstone

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Greenstone

New Zealand Digital Library Project at the University of Waikato
  • In cooperation with UNESCO, Human Info NGO International, every continent
Examples:
  • Academic
    – Digitization projects
    – Classes on digital libraries
  • Non-academic
    – UNESCO humanitarian documentation
Greenstone features

• Works with existing documents
  – Imports several formats
• Searching: full text and metadata
  – Dublin Core, custom metadata
• Browse
• Structured documents
  – Indexing, access
• Extensible & customizable
• OpenSource software (GPL)
User Interface overview

• Finding documents
  – Search full text and metadata indexes
  – Classifiers: browse lists for navigating collections

• Navigating documents
  – Navigate hierarchical documents by logical structure
  – Simple page turning (not shown)
  – Single page for simple documents (not shown)
About this collection

The Virtual Disaster Library was developed in November 1999, by PAHO/WHO (Pan American Health Organization / Regional Office of the World Health Organization). It contains 250 publications (25,000 pages) of experiences, ideas and solutions to advance the cause of disaster reduction.

How to find information in the Virtual Disaster Library collection

There are 4 ways to find information in this collection:

- search for particular words
- access publications by title
- access publications by subject
- access publications by organization
About this collection

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results 1 – 20 for query: purify drinking water

Word count: purify: 1, drinking: 301, water: 2358
39 documents matched the query.

- Natural Disaster Mitigation in Drinking Water and Sewerage Systems - Guidelines for Vulnerability Analysis (PAHO)
- Environmental Health Management after Natural Disasters (PAHO): Part II: The management of disaster-created environmental health conditions: Chapter 3: Phase two: Measures taken during disaster and in the aftermath: Immediate postdisaster emergency period: Water supply
- Health Services Organization in the Event of Disaster (PAHO): Chapter 5:
Water supply

Drinking water, the most essential item provided to disaster-stricken populations, is both indispensable to the support of life and a major medium of disease transmission. Thus, although
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How to find information in the Virtual Disaster Library collection

There are 4 ways to find information in this collection:

- search for particular words
- access publications by title
- access publications by subject
- access publications by organization
ENGLISH

- ACCIDENTS
- ASSESSMENT
- BIOLOGICAL CONTROL OF VECTORS
- CARIBBEAN
- CITIES AT RISK
- CITY PLANNING
- COMMUNICABLE DISEASE CONTROL
- COMMUNITY PARTICIPATION
- DISASTER EDUCATION
- DISASTER MITIGATION
- DISASTER PLANNING
- DISASTER PREPAREDNESS
- DISASTER PREVENTION
- DISASTER RESPONSE
- DOMINICA
- DRINKING WATER
ENGLISH

CITY PLANNING

Cities At Risk - Making Cities Safer ... Before Disaster Strikes (IDNDR)

UN-IDNDR and QUIPUNET Internet Conference - Solutions for Cities at Risk - International Decade for Natural Disaster Reduction (IDNDR)
Cities At Risk - Making Cities Safer ... Before Disaster Strikes (IDNDR)

(introductory text...)

Foreword

- Part One: Why Focus on Disasters in Cities?
- Part Two: What Is Being Done?
- Part Three: Where Do We Go From Here?
Cities At Risk - Making Cities Safer ... Before Disaster Strikes (IDNDR)

Part Three: Where Do We Go From Here?

(introductory text...)

Making Cities Safer ... before disaster strikes

Contacts on Urbanization and Disasters

References

About the International Decade for Natural Disaster Reduction
(introductory text...)

Policies for Safer Cities

Reducing the impact of disasters in urban areas is not something that will happen overnight, nor even within the time span of the International Decade for Natural, Disaster Reduction.
Greenstone Architecture

Redrawn from Witten & Bainbridge, How to Build a Digital Library, p. 356
Greenstone Architecture

Receptionist
• Provides user interface
• Accept user input
• Send to appropriate collection server
• Accept results
• Dynamic page generation

Collection Server
• Handle collection content
• Search and filter information
• Return results
• multiple collections
Building collections

• Create a collection framework
  – or work with an old collection
• Select documents
• Import documents
  – Converts to internal XML format (GSAF)
• Build collection
  – creates search indexes and browse listings
GSAF: internal XML format

```xml
<Section>
  <Description>
    <Metadata name="Title" value="...">
  </Description>
  <Content>
    [Text, images, links, etc.]
  </Content>
  <Section>
    <Description>
      <Metadata name="Title" >
    </Description>
    <Content>...
      <Section>...
      <Section>...
      <Section>...
  </Section>
</Section>
```
GSAF: internal XML format

Section:
• Description
  – Metadata fields
• Content
  – Text, internal markup, images
• Section
  – No limit in number or depth

Hierarchical documents
Sections nest, tree structure
Config file: collect.cfg

Collection-specific configuration file, collect.cfg, specifies:

• file types to import
• Indexes and browse lists
  – Document or section level
  – paragraph (text index only)
• display of results and browse listings
• document displays
About this collection

This collection contains 933 photographs by Gordon Paynter.

How to find information in the Pictures of Places collection

There are 5 ways to find information in this collection:

- search for particular words
- access publications by title
- access publications by place occurrence
- access publications by virtual film
- access publications by date

You can search for particular words that appear in the text from the "search" page.
New Zealand (270)
United States of America (343)
England (40)
Italy (Italia) (161)
Greece (Hellas) (103)
pictures of the world

search titles places films dates

Italy (Italia) (161)
  Rome (Roma) (30)
  Cinque Terre (73)
  Pisa (3)
  Florence (Firenze) (29)
  Venice (Venezia) (26)
pictures of the world

search titles places films dates

Italy (Italia) (161)

Rome (Roma) (30)

The Trevi Fountain
Rome
1200x1800 pixels
5 May 2002

The Trevi Fountain
Rome
1800x1200 pixels
5 May 2002

The Pantheon, Rome
Rome
1800x1200 pixels
5 May 2002
The Trevi Fountain

Photographer: Gordon Paynter
Copyright Gordon Paynter
Location: Rome
Date: 5 May 2002
Size: 1800x1200 pixels
Chopin Early Editions

Over 400 early edition Chopin scores
1830’s to 1880’s
Target audience: music scholars & musicians.
On web, page-turnable JPEG images.
Online in March 2003
Currently 372 scores in online collection
Usage:
Nearly 100 hits per day, > 30% of use is international.
The University of Chicago Library is home to a distinguished collection of over 400 first and early printed editions of musical compositions by Frédéric Chopin. These editions are of particular interest to Chopin scholars and bibliographers because Chopin's works were often published concurrently in several countries with variant texts. Early re-printings were issued using the same plates, causing difficulties identifying first and subsequent impressions. Scholars can establish a sequence of publication by comparing a range of printings. The collection at the University of Chicago, maintained in the Special Collections Research Center, contains evidence that contributes to an understanding of the printing and publishing history of Chopin's works.

When completed, the Chopin Early Editions online collection will consist of digitized images of all scores in the University of Chicago Library's Chopin collection. As of February 2003, over a third of the collection is available for viewing online. Users can search or browse the Chopin Early Editions collection via a variety of data points, including titles, genres, plate numbers, publishers and place of publication. Access to individual scores in the digital collection is also available through records in the Library's catalog with links to this Web site. The scanned images of all pages of the scores provide scholars, bibliographers, collectors,
Chopin|Early Editions

search titles uniform titles genres dedicatees

Nocturnes, (38 scores)

13e, et 14e. nocturne pour piano, op. 48. / Paris (Rue Richelieu, 97) : Chez Maurice Schlesinger ; [1841] Nocturnes, piano, op. 48. No. 1

13e, et 14e. nocturne pour piano, op. 48. / Paris : Chez Maurice Schlesinger (Rue Richelieu, 97) ; [1841] Nocturnes, piano, op. 48. No. 2

13e, et 14e. nocturne pour piano, op. 48. / Paris (Rue Richelieu, 97) : Chez Maurice Schlesinger ; [1841] Nocturnes, piano, op. 48. No. 1

15me, et 16me. nocturne. / London (No. 229, Regent Street, corner of Hanover Street) : Wessel & Co., importers and publishers of foreign music, [between 1848 and 1856] Nocturnes, piano, op. 55

2 nocturnes pour le piano, op. 55. / Paris : Chez Mce. Schlesinger ; [1844] Nocturnes, piano, op. 55

2 nocturnes pour piano, op. 62. / Paris : Maison Mce. Schlesinger : Nocturnes, piano, op. 62

3 nocturnes pour le piano, op. 9. /
Chopin Early Editions

search titles uniform titles genres dedicatees

15me. & 16me. nocturno /

UniformTitle: Nocturnes, piano, op. 55
Title: 15me. & 16me. nocturno /
Title: Quinzième et seizième nocturno
Composer: Chopin, Frédéric, 1810-1849
Dedicatee: Stirling, Jane Wilhelmina
Publication Info.: London (No. 229, Regent Street, corner of Hanover Street) : Wessel & Co., importers and publishers of foreign music.[between 1848 and 1856]
Description: 10 p. of music ; 33 cm.
Notes: [composé par Frederic Chopin].
Title from list t.p.
"Dédie à Mademoiselle J.W. Stirling"--Caption.
Also available on the Internet.
Subject: Piano music
Plate No.: W & Co. No. 5308
Plate No.: 5308
URI: http://pi.lib.uchicago.edu/1001/dig/chopin/108
Call No.: M25 C54 N014
unnumbered page
Chopin Early Editions

search titles uniform titles genres dedicatees

15me. & 16me. nocturno /

unnumbered page

Page 1: Nocturne, no.15
Page 2
Page 3
Page 4
Page 5
Page 6: Nocturne, no.16
Page 7
Page 8
Page 9
Page 10
Chopin | Early Editions

15me. & 16me. nocturno /

Page 1: Nocturne, no.15

15ème NOCTURNO Composé par FREDERIC CHOPIN. Op: 33.

Dedie à Madame J.W. STIRLING.

ANDANTE.
Build overview

Catalog records

Scanned Images

Structural metadata

METS & MODS

XML-based automated processing

Greenstone Archive Format

Greenstone Dig. Library Software

Human processing
Catalog records

- Detailed MARC/AACR2 record for each score
- Luxury: few print music collections have this much metadata
Scanned score images

- Scanned by Preservation staff
- Archival TIFF images
  - 400dpi, 24-bit color, uncompressed
- JPEG derivatives for web-based delivery
### Structural and other metadata

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- "chopin","108","002","","1",""
- "chopin","108","003","1","1","Nocturne, no.15"
- "chopin","108","004","2","1",""
- "chopin","108","005","3","1",""
Structural metadata

• Identify each image
  – document (score) no. & sequential image no.

• Image content:
  – page no. as printed, milestones

• Staff use familiar RDB product

• Export data in CSV format

• Technical metadata recorded, not yet used
Build overview

- Catalog records
- Scanned Images
- Structural metadata

XML-based automated processing

- METS & MODS
- Greenstone Archive Format
- Greenstone Dig. Library Software

Human processing
METS & MODS

Catalog record (MARC)

Scanned images (JPEG)

Structural metadata

dmdSec -> MODS

fileSec

structMap

div DMDID=1

div FILEID=1

div FILEID=2

URL: page1.jpg

URL: page2.jpg
METS & MODS

Program uses structural metadata to:

• Generate structMap
• Generate image URLs for fileSec
  – Images stored by naming convention
• Structural md carries catalog record no.
• Extract MARC from catalog
• crosswalk to MODS
• Embed in dmdSec
GSAF

- XML format for internal storage
- Hierarchical document structure
  - Nested sections: e.g. part 1, chapt. 2
- METS to GSAF via XSLT
- Natural mapping from METS to GSAF
  - Map structural hierarchy
  - Follow links
    - Descriptive metadata
    - File content
METS to GSAF

Section
  Description
    Metadata: Title, ...
  Content:
    Title, ...

Section
  Content: Page 1
    page1.jpg

Section
  Content: Page 2
    page2.jpg
METS to GSAF

- dmdSec
  - MODS: Title, ...
- fileSec
  - page1.jpg
  - page2.jpg
- structMap
  - div: Score
    - div: Page 1
    - div: Page 2

Section
  - Description
    - Metadata: Title, ...
  - Content:
    - Title, ...
    - Section
      - Content: Page 1
        - page1.jpg
      - Section
        - Content: Page 2
          - page2.jpg
METS to GSAF

Section
  Description
  Metadata: Title, ...
  Section
    Content:
      Title, ...
    Section
      Content: Page 1
        page1.jpg
      Section
        Content: Page 2
        page2.jpg
METS to GSAF

• Walk structural metadata to create the tree of <Section> elements

• Descriptive metadata:
  – <Description>
    • Crosswalk to desired metadata names
  – <Content>:
    • Format metadata desired for display

• File data
  – <Content>:
    • Inline text, link to images, etc.
Customizing Chopin collection

- Focus on navigation
  - Metadata for custom access
    - E.g. genre, dedicatee not in MARC/AACR2
    - Can support with METS, MODS, Greenstone
  - Custom document navigation
    - Separate description from scores
    - Custom page navigation
  - Improves usability
- Branding in next phase
Chopin Early Editions

search		titles		uniform titles		genres	
dedicatees

- **Ballades**, (16 scores)
- **Barcarolle**, (2 scores)
- **Berceuse**, (6 scores)
- **Bolero**, (5 scores)
- **Concertos**, (16 scores)
- **Etudes**, (16 scores)
- **Ecossaises**, (2 scores)
- **Fantasia**, (6 scores)
- **Mazurkas**, (65 scores)
- **Nocturnes**, (40 scores)
- **Polonaises**, (40 scores)
- **Preludes**, (11 scores)
- **Rondos**, (20 scores)
- **Scherzos**, (17 scores)
- **Sonatas**, (20 scores)
- **Tarantella**, (3 scores)
- **Trio**, (2 scores)
- **Waltzes**, (54 scores)
Chopin\textit{Early Editions} (8 scores)

- \textit{Nocturnes}, (38 scores)
  - \textit{13e et 14e nocturne pour piano, op. 48/},
    - Paris (Rue Richelieu, 97) : Chez Maurice Schlesinger ; [1841]
    - Nocturnes, piano, op. 48. No. 1
  - \textit{13e et 14e nocturne pour piano, op. 48/},
    - Paris : Chez Maurice Schlesinger (Rue Richelieu, 97) ; [1841]
    - Nocturnes, piano, op. 48. No. 2
  - \textit{13e et 14e nocturne pour piano, op. 48/},
    - Paris (Rue Richelieu, 97) : Chez Maurice Schlesinger ; [1841]
    - Nocturnes, piano, op. 48. No. 1
  - \textit{15me et 16me nocturne/},
    - London (No. 229, Regent Street, corner of Hanover Street) : Wessel & Co., importers and publishers of foreign music, [between 1848 and 1856]
    - Nocturnes, piano, op. 55
  - \textit{2 nocturnes pour le piano, op. 55/},
    - Paris : Chez Mce. Schlesinger ; [1844]
    - Nocturnes, piano, op. 55
  - \textit{2 nocturnes pour piano, op. 62/},
    - Paris : Maison Mce. Schlesinger : Nocturnes, piano, op. 62
  - \textit{3 nocturnes pour le piano, op. 9/},

[Image of musical notation]
Chopin Early Editions

15me. & 16me. nocturno /

UniformTitle: Nocturnes, piano op. 55
Title: 15me. & 16me. nocturno /
Title: Quinzième et seizième nocturno
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"Dédie à Mademoiselle J.W. Stirling"--Caption.
Also available on the Internet.
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Plate No.: W & Co. No. 5308
Plate No.: 5308
URI: http://pi.lib.uchicago.edu/1001/dig/chopin/108
Call No.: M25 C54 N014
UniformTitle: Nocturnes, piano, op. 55
Title: 15me. & 16me. nocturno /
Title: Quinzième et seizième nocturno
Composer: Chopin, Frédéric, 1810-1849
Dedicatee: Stirling, Jane Wilhelmina
Publication Info.: London (No. 229, Regent Street, corner of Hanover Street) : Wessel & Co., importers and publishers of foreign music. [between 1848 and 1856]
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Notes: [composé par Frédéric Chopin].
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"Dédie à Mademoiselle J.W. Stirling" -- Caption.
Also available on the Internet.
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Plate No.: W & Co. No. 5308
Plate No.: 5308
URI: http://pi.lib.uchicago.edu/1001/dig/chopin/108
Call No.: M25.C54 N014
Chopin Early Editions

search titles uniform titles genres dedicatees

15me. & 16me. nocturno /

unnumbered page

unnumbered page
Chopin Early Editions

15me. & 16me. nocturno / unnumbered page
Page 1: Nocturne, no.15
Comments on Chopin Early Editions

• Data created by staff using familiar tools
  – Structural md created in desktop application
• Catalog records a luxury
• Catalog is DB of record
  – Project IDs in 909
  – POIs point into Greenstone
• METS/MODS assembled by program
  – Expect to repurpose METS for other applications
• Customization: navigation, not branding
  – Faster to bring up collection, get user reaction
Greenstone benefits for Chopin

• Robust, mature system
• Recovered time in project
  – Fast to bring up
  – UI out of the box
  – Dynamic page generation
  – Incremental customization
• XML compliant
  – Natural mapping from METS to GSAF
Future work: Chopin

- Add DjVu image format
- Repurpose METS for other applications
  - OAI
- Standardize new digitization production flow
  - Project was first for METS, MODS, GS, & 6 depts.
  - Standardize collection of structural metadata
  - Plug in descriptive metadata as appropriate
    - Store archival descriptive metadata in METS object
    - Repurpose via XSLT for delivery
Other custom UI examples

• Lehigh Digital Bridges
  – Extensive changes to look

• Washington Research Libraries Consortium (WRLC)
  – Custom page banner
  – Popup page turner in Perl
  – GS as component of DL suite
Book Collection Titles (30)

Album of designs of the Phoenix bridge company: successors to Clarke, Reeves & Co., Phoenixville, by Phoenix Bridge Company (Philadelphia: J.B. Lippincott, 1885.)

Album of designs of the Philadelphia Bridge-Works, by Clark, Reeves & Co. (Philadelphia: J. B. Lippincott, 1873.)

American iron bridges: abstract of the discussion upon a paper submitted by Zerah Colburn, by Zerah Colburn, edited by Charles Manby and James Forrest. (New York: Van Nostrand, 1867.)

American versus English methods of bridge designing, by J.A.L. Waddell. (Tokyo: 1886)
Album of designs of the Phoenix Bridge Company

Corporate author:
Phoenix Bridge Company.

Title:
Album of designs of the Phoenix Bridge Company: successors to Clarke, Reeves & Co., Phoenixville bridge works.

Variant title:
Phoenix Bridge Company.

Publication info:
Philadelphia: J.B. Lippincott, 1885.

Physical description:
Title:

Album of designs of the Phoenix bridge company : successors to Clarke, Reeves & Co., Phoenixville bridge works

- Front Matter
- Album of designs of the Phoenix bridge company : successors to Clarke, Reeves & Co., Phoenixville bridge works
- List of Wrought-Iron Bridges, Viaducts, and Piers
- General Specifications for Railway Bridges
- Phoenixville Bridge Works
- Description of Designs
- Description of Plates
- Designs Showing Usual Forms of Bridges Built by the Phoenix Bridge Company for Various Lengths of Spans
- Plates showing Photographic Views of Bridges and Other Structures
About This Collection

In 1821, William Staughton was appointed as the first president of Columbian College in Washington, D.C., which became The George Washington University. His tenure as President saw the founding of the law school, the departments of classics, medicine and theology, and a preparatory school. The first Columbian College commencement, held in 1824, included among its guests President Monroe, members of his cabinet, members of the Senate, House and Supreme Court, and the Marquis de Lafayette.

The William Staughton Collection contains correspondence, photographs of paintings and etchings of William Staughton, and lists of materials at the University Archives with genealogical and family information.
The William Staughton Collection

Description: The letter was photocopied from Gideon Welles Papers (No. 19016), the Manuscript Division, Library of Congress.

Person: Staughton, William, 1770-1829 -- Correspondence
        Brown, Obadiah B., 1779-1852 -- Correspondence
        Rice, Luther, 1783-1836 -- Correspondence
        Monroe, James, 1758-1831 -- Correspondence

Date: 1823-02-26

Place name: United States -- District of Columbia -- Washington

Resource type: Correspondence

Creator: Staughton, William, 1770-1829

Click to see document
Washington, July 26th, 1823.

Highly respected Sir,

Understanding that, in the Providence of Heaven, the chaplainship of the army has become vacant, the subscriber, with all that consideration due to your enlightened judgment, does submit to you the propriety of permitting the Rev. Dr. Allison to become his successor.

They are well persuaded that the Doctor is a firm friend of the Administration, in the memorable struggle for Independence, his whole life has been on the side of his country.
Ongoing work: Greenstone

- Greenstone Librarian Interface (GLI)
- Greenstone 3
Greenstone Librarian Interface (GLI)

- Collection management
  - Informed by work at GS sites
  - Assist collection designer
  - Support all phases of collection build process
  - Do not specify workflow

- Java-based GUI tool
  - Formerly called the “Gatherer”

- 2 yrs in development

- In beta outside of lab
  - Bangalore, other sites
  - in current distribution
GLI functions

- Establish new collection (or work on old)
- Select files to include in collection
- Enrich files with metadata
- Select indexes, classifiers
- Build collection
- Customize appearance
- Preview collection
Greenstone 3

GS2 mature, 5+ yrs., wide deployment
  – Constraints: support legacy systems
  – Other technologies have matured: Java, XML

GS3: rewrite in Java, XML, XSLT
  • Distributed architecture, SOAP
  • METS as internal format
    – Group assembled for Greenstone METS profile(s)
  • OAI support planned
  • 1 year in dev; alpha testing in lab
Conclusion

- Positive experiences
- Good direction for development
- Strong user community
- Proven in real digital library projects
Links & Further Information

Chopin Early Editions:  
http://chopin.lib.uchicago.edu/

Greenstone:  http://www.greenstone.org/  
Downloads, documentation, examples

New Zealand Digital Library Project:  
http://www.nzdl.org/  
UNESCO & related collections, many demos