Supporting Lacey Act Compliance

Shelley Gardner

Contributors: Dr. John Hermanson, Dr. Cady Lancaster, Suzanne Peyer
Arbor Harbor
A Trees to Trade Reference System

S. Gardner¹, J. Hermanson²,³, S. Peyer⁴, C. Stahl⁵

¹U.S. Forest Service International Programs
²U.S. Forest Service Forest Products Laboratory
³University of Wisconsin - Madison, Dept of Civil and Environmental Engineering
⁴University of Wisconsin - Madison, Department of Integrative Biology
⁵U.S. Animal and Plant Health Inspection Service

Gardner et al. (shelleygardner@fs.fed.us)  Arbor Harbor: www.woodid.info
Background

- Growing legal requirements with traded lumber
- Need species-level risk assessment
- Growing number of references
- Inadequately linked species data
- Limits on time & available expertise

Motivation: Need for coalesced & accessible data
Objective

Construct a reference system that integrates:

- taxonomy
- vernacular
- conservation status
- trade regulation
- origin of species

End users: Organizations monitoring timber trade for compliance & law enforcement
## Data Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Rows</th>
<th>Size</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxonomy</td>
<td>1,071,536</td>
<td>511 MB</td>
<td>CoL</td>
</tr>
<tr>
<td>Vernacular</td>
<td>41,750</td>
<td>4 MB</td>
<td>CoL</td>
</tr>
<tr>
<td>Description</td>
<td>811,056</td>
<td>65.6 MB</td>
<td>CoL</td>
</tr>
<tr>
<td>Distribution</td>
<td>29,732</td>
<td>3 MB</td>
<td>CoL</td>
</tr>
<tr>
<td>Reference</td>
<td>332,275</td>
<td>31.6 MB</td>
<td>CoL</td>
</tr>
<tr>
<td>USFS vernacular</td>
<td>88,856</td>
<td>46.6 MB</td>
<td>USFS</td>
</tr>
<tr>
<td>CITES-Species+</td>
<td>31,158</td>
<td>119.2 MB</td>
<td>CITES</td>
</tr>
<tr>
<td>Look-alikes</td>
<td>63</td>
<td>48 kB</td>
<td>CITES, UN</td>
</tr>
<tr>
<td>Cultivation</td>
<td>123</td>
<td>26 kB</td>
<td>IUCN, other</td>
</tr>
<tr>
<td>Tariff Codes</td>
<td>118</td>
<td>16 kB</td>
<td>US ITC</td>
</tr>
<tr>
<td>Export Bans</td>
<td>34</td>
<td>32 kB</td>
<td>WRI</td>
</tr>
<tr>
<td>Country</td>
<td>247</td>
<td>16 kB</td>
<td>World Atlas</td>
</tr>
<tr>
<td>12 tables</td>
<td>2,415,486</td>
<td>781.3 MB</td>
<td></td>
</tr>
</tbody>
</table>
Overview

Arbor Harbor is a reference system coalescing information on trees and their global trade, especially those species at risk of over harvesting. The system integrates data on taxonomy, conservation, geography, and trade regulations, all acquired from online databases or primary literature. The intended users include professionals working with forest resources and their conservation.
Interface

Arbor Harbor
a trees to trade reference system

Search | Sources | Partners

Search

This reference system is a collection of taxonomic, conservation, geographical, and trade data, with a particular focus on tree species vulnerable to overharvesting. Search results will include information on the topics indicated in the tabs below only if the data are available.

Enter search

- Search by common name, genus, or species. Note: A search on country alone could return a lengthy list of entries and therefore, is not recommended.
- In wildcard searches, please use % in place of unknown letters. For example, "%guatemalteco" returns "abeto guatemalteco" (a common name), "A%" returns "Abies" (a genus), and "%malensis" returns "guatemalensis" (a species).
- After submitting a search, you will be directed to select a "Taxon ID" to retrieve more information about a particular species.

Common name: abeto guatemalteco
Genus: Abies
Species: guatemalensis
Country: Guatemala

Search
Future Work & Considerations

- Link Arbor Harbor to wood identification tools
- Integrate with GTTN Service Provider Directory
- Incorporate user knowledge into data set
- Create Arbor Harbor API
- Test Arbor Harbor as a flagging system
- Improve user interface
- Maintain & Automate

http://woodid.info/
Direct Analysis in Real Time
Time-of-Flight Mass Spectrometry

Benefits of DART-TOFMS

Single, small slivers or powders are used to generate a chemotype (chemical profile)
  • Excellent for finished products & those with limited access to anatomical features

Lab cost: 5-10 cents per sample
  • Collection time: 6 seconds

Robust Database
  • 15,000+ references available, 2000 species tropical hardwoods
  • 250+ CITES and lookalike species
  • Doubled in size in 2 years and still growing
  • Provides species level identification

Actively used in 100+ forensic cases, 800+ items
FS IP Wood Identification

USFS International Programs
• Housed within the US Fish & Wildlife Forensics Laboratory (Ashland, OR)

• Conducts forensic wood identification and provides species screening for non-commercial entities (xylaria, academia, individuals, governments).

• Screening for NGOs on a case-by-case basis

For Questions:
Dr. Cady Lancaster
(541) 488-6526
(385) 239-8260
cadylancaster@fs.fed.us
XyloTron and Wood Anatomy Application

Application for frontline personnel and laboratory:

• Adding efficiencies to wood anatomy XyloTron-MikoTron (Mike Wiemann)

• Identification of 39 species (reference image library is expanding)

• High fidelity image capture for visual comparison

• Virtual wood ID

• Segregate wood samples into groups (unknowns)
XyloTron and Wood Anatomy

Coming soon
http://xylotron.org/

Contact:
John Hermanson
US Forest Service Forest Products Laboratory and University of Washington, CINTRAFORE
(Center for International Trade in Forest Products)
jhermans@uw.edu
Stable Isotopes Application

First pilot of stable isotope analysis of suspected Lacey Act violation to determine country of harvest.
Thank you!