



agroisolab
UNITED KINGDOM

Origin Authentication **Timber**

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Agroisolab UK Ltd

In partnership with Agroisolab GmbH,
accredited testing laboratory in accordance
with DIN EN ISO/IEC 17025:2005



Stable Isotope Ratio Analysis
(SIRA)
-the science-

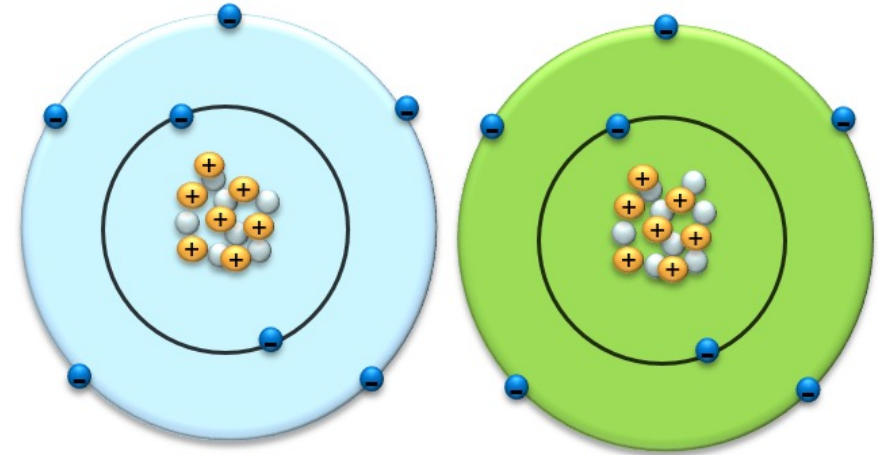
Stable Isotopes

Isotopes variation within elements

- Same number of **protons**
- Different number of **neutrons**
- All elements have one or more isotopic forms
- Isotopes have identical chemistry

Stable isotopes

- Naturally occurring
- Non-radioactive
- Chemically identical
- Differ only in mass




Stable



Stable

Stable Isotope signatures – 5 in timber

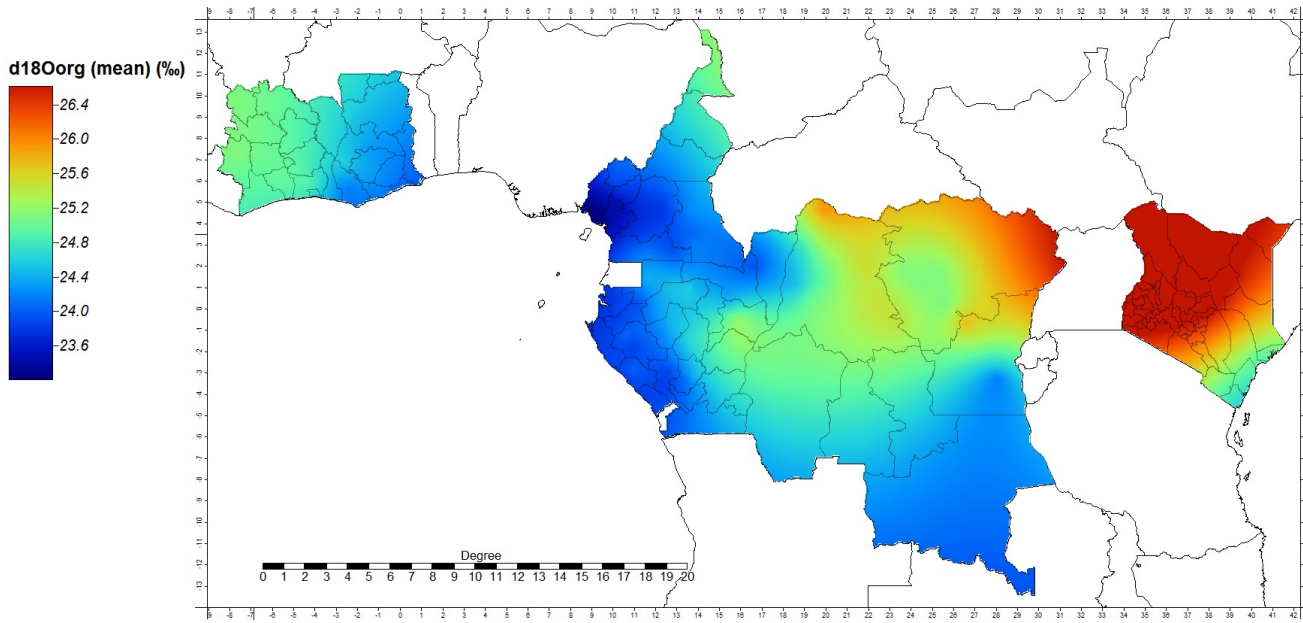
Decl.	D/H _{org} * [‰] v.s. vsmow	¹⁸ O/ ¹⁶ O _{org} * [‰] v.s. vsmow	¹³ C/ ¹² C* [‰] v.s. PDB	³⁴ S/ ³² S* [‰] v.s. CDT	⁸⁷ Sr/ ⁸⁶ Sr [ppm]	Origin Evaluation
Country of harvest: Brazil	-100.4 +/- 1.5	19.3 +/- 0.3	-27.3 +/- 0.1	7.4 +/- 0.3	0.7403 +/- 0.003	

* +/- single standard deviation

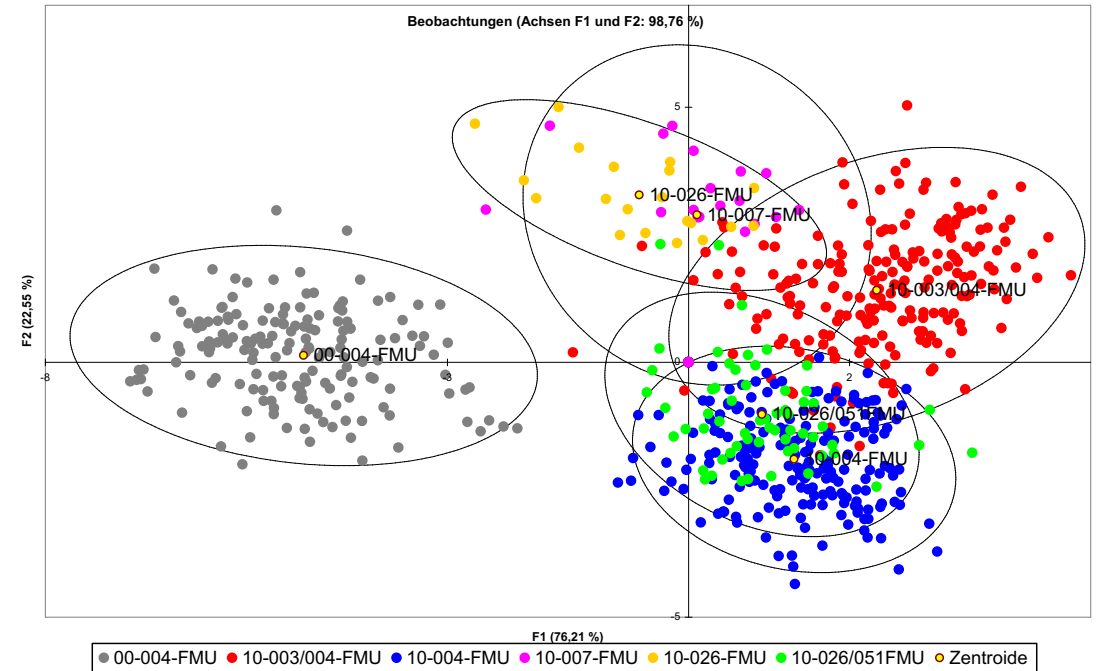
$$\frac{\text{Percent}}{0.2\%} = \frac{\text{Permil}}{2.0\text{‰}}$$

SIRA results interpretation - *Statistics*-

Qualitative and statistical answers

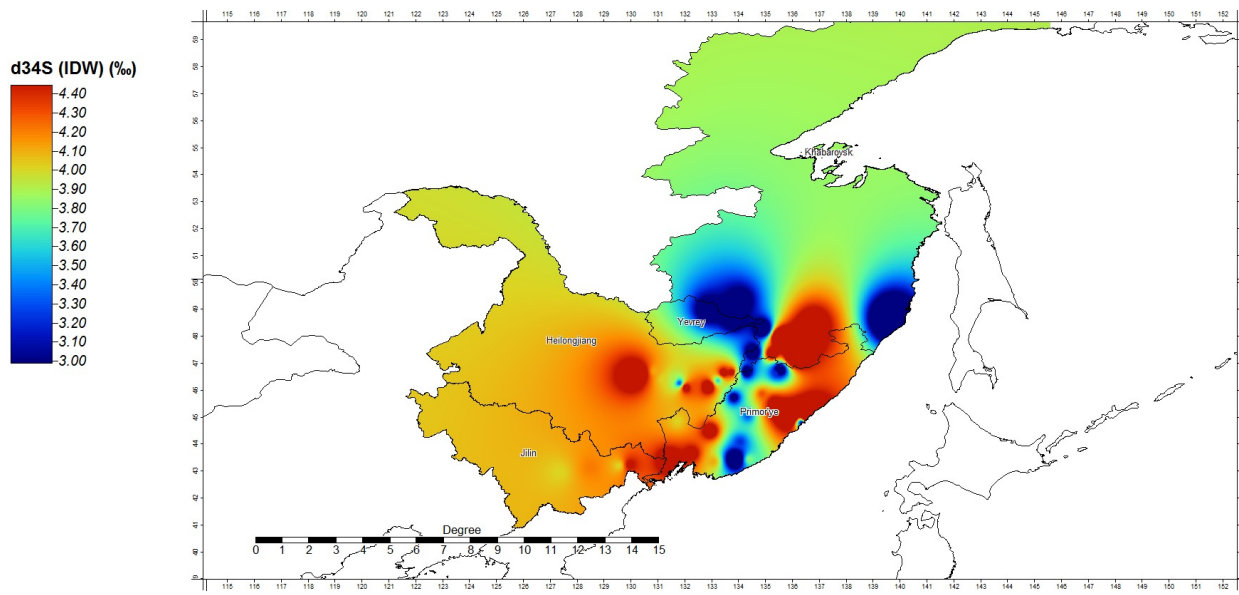
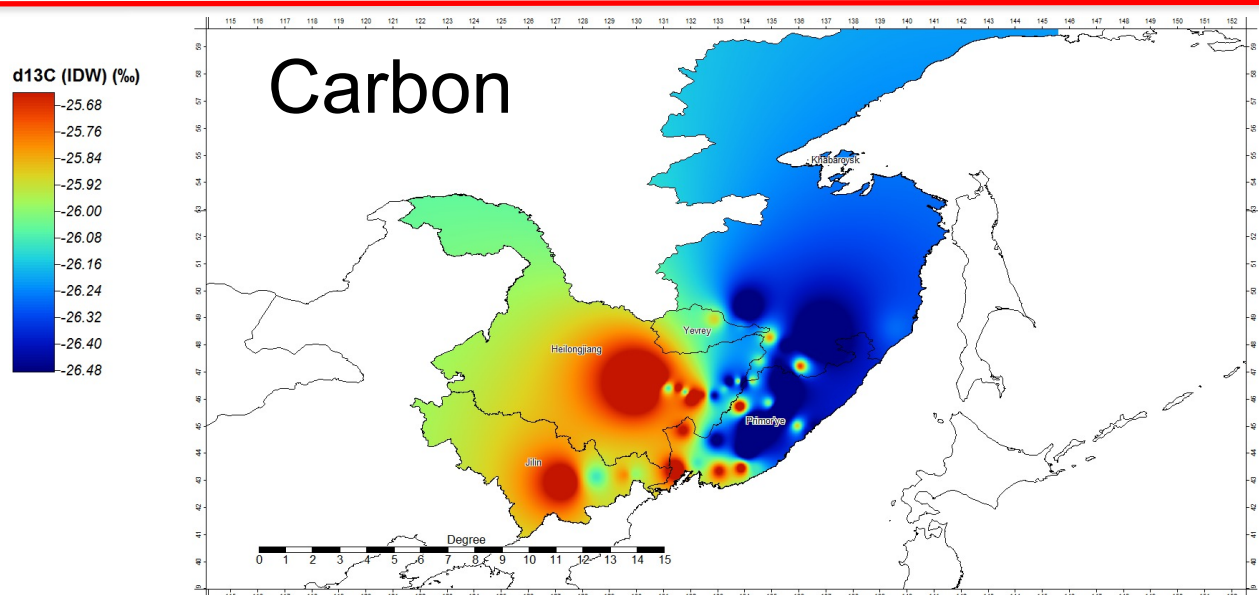
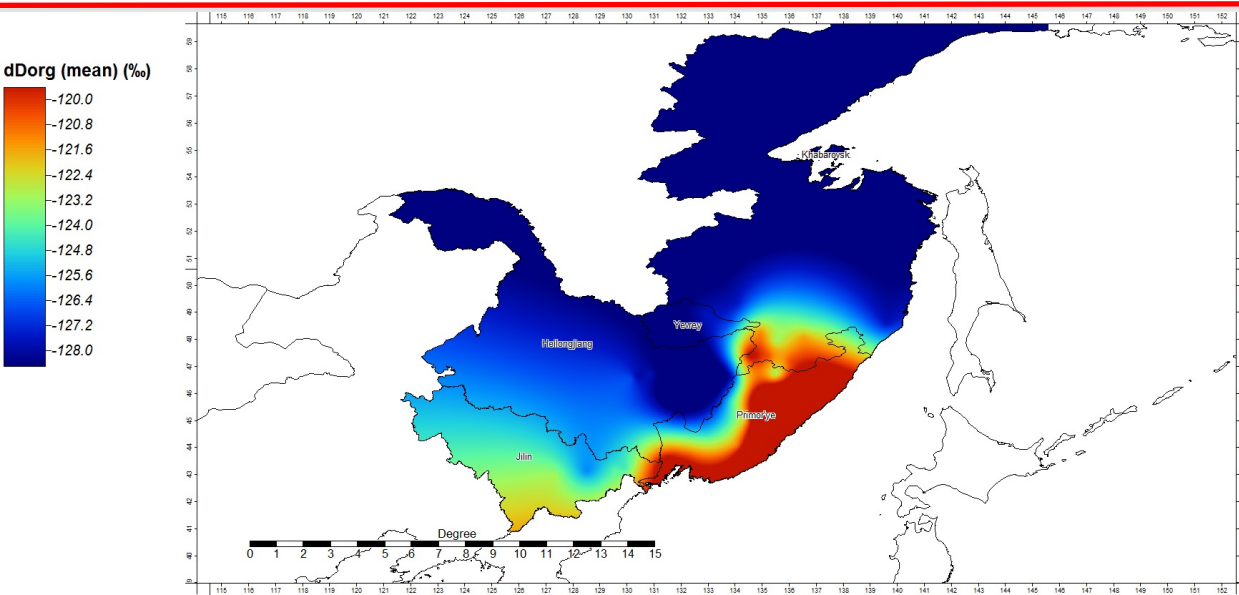


$^{18}O/^{16}O$ isotope ratios in Iroko in seven African countries (left to right, Ivory coast, Ghana, Cameroon, Gabon, Congo, Democratic republic of Congo, Kenya)



Iroko and Sapelli from different concessions in Cameroon (DA Rotating: D, ^{18}O , ^{13}C , ^{15}N , ^{34}S)

White Oak – *Q. mongolica* Amur basin



Hydrogen (D/H), Carbon (¹³C/¹²C), and Sulfur (³⁴S/³²S) isotope ratios in oak in the Amur region of Russia and China.

D/H D/H

Service Delivery of Science

Isotope Ratio Mass Spectrometry (IRMS)

Modern IRMS devices

- Accuracy: mass of 2 atoms in 200,000,000
- Price per device €80-120k
- Inter-lab round-robin calibration
- Standards oversight - IAEA

Agroisolab GmbH

- 11 IRMS devices
- Working in parallel
- 100 -150 samples/week
- 10 lab staff



Chinese visitors at Agroisolab, Jülich, 2016

Species check: DART Direct Analysis in Real Time Mass Spectrometry

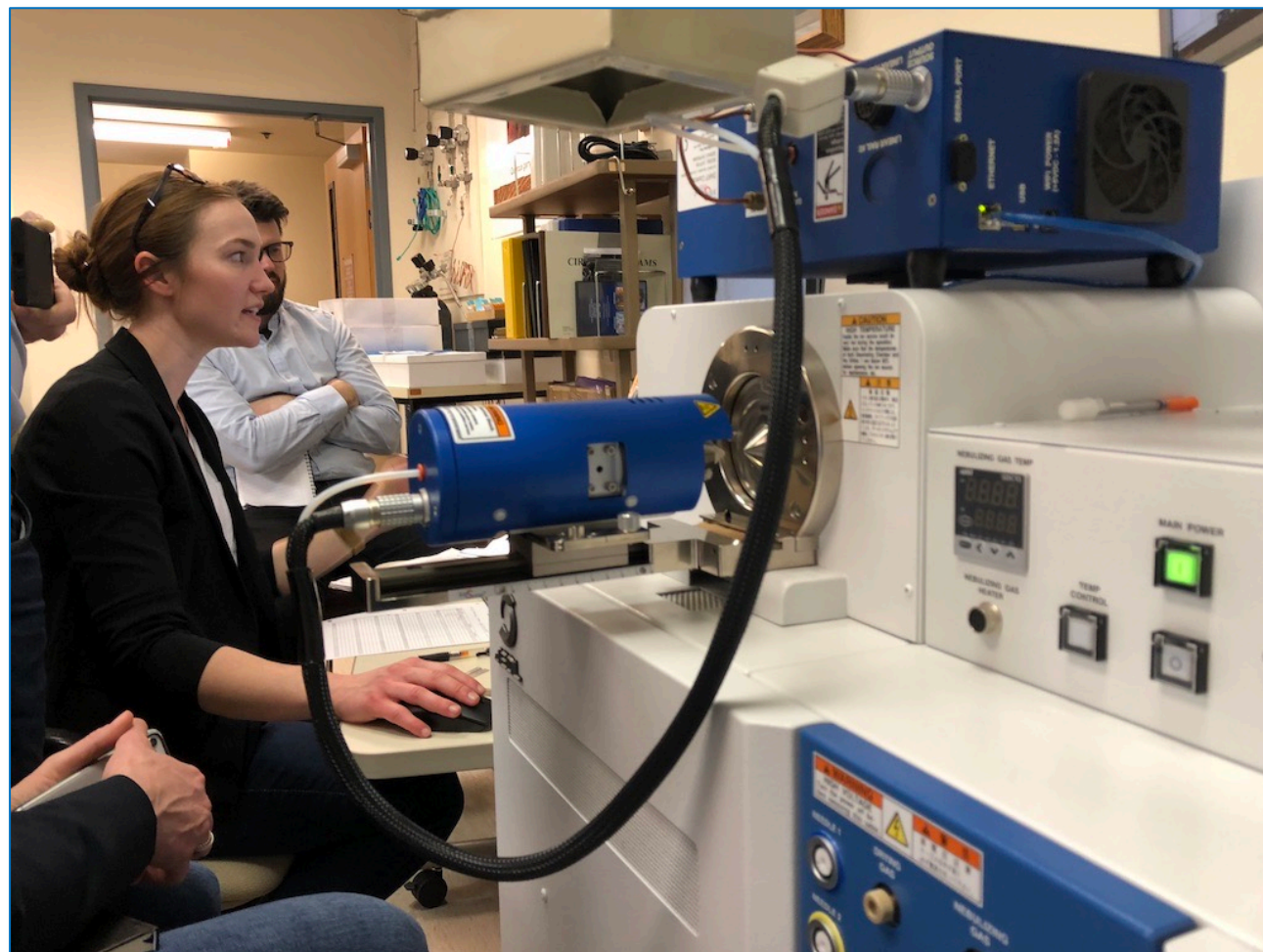
Agroislab acquired 1x device 2019

JEOL Inc. USA

- \$250,000
- IonSense Vapur[®] Interface

High-resolution, exact mass
Measurements of

- Gases
- Liquids
- Solids



<https://www.fws.gov/lab/>

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How service deliver works – the exclusion principle



Existing oak database China/Russia Far East

- 250 samples
- 50 Russian locations
- 17 China locations

Total 250 samples

A good dataset – **but** collected undercover by brave NGO staff. Not a scalable process



Regulatory Enforcement

EUTR now...



EUROPEAN COMMISSION

EU REGULATION

995/2010

Brussels

12 February 2016

C(2016) 755 final

- **On the internal market**
- **For the first time e.**

- **In the course of a commercial activity**

Due diligence requires operators to gather information about the timber and timber productsin order to carry out a full risk assessment

...soon to be UKTR

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2008 ...amended to include timber and paper

LACEY ACT is a fact-based statute with strict liability,

Third-party certification/verification schemes cannot "prove" legality

Violators face criminal & civil sanction even if unaware they were dealing with illegally harvested timber

Gibson Guitars 2012

violated the Lacey Act... ...purchasing & importing illegally

Wood from Madagascar & India

... fined \$300,00 + \$261,844 timber confiscated

Timber Regulations in other countries

Australia



FOREST LEGALITY INITIATIVE

Home About **Laws & Policies** Document Library Events Blog

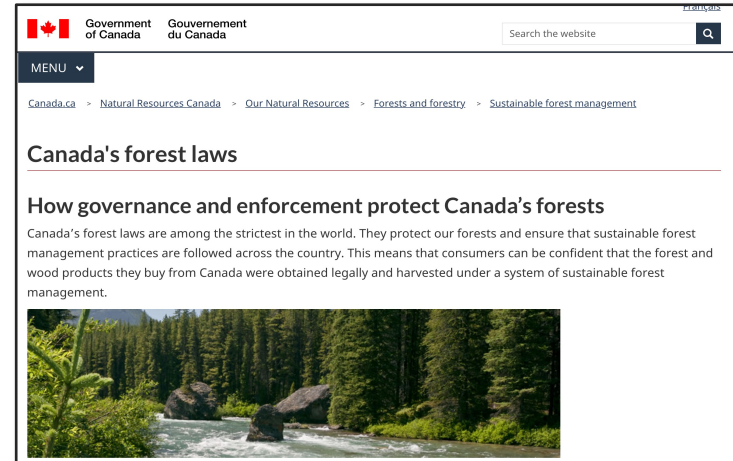
Australia Illegal Logging Prohibition Act

Australia's illegal logging laws, like similar legislation in the European Union and the United States, has been designed to support the trade of legal timber into the Australian market. The laws consist of the *Illegal Logging Prohibition Act 2012* (the Act) and the *Illegal Logging Prohibition Regulation 2012* (the Regulation).

The Act

The Act commenced on 28 November 2012 and establishes Australia's illegal logging framework. The Act makes it a criminal offense to intentionally, knowingly or recklessly import wood, pulp and paper products into Australia or process Australian raw logs that have been illegally logged. It also outlines that businesses must undertake 'due

Canada



Government of Canada / Gouvernement du Canada

Search the website


MENU

Canada.ca > Natural Resources Canada > Our Natural Resources > Forests and forestry > Sustainable forest management

Canada's forest laws

How governance and enforcement protect Canada's forests

Canada's forest laws are among the strictest in the world. They protect our forests and ensure that sustainable forest management practices are followed across the country. This means that consumers can be confident that the forest and wood products they buy from Canada were obtained legally and harvested under a system of sustainable forest management.



Japan



EU FLEGT Facility

Home What is FLEGT What we do Where we work Publications Media room

Publications > A comparison of the Japanese Clean Wood Act and the EU Timber Regulation

Briefing

A comparison of the Japanese Clean Wood Act and the EU Timber Regulation

In 2015, Japan was the world's fourth largest importer of timber and timber products after China, the United States (US) and the European Union (EU), and it was the third largest importer of wooden furniture after the US and the EU.[1]

About this briefing
A comparison of the Japanese Clean Wood Act and the EU Timber Regulation

South Korea



KOREA: NEW REGULATION AGAINST ILLEGAL TIMBER TRADE

Nov 27, 2019 08:32 | Silvana Mühr, Switzerland Global Enterprise

The Republic of Korea aims to stop the trade in illegally-felled timber and is introducing new legislation accordingly. The new regulation will apply to exporters from October 1, 2019.



Korea's new law on the sustainable use of wood has been trialed in a test phase launched in October 2018. The aim here is to promote the legal timber trade by restricting the import and distribution of illegally harvested wood. According to the Korean authorities, the test phase was successful. While 80% of the documents had still not been submitted correctly in November 2018, that proportion had fallen to 20% by June 2019.

Regulatory Enforcement *-new laws-*

UK 2021... Agricultural Products to be included



Department
for Environment
Food & Rural Affairs

Due diligence on forest risk commodities

Consultation document

August 2020

The law we are proposing would work by requiring a relatively small number of larger businesses to make sure that the ‘forest risk’ commodities they use – commodities that can cause wide-scale deforestation – have been produced legally. This is because globally a large proportion of forest clearance to produce these commodities is not considered legal¹.

2022 New Regulations arriving in USA – the Schatz Bill

New regulation will drive corporates trading timber and any product that could come from de-forestation to do more...



BRIAN SCHATZ
UNITED STATES SENATOR FOR HAWAII

SCHATZ, SENATORS PUSH FINANCIAL FIRMS TO HELP STOP GLOBAL DEFORESTATION

Deforestation, A Major Contributor to Climate Change, Accounts for 12% of Global Greenhouse Gas Emissions

Monday, February 4, 2019

WASHINGTON – Today, U.S. Senator Brian Schatz (D-Hawai'i), co-chair of the Senate Climate Action Task Force and a member of the Senate Banking Committee, led a group of eight senators in calling on investment firms to help mitigate climate change by using their investment portfolios to stop tropical deforestation.

"We are concerned that some companies in your portfolio may not be living up to their commitments to address deforestation in their supply chain—if they have made such commitments at all," the senators wrote. **"It is our view that addressing risks from deforestation is in line with your fiduciary responsibility. As such, we are interested in learning what due diligence and risk management procedures your firm has put in place to address and mitigate these risks for both active investments and passively managed funds."**

... a great opportunity for authentication analysis

Agroisolab Enforcement Experience

Contracted service delivery

- UK – EUTR: competent authority, BEIS
- USA – Lacey Act: APHIS/CPB/DHS/DoJ

Enforcement interest/pilot project

- Sweden - EUTR
- Norway - EUTR
- Denmark - EUTR
- Finland – EUTR
- Spain – EUTR
- Japan
- South Korea
- Australia

Dept of Justice prosecution 2016

Virginia Hardwood Flooring Company sentenced for Illegal Importation of hardwood and related environmental crimes

Pay \$13.15 Million fine... ...largest Lacey Act Penalty

...including \$969,175 criminal forfeiture

Reference samples & reference databases

The need for reference data

2x attributes of wood

- Species
- Origin

Science-based traceability

- Wood Anatomy
- Stable Isotope Reference Analysis (SIRA)
- Genetics
- NiR
- Trace Element Analysis
- DART



comparative technologies

Royal Botanic Gardens Kew, London – *historic collection*



Established c.1750
44,000 specimens
Not geo-located



Agroisolab timber reference data

OK... but limited in scope, expensive and complex to build. Not scalable

Mahogany (Inc. African Mahogany)

- Congo
- Costa Rica
- Democratic republic of the Congo
- Ecuador
- Ghana
- Honduras
- India
- Java
- Panama
- Peru

Teak (*Tectona grandis*)

- Brazil
- Costa Rica
- Ghana
- Honduras
- India
- Indonesia
- Java
- Laos
- Myanmar (Burma)
- Panama
- Papua New Guinea
- Vietnam

Spruce

- Austria
- Belarus
- Finland
- Germany
- Norway
- Poland
- Russia
- Sweden

Sapelli

- Cameroon
- Congo
- Democratic Republic of the Congo

Iroko

- Cameroon
- Congo
- Democratic Republic of the Congo
- Gabon
- Ghana
- Ivory Coast
- Kenya

Birch

- Lithuania (new)

Oak

- Amur region (China/Russia)
- USA
- Europe
- UK (new)

Cedar

- Solomon Islands

Bintangor

- Solomon Islands




WFID Advisory Board

- Agroisolab
- US Forest Service
- RBGKew
- FSC
- Forest Trends
- World Resource Institute

World ForestID



	<i>Forest Sampling</i>	<i>Curation</i>	<i>Analysis</i>	<i>End Users</i>
	<ul style="list-style-type: none"> - Private forest owners - Forest agencies - Certified concessions - Certification bodies - Community forestry projects - FLEGT TLAS officials - Independent auditors - Independent monitors - Scientific projects (academic) - CITES projects - Partnerships through GTTN - Corporates 	 <p>Advisory Group...</p> <p>KEW</p> <ul style="list-style-type: none"> • Sample accession and processing • Share sub-samples • Support calibration/standards • Research 	<ul style="list-style-type: none"> • Government labs • Labs contracted to end users 	<ul style="list-style-type: none"> - Companies for DDS - Enforcement officials for 'Demand-side' Legislation - Companies testing suppliers - Government agencies responsible for FLEGT license credibility / other "positive" claims - Certification schemes testing for brand credibility - Certification schemes testing for brand credibility - NGOs + Media testing for brand credibility - FLEGT TLAS officials - Research institutes
FUNDING	<ul style="list-style-type: none"> - Donors: DFID, USFS, NORAD? - Corporates - Philanthropic Inst. - Private benefactors 	<ul style="list-style-type: none"> - DEFRA 	<ul style="list-style-type: none"> - Funding for sample analysis - Pay/sample for testing by end users 	<ul style="list-style-type: none"> - Self funded

www.WorldForestID.org





- Governments
- National Institutions
- Govt Labs
- NGOs
- Universities
- For-profit labs

World ForestID Funding

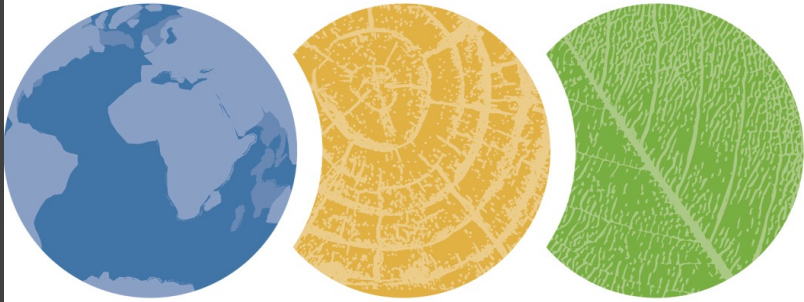
- US State Department
- US Dept Ag and USFC
 - Uni of Connecticut – WFID Database USD250k
 - Uni of Knoxville – WFID mobile App USD 100k
- UK Defra £5.3m to RSBKew
 - RBG Kew staff
 - DART ToF MS
 - Stable Isotopes
- FSC – funding WFID 1st year staff
- Forest Trends
- Agroisolab – developed protocols

Investment to date ~USD850,0000

www.WorldForestID.org

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WORLD



FOREST ID

New
Reference
Projects

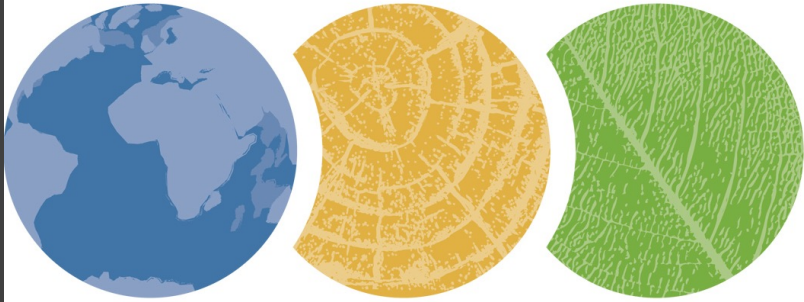
www.WorldForestID.org

WFID Collection Expeditions

- US Oak Project 2017
- Latin America 2018-2020
 - Peru
 - Nicaragua
 - Honduras
 - Guatemala
- Solomon Islands & PNG 2019
- Gabon -2020
- Latvia – 2021
- Latin & South America
 - Mexico
 - Colombia
 - Brazil
- Thailand – 2020
- ForestMinds €5.3m
- Horizon 2021-3 €7.5m 4,000 samples
 - 5x Eastern European countries
 - Congo Basin
- US Hardwood reference project USD~5m 2022-3

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Sampling device

Pickering Punch
Patented 2020

New sampling device

Lab analysis sample requirement ...
Sample: plug 125mm x 20mm

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In partnership with Agroisolab GmbH,
accredited testing laboratory in accordance
with DIN EN ISO/IEC 17025:2005

