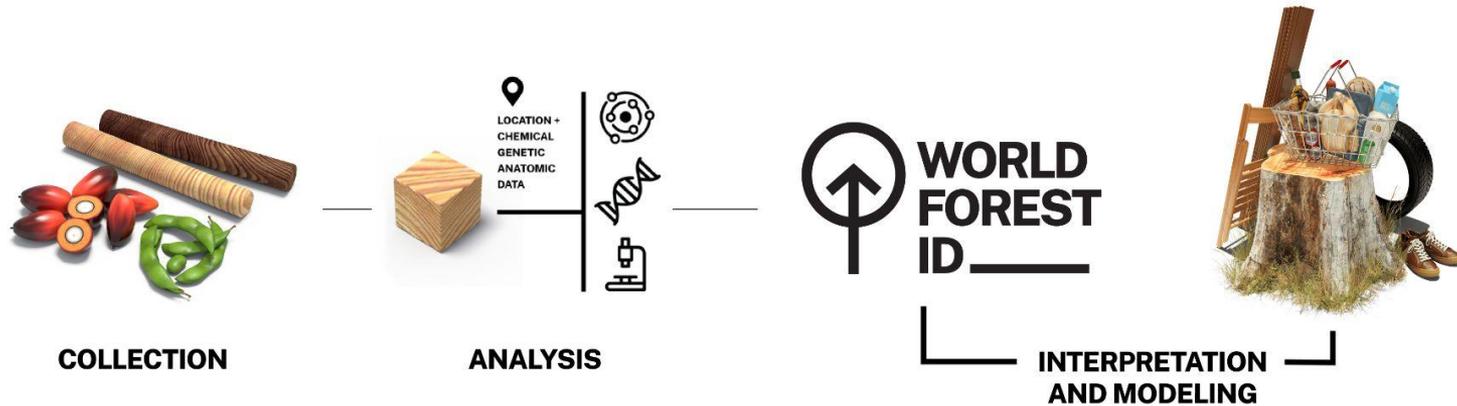

Scientific verification of species and origin

Jade Saunders, Executive Director

Dr Thomas Mortier, Data Scientist

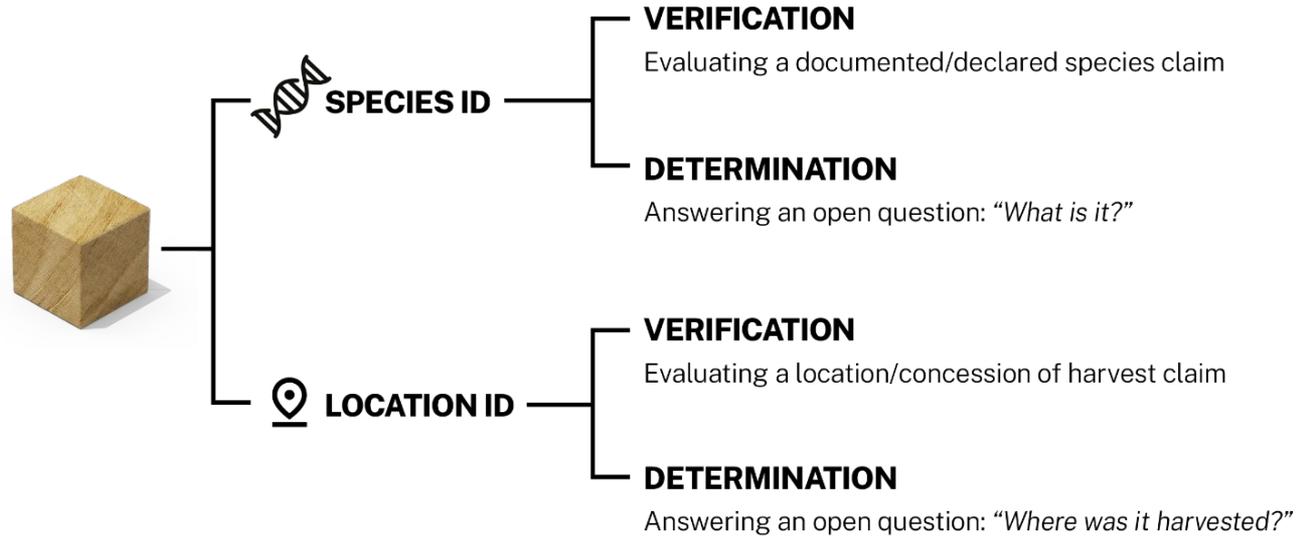


What is World Forest ID?

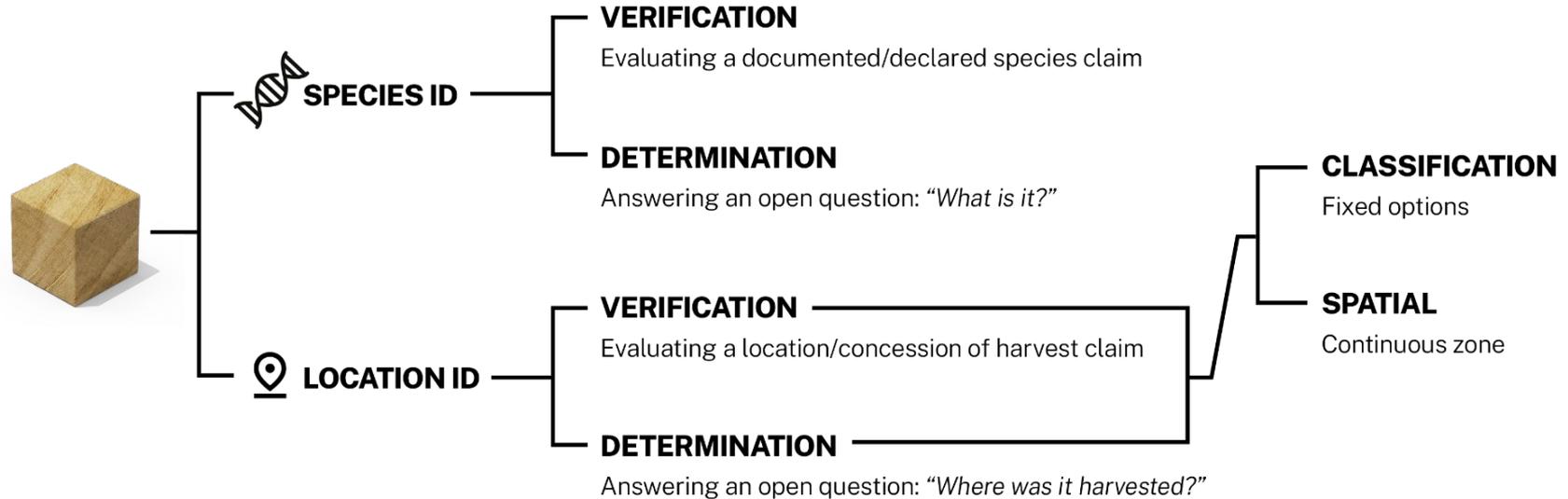
US registered 501c3: ‘Non profit’ institution that acts as a facilitator to a growing global consortium of public scientific institutes.

1. Focused on creating data and tools to scrutinise traceability / geolocation claims in forest-connected supply chains.
2. Creates unique non-proprietary reference material for enforcement of environmental laws.
3. Uses existing public data in innovative ways / combines them with our data to create new actionable knowledge.
4. Works with enforcement agencies and government scientists to establish protocols and norms for credible use of science in law enforcement.

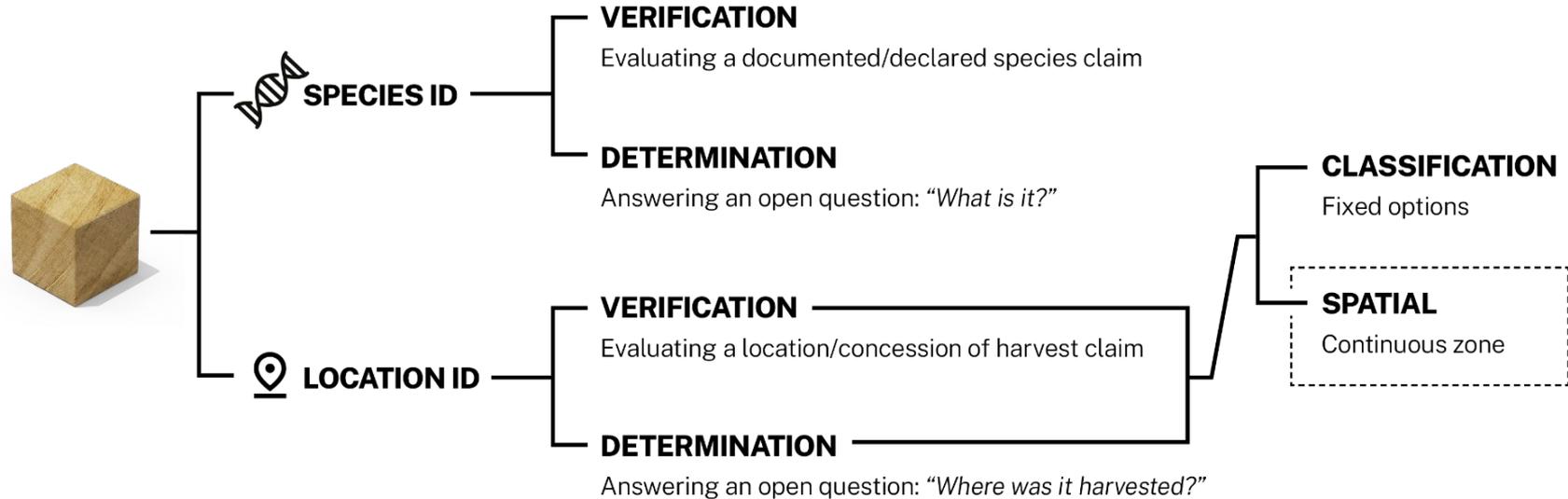
What is Wood ID?



What is Wood ID?



What are we doing that's different?



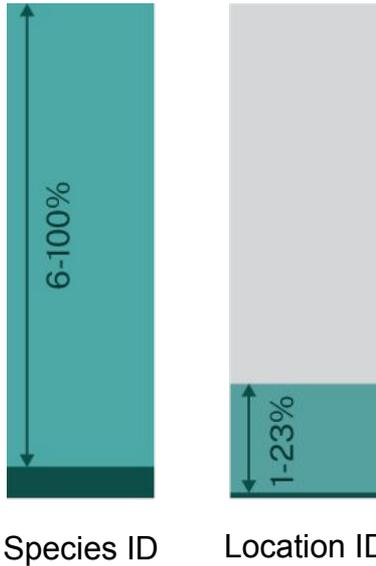
Collected in the field with fully documented chain of custody

All collectors are trained to follow strict protocols. With our sample collection app we ensure that the geolocation and transport of samples is documented at all stages of the process. Our sample collection database was designed in collaboration with environmental prosecutors and .

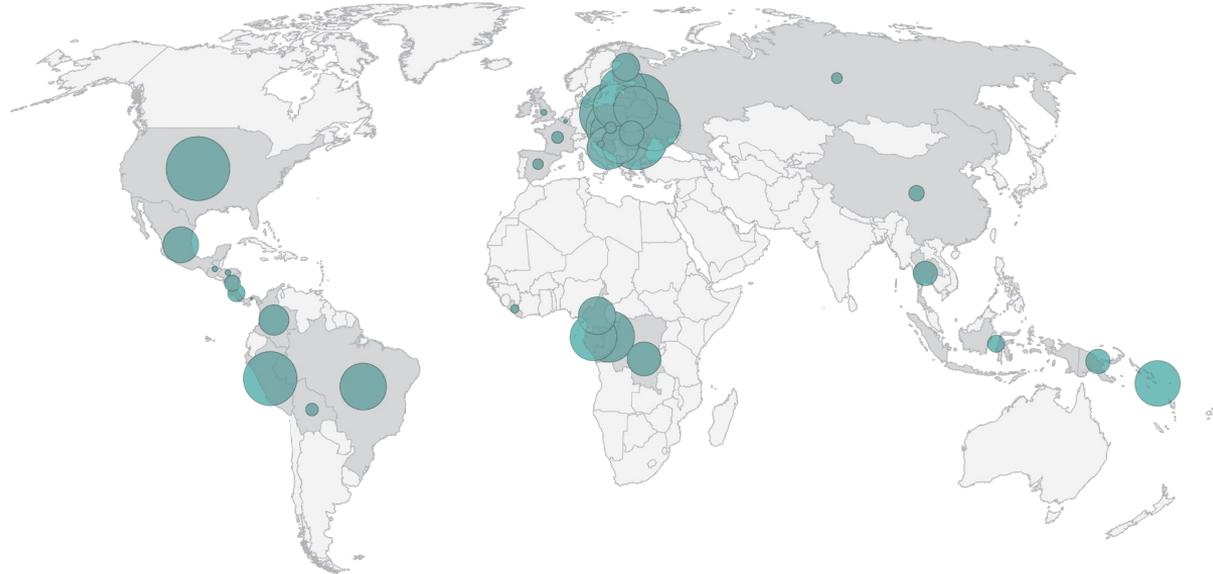


Filling the gaps in robust reference material

Existing reference material for priority species*



Trees sampled by World Forest ID globally and available for all techniques



*Low, M. et al. (2022). Tracing the World's timber: The status of scientific verification technologies for species and origin identification. International Association of Wood Anatomists. 2022:1-22.

A combined approach to analysis - location



TRACE ELEMENT ANALYSIS

Trace element analysis enables scientists to measure ***small quantities of chemical elements in a sample***, typically between one and 100 parts per million. Trace elements are ubiquitous in the environment and different plant species absorb different amounts of these elements from the **soil**. The quantity of these elements in a given species and location then creates a "fingerprint" that can be used to identify the ***location of harvest*** of a sample.



STABLE ISOTOPE RATIO ANALYSIS

Climate factors such as humidity, rainfall, and temperature, as well as soil composition affect the ***presence and ratio of various isotopes*** in organic matter. SIRA works by measuring the ratios of different isotopes in a sample. Due to the strong connection of isotopic composition to climatic and environmental factors, SIRA is a reliable technique to be used for verification or determination of ***location of harvest***.

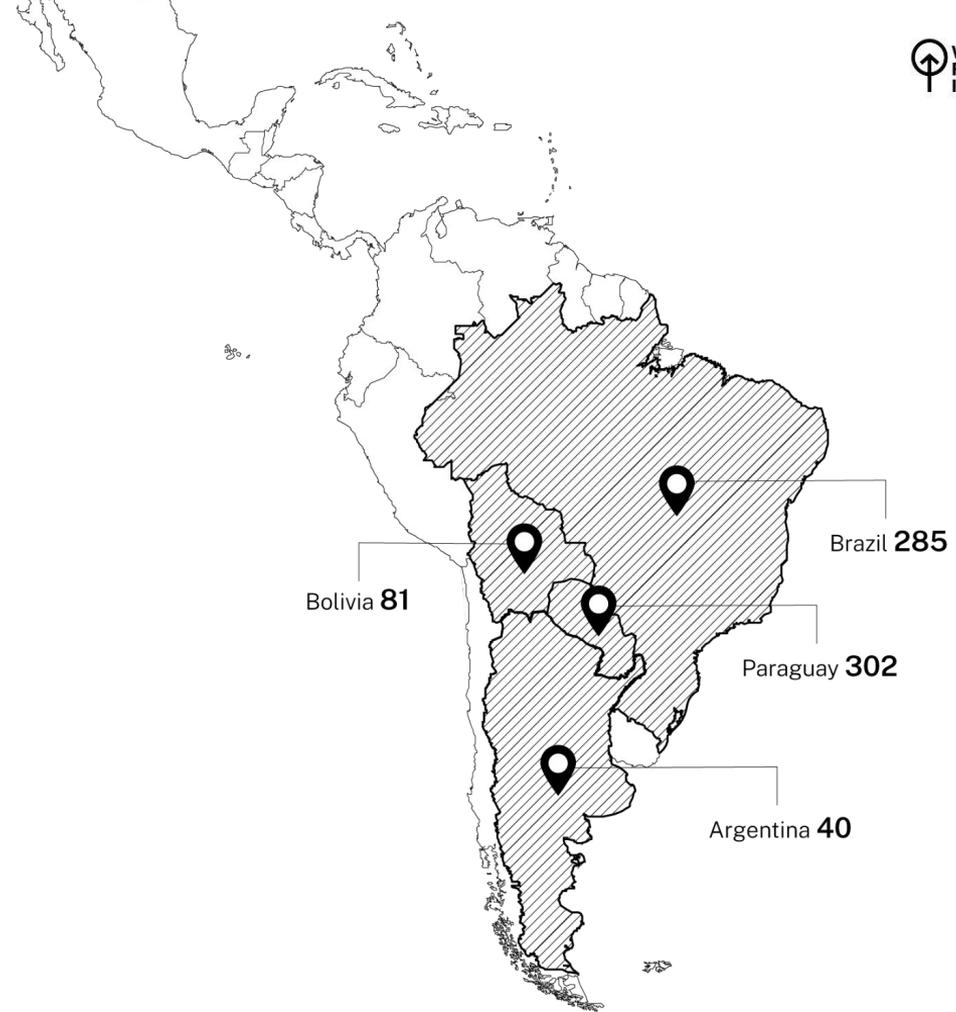
Asia Pacific Timber Supply Chains

AMBITION: To create reference material for multiple analytical techniques to facilitate transparency and law enforcement in high-risk supply chains in the Asia Pacific region.



Latin America Soy (Case Study)

AMBITION: To provide the reference material necessary for officials to be able to identify misdeclared origin under the new EU Deforestation Regulation.

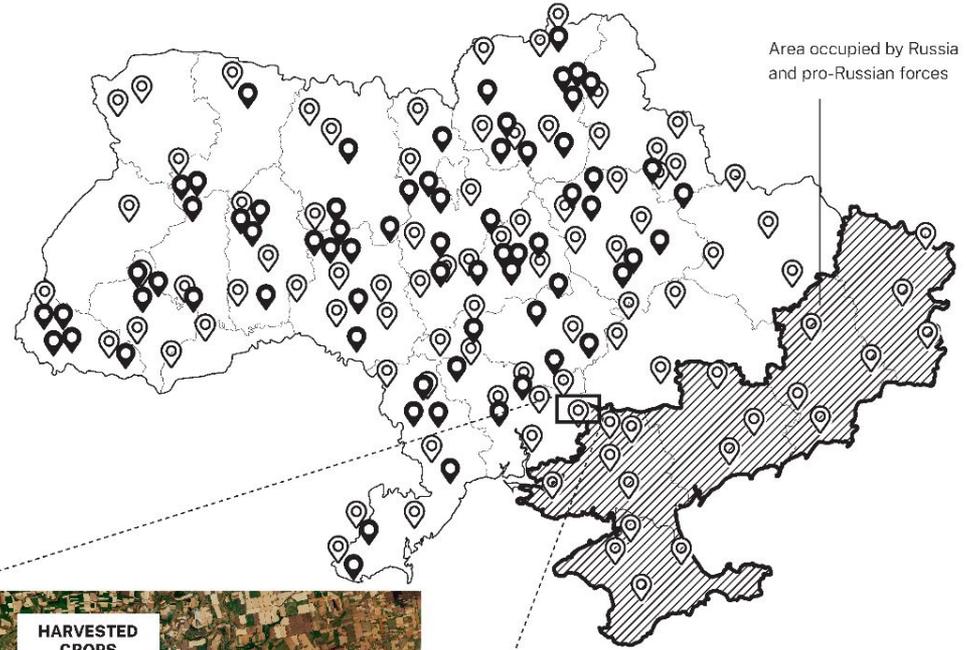


Grain Verification Scheme (GVS)

AMBITION: To build sufficient reference data of wheat, barley, maize, and sunflower to help customs agents identify stolen Ukrainian grains in global trade. Information from satellites and organizations on the ground is used to target collections and support investigations & enforcement.

April 2022	Headline news of grain theft from Ukraine
June 2022	UK Government request assistance
Sept 2022	UK Government contracts World Forest ID
Sept 2022 - Dec 2023	Sample collection
Feb 2023 - Feb 2024	Sample analysis
Feb 2023 - March 2024	Data integration and interpretation
Summer 2024	Available to Ukrainian officials

 AVAILABLE SAMPLE LOCATIONS
  IDEAL SAMPLING LOCATIONS (CLIMATE MODEL)



Eastern European Conflict Timber

AMBITION: To create the most comprehensive dataset possible to identify stolen Ukrainian timber and/or Russian and Belarusian conflict timber in trade.

SAMPLES COLLECTED

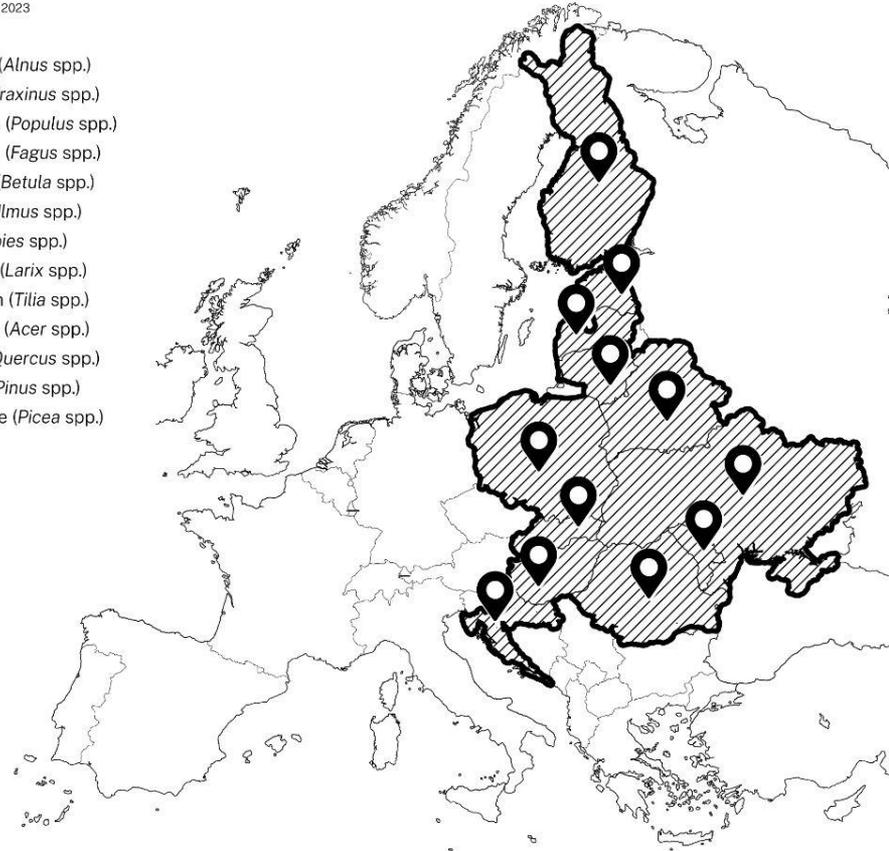
As of Jan 2023

Belarus	542
Croatia	296
Estonia	349
Finland	125
Hungary	345
Latvia	310
Lithuania	324
Moldova	99
Poland	590
Romania	622
Slovakia	498
Ukraine	453
TOTAL	4,553

SPECIES COLLECTED:

As of Jan 2023

Alder (<i>Alnus</i> spp.)
Ash (<i>Fraxinus</i> spp.)
Aspen (<i>Populus</i> spp.)
Beech (<i>Fagus</i> spp.)
Birch (<i>Betula</i> spp.)
Elm (<i>Ulmus</i> spp.)
Fir (<i>Abies</i> spp.)
Larch (<i>Larix</i> spp.)
Linden (<i>Tilia</i> spp.)
Maple (<i>Acer</i> spp.)
Oak (<i>Quercus</i> spp.)
Pine (<i>Pinus</i> spp.)
Spruce (<i>Picea</i> spp.)



Illegal Russian timber intercepted in Belgium

Working directly
with enforcement
agencies for
Impact



©Bloomberg Creative

LARS BOVÉ

Today at 00:05

The Federal Public Environment Service has established that tons of Russian wood is still being imported into our country despite the embargo since the invasion of Ukraine.

This has been demonstrated for the first time through an isotope analysis of samples of imported wood.

Transparent, peer
reviewed science
for **Impact**

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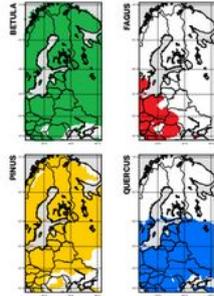
A framework for tracing timber following the Ukraine invasion

[Thomas Mortier](#), [Jakub Truszkowski](#), [Marigold Norman](#), [Markus Boner](#), [Bogdan Buliga](#), [Caspar Chater](#), [Henry Jennings](#), [Jade Saunders](#), [Rosie Sibley](#), [Alexandre Antonelli](#), [Willem Waegeman](#) & [Victor Deklerck](#) 

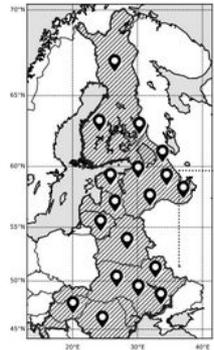
[Nature Plants](#) (2024) | [Cite this article](#)

World Forest ID AI enabled 'origin' modeling

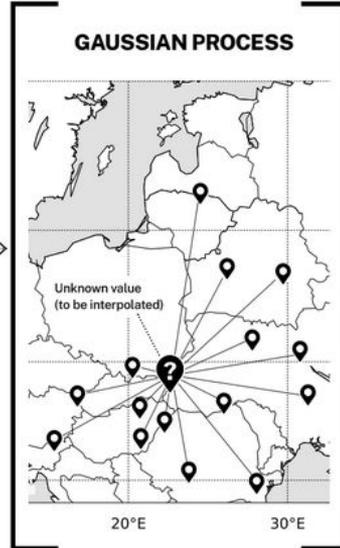
GENUS DISTRIBUTION



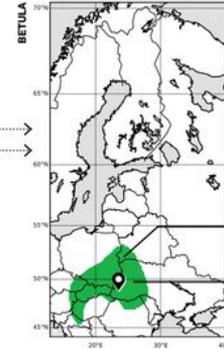
REFERENCE DATA



WOOD SAMPLE
Stable Isotope Ratios &
Trace Element Ratios

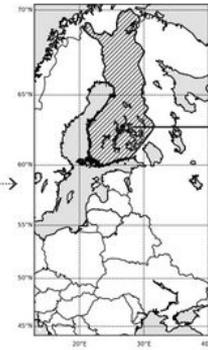


DETERMINATION



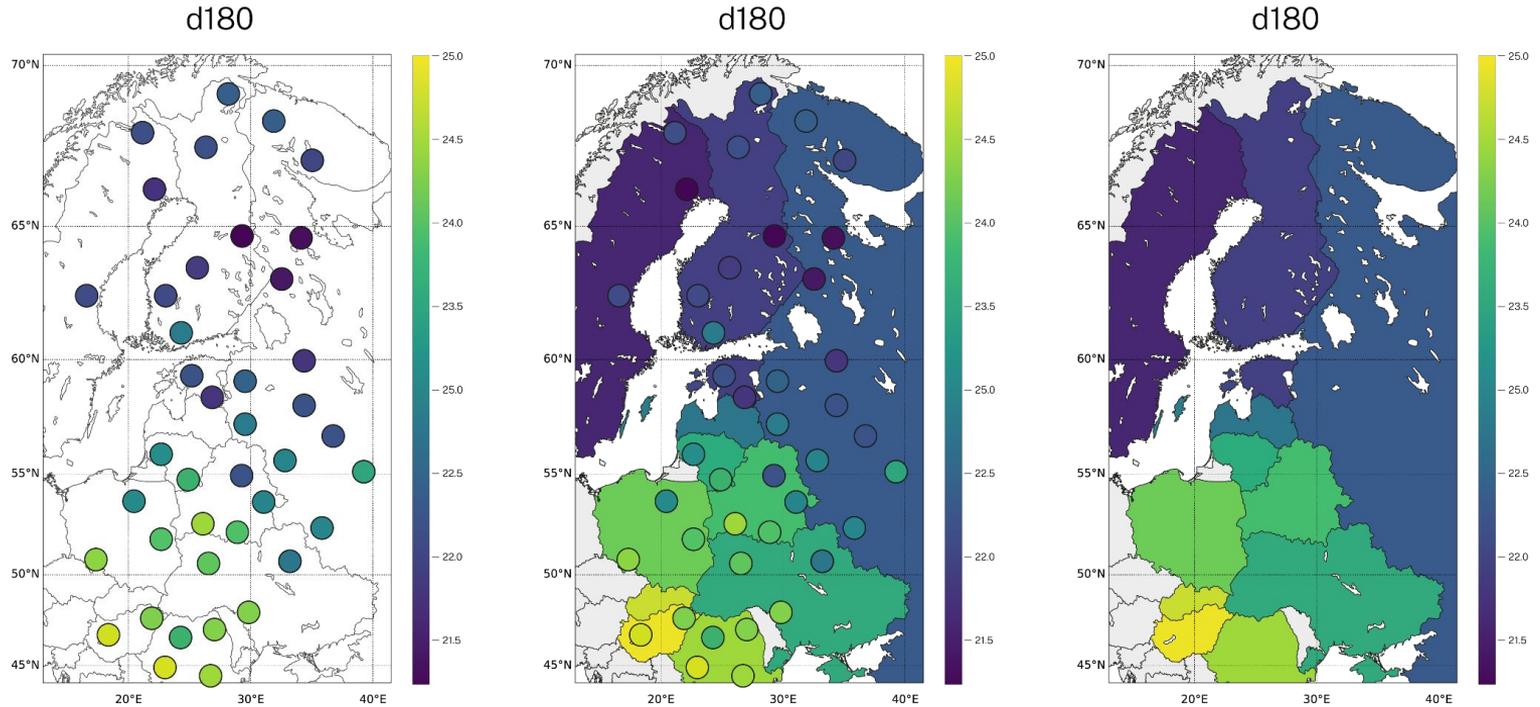
PREDICTED REGION
(95% confidence)
TRUE LOCATION

VERIFICATION

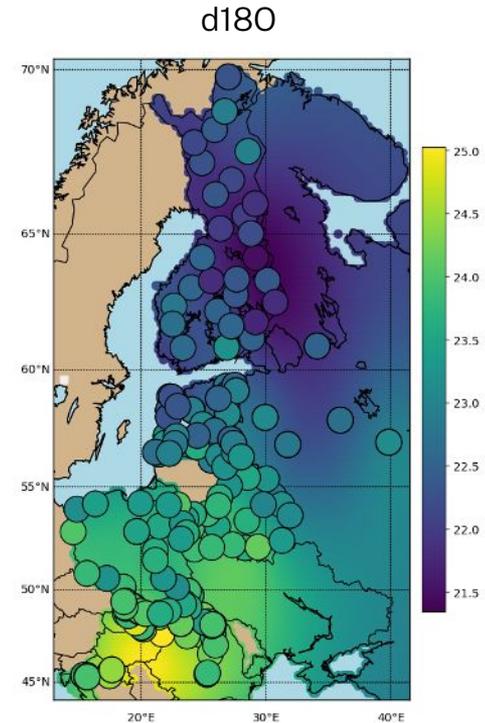
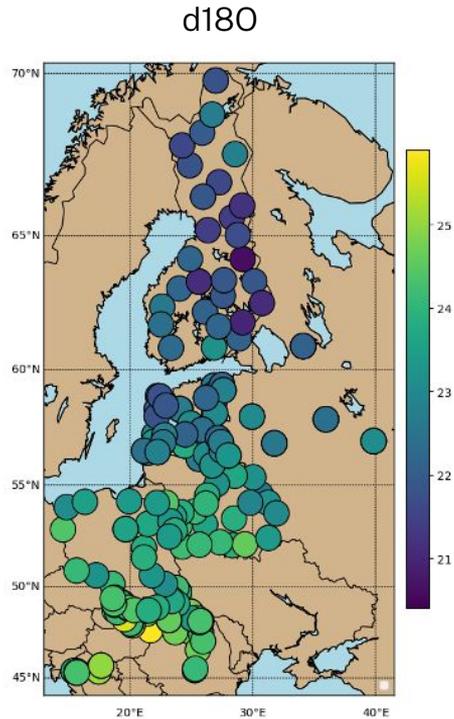


TRADED SAMPLE
Claimed origin Finland

Creating statistical models to support ‘forced determination’ queries



Creating Gaussian ‘element landscapes’ to answer spatial queries



INSIGHT MARCH 2024



AI-empowered traceability for forest-connected supply chains

Effective implementation of regulations such as the EUDR, CITES, and the Lacey Act demands credible, cost-effective methods for verifying harvest locations.

Deforestation is increasingly recognized as a critical barrier to achieving internationally agreed goals on combating biodiversity loss, mitigating anthropogenic climate change, and achieving sustainable and equitable development. In tropical forests, deforestation is driven largely by the expansion of industrial-scale commodity agriculture, as well as logging for timber. Many countries have responded with 'demand-side' laws requiring due diligence which necessitates knowledge of the harvest origin¹ of such commodities in international trade, most notably the recent European Union Deforestation Regulation (EUDR). Effective implementation of the EUDR, and agreements like the Convention on International Trade in Endangered Species (CITES), or enforcement of the US Lacey Act and relevant sanctions, requires credible and cost-effective methods for scrutinizing declared location of harvest and determining the origin of particular commodities and products in trade.

THE INSIGHT SERIES

World Forest ID's Insight series is designed to communicate the outputs of our long form research in a timely manner, by summarizing data snapshots and interim learning. All research is ultimately published in appropriate peer reviewed journals and citations should reflect full articles wherever possible.

[Access full article: A framework for tracing timber following the Ukraine invasion](#)

1. The World Trade Organization (WTO) defines 'country of origin' as "the country where goods were wholly produced or were subjected to sufficient processing". However, in the context of our work, and throughout this report, we refer to 'origin' as the location of harvest of tree and plant materials used in the manufacture of traded products.

Translating science into policy for Impact

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With thanks to
our Funders

