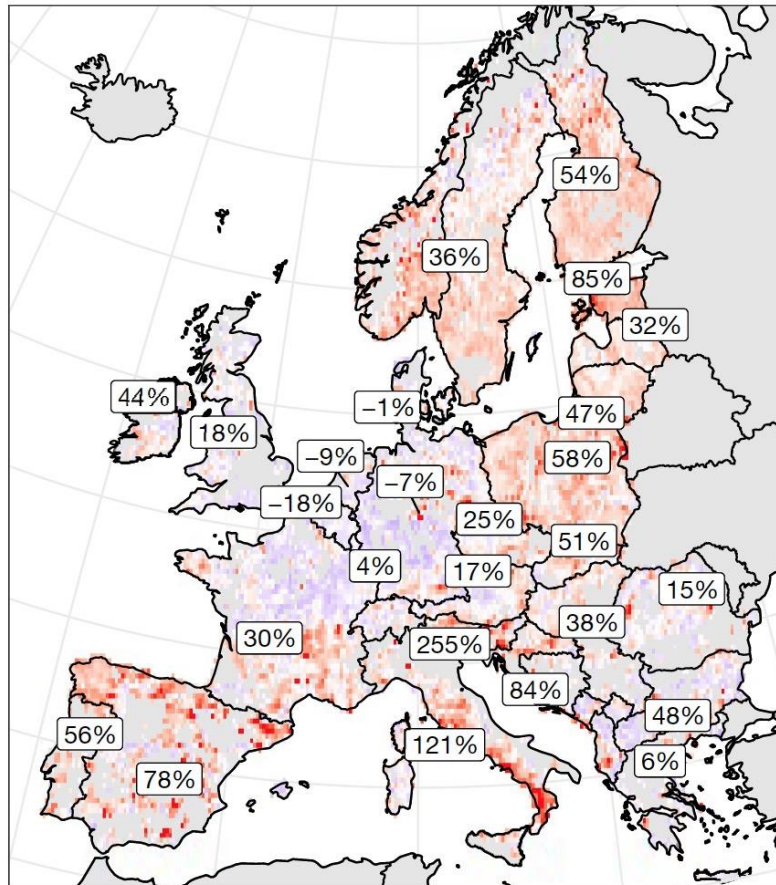


*“Abrupt increase in harvested  
forest area over  
Europe after 2015”*

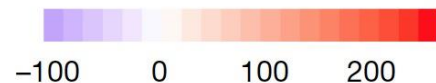
Really?

Peter Holmgren

7 December 2020



Change in harvested forest area  
2016–2018 versus 2004–2015 (%)



## Article

# Abrupt increase in harvested forest area over Europe after 2015

<https://doi.org/10.1038/s41586-020-2438-y>

Received: 17 May 2019

Accepted: 23 April 2020

Published online: 1 July 2020

Check for updates

Guido Ceccherini<sup>1</sup>✉, Gregory Duveiller<sup>1</sup>, Giacomo Grassi<sup>1</sup>, Guido Lemoine<sup>2</sup>, Valerio Avitabile<sup>1</sup>, Roberto Pilli<sup>1</sup> & Alessandro Cescatti<sup>1</sup>

Forests provide a series of ecosystem services that are crucial to our society. In the European Union (EU), forests account for approximately 38% of the total land surface<sup>1</sup>. These forests are important carbon sinks, and their conservation efforts are vital for the EU's vision of achieving climate neutrality by 2050<sup>2</sup>. However, the increasing demand for forest services and products, driven by the bioeconomy, poses challenges for sustainable forest management. Here we use fine-scale satellite data to observe an increase in the harvested forest area (49 per cent) and an increase in biomass loss (69 per cent) over Europe for the period of 2016–2018 relative to 2011–2015, with large losses occurring on the Iberian Peninsula and in the Nordic and Baltic countries.

Satellite imagery further reveals that the average patch size of harvested area increased by 34 per cent across Europe, with potential effects on biodiversity, soil erosion and water regulation. The increase in the rate of forest harvest is the result of the recent expansion of wood markets, as suggested by econometric indicators on forestry, wood-based bioenergy and international trade. If such a high rate of forest harvest continues, the post-2020 EU vision of forest-based climate mitigation may be hampered, and the additional carbon losses from forests would require extra emission reductions in other sectors in order to reach climate neutrality by 2050<sup>3</sup>.

Unsupported  
policy  
conclusions

# Nature Editorial 1 July 2020

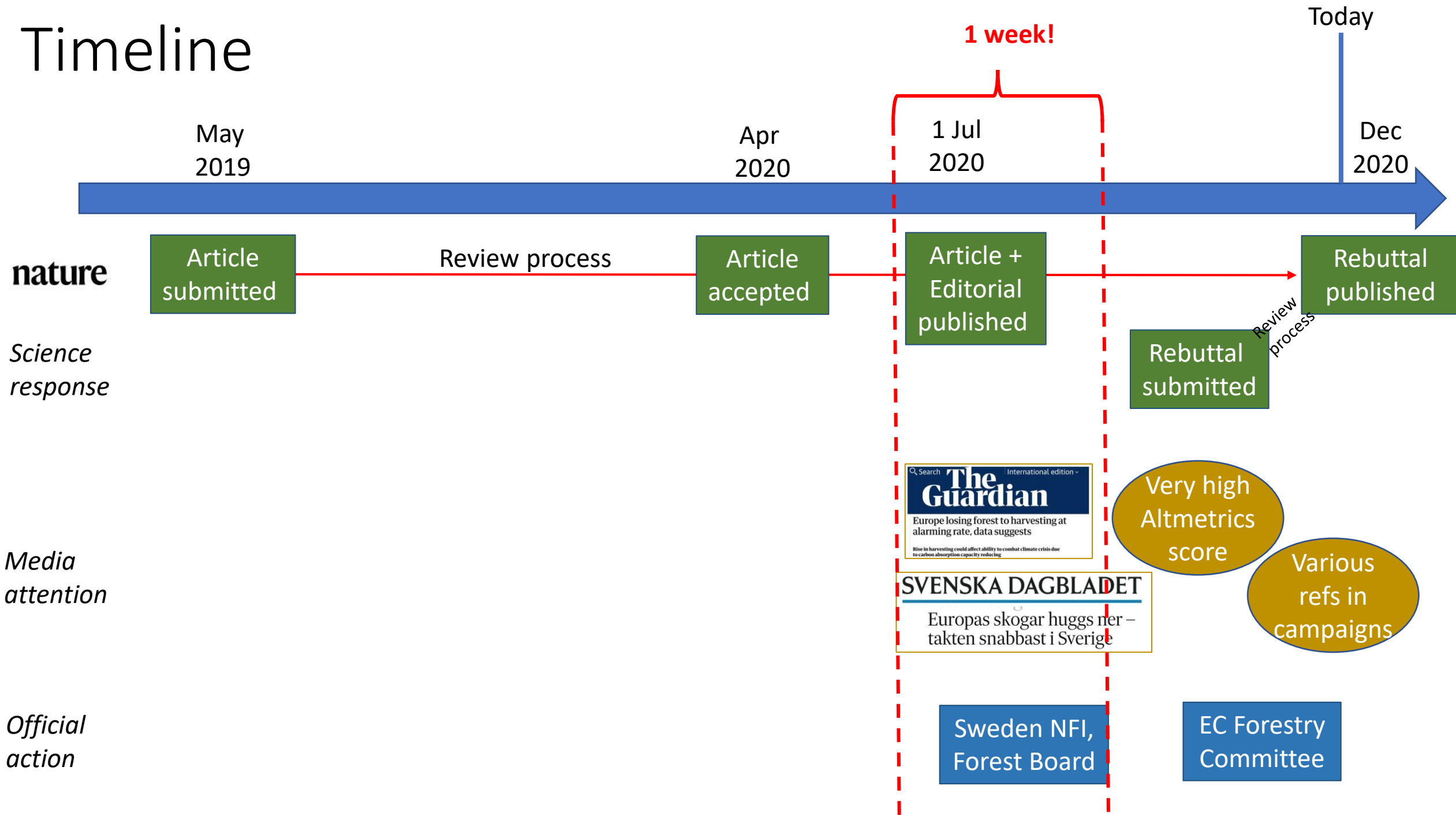
## How Europe can fix its forests data gap

The European Union must improve how it collects forest data, which are essential to its ambitions in biodiversity and climate change.

  
**Time is running out. Forest exploitation cannot continue at the current rate.**

- Harvest increase of near 50%, SE+FI half the increase
- "Surge in harvesting may reduce forests' ability to absorb carbon"
- "Takes long for new young trees to absorb harvested carbon"
- Increase in harvests said to be driven by bioenergy demand
- Bioeconomy strategy successful economically, but at "ecological cost"
- If forest harvesting continues at current rate then difficult to meet 30% protected areas as per biodiversity strategy
- "Meeting renewable energy targets means burning all of Europe's harvest"
- "The planned forest observatory is a crucial development, and one for which the commission deserves to be commended"
- "Once its (satellite) data become available, EU member states need to incorporate them into the official statistics that policymakers use to make decisions — for example, when planning strategies to reach net-zero emissions."
- "Manual forest surveys" are "important" "but in some cases carried out at decadal intervals"
- A "dedicated observatory will provide much more timely data"
- "(Forest) exploitation cannot continue at the current rate"

# Timeline



A scenic landscape of a forested valley. In the foreground, there is a dense forest of tall, thin trees. A small lake or pond is visible in the middle ground, reflecting the surrounding greenery. The background shows rolling hills and mountains under a clear sky. The overall scene is peaceful and natural.

*Where the results  
reasonable?*

*No.*

# Very quick & firm rebuttal by Swedish authorities



## Felaktig statistik om avverkning i tidskriften Nature

Nyhet - 03 juli 2020

Tidskriften Natures artikel om drastiskt ökade avverkningar stämmer inte med svensk statistik och bygger på tveksamma metoder. Detta enligt statistiker och forskare på Skogsstyrelsen och Sveriges lantbruksuniversitet.

## Flera statistikkällor styrker att avverkningen inte har ökat

Nyhet | Statistik - 06 oktober 2020

I en uppmärksamrad artikel i tidskriften Nature hävdar ett forskarlag att avverkningen inom EU ökat lavinartat under senare år. Skogsstyrelsen har nu gått igenom flera oberoende statistikkällor för att tydliggöra att dessa uppgifter är felaktiga.



EUROPEAN FOREST  
INSTITUTE

# Errors Undermine Reported Harvests in a Recent Nature Article

Dr Marc Palahí

European Forest Institute

Dr Rubén Valbuena

Bangor University, UK



PRIFYSGOL  
**BANGOR**  
UNIVERSITY

Prof. Gert-Jan Nabuurs

University of Wageningen,  
Netherlands



**WAGENINGEN**  
UNIVERSITY & RESEARCH

# Main flaws in Ceccherini et al.:

1. They used a **remote sensing product that is not consistent** over time and cannot be used for temporal analyses.
2. They did not factor out the **natural disturbances**. We identified several areas of natural disturbances claimed to be wood harvest.
3. **Insinuations that harvest increase is due to bioeconomy growth**. This is not supported by their shown data.

A wide-angle landscape photograph showing a dense forest of evergreen trees in the foreground and middle ground. A calm lake is visible in the middle distance, reflecting the surrounding greenery. In the background, rolling hills and mountains are visible under a clear sky. The overall scene is bright and natural.

*What was the uptake?*

*Huge.*

# Altmetrics score (=impact beyond citations)



TWITTER DEMOGRAPHICS

MENDELEY READERS

ATTENTION SCORE IN CONTEXT



This research output has an **Altmetric Attention Score** of **801**. This is our high-level measure of the quality and quantity of online attention that it has received. This Attention Score, as well as the ranking and number of research outputs shown below, was calculated when the research output was last mentioned on **16 November 2020**.

ALL RESEARCH OUTPUTS

#10,618

of 16,331,297 outputs

OUTPUTS FROM  
NATURE

#1,402

of 76,912 outputs

OUTPUTS OF  
SIMILAR AGE

#774

of 291,222 outputs

OUTPUTS OF  
SIMILAR AGE FROM  
NATURE

#82

of 708 outputs

Altmetric has tracked 16,331,297 research outputs across all sources so far. Compared to these this one has done particularly well and is in the 99th percentile: it's **in the top 5% of all research outputs ever tracked** by Altmetric.

*Cf. Rockström et al. 2009. A safe operating space for humanity (Planetary Boundaries) scores 923*

**La perdita di foreste naturali in Estonia**  
ECPPlanet, 08 Nov 2020  
Un documento pubblicato su Nature in luglio ha rilevato che l'Estonia ha uno dei più alti tassi di perdita di foreste in Europa...

**In tiny Estonia, a fraught debate: What are forests for?**  
National Geographic, 19 Oct 2020  
This article has been revised to correct several factual errors and to provide more context concerning the operations of...

**Estonia's 'holy forests' threatened by demand for biofuels**  
Pressfrom, 24 Aug 2020  
When Arvo Sepp was a boy in Soviet-ruled central Estonia, his parents would walk into the forest, carrying gifts.

**Estonia's 'holy forests' threatened by demand for biofuels**  
National Geographic, 24 Aug 2020  
When Arvo Sepp was a boy in Soviet-ruled central Estonia, his parents would walk into the forest, carrying gifts.

**bild der wissenschaft 09-2020 - wissenschaft.de**  
Wissenschaft.de, 18 Aug 2020  
Zu den Nachrichten in der Rubrik „Magazin“ in der bild der wissenschaft-Ausgabe 09/2020, finden Sie hier die Quellen und weiterfüh...

**Naukowcy nie mają złudzeń. Nowe dane dotyczące polskich lasów**  
Wprost, 07 Aug 2020  
Słyszymy, że w Polsce przybývá zasobów leśnych. To jednak nieznaczy, że dotychczas tolasów starych, naturalnych.

**Eesti ja kogu Euroopa metsaraie on järsult hoogustunud**  
ERR.ee, 13 Jul 2020  
Paljud meist on pannud Eesti eri paiguse lähel, et metsal on vilmasel ajal kahtlasel sageli kombeks kaduda.

**L'Europa raccoglie troppa legna: a rischio i piani contro il cambiamento climatico - Galileo**  
GalileoNet, 06 Jul 2020  
Foreste più estese ma troppo giovani il 38% della superficie del Vecchio Continente è occupata da foreste, e l'Unione Europea...

**En Europa se aceleró la pérdida de áreas forestales**  
El Espectador, 05 Jul 2020  
Noticias destacadas de Medio Ambiente Un informe publicado en la revista Nature señala que este continente ha perdido en los últi...

**News story from Slate France on Saturday 04 July 2020**  
Slate France, 04 Jul 2020

**Tuore Nature-artikkelit ylliarvioi karkeasti metsien kytn listyst Euroopassa**  
Maailmaväestö Tulevaisuus, 03 Jul 2020  
FAO:n tilastojen mukaan EU-maiden hakkuut kasvoivat 2011-2018 vain viisi prosenttia.

**News story from Publico on Friday 03 July 2020**  
Publico, 03 Jul 2020

**News story from Publico on Friday 23 October 2020**  
Publico, 23 Oct 2020

**News story from Publico on Monday 31 August 2020**  
Publico, 31 Aug 2020

**Estonia's 'holy forests' threatened by demand for biofuels**  
MSN, 24 Aug 2020  
When Arvo Sepp was a boy in Soviet-ruled central Estonia, his parents would walk into the forest, carrying gifts.

**L'exploitation des forêts européennes a augmenté de 49% en quelques années**  
National Geographic, 18 Aug 2020  
«Nous nous sommes appuyés sur des couches d'Informations spatialisées sur le couvert arboré, avec une résolution spatiale de 30...

**News story from Publico on Saturday 08 August 2020**  
Publico, 08 Aug 2020

**2015년 이후 유럽 전역의 수확 산림의 급격한 증가**  
Nature Asia, 15 Jul 2020  
러시아 하이머리브 2020년7월2일 Nature 583, 7814 산림(Forest)은 중요한 탄소 흡수원(Carbon sinks)이며, 이를 보존시키려는 노력은 기후 변화를 완화시  
키는 중요한 역할을 한다.

**In Europa si tagliano sempre più alberi**  
Focus.it, 09 Jul 2020  
Le foreste europee sono in espansione anno su anno, dicono i dati: tra il 1990 e il 2015 la superficie forestata del continente è...

**Europe losing forest to harvesting at alarming rate, data suggests**  
Infocourby, 05 Jul 2020  
Rise in harvesting could affect ability to combat climate crisis due to carbon absorption capacity reducing Europe has lost a...

**Holzerte-Explosion in Europa?: Kahlschlag aus heiterem Himmel**  
Frankfurter Allgemeine, 05 Jul 2020  
Ein von Trockenheit gezeichnete Fichtenbestand im Landkreis Märkisch-Oderland. Bild: dpa Betreiben die Europäer nun auch...

**Europas skogar huggs ner – Sverige leder ligan | SvD**  
SvD, 04 Jul 2020  
Håller vi på att säga oss själva i foten? I veckans klimatkrönika skriver jag om en ny studie i tidskriften Nature som väcker frå...

**Europas skogar huggs ner – takten snabbast i Sverige | SvD**  
SvD, 03 Jul 2020  
Europas skogar huggs ner i ett allt högre tempo, enligt en ny studie. Snabbast ökar avverkingen i Sverige.

**En Europe, la surface des forêts se réduit à cause de l'accélération des coupes d'arbres BFMTV**  
BFMTV, 02 Jul 2020  
De nouvelles données satellites montrent que l'Europe perd en surface forestière à un rythme effréné depuis quelques années.

**En Europe, la surface des forêts se réduit à cause de l'accélération des coupes d'arbres**  
Yahoo! News, 02 Jul 2020  
L'Europe a perdu une importante superficie de forêts ces dernières années, révèle de nouvelles données satellitaires analysées...

**Nieuwe boskapstudie oogst direct kritiek**  
NRC Handelsblad, 02 Jul 2020  
Het gekapt bosgebied in Europa is de laatste jaren met bijna de helft toegenomen.

**UE: la raccolta di legname mette a rischio gli obiettivi climatici**  
Innovazione, 02 Jul 2020  
Credits: Couleux da Pixabay Nel giro di due anni, la raccolta di legname ha ridotto la biomassa delle foreste europee del 70% (Ri...

**Polska w europejskiej czołówce wycinki drzew**  
Onet Wiadomości, 02 Jul 2020  
O znikaniu lasów w Europie w zaskakującym tempie informuje czasopismo "Nature". Z ustaleń naukowców pod auspicjami Komisji...

**Los satélites detectan un brusco aumento de la explotación forestal en Europa**  
Agencia SINC, 02 Jul 2020  
Los bosques representan aproximadamente el 38 % de la superficie de la Unión Europea y proporcionan servicios esenciales para...

**News story from Finanz Nachrichten on Thursday 02 July 2020**  
Finanz Nachrichten, 02 Jul 2020

**Baumfällungen in der EU haben stark zugenommen**  
Ariva.de, 02 Jul 2020  
Ein Mann liest Wirtschaftsnews (Symbolbild). pixabay.com ISFRA (dpa-AFX) - Der Holzeinschlag in den Ländern der EU hat...

**Baumfällungen in der EU haben stark zugenommen**  
FOCUS Online, 02 Jul 2020  
Der Holzeinschlag in den Ländern der EU hat sich drastisch erhöht: Von 2016 bis 2018 lag die Holzentnahme um 49 Prozent höher...

**Europa: Boom bei der Waldrodung**  
Scinext, 01 Jul 2020  
Abholzungs-Schub: In Europa hat die Waldrodung ab dem Jahr 2016 deutlich zugenommen.

**Satellites reveal a 49 per cent increase in tree felling in Europe**  
New Scientist, 01 Jul 2020  
Anterra/Universal Images Group There has been a large increase in the number of trees felled and removed from European forests.

**Forest harvesting in Europe threatens climate goals: study**  
Space Daily, 01 Jul 2020  
Annual forest harvesting in 26 European countries increased nearly 50 percent during 2016-2018 compared to an average of the...

**Mehr Waldrodungen: Satellitenbilder zeigen, wie Wälder in Europa abgeholzt werden**  
Mitteldeutscher Rundfunk, 01 Jul 2020  
Wenn es um Waldrodungen geht, blicken wir häufig nach Brasilien oder Borneo. Seit Jahren muss der Regenwald dort...

**Europe losing forest to harvesting at alarming rate, data suggests**  
The Guardian, 01 Jul 2020  
Rise in harvesting could affect ability to combat climate crisis due to carbon absorption capacity reducing Europe has lost a...

**Holzeinschlag in EU drastisch gestiegen**  
ORF.at, 01 Jul 2020  
Satellitendaten Der Holzeinschlag in den Ländern der EU hat sich drastisch erhöht: Von 2016 bis 2018 wurden fast doppelt so...

**Forest harvesting in Europe threatens climate goals: study**  
The Independent (Bangladesh), 02 Jul 2020  
Annual forest harvesting in 26 European countries increased nearly 50 percent during 2016-2018 compared to an average of the...

**Uuring: metsaraie on kasvanud hüppeliselt üle terve Euroopa**  
ERR.ee, 02 Jul 2020  
Alates 2016. aastast on kasvanud hüppeliselt nii raiutava metsa ulatus kui ka selle käigus eemaldatava biomassi hulk, vitavad...

**Los satélites detectan un brusco aumento de la explotación forestal en Europa**  
LaSexta, 02 Jul 2020  
En los últimos años el área boscosa europea destinada a la silvicultura ha aumentado un 49 %, a la vez que se ha elevado un 69...

**Los satélites detectan un brusco aumento de la explotación forestal en Europa**  
El Boleín, 02 Jul 2020  
Los bosques representan aproximadamente el 38 % de la superficie de la Unión Europea y proporcionan servicios esenciales para...

**Forest harvesting in Europe threatens climate goals: study**  
Bangladesh Sangha Sangha, 02 Jul 2020  
[BSS/AFP] - Annual forest harvesting in 26 European countries increased nearly 50 percent during 2016-2018 compared to an...

**Baumfällungen in der EU haben stark zugenommen**  
Finanzen, 02 Jul 2020  
ISFRA (dpa-AFX) - Der Holzeinschlag in den Ländern der EU hat sich drastisch erhöht: Von 2016 bis 2018 lag die Holzentnahme um...

**Baumfällungen in der EU haben stark zugenommen**  
Wall Street Online Denmark, 02 Jul 2020  
ISFRA (dpa-AFX) - Der Holzeinschlag in den Ländern der EU hat sich drastisch erhöht: Von 2016 bis 2018 lag die Holzentnahme um...

**Environmental sciences: Satellite data suggest a surge in forest harvesting in Europe**  
Nature Asia, 02 Jul 2020  
Research highlight: Nature July 2, 2020 Harvested forest area and forest biomass loss increased by 49% and 69%, respectively, in...

**2015년 이후 유럽 전역의 수확 산림의 급격한 증가(Nature)**  
Nature Asia, 01 Jul 2020  
러시아 하이머리브 2020년7월2일 Nature 583, 7814 산림(Forest)은 중요한 탄소 흡수원(Carbon sinks)이며, 이를 보존시키려는 노력은 기후 변화를 완화시  
키는 중요한 역할을 한다.

**Forest harvesting in Europe threatens climate goals: study**  
Phys.org, 01 Jul 2020  
Annual forest harvesting in 26 European countries increased nearly 50 percent during 2016-2018 compared to an average of the...

**Waldwirtschaft: Ist der Holzeinschlag in Europa sprunghaft angestiegen?**  
Spektrum.de, 01 Jul 2020  
Waldwirtschaft: Ist der Holzeinschlag in Europa sprunghaft angestiegen? Laut Satellitendaten wurde in Europa seit2016 deutlic...

**Europe losing forest to harvesting at alarming rate, data suggests**  
Yahoo! News, 01 Jul 2020  
Europe has lost a vastly increased area of forest to harvesting in recent years, data suggests, reducing the continent's carbon...

**Holzeinschlag in EU drastisch gestiegen**  
ORF.at, 01 Jul 2020  
Satellitendaten Der Holzeinschlag in den Ländern der EU hat sich drastisch erhöht: Von 2016 bis 2018 wurden fast doppelt so...

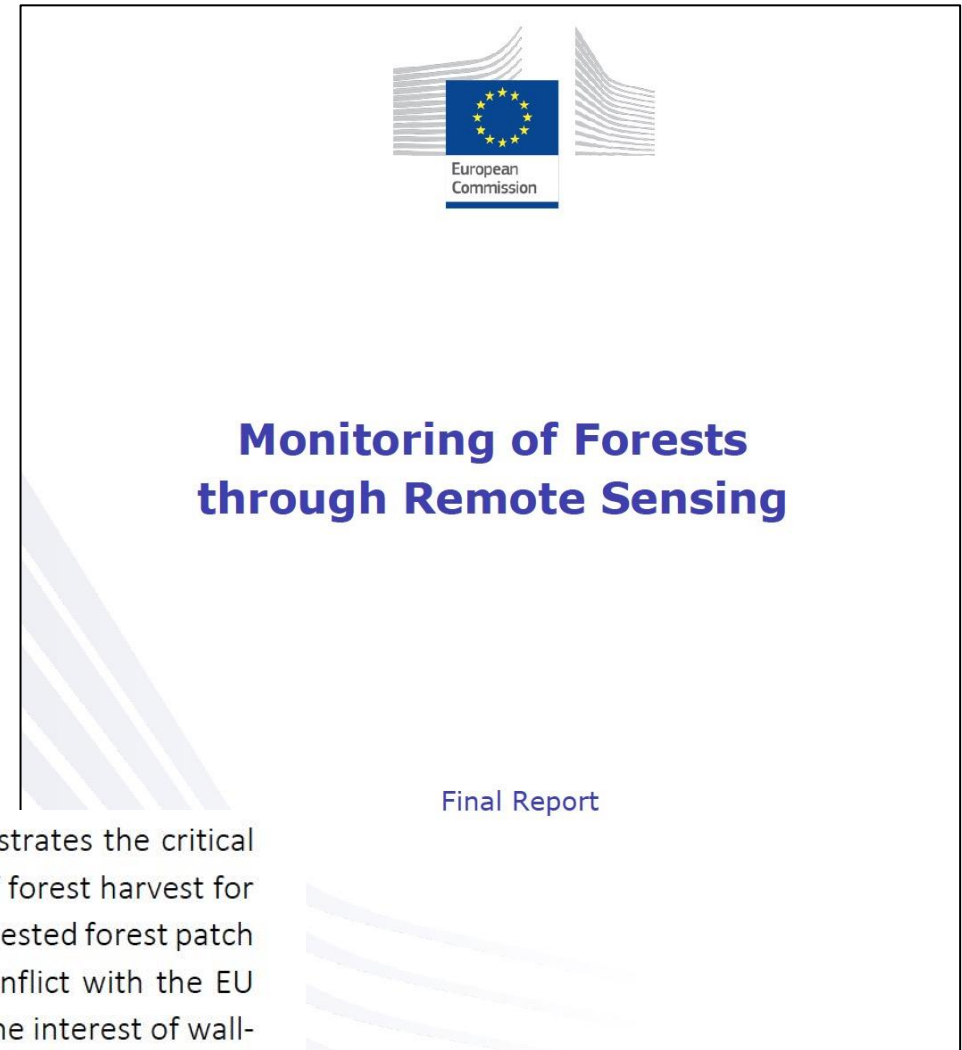
**Waldrodungen in Europa haben zugenommen - wissenschaft.de**  
Wissenschaft.de, 01 Jul 2020  
Europa ist zu mehr als einem Drittel mit Wald bedeckt. Doch wie nun eine Studie aufzeigt, reißten in diesen Wäldern seit 2016...



*Why should we worry?*

- One flawed paper gets disproportionate attention, sowing dispute
- Science process has promoted it, rather than being critical
- It contains unsupported policy suggestions
- Science journalists picks it up as (a) it is in Nature after all., (b) it has news worthiness, (c) everyone else picks it up, (d) capacity for critical review is missing
- Institutional manoeuvring – bordering corruption
- More of an opinion piece for current campaigns than science

# DG-ENVI report October 2020



” to assess the annual forest harvesting in the 28 EU countries. This study clearly illustrates the critical role of EO to assess the EU policies impact by highlighting an unexpected increase of forest harvest for the last few years in relation to the new EU bioeconomy policy, an increase of the harvested forest patch sizes impacting negatively the biodiversity landscape, and the carbon impact in conflict with the EU climate targets in the context of the Paris Agreement. Such analysis demonstrating the interest of wall-to-wall mapping compared to classical inventory-based statistics (e.g. Eurostat, FAO) for analysing the policies impact calls for an independent solution to monitor the EU forest using the Copernicus assets. ”

# EC & EU member countries have spent a lot of time on the paper...

Ref. Ares(2020)06546179 - 10/11/2020

EUROPEAN COMMISSION  
DIRECTORATE-GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT

Directorate D. Sustainability and income support  
D.4. Environment, climate change, forestry and bio-economy

Brussels,  
AGRI.DDG.2/D/PB

## MINUTES

### Joint Meeting of the Standing Forestry Committee and the Civil Dialogue Group "Forestry & Cork"

15-16 October 2020 (Videoconference, Webex)

Chair: Mr Mauro Poinelli (European Commission) and Mr Antonio Paula Soares/Mr Mårten Larsson (CDG Forestry & Cork)

Organisations present: All Member States were present except Denmark, Luxembourg and Romania and from CDGFC all organisations were present, except EFFAT.

<https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc&docid=44623>

#### 3) Presentation of the latest JRC study on harvesting levels

JRC made a presentation that is available on CIRCABC.

Questions and answers

Cyprus asked if Cyprus was absent from the study.

JRC confirmed that some countries, such as Cyprus and Malta were not covered by the study.

Sweden thanked JRC for the presentation and stressed its shared enthusiasm for using satellite for monitoring forests, as it uses Sentinel's imagery to check the whole country twice a week and its remote sensing division of the forest agency is a great supporter of the technique. It raised several comments on the article that was published in Nature, as the presentation given by JRC focused a bit more on the uncertainties. In the article, it is claimed that the annual harvesting area in Sweden increased by 41% in the studied period, as 18 000 ha, which in volume would amount to 20 million m<sup>3</sup>. Opposite, Swedish university of agriculture, NFI data and the Swedish remote sensing analysis team, supported by satellite imagery, points to a 7-8% decrease in this period. Official harvesting statistics show indeed that the gross harvesting volume has somewhat increased by around 3%. Thus, Sweden investigated further to understand where from the big increase found by the study came from. It looked into other independent official statistics like production, trade and energy ones. The consumption of roundwood in the Swedish industry (e.g. sawmill, panels, ...) increased by 2% but the consumption of roundwood for energy decreased by 5% during the said period. These changes correspond with official statistics at hand and the NFI. Following this, Sweden investigated in forestry trade statistics, but the roundwood export only increased by very little. Sweden stated that the explanation in the Nature's article related to the harvest increase, i.e. a growing bioeconomy, is not supported by Swedish production, trade, energy and net employment statistics. Official Swedish states do not indicate any increased use of increased wood for an increase in diesel consumption (which are used by harvesting

machines). Moreover, Sweden pointed out that if more harvesting was taking place, more people should work in forestry, which official employment statistics do not confirm. Therefore, Swedish experts collegially agree that the 10 times higher harvesting rates that are presented in the study must come from fault in calculation and method, rather than the situation in Swedish forest or bioeconomy. Sweden raised its unhappiness about the study and stated that it is a study and misleading estimate of Swedish harvests.

JRC thanked Sweden for its interest and the careful check of its statistics. It stressed that the study was designed to look at the whole of Europe and should therefore not be looked at from a specific country angle. As a scientific body, JRC stressed its interest and concerns on the mistakes. This is why it looked into further validation through visual assessment. This exercise confirmed JRC findings and the mismatch source has still not been found. It called for joint work to understand where the discrepancies originate from. JRC added that a statistical comparison of time series of their remote sensing data and Swedish national statistics for final filling were statistically close, according to t-test. The only exceptions being anomalies in the most recent data. The only documented changes that may have reduced the temporal consistency in the Global Forest Cover dataset used for the analysis are a 1) new algorithm implemented in 2017 and 2) the entering in service of Landsat 8 from 2013 onward. These discontinuities cannot explain the gaps. Thus, reasons remain unclear and JRC calls for further joint work to solve this.

ESTAFOR endorsed the ambition of having a common methodology for forest statistics in the Union. This being said, Estafor members reported opposite conclusions than the one from JRC. Investigation on this will be needed and Estafor had at this stage, the plan to collect all available data to harmonise JRC's study and currently being used as proof for the intensification of harvesting in recent years. Estafor found this information scarce & adds confirmation to the discussion. Estafor said it would welcome comments from the Commission on this.

JRC reiterated its call for a joint effort to understand where the gaps are coming from. It stressed that the future EU Observatory on deforestation and forest degradation will help to have a platform to discuss and produce a joint effort. The Observatory is expected to be able to collect all available data to harmonise JRC's study and currently being used as proof for the intensification of harvesting in recent years. Estafor found this information scarce & adds confirmation to the discussion. Estafor said it would welcome comments from the Commission on this.

JRC explained that JRC for its presentation and supported previous speakers' statement that remote sensing is an excellent tool to collect information and changes in forest and to improve forest inventory. In this, it fully supports the type of work done by JRC but added that as the outcomes of the study appeared to be in full contradiction with Hungarian national data, the first logical step should have been to contact the Member States for verification said Hungary. It noted that Hungary was not approached to comment on the outcomes, which it considered very interesting. Hungary stressed its trust in its national data, but when such different assessments are produced, it would have welcomed the opportunity to reflect on JRC assessments, to compare them with national data and to verify them. At the moment, the credibility of the EU's remote sensing data is not understood in what is happening in forestry stated Hungary. In one hand, there is national data, that does not show an important increase in harvested areas, and on the other hand, there is this study, which goes worldwide publicity. Hungary questioned how partners of the EU would trust in the remote sensing data in climate change negotiations. Hungary noted that politicians usually have no time to go in-depth into the article, only into the messages that politicians get was that the national data is not reliable, that there could be a 30% more harvesting taking place. This made a lot of harm, which could undermine the future of forest management at the national level warned Hungary. Hungary concluded that the missing part was the close contacts between JRC and the Member States and a coordinated verification before publication.

Hungary is open to discuss the results to guide it in the right direction to avoid a further similar issue. JRC acknowledged that the paper was overinterpreted and that counterintuitive results is always an issue. The initial scope was to explore the possibilities offered by remote sensing to produce spatial data and timely outcomes. JRC agreed that consensus should be aimed at and reached and noted that this can only be achieved by data analysis. For this, JRC stressed the need to incorporate satellite images in the upcoming EU Observatory work. It called to integrate and design within the Observatory a place to work jointly on the issue. JRC acknowledged the difficulties produced by the publication in Nature but reminded that as a research institute, it needs to "open the way" for new developments.

Spain talks for the detailed and comprehensive presentation and noted that it was surprised as often colleagues by the alarming results of the study, which announced harvested volumes exceed by far any official statistical data of inventory. In addition, Spain noted that the area identified in the article did not correspond to most cases to productive forest areas with relevant industries, which is never identified as a possible cause. Spain stressed JRC estimates with two different data sources and statistical data, in a similar way as it is done in the article. In all cases, Spain pointed out that the estimates are significantly lower, and consistent between themselves. Spain suggested possible reasons for this difference such as the methodology, misclassification of forest affected by natural disaster (e.g. forest fires, drought, pests or illnesses). Spain sees the need to compare the JRC outcomes with high-resolution data and field data. For this, it asked about the possibility of accessing the georeferenced results of the article by open-access or by request. Spain pointed out that the results of this study are not as surprising as it is presented in the article. Spain concluded by stating that it values remote sensing tools to support national forest data. However, it stressed that the results of this study are not as surprising as it is presented in the article, especially when the results are alarming and infeasible as in this case.

JRC acknowledged that Spain is one of the lesser examples of what happens in case of a continental assessment. It said that there might be some specific issue with data set such as the tree cover from Hansen, just because the definitions of forest are different. JRC stated that Hansen's definition is when trees are at least 5m in height whereas the Spanish definition refers to 3m. Such country-specificities are a challenge to find the best balance with generality, and it will need to be improved. With regards to the code and analysis are publicly available and original Hansen's dataset can be retrieved from Global Forest Watch website informed JRC.

Czech Republic asked about the exact definition of the term "harvested area". It explained that in Czech Republic, there is a national limit of 1 ha for a clear-cut. In addition, any neighbouring clear cut can not take place before the regeneration and established regeneration, so at least 7 years. Therefore, Czech Republic asked how the study avoided to double count single and separate harvested areas, that would happen in closely located areas. JRC explained that gap years are evaluated yearly and that identification of newly harvested areas follows the new variation in tree cover in inter-connected pixels changing status during the same year. JRC noted that this approach is not perfect as two different properties connected by one corner of a pixel could be considered as a single area. This aggregated can be up by generating larger clear cut that the administrative areas considered said JRC. JRC still stressed that this methodology is consistent across time, so in terms of trends, it remains valid even if the absolute values are higher due to the aggregates. Regarding the size of the gap, single-pixel harvested areas were excluded from the analysis said JRC due to their too-high uncertainties.

JRC agreed about the cooperation point raised by Finland a suggested that the Observatory could be the formal set up for the future. With regards to the "forest loss", JRC said that it was an unfortunate use of the term, as it is the one originally used by Hansen in the tree cover dataset. JRC did not anticipate the impact it could have, nor the misinterpretation it

Austria stressed that the European National Forest Inventories' Network (ENFIN) is cooperating. Usually, with JRC for more than 10 years under framework contracts on harmonising European NFI results and information. This being said, Austria registered that relating to the Nature's article ENFIN was not involved at all. For the future, Austria stressed the available expertise within the NFI that could support JRC, including on the use of remote sensing tools for forestry application. Austria pointed out that ENFIN published a detailed overview of the identified shortcomings of the article (see [http://23ba.wbserver.at/images/download/ENFIN\\_response\\_NatureArticle\\_2020.pdf](http://23ba.wbserver.at/images/download/ENFIN_response_NatureArticle_2020.pdf)). One of these shortcomings said Austria is the definition, an national forest definitions are not accounted for at all. To illustrate this, for Austria the paper assumes a crown cover of 55%, the double of the national definition. This could explain the mismatches said Austria. For future work, Austria called for much more cooperation when working on remote sensing data for the EU and to avoid a top-down approach. To this aim, the inclusion and gathering of the national expertise is crucial, gathering should not be limited to data. For the use of the data, it will not be possible to base forest information to just remote sensing explained Austria. Austria also reminded that 1,000,000 plots in the EU are monitored by NFI, ENFIN and NFI are not old fashioned and has decade-long expertise with remote sensing while also being aware of the limitations of such techniques and the valuable role of field visits. Austria expected future cooperation between ENFIN and JRC, including on remote sensing technologies.

JRC took note of the Austrian suggestion and reiterated that this is aimed to happen within the EU Observatory. JRC called for NFI pilots to be fully useful for remote sensing and to be designed for satellite imagery, and agreed for accurate coordinates of those plots. Austria answered that coordination has been discussed between ENFIN and JRC for more than 10 years and that solutions were already found. They can be used in the future.

Finland thanked for the presentation and the important discussion taking place in the SIC. First, Finland highlighted a few general comments: as many countries have decades of experience with NFI and as a matter of respect to them, to agree with Austria on the importance of increasing cooperation in the future and to proof check results with national statistics. New methods should be proof checked with national statistics, even more, when they produce unexpected results. Finland informed that its data is publicly available. High-resolution remote sensing is available in Finland, even from airplane image (so close to ground level), which are combined with field inventory. For the future, Finland called JRC for close cooperation and to avoid developing new methodologies in isolation. Also, Finland brought some detailed comments: in the presentation, harvested patch sizes were shown, for Finland it gave 7 ha average size, which is well above national data where there is an average of 1.3 ha in private forests and 3 ha in public forests. Finland underlined that satellite imagery might miss up properties' boundaries, but this cannot be sufficient to explain this level of discrepancy. Finland called for real comparison with national statistics and stressed that the mathematical model or the coding might not be the main issues and that there could be something else. Finland reminded that "forest loss" is not an equivalent word for "harvest". "Forest loss" has a strong negative meaning and is related to deforestation, whereas "harvest" related to the normal harvesting within sustainable forest management practices. Finland concluded that there is a clear need to be careful with chosen wording to avoid sending misleading messages.

JRC agreed about the cooperation point raised by Finland a suggested that the Observatory could be the formal set up for the future. With regards to the "forest loss", JRC said that it was an unfortunate use of the term, as it is the one originally used by Hansen in the tree cover dataset. JRC did not anticipate the impact it could have, nor the misinterpretation it

would cause and stressed it should have used "harvest". On gap size, JRC believes still that the issue comes from the algorithm and used criteria to define where a gap ends and where the other one starts. JRC said that type of analysis and corrections would be quickly carried out when it would have access to detailed data.

Cepl asked for the presentation and stressed that the pulp and paper industry welcome science based and accurate sources as they are important for further development of bioeconomy. Based on the on-going talk and ENFIN call, Cepl noted that there are still many issues remaining relating to the study and they need to be solved. Cepl supported Hungary statement that when JRC publish such a controversial study it has devastating consequences on policymakers perception of the status of our forests. Cepl also supported the statement from Finland about the incorrect use of the term and the fact that the study had a wider outreach than just Nature's readers.

JRC stressed that communication is challenging and that lesson from this study publication will be learnt, moreover when this is as sensitive. JRC acknowledged that some media misinterpreted the terms used and on every media interview, JRC tried to convey the correct message.

Estofin informed that its environmental agency wrote an article on the discrepancies found with the study. It also wondered with whom in Estofin JRC was in touch or cooperated with. It stressed that its national agency is much working with new technologies such as remote sensing and deployed the negative impact that the study had on the perception of Estonian work. Estofin, therefore, called for future close contacts ahead of any publications and wished that JRC would be in touch with Estofin NFI for the revised article in Nature.

JRC understood that this is an important discussion and noted that it would not comment on the scientific findings. CEFP welcomed the call of JRC for improved cooperation between field and satellite observations. CEFP recalled JRC stating that a scientist body "needs to be brave to open the debate". However, CEFP noted that this article and the related study are going beyond scientific debate, as its results led to some misconceptions in the public debate and which are already influencing the policy discussion. JRC mentioned that the study aims to support Green Deal implementation, recalled CEFP. This is problematic as the scientific debate is not over while the policy consequences are. Thus, CEFP asked three questions. First, as the study endorsed by the European Commission and is thus an official Commission study. Second, as JRC mentioned that this study could be a complementary tool to monitor bioeconomy, CEFP asked for more information on practical application. Thirdly, as the Deforestation and forest degradation's Observatory was already several times mentioned, CEFP asked if the method used in this study is aimed at being used in this context as well and on the link between the Observatory and the ongoing discussion.

JRC explained that as a research institute it does sciences and scientific support to policymaking and policy. Therefore, its scientific production is approved within JRC own hierarchy and thus shared with the Commission. JRC explained that the use of spatial results about forest resources could be a way to support the development of the Bioeconomy Strategy, as the implementation of a policy that requires biomass or biological products will be informed with such data. JRC further elaborated that it would be interesting to be able to support a biomass plant by providing it with information on the spatial location of biomass, and thus optimise the sustainable use of the resource. This type of analysis, not this specific study, could be considered in this frame. On the EU Observatory for Deforestation and Forest Degradation, JRC underlined that such EU Observatory would not focus solely on the EU. The Observatory aims to monitor global forests, including EU ones, with multiples objectives using multiple instruments said JRC. It will work specifically on tropical deforestation, following demand from the Commission, and focus on e.g. the assessment of

its link with the trade of specific commodities such as soybeans or beef. In addition, the Observatory will have a specific interest on EU forests, with focus on climate risk for forest (work is already ongoing within JRC) and how to better design adaptation strategies. The Observatory will help to better monitor the resources, with methodologies that could arise from this study. JRC stressed that the Observatory will be much broader than this study, both in terms of topics to address and in terms of the geographical scope.

The Chair thanked all participants for the interesting discussion and suggested to move to the discussion of the next point.

#### 4) Presentation by EFI of the recent study

Marc Palahi, Ruben Valbuena and Ger-Jan Naburs from EFI gave a presentation entitled "Errors and omissions reporting harvest in a recent Nature article". These three scientists are the leading authors of a reply sent to Nature in response to the article from JRC. The whole group of authors consist of over 30 scientists from 14 countries including an author from the Hansen group. In this work, they found substantial errors both in the analysis and interpretations by JRC authors which invalidate both the claim of abrupt changes in forest harvesting as well as the causes behind it. According to EFI, the main flaws in Cepl's article are: 1) the use of a remote sensing product that is not consistent over time and cannot be used to temporal analysis; 2) they did not factor out the natural disturbances whereas EFI identified several areas of natural disturbances claimed to be wood harvest; 3) imitations that harvest increase is due to bioeconomy growth is not supported by shown data.

EFI presenters concluded that their analysis shows that neither the claimed changes nor their supposed caused can be supported and that the abrupt changes in harvested area report by Cepl's article is wrong. They indicated that the increasing impact of natural disturbances in Europe requires special attention and that, to inform policymakers, a collective European effort is needed to obtain data at a different spatial and temporal level as well from different countries, disciplines and sources. They also called for urgent science-based climate-smart forestry strategies.

In answer to this presentation, JRC said that the change that took place in the model in 2015 is not in any way technical discussion and it was therefore impossible for JRC to know it at the time. JRC further clarified that the information was taken seriously, and therefore it was decided to run a validation exercise through a sample-based approach relying on the visual assessment of high-resolution aerial photographs in Scandinavian countries. However, this did not show a higher sensitivity to thinning in the most recent years, as suggested by EFI. About natural disturbance, the maps presented include also the harvesting including natural disturbances. EFI author who replicated the maps data from the original author's code replied that it included the part where disturbances were factored out, and thus the maps included only harvesting as in JRC article. JRC clarified that the disturbances are factored out in the statistics presented aside from the map. On the attribution, it is a controversial point and the most uncertain as it is fundamentally difficult to establish a direct attribution of an event like harvesting in Europe. This was a minor part of the study. It was not possible to attribute the harvest to explain the trends observed in the study. This certainly requires more work. The way forward is to try to understand better the problems and discrepancies. Doing it all together with EFI and other authors is the best way to go.

COPA-COGECA, UEF and CEFP expressed support to the presentations and conclusions of EFI.

Birdlife Europe asked on how these studies relate to the trend that has been reflected by the Member States in their National Energy and Climate Plans that natural sinks are decreasing due to several factors, including an increase of natural disturbances and increase of harvesting. Information reveals that around a third of the carbon sink declining out to 2030 compared to 2005.

Ger-Jan Naburs answered that the climate progress report does indicate a declining sink but that is only for the Kyoto protocol part of the reporting and that is different from the reporting of the full carbon sink. There are indications that the full sink is declining a little bit, not as much as what the Kyoto protocol part indicates.

CEFP asked if there will be a publication in the Nature Magazine of the more differentiated views compared to the ones presented in the initial article. This would allow that the group of people who read the first article are put in a position to also get the full picture. EFI answered that it may be published in a month if the replies is accepted by Nature. If these would not be published in Nature, it will be published somewhere else. JRC indicated that they also received the comments from EFI and replied to these so if Nature decided to publish EFI replies, JRC reply would also be published together with JRC comments.

Finland highlighted the importance of the excellent presentation by EFI, which is aligned with the worries on the initial article published in Nature.

Sweden indicated that the methodological exercise under discussion is very interesting and reminded that there are many independent sources of statistics that would have shown an indication of a change if there had been one, but they have not. From the SE official position, the results presented in Nature are faulty and impossible.

Poland expressed support to EFI opinion and stressed the strong need to consult the Member States before the publication of data. The results presented in Nature do not reflect the harvesting situation in Poland and it would be appreciated that data is checked with the Member States.

Austria said that after this discussion and all statements, a follow up is needed to find a common solution and communication line and asked what the European Commission intends to do.

DG AGRI stressed that it is important to remain careful to not underestimate political sensitivities. When new directions and instruments are explored, it is important to remain humble, transparent, prudent and open to a cooperation inside the Commission and outside the Commission. This discussion has shown that the Members of the SIC are open to cooperation to progress towards new technologies and DG AGRI expressed hopes that on the other side, there will be this same openness and transparency. DG AGRI has helped JRC to collect data on the national inventories and will distribute the information collected from the Member States on natural disturbances and presented during the morning session. Regarding the article in Nature, DG AGRI indicated that it will underline cooperation and prudence and that some clarifications should be brought to specify that the aim of the exercise was methodological exploration.

JRC replied that they are on a scientific agenda that should lead to the observatory to reach a different level for the monitoring and reporting of forest information at EU scale. The cooperation between NFI and remote sensing is important, and a formal process could be set to fully integrate these "two legs".

# What are the risks?

- for science integrity?
- with science as a political power?
- in eroding trust in established evidence and data?
- of ineffective/erroneous policy decisions?