






MEDfOR Summer School
Pieve Tesino (TN), 24 July 2024

**The governance of extreme events:
lessons learnt from the Vaia windstorm and the
bark beetle attacks in Northeastern Italy**


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Nicola Andrighetto, Laura Secco
TESAF Department - University of Padova (Italy)






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Contents

- The Vaia Storm and the following bark beetle damages: some data
- Policy and governance response:
 - The emergency phase
 - The post-emergency period
- Conclusions: lessons learnt



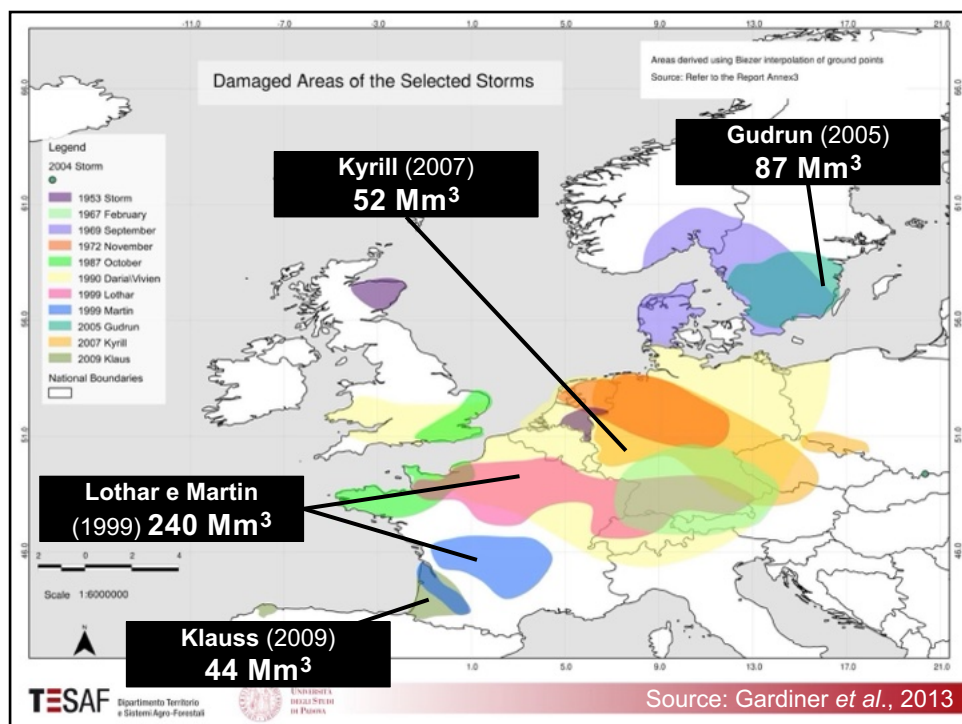
The slides can be downloaded from the web: search «pettenella» or:

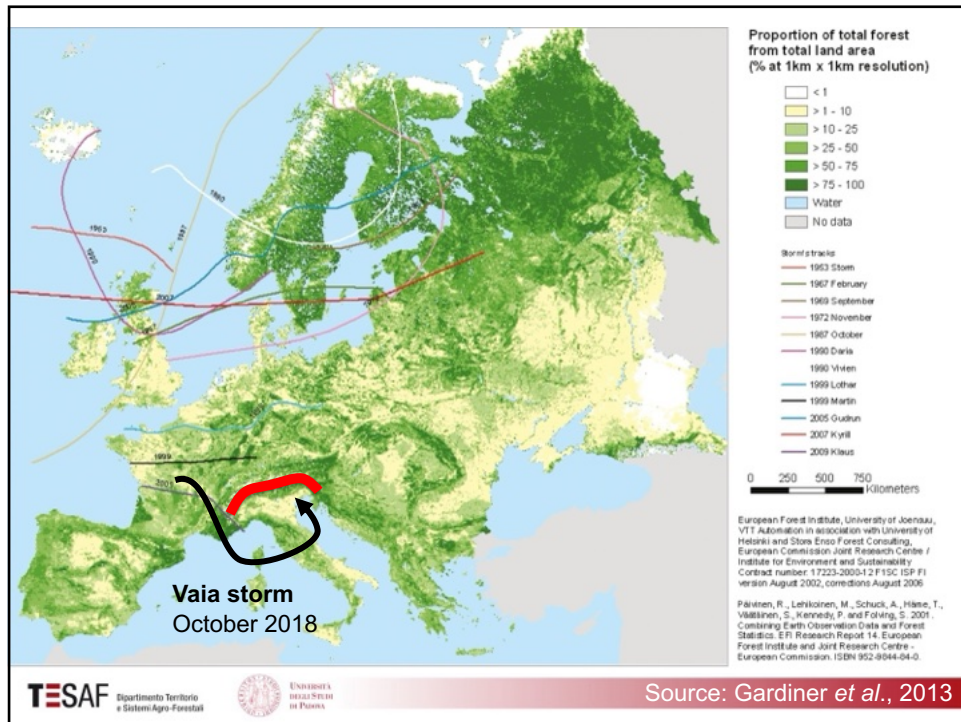



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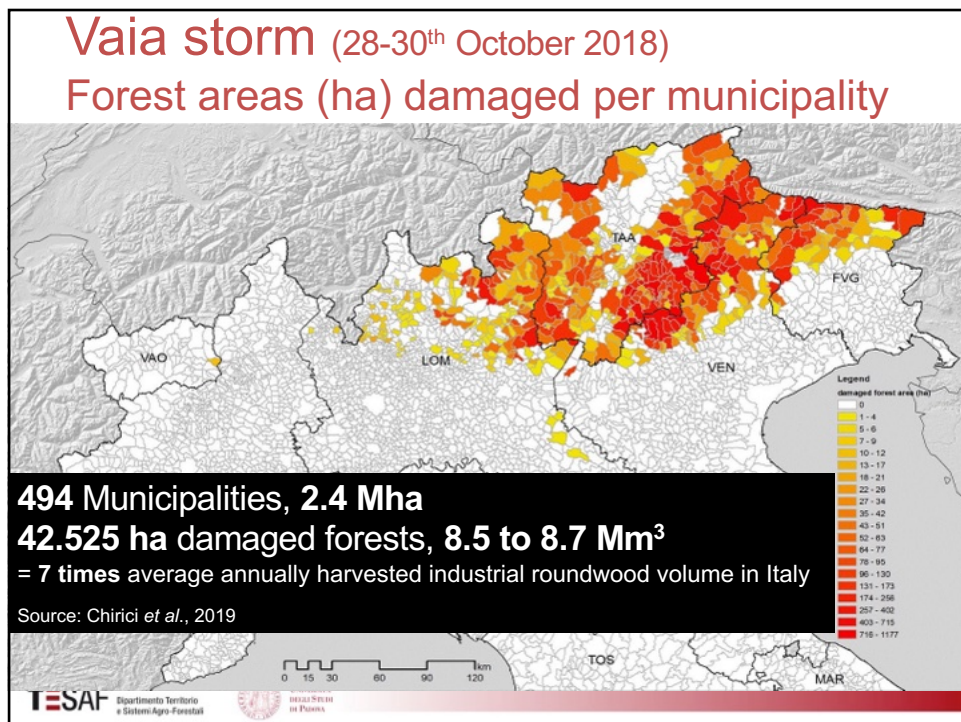
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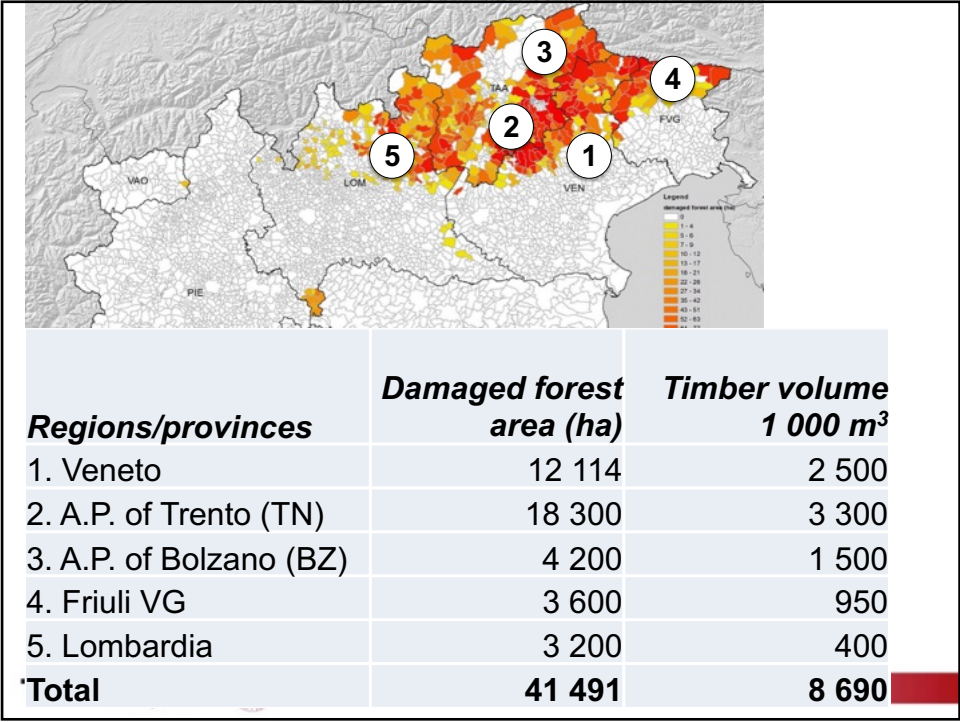




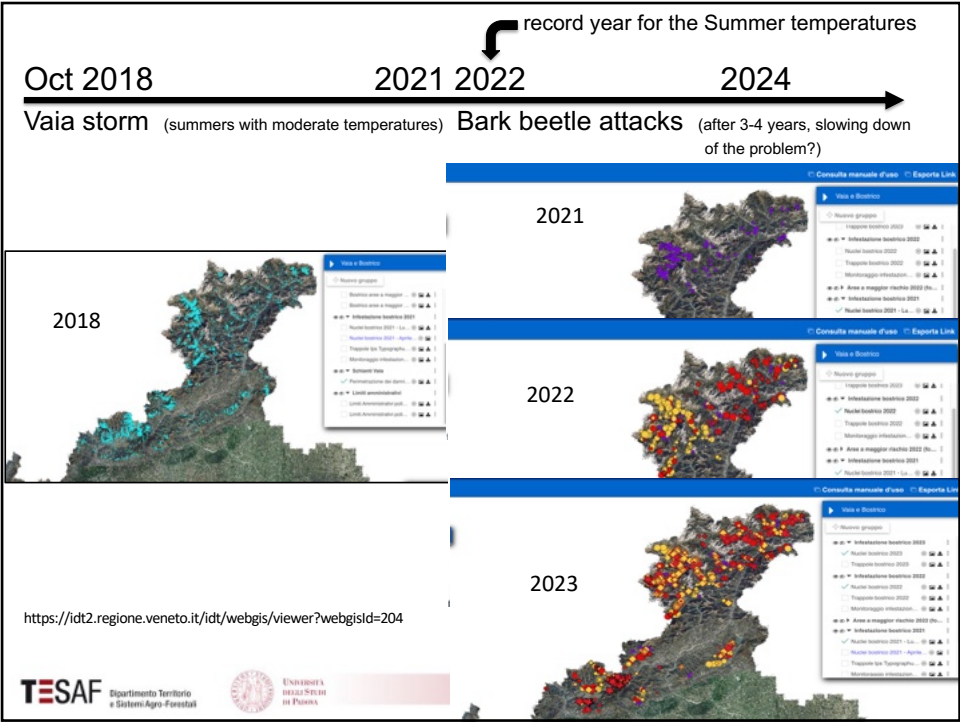
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A multifaceted event: main impacts and future increased risks

- Natural capital and biodiversity
- Infrastructures and hydrogeological risks
- Economic impacts
- Social aspects

Increased damages for the lack of protective functions by forests



Impacted infrastructures






Adventure park
Roana (VI)
Credits: S. Cesca




- Power/mobile lines
- Water facilities
- Roads and forest roads
- Hiking and bike paths
- Defensive infrastructures

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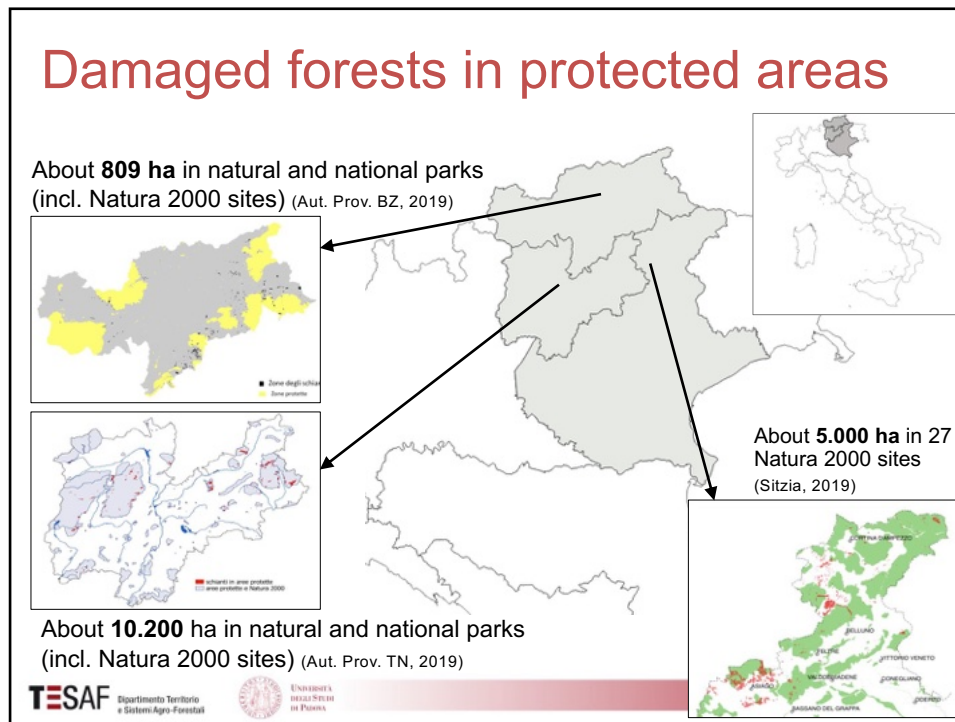
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Source: "Veneto in ginocchio" – Veneto Region, 2018

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Relevant impacts on tourism

Dolomites High Routes

Experience the Dolomites mountains on fascinating long distance alpine tours



The Alte Vie delle Dolomiti, the Dolomites High Routes, are long distance alpine tours for those who want to experience even more closely the real charm of the mountain.

The daily stages wind across the Dolomites mountains, from east to west or from north to south. You will trek constantly at high altitude, from one valley to another, enjoying the super view down to the valleys.

A backpack with a few essential items, some clothes, the joy of trekking and physical fitness and you're ready for a fantastic adventure.

The 10 Dolomites High Routes have different characteristics and difficulty levels.

Credit: <http://www.dolomitipark.it>

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TRENTINO

MUOVITI CON ATTENZIONE
MENTRE IL BOSCO RINASCE
RISPETTA LA SEGNALETICA

BITTE BEACHTEN SIE | MOVE CAREFULLY
WÄHREND DER WALD WIEDER
AUFGEBOUET WIRD BEACHTEN
SIE BITTE DIE AUSWEISUNG

SENTIERI INAGIBILI
GESPERRTE WEGE | CLOSED PATHS

340	349	341	414	511
616	618	624	639	639

Neufolgende 2018 il Trentino è stato colpito da un forte maltempo che ha causato l'impetimento temporaneo di alcuni sentieri. Die elfenwege temporäre al bare sperigelt.

In Oktober 2018 wurde das Trentino von schweren Wetterbedingungen betroffen. Dadurch wurden viele Wanderwege zeitweilig gesperrt. Die elfenwege temporäre al bare sperigelt.

In October 2018 Trentino was hit by severe weather conditions that damaged some of our beautiful paths, and subsequently these had to be temporarily closed down. We are now working to restore the paths.

Info aggiornate e itinerari percorribili
Aktuelle Infos und mögliche Routen | All updates and possible routes

www.visitrentino.info/mca

Adriano per il Turismo Val di Fiemme
Tourism Board Val di Fiemme
Tel. +39 0462 609 500

PROVINCIA AUTONOMA DI TRENTO | Dolomiten / Dolomiten / Dolomiten N. 78
14 aprile/April 2018

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Policy and governance response

A “black and white” picture

- Emergency phase: a **quick reaction by institutional and voluntary bodies** (safety, basic services and infrastructures)
 - No casualties from floods (1 driver killed by a tree fell down in urban area), all communication infrastructures restored in few days

Policy and governance response

A “black and white” picture

- Emergency phase: a **quick reaction by institutional and voluntary bodies** (safety, basic services and infrastructures)
- **Post-emergency issues:**
 - **Quick and (quite) significant reaction by:**
 - Media
 - Civil society organizations
 - Education institutions (Schools and Universities)
 - Companies

Never Italian media gave such a coverage to a forest event

- TV special reports
- Videos
- Interviews
- Conferences
- ...

also after many months from the event

la Repubblica

Approfondimento **Ambiente**

L'ultima sfida di mister Dinamite: “Ripulirò i boschi devastati da Vaia”

28 AGOSTO 2019

Via le ceppaie di pini, abeti e larici crollati. Si parte da Asiago, tra le zone più colpite dalla bufera di fine ottobre. Il piano di Coppe, che ha demolito il ponte Morandi: “Faremo in due anni quel che la natura farebbe in cento”

DAL NOSTRO INVIATO GIAMPAOLO VISETTI

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Field-trips and on-site visits

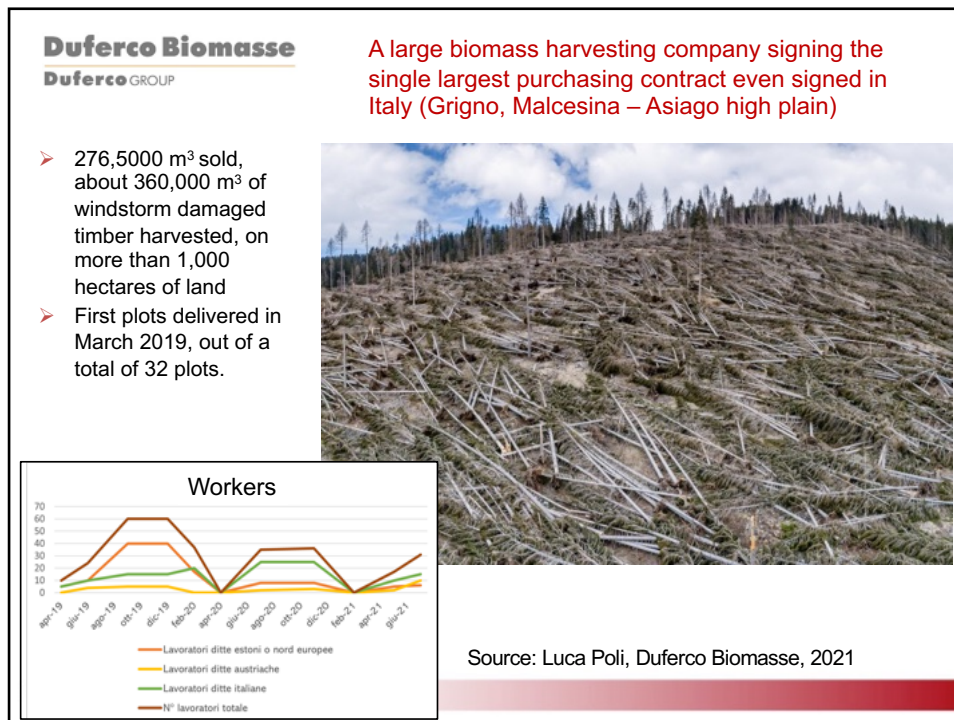


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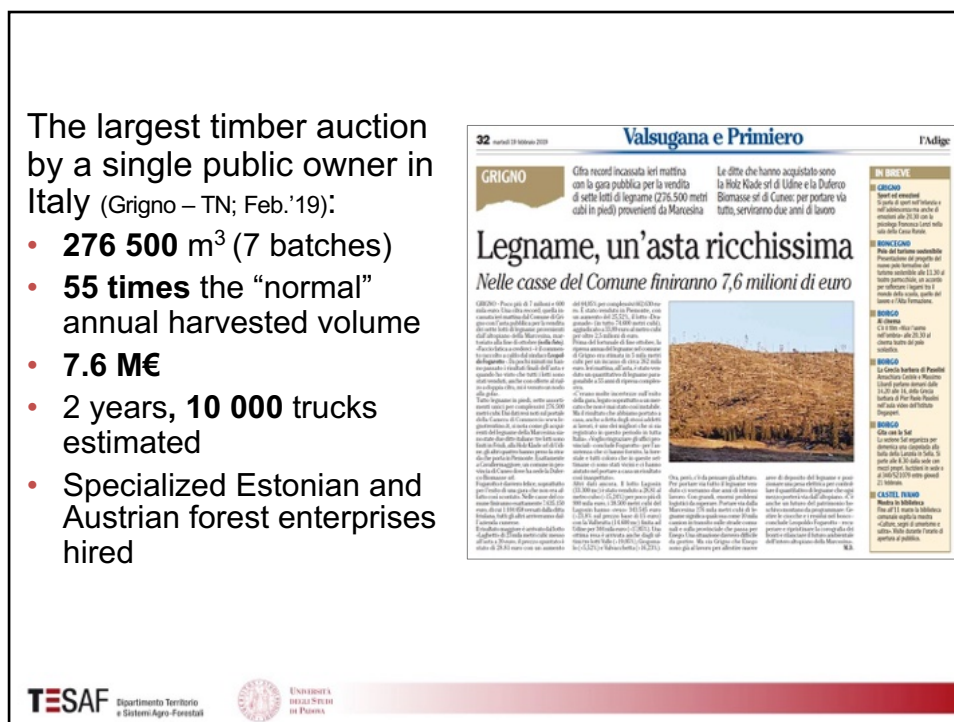


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More visibility for the forestry sector

A TV series on 4 highly-specialized forest-enterprises working in forest areas damaged by Vaia storm



<https://dmax.it/programmi-dmax/undercut-l-oro-di-legno>


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Disaster tourism

Promoturismo FVG a Boster nord est con 3 escursioni nei boschi colpiti dalla tempesta Vaia

lunedì 12 agosto 2019



Quest'anno tutta la manifestazione Boster nord est avrà come filo conduttore i temi del "dopo Tempesta Vaia", sia all'interno dei convegni e workshop, sia durante le dimostrazioni che si svolgeranno ai cantieri forestali e durante le visite guidate organizzate in fiera.

Promoturismo FVG, come fu per la precedente edizione, parteciperà alla manifestazione proponendo, per le giornate di sabato e domenica, **3 escursioni attraverso i boschi dei Laghetti di Timau colpiti dalla tempesta Vaia**, per meglio comprendere cosa ha comportato e cosa potrebbe ancora comportare in futuro una simile calamità, soffermandosi sugli aspetti naturalistico-ambientali dei luoghi.

Nella giornata di sabato accompagnatore qualificato AIGAE FR 061 sarà **CLAUDIO BELTRAME** (Via Melar, 1/1, 33030 Canussio di Varmo - UD) - 0432770020 - 3334852227

c.beltrame62@gmail.com

Italians are realizing that we live in a forest-rich country and that forests are the most relevant green infrastructure of the country

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International visibility and networking



Coping with the aftermath of storm Vaia in North-East Italy

by Silvia Abruscato — February 15, 2019 2 Comments

by Silvia Abruscato, Gherardo Chini, Giorgio Mattucci, and Davide Pettenella

On October 27-30th 2018, the storm Vaia hit North-eastern Italy with peak winds of 200 km/h, which compares to a very strong hurricane, and very relevant rainfall. Vaia has not only been the largest single windstorm event in recorded history causing serious damages to the forests in Italy. The storm was also a singular event that has raised unprecedented public attention because it hit some of the most beautiful and most productive forests in Italy located in the Dolomites Mountains, where several UNESCO world heritage sites full of history, culture, and traditions are located. Finally, Vaia caused enormous economic losses: the spruce and fir dominated mountain forests in the

Welcome to Resilience Blog

The Resilience Blog is published by European Forest Institute's [Resilience Research Programme](#), which focuses on forest-related risks such as climate change and the role of forests and trees in urban areas.

We post both in English and German to address local and international readers.

Our articles make no claim to completeness and do not necessarily represent the opinion of EFI.



<https://resilience-blog.com/2019/02/15/coping-with-the-aftermath-of-storm-vaia-in-north-east-italy/>

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A broad set of (different) initiatives involving/promoted by TESAF-UNIPD

- *Formal involvement by the regional government in post-event initiatives*
- Conferences/Public events
- International networking
- Initiatives by Department staff
- PhD research activities
- Initiatives for/in cooperation with students
- Side initiatives promoted by partner organizations

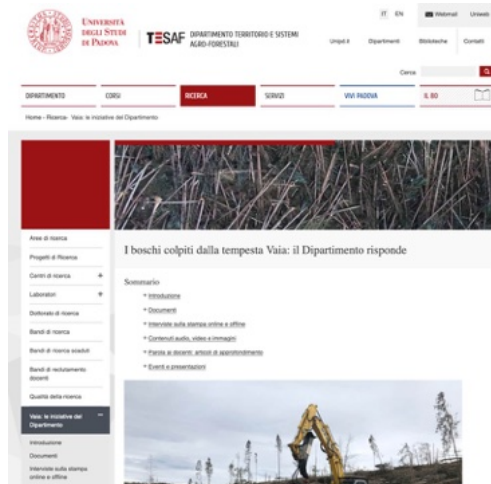
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Initiatives by Department research staff



A “living” collection of docs/materials made available via the Department website:

- 24 interviews
- 11 pod-casts (TV & radio)
- 6 papers on magazines
- 20+ presentations

www.tesaf.unipd.it/ricerca/i-boschi-colpiti-dalla-tempesta-vaia-il-dipartimento-risponde

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A multidisciplinary research project proposal covering key-aspects (draft) (including grants for young scientists)



Early draft version for consultation only, please do not cite or circulate

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Initiatives for/in cooperation with students



Vaia: an integrated approach for post-event management - 15th March 2019

Research and teaching staff:

Addressing “extreme events and forests” from different view points (from silviculture to forest governance)

(Informal) commitment to include “Extreme events” as a complementary topic within multiple courses of Forest Science MSc and BSc programs

Roundtable with experts from 5 regional Forestry Departments

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AFNAE Dipartimento di Agronomia, Alimentari, Risorse Naturali, Ambientali e Alimentari

Giornata di studio: Vaia 5 anni dopo
Lunedì/Monday 30.10.2023 - Agripolis

Sessione 1 (in Italiano)
La gestione delle foreste e del territorio in ambiente montano: esperienze e conoscenze a cinque anni dalla tempesta Vaia

9.30-13.00 (Aula Magna – Edificio Pentagono – Campus di Agripolis) (in italiano/in Italian)
Moderatore: Prof. Vincenzo D'Agostino

9.30 Saluti istituzionali
9.45 Interventi Regione del Veneto, Provincia autonoma di Trento, Provincia autonoma di Bolzano, Regione Friuli Venezia Giulia e Regione Lombardia
11.00 Progetto Vaia-FRONT: un'opportunità di studio e un'occasione di riflessione (Prof. Emanuele Lingua)
11.30 Uomini, Boschi e Macchine (Prof. Raffaele Cavalli)
12.15 Dibattito e chiusura sessione
12.30 Presentazione Mostra fotografica “THERE IS NO CALM AFTER THE STORM” di Matteo de Mayda

Sessione 2 (in English)
Vaia-FRONT From Lessons Learnt to Future Options

15.00-17.30 (Aula Magna – Edificio Pentagono – Campus di Agripolis)
Moderatrice (Chair): Prof.ssa Laura Secco

[ITA] La sessione prevede interventi specifici dei gruppi di lavoro dei Dipartimenti TESAF e AFNAE, che sono stati impegnati nell'attività di ricerca e terza missione inerenti gli effetti diretti e indiretti della tempesta Vaia. La sessione è aperta ai ricercatori e tecnici e agli studenti dei corsi di laurea in Scienze Forestali ed Ambientali e Forest Science. Le presentazioni saranno tenute in lingua inglese.

[EN] Insights from the Vaia-Front project – presentations on various technical aspects of the Vaia storms and its effects based on the results of research carried out by the Working Groups and researchers of TESAF and AFNAE Departments, University of Padua. The session is open to everyone interested, included students of Science Forestal ed Ambientale and Forest Science and will be held in English.

Exchange of
opinions among
stakeholders
after 5 years

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A very positive outcome among civil society organizations, the general public and local authorities: **cooperation**

Fundraising and philanthropic investments

Organisation	Web site	Type of intervention
beLeafing	https://beleafing.com	Planting (geolocalized trees)
Mosaico verde	https://www.mosaicoverde.it	Planting in protected areas and in other special sites
treedom	https://www.treedom.net	Planting (geolocalized trees) and Carbon accounting
tree-nation	https://tree-nation.com	Planting (geolocalized trees), single tree "adoption" and Carbon accounting
WOWNature	https://www.wownature.eu	Forest reconstruction (not only planting) in selected forest sites
Trentino TreeAgreement	https://www.trentinotreeagreement.it/	Forest reconstruction (not only planting) and visitors' infrastructures in 3 selected forest sites
Filiera solidale PEFC	https://filierasolidalepec.it/	Special PEFC label for the wood coming from the regions sold to Italian companies

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Initiatives promoted by partner organizations



The screenshot shows the WOWNature website interface. At the top, there's a navigation bar with links: Perché WOWNature, Cresci il tuo albero, Racconti WOW, HOST, and Contattaci. Below the navigation bar is a large banner image of a forest with cartoon characters. The text 'WOWalps la rinascita delle foreste alpine' is overlaid on the image. At the bottom of the banner, there's a red box containing logos for 'WOWNature is powered by' and 'SPIN OFF DELL'UNIVERSITA' DI PADOVA'. To the right of the red box, there's a sidebar with links: Cresci il tuo albero, Racconti WOW, Vuoi diventare HOST?, Scopri gli altri host, FAQ Come possiamo aiutarti?, Registrati, Contattaci, Termini di utilizzo, Iscriviti alla newsletter, and Info@wownature.eu. At the bottom of the page, there's a footer with the TESAF logo, the text 'Dipartimento Territorio e Sistemi Agro-Forestali', the University of Padua logo, and the website address 'www.wownature.eu'.

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Leading international company Luxottica based in Agordino supporting projects to restore the damaged forests affected in its territory

Source: ETIFOR. www.luxottica.com/en/luxottica-restore-its-first-forest-agordo-wake-storm-vaia



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Synergies in forest land restoration

Source: ETIFOR


www.wownature.eu/areewow/agordo/

- Luxottica
- Etifor – spin-off of the University of Padua
- 77 private land owners involved
- Municipality of Agordo
- Local consultancy company (Ecosinergia)
- Duferco Biomasse large biomass harvesting forestry company



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Cooperation PhD research activities



PHD LERH Program

- About the PhD Program
- LERH
- Governance
- Teachers and students
- Priority research topics**
- How to apply
- Teaching
- Documents
- Links
- Research Projects
- Research groups
- Research centers
- Laboratories

Priority research topics

Research area Agriculture, forest and food economics and policy


Under the Collaborative Doctoral Partnership (CDP) with the Joint Research Centre (JRC) of the European Commission ([see here](#) for more information) a special research topic is:

Ecosystem services at regional scale in the EU bio-economies.


The updated EU bioeconomy strategy encompasses not only the primary production sectors and the industrial sectors that use biological resources and processes normally at large scale in capital- and labor-intensive industrial plants, but also the ecosystems and the cultural and regulating services they provide, with potential positive effects in the local economies, even if mainly in small scale activities connected to tourism, educational, cultural and sport activities. In this context, the assessment and valuing of forest ecosystem services and their role in the whole economy is essential. The overall aim of the PhD is to investigate over the contribution of forest ecosystems to the local and regional (bio-)economies, characterizing the type of beneficiaries such as e.g. industries or citizens in rural areas or cities.

"Young scientists for Vaia" research program: 4 topics on the dynamic, impacts and management options related to the Vaia storm

- The Vaia storm: risk perception, TEV of the damages and attitudes versus mitigation programs (D.Pettinella, M.Thiene, T.Tempesta, P.Gatto, L.Secco, D.Vecchiato, M.Masiero)
- Post-windthrow short-term regeneration dynamics: monitoring the effect of deadwood manipulation (T.Anfodillo, M.Camer, E.Lingua, G.Petti)
- Wood transportation and logistics in complex scenarios and the role of primary and secondary road network. The case of Vaia storm in the Northeast of Italy (R.Cavalli, S.Grigolato, F.Pirotti)
- The Vaia flood event: observations and prediction of sediment and large wood dynamics (M.Lenzi, M.Borga, V.D'Agostino, P.Tanoli, L.Pico, C.Gregoret)



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www.tesaf.unipd.it/en/research/doctoral-degrees-phd-lerh-program

Young scientists for Vaia research program

4 thematic areas for PhD candidates applying in 2019

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Training courses for students and practitioners



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UNIVERSITÀ DEGLI STUDI DI PADOVA

CENTRO STUDI AMBIENTE ALPINO

L. Susmel



55° CORSO DI CULTURA IN ECOLOGIA

Foreste e danni da vento

Storm damages to forests

3-5 giugno 2019



In Europa i danni da vento sono responsabili di più del 50% dei danni totali alle foreste in termini di perdita di biomassa.

In media si verificano 2 eventi di grandi proporzioni all'anno. Nel sud delle Alpi la frequenza degli eventi è sicuramente inferiore rispetto a ciò che avviene nel centro e nord Europa ma ad ottobre 2018 anche il triveneto è stato colpito da un fenomeno di grandi proporzioni.

Circa 8 milioni m³ sono stati abbattuti determinando situazioni di forte criticità che perdureranno per molti anni.

INFORMAZIONI

ISCRIZIONE ONLINE
Partecipazione gratuita anche per singoli giorni
[Modulo d'iscrizione](#)

PROGRAMMA
[Elenco degli interventi e dei relatori](#)

DIRETTORE DEL CORSO
Tommaso Anfodillo

COMITATO SCIENTIFICO
Stefano Grigolato
Emanuele Lingua
Francesco Pirotti
Mario Pividori
Tommaso Sitzia




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Single private donors and corporate




Cresci il tuo albero a Feltre con FriulAdria

HOST: Mosaico Verde

Crédit Agricole FriulAdria, insieme ai suoi clienti, sostiene la rinascita della Città di Feltre colpita dalla tempesta Vaia. L'iniziativa è parte della campagna nazionale Mosaico Verde promossa da AzzerCO2 e Legambiente.

📍 Feltre

[CRESCI QUI IL TUO ALBERO!](#)




Cresci il tuo albero a Sappada

HOST: Mosaico Verde

Crédit Agricole FriulAdria, insieme ai suoi clienti, sostiene la rinascita di uno dei boschi più colpiti dalla tempesta Vaia a Sappada. L'iniziativa è parte della campagna nazionale Mosaico Verde promossa da AzzerCO2 e Legambiente.

📍 Sappada

[CRESCI QUI IL TUO ALBERO!](#)



Cresci un albero in Val di Fiemme (TN)

HOST: WQWalps

Scopri di più su questa valle conosciuta in tutto il mondo per l'eccellenza e il pregio delle sue foreste e dei suoi abeti di risonanza utilizzati per gli strumenti musicali.

📍 Magnifica Comunità di Fiemme

[CRESCI QUI IL TUO ALBERO!](#)

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Fundraising and activities

3 companies:

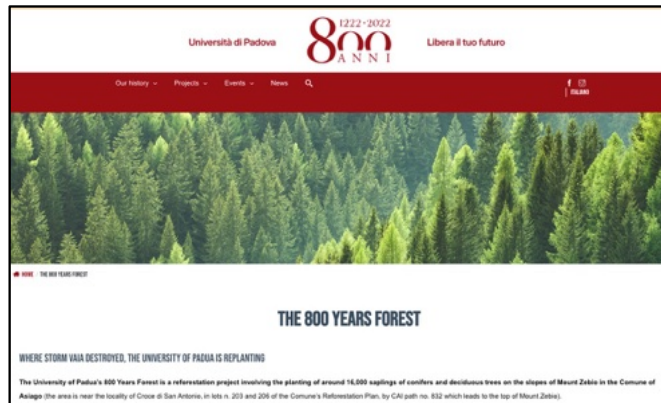
- Barilla → improved habitats
 - Levico → carbon sequestration
 - Prodeco → tree planting
- Impacts to be verified via FSC® procedure for ecosystem services

+ About 300 single donors

Support to: planting, planning, management, FSC certification, communication & promotional activities

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Spillovers in communication



Policy and governance response

A “black and white” picture

- Emergency phase: a **quick reaction by institutional and voluntary bodies** (safety, basic services and infrastructures)
- **Post-emergency issues:**
 - **Quick and (quite) significant reaction by:**
 - Civil society organizations
 - Education institutions (Schools and Universities)
 - Private sector organizations
 - Mayors and institutions at municipal level
 - **Inadequate reaction by regional/provincial/State administration bodies**

Inadequate reaction by regional/provincial/State administration bodies

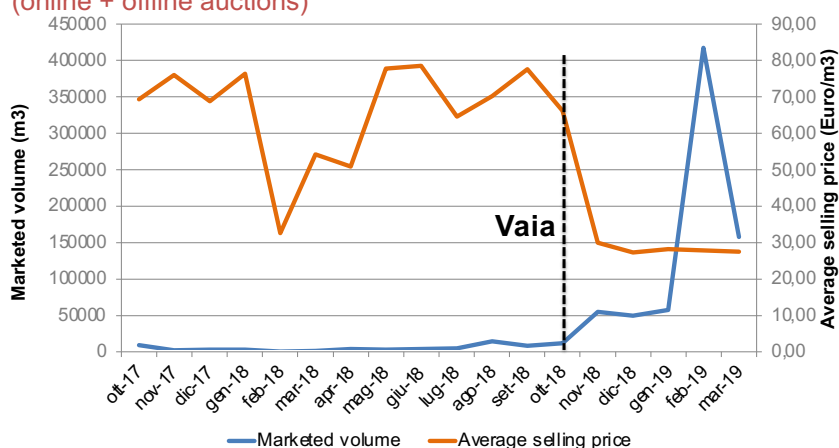
No coordinated policy (← Italian decentralized system):

- for **recruiting** harvesting companies
- for **financially supporting** and **training** the forest operators (7 deceased workers in harvesting operations)
- for organizing the **sales and promoting wood** consumption
- for **log storage**

Only the **inventory** of the forest damages (physical quantities, **not the economic damages**) and the **simplification of legislation** has been carried out in a coordinated way

The immediate impact: the collapse of wood prices

Standing trees - Autonomous Province of Trento
(online + offline auctions)



Source: own elaborations from Legno Trentino web portal & Autonomous Province of TN data



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From 2021: the new emergency with the bark beetle



- Emergency is becoming the **ordinary life!**
- **More damages** and **more visible** → increased perception of the gravity of the problem by people
- Much **better coordination in monitoring** among the Central and Regional administrations
- Forest **owners and harvesting companies more prepared** and equipped to tackle the problem
- **Not clear guidelines** on how to treat the damaged forests
- Still a serious problem for **matching market dynamic** (wood prices) **with the supplying of logs** (new investments in log stocking)

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Social impacts

Catastrophic events might increase/accelerate on-going abandonment trends in marginalized areas

An example – Southern Belluno area (23 municipalities):

2011-17 Population Var. **-8.6%**

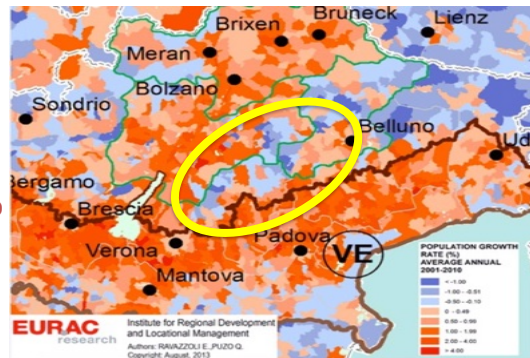
2011-15: **-1.8%**

2015-17: **-6.8%**

Ageing:

<50 years old: **-4%**

>50 years old: **+4.4%**



Source: own elaboration from Istat 2011-2015 and Comuni Italiani.it, 2017

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Windstorm: “God’s timber hammer”
Winners and losers in the short run




Prof. Bernard Hellrigl

Loser	Winners/Gainers
Society at large (esp. in affected areas)	Forest enterprises (net of direct damages they suffered) and logistic enterprises
Forest owners	Biomass and timber traders
	Power and heat plants
	Firewood consumers
	Sawmills
	Pulp & paper industry
	Wood panel industry
	Wood packaging industry

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Vaia damages to forest resources: a draft preliminary assessment

Regions/provinces	Damaged forest area (ha)	Timber volume 1 000 m ³	Damage estimation (M€)		
			Timber		ES
			1,000 € (50 €/m ³) ^A	1,000 € (20 €/m ³) ^B	1,000 € /year ^C
Veneto	12 114	2 500	100	175	5,694
A.P. of TN	18 300	3 300	132	231	8,601
A.P. of BZ	4 200	1 500	60	105	1,974
Friuli VG	3 600	950	38	66,5	1,692
Lombardia	3 200	400	16	28	1,504
Total	41 491	8 690	347,6	608,3	19,501

A. Assuming an average stumpage price equal to 50 €/m³ (A) or to 20 €/m³ (B) instead of the ordinary price of 90 €/m³.

C. Quick estimation via benefit transfer assuming an average value of 470 €/ha/year for ecosystem services (ES) losses (CLIBIO project quoted by ten Brink et al. 2009)

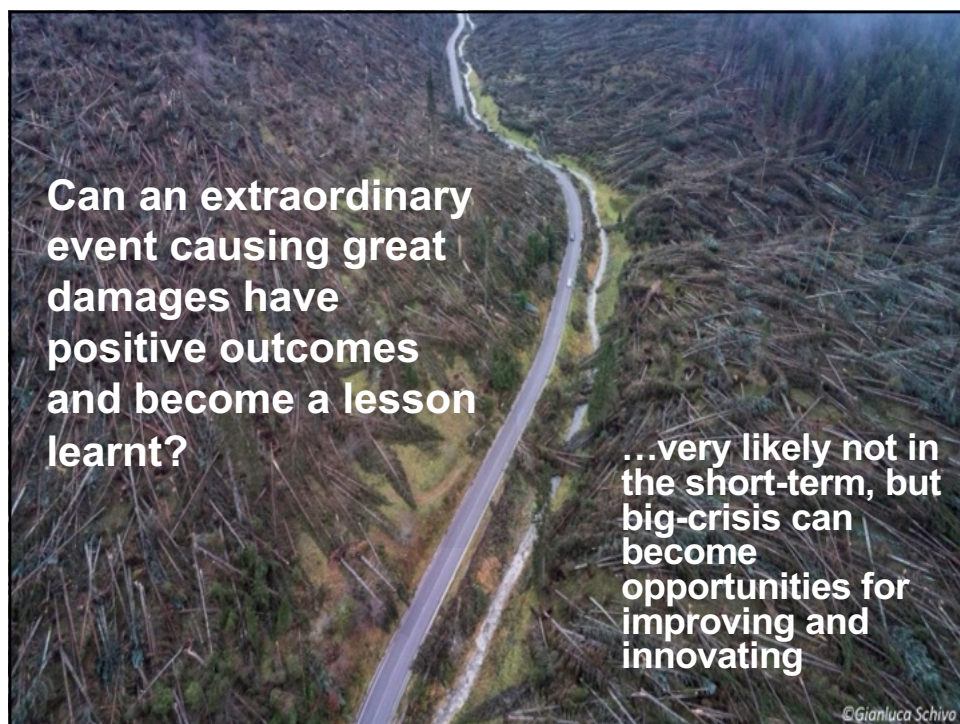
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Conclusions: lessons learned

- A new perception by the general public of the importance of an **active forest management policy** (more resilient forests, wood mobilization)
... also because extreme events likely to become more intense and frequent
- The complete **decentralized forest governance system** is not able to cope with such extraordinary events: “(...) *a rapid response to such disorganizing, catastrophic, psychologically shocking events rarely produces good results unless there is already a deep understanding of forest ecology [...] and governance firmly embedded in management rules and culture*” (Vallauri, 2005; p. 342) → need for interregional and European cooperation
 - **Learning, educating and supporting each-other** across Europe and globally
 - Rethinking and reorganizing **governance structures** to fill the gaps and make them more effective

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