



The ongoing outbreak of *Ips typographus* in northern Austria

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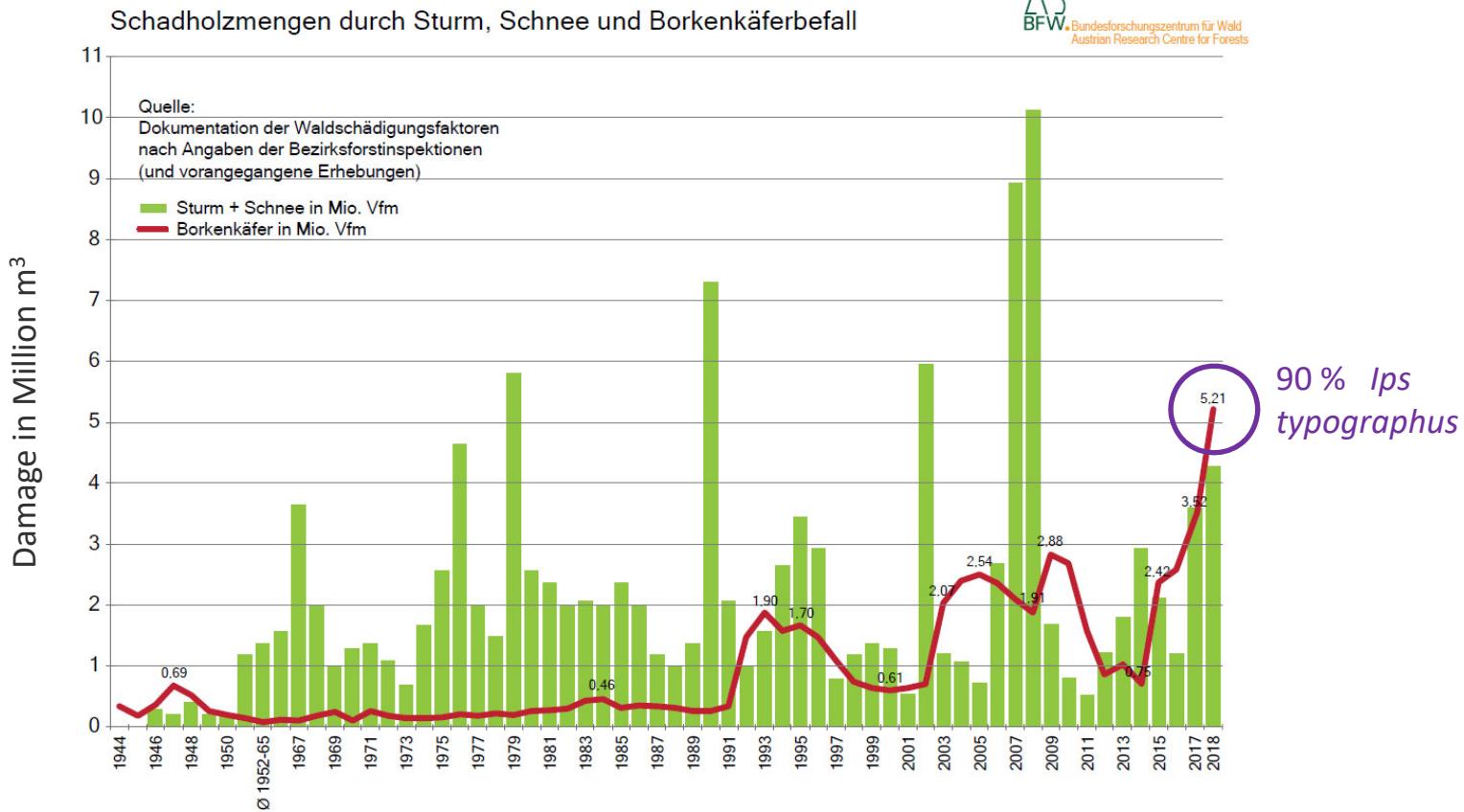
Slovenija

June 6, 2019

Cleared outbreak site in Lower Austria in July 2018, near CZ border



Photo: Hoch, BFW

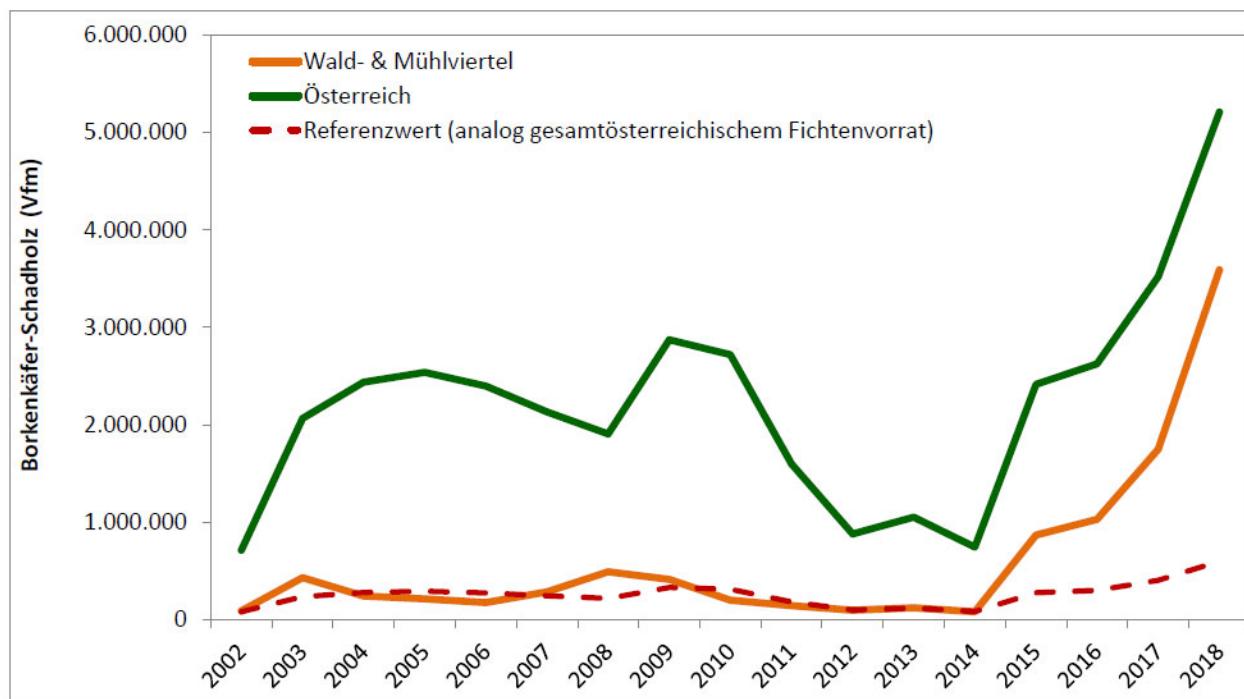


Annual damage by bark beetles and storm/snow in Austria
(Documentation of forest damaging factors, DWF)



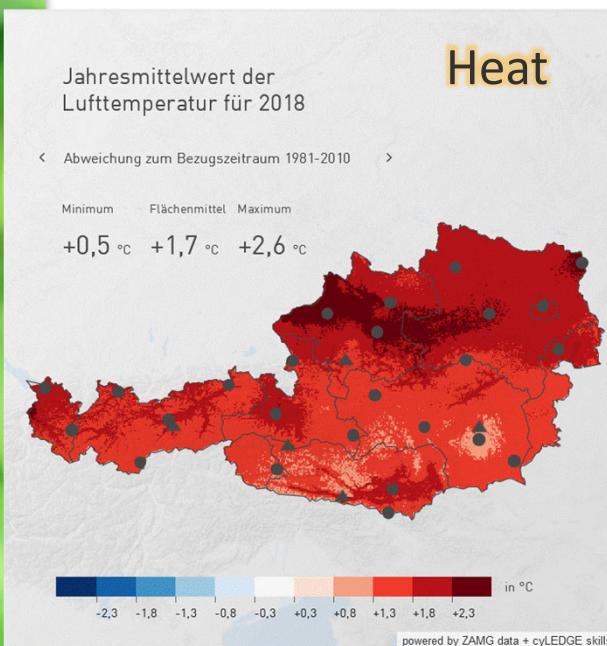
Major storm events providing abundant breeding material preceded previous outbreaks of *I. typographus* in AT (e.g. 1992, 2003, 2009).

No such major events occurred in the year(s) before 2015 (only regional damage by ice breakage).

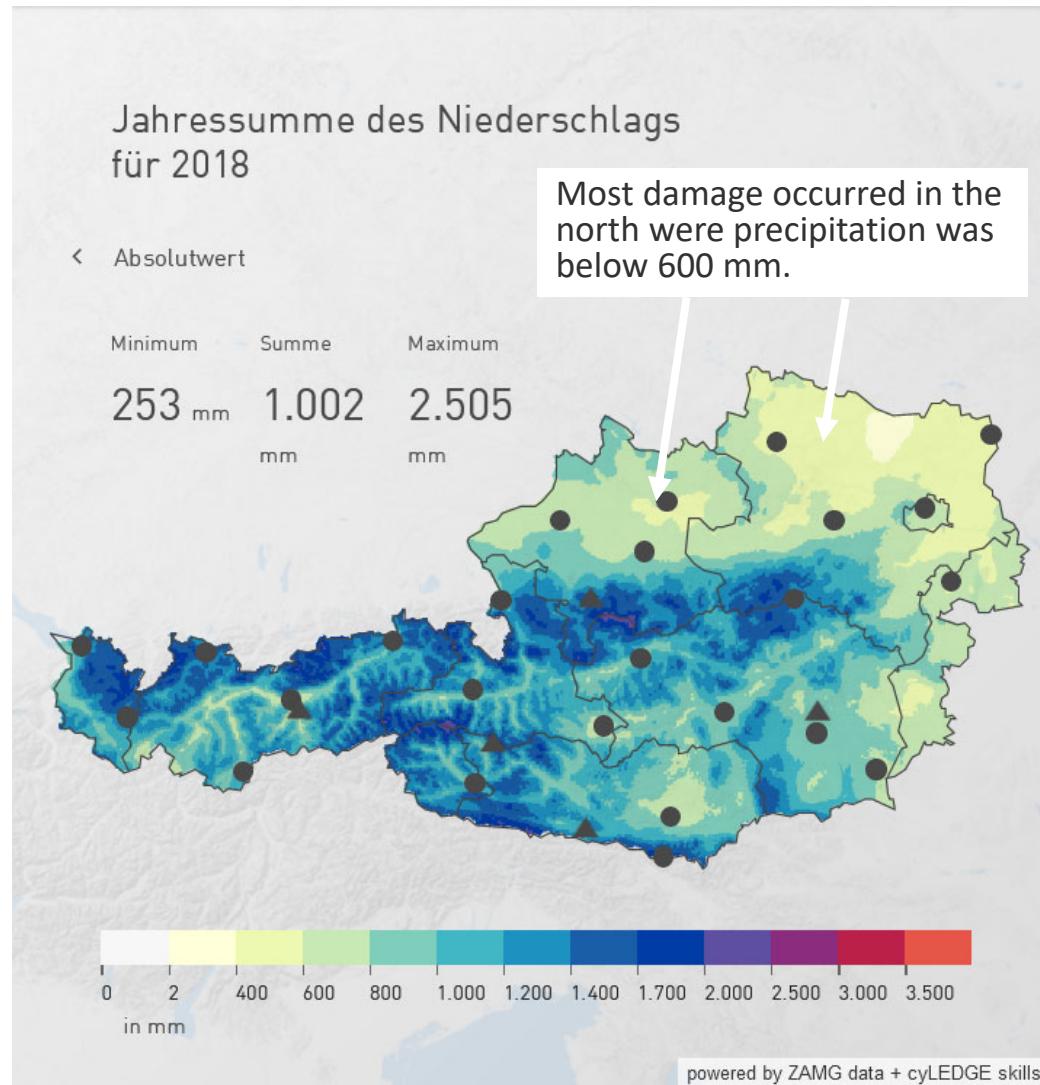


Damage by bark beetles (total) (Documentation of forest damaging factors, DWF): Wald- und Mühlviertel (i.e., northern Austria) in comparison to Austria total (Referenzwert = expected value based on spruce stock).

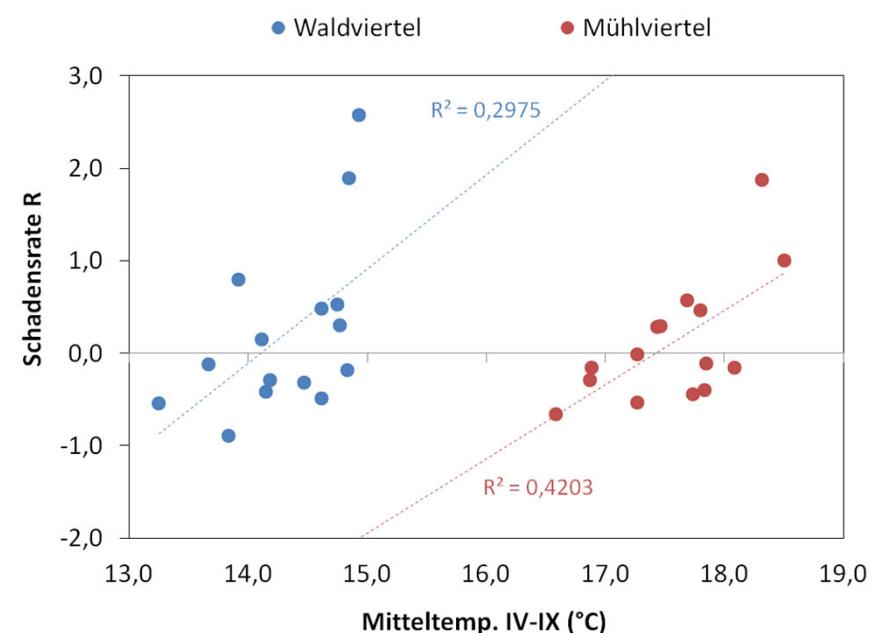
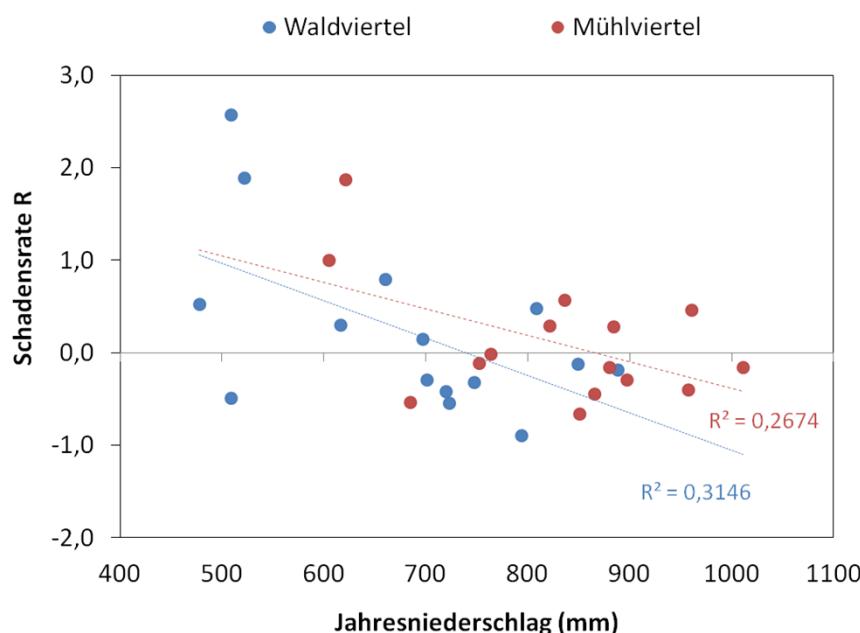
Drought



Zentralanstalt für Meteorologie und Geodynamik
www.zamg.ac.at



Bark beetle damage is correlated to climate in the Waldviertel and Mühlviertel Regions 2002-2017



Precipitation and summer temperature affect rate of bark beetle damage
 $[R = \ln(\text{damage}_t / \text{damage}_{t-1})]$ in the Waldviertel and Mühlviertel Regions

Data: DWF and ZAMG (Stationen: Zwettl-Stift, Linz-Stadt)



Bezirk Urfahr-Umgebung, 18.7.2018 (Photo: Hoch, BFW)



Attack of young spruce stand



Photo: Hoch, BFW

Bez. Urfahr-Umgebung (near Linz, north of the Danube), 18.7.2018 (Photo: Hoch, BFW)



Also individual trees attacked in mixed forests.

In the outbreak situation, species mixture did not prevent the attack. However, the photo shows the „insurance effect“ – the area is not deforested.

Bez. Waidhofen/Thaya, 27.4.2019



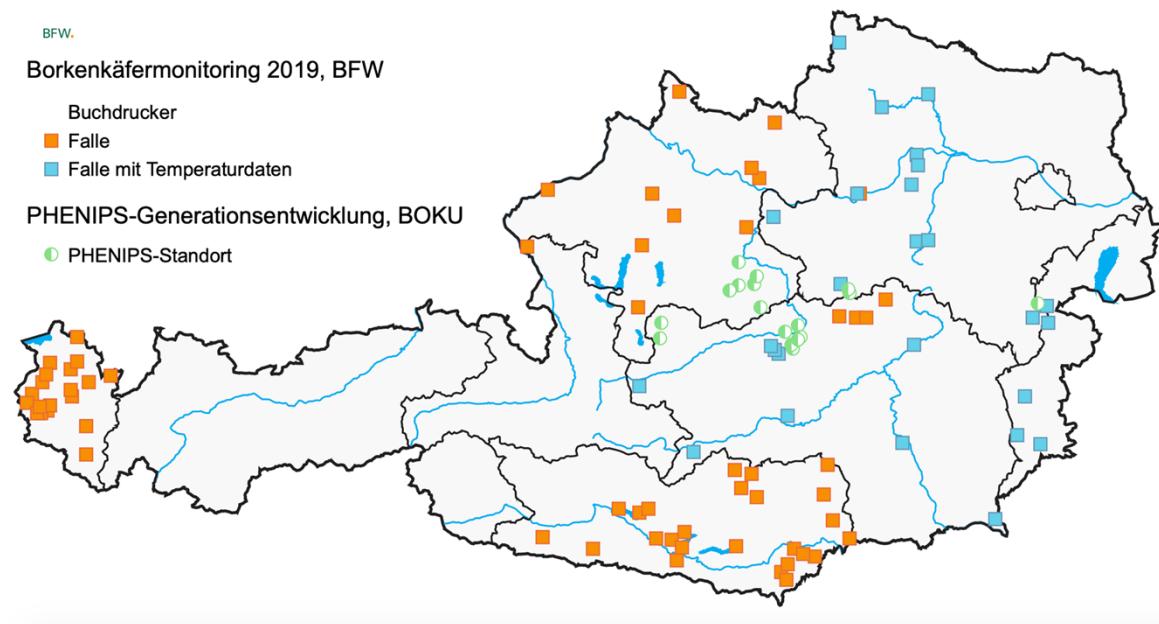
Photo: Hoch, BFW

Recommendations for forest managers

- Hygienic measures (timely removal of suitable breeding material, continuous search for new attacks, and **timely removal** of infested trees)
- In severely affected areas – increased and **targeted** actions, higher effort is necessary
- **Protection measures** (the safe **storage of timber** is one crucial issue)

Bark beetle monitoring – Information available online

- <http://bfw.ac.at> and www.borkenkaefer.at
- Flight monitoring: **Pheromone traps** (forest authorities, coordinated by BFW)
- Development model **PHENIPS** (BOKU University)



2018

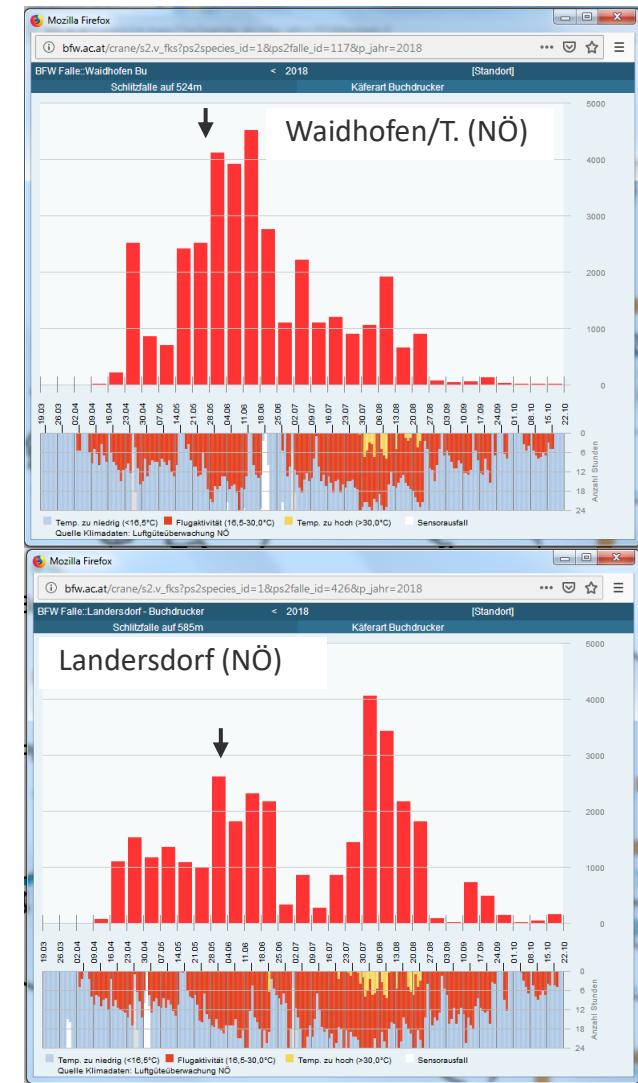
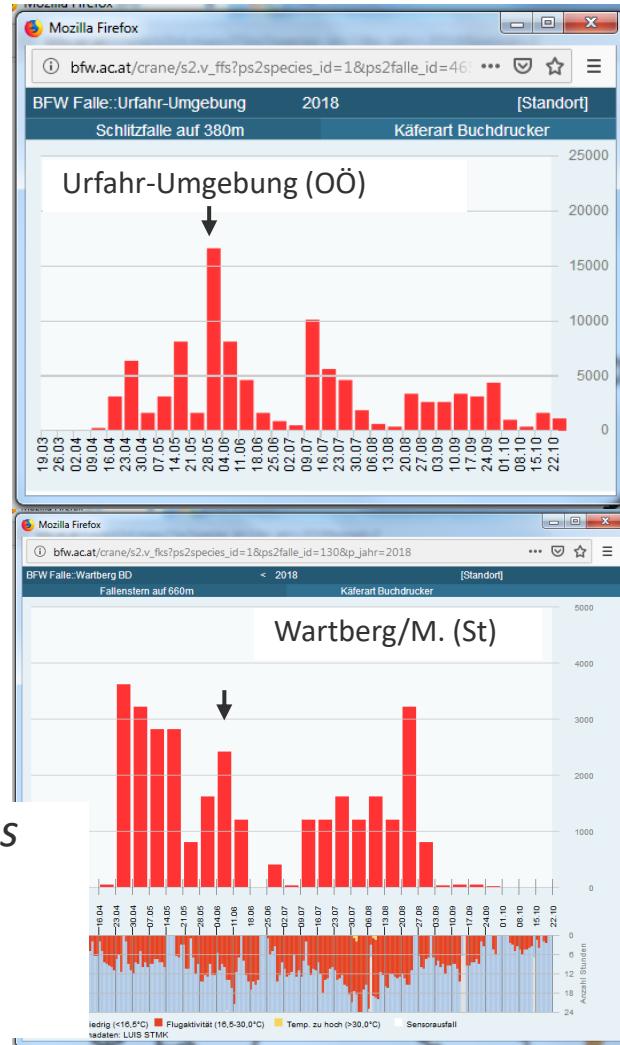
Massive flight in
spring

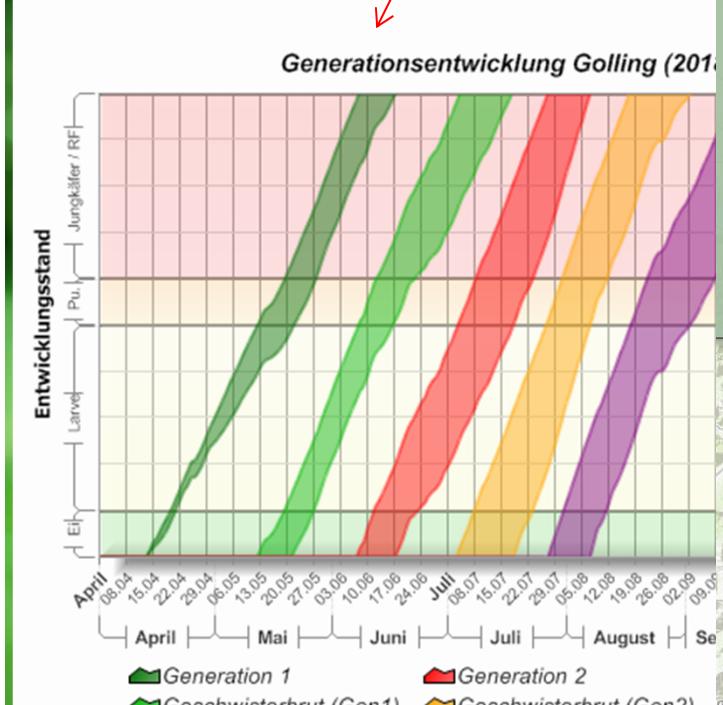
Early flight of the
first generation
(arrows)

Continuous high
trap catches

Weekly trap catches of *Ips typographus*

Bark beetle monitoring
<http://bfw.ac.at>

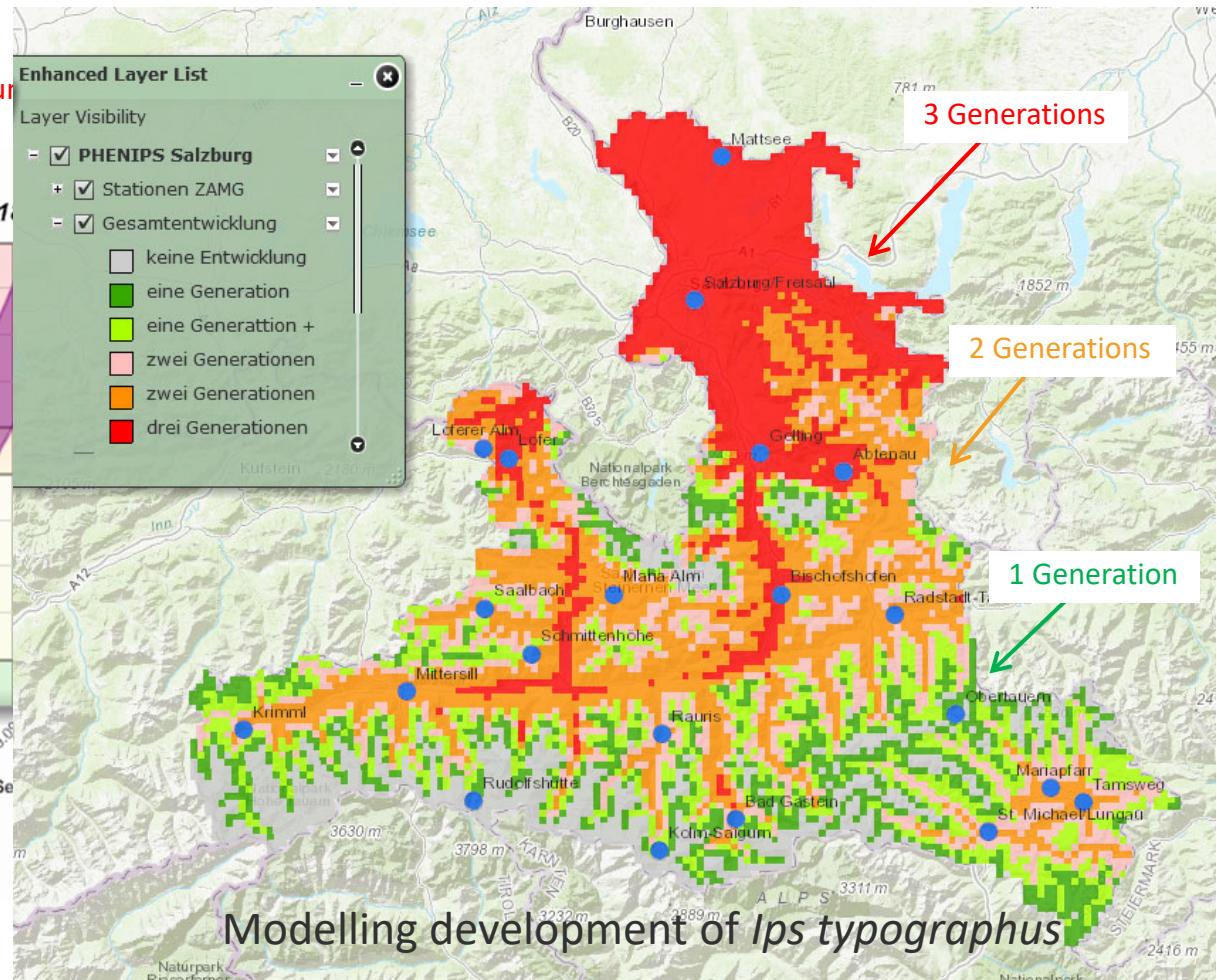




Generation 1 emerged: 8 Jun



Borkenkäfermonitoring
<http://bfw.ac.at>



Legal background

Austrian Forest Law (Forstgesetz) 1975

§ 44. (1) The **forest owner must** in appropriate and reasonable manner
a) take care to **prevent a threatening damage** of the forest by forest pests
and
b) to **effectively control forest pests** that occur in dangerous outbreak condition.

Forest Protection Directive (Forstschutzverordnung) 2003

§ 2. Infested trees or wood have to be treated
§ 3. Treatment: Debarking, wet storage, chipping, burning, technical drying,
registered insecticides, fumigation
§ 4. Storage of untreated wood is not allowed



Photo: Hoch, BFW

Problem: Storage of infested timber

Even when new infestations were detected early, felling and removing trees, or transportation/sale of wood often turned out to be a major problem

- Machine capacity and manpower
- Transport capacity
- Oversupply of industry

Temporary storage without treatment on registered sites authorized by forest authorities (considering distance to susceptible forests, establishment of monitoring system)

More methods for treating infested wood for temporary storage are necessary (both, at large and small scale)

Treatment of stored wood

- Reduce suitability for breeding:
cutting, chipping, enhance drying
- Debark
- Storage in foil (oxygen depletion)
- Cover with **insecticide net** (Storanet®)
Testing alternative methods
- **Insecticides** (registered for this
purpose, authorised users)
- Wet storage for large amounts



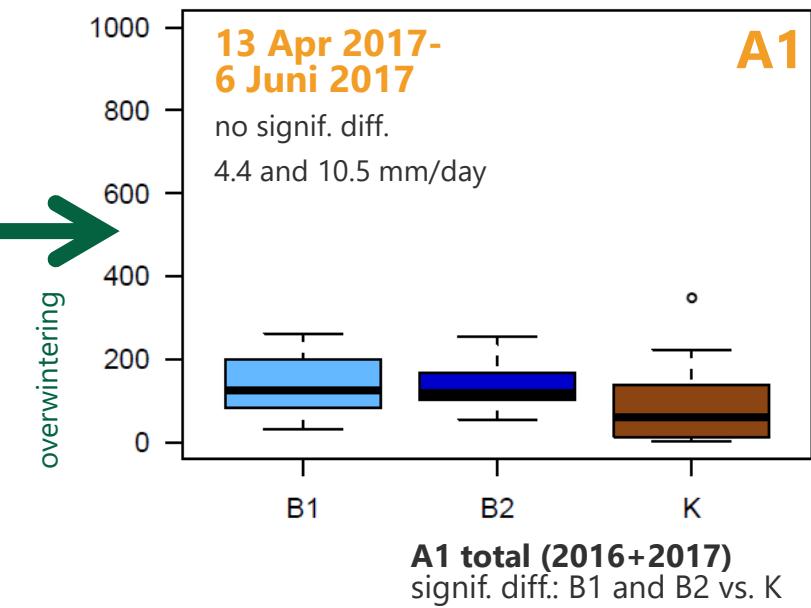
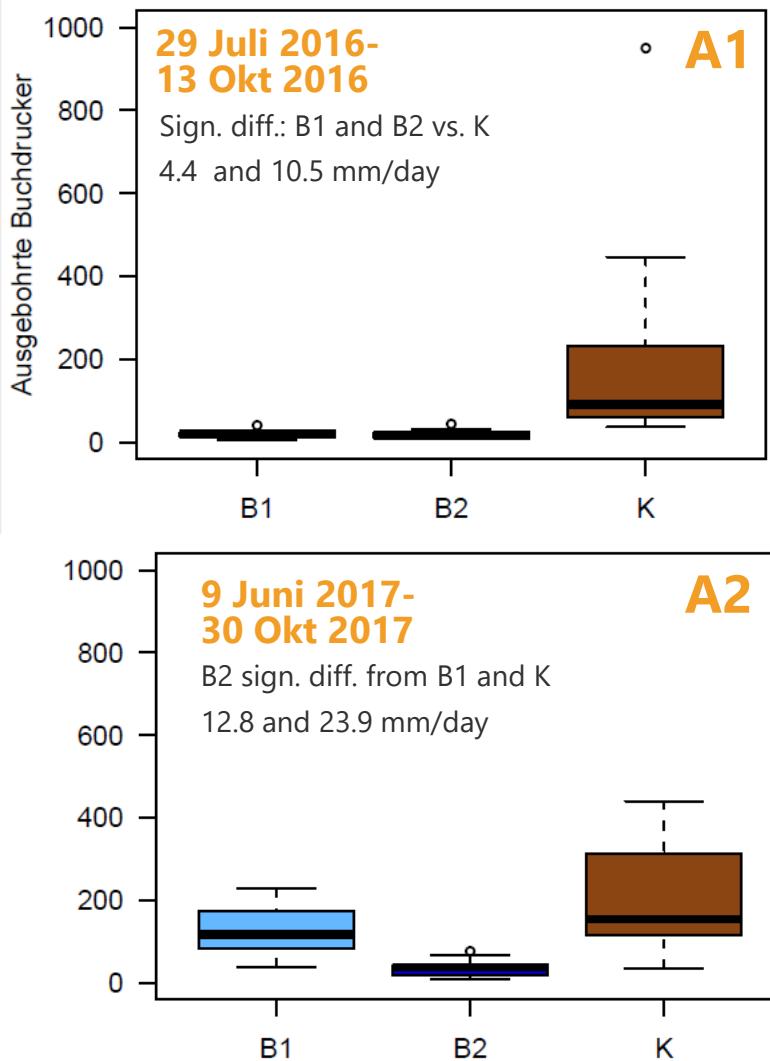
Wet storage

An established method to conserve uninfested timber

...might also be a method to prevent emergence of beetles from infested logs



Experiment at BFW: Effect of irrigation on the emergence of *Ips typographus*



→ Irrigation can temporarily prevent emergence of *Ips typographus* from logs

Number of beetles emerging from irrigated logs (B1, B2) and dry stored logs (K) (Thür, Putz & Hoch, unpubl.)

Debarking by harvester

DEBARK: Project of BOKU Univ. (Franz Holzleitner) & BFW (Bernhard Perny)



John Deere Forestry Oy:
Harvester 1270G
Aggregat H415

Larvae/Pupae



Beetles



Debarking by harvester

Number of beetles in logs (under remaining bark)

Treatment	Stadium	n	<i>Ips typographus</i>
Debarked	Larvae-Pupae	10	26,3
Control	Larvae-Pupae	10	171,3
Debarked	Beetles	10	3,5
Control	Beetles	10	95,2
Reg. Harvester	Beetles	4	137

- Many (particularly filial) beetles killed mechanically
- Bark strips < 6 cm: no completion of brood
- Higher effort
- Technical issues: Transport and timber quality (incl. Blue stain)
- Forest protection: preliminary results are encouraging – cont. in 2019



Development in removed bark:

- Immature – no development
- Many beetles killed



Outlook

Increasing temperatures and more frequent drought periods will favor bark beetles and other secondary pests

Bark beetles will remain a major problem for forests in AT



Thank you for listening!

Photo: Hoch, BFW