

The summit glacier on the Weißseespitze

(C)old ice project



- Is there (still) cold ice in the Austrian Alps?
- Project started in 2016
- Led by Andrea Fischer (IGF – Innsbruck)
- Where, how old, why, how long?
- Weißseespitze chosen as main research site



Occasion: Advanced Elmer/Ice-course (Espoo, 29. - 31.10.2018)

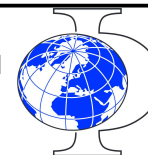
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Josef Lier



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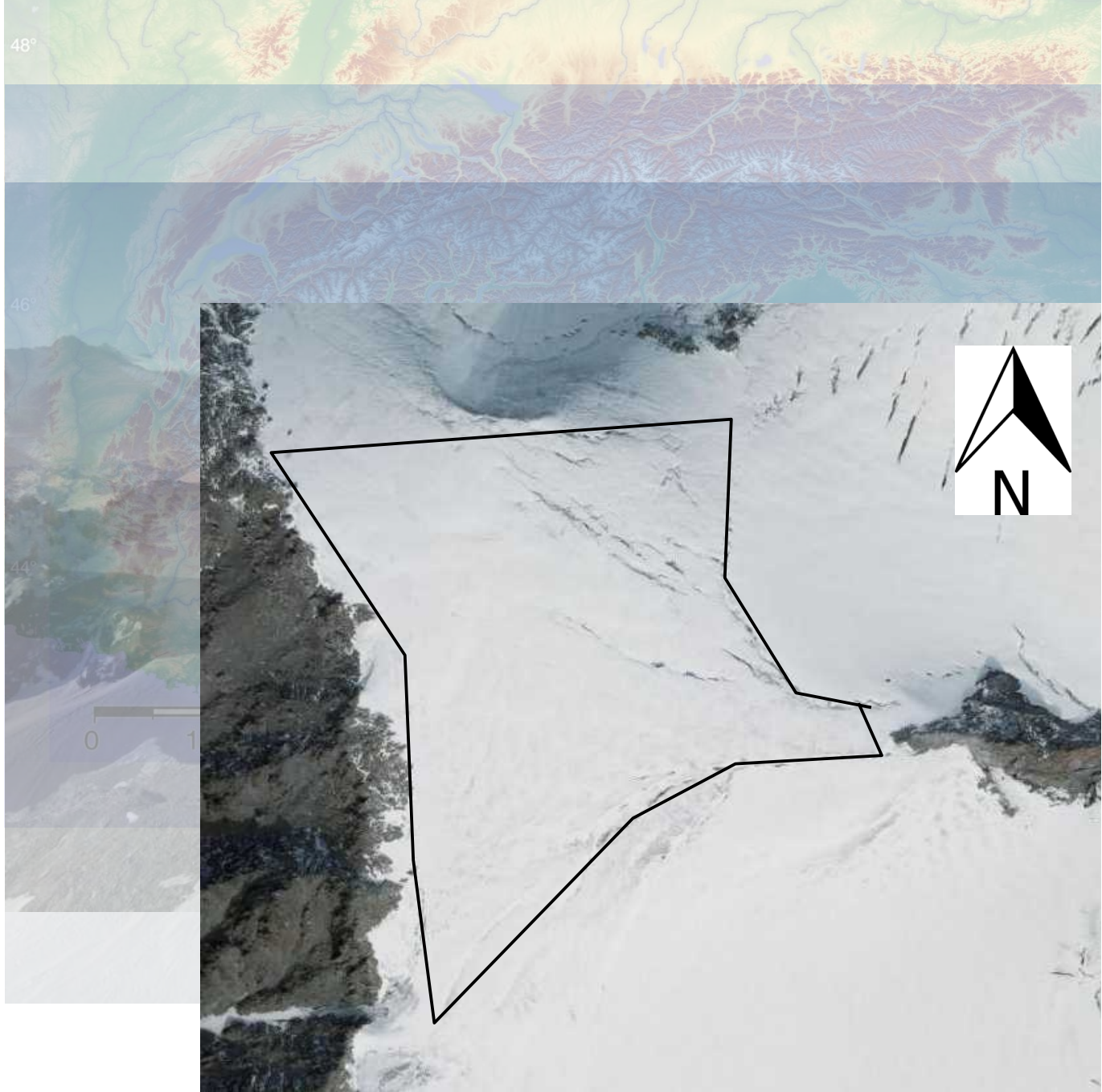
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General Characteristics

- Location: Ötztal Alps (Austria/Italy)
- Altitude: ca. 3450 m
Accumulation zone of Gepatschferner
- Dome shaped
- Extent: ca. 250 m x 250 m
- Ice thickness: up to ca. 20 m



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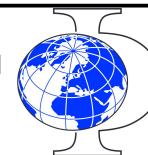
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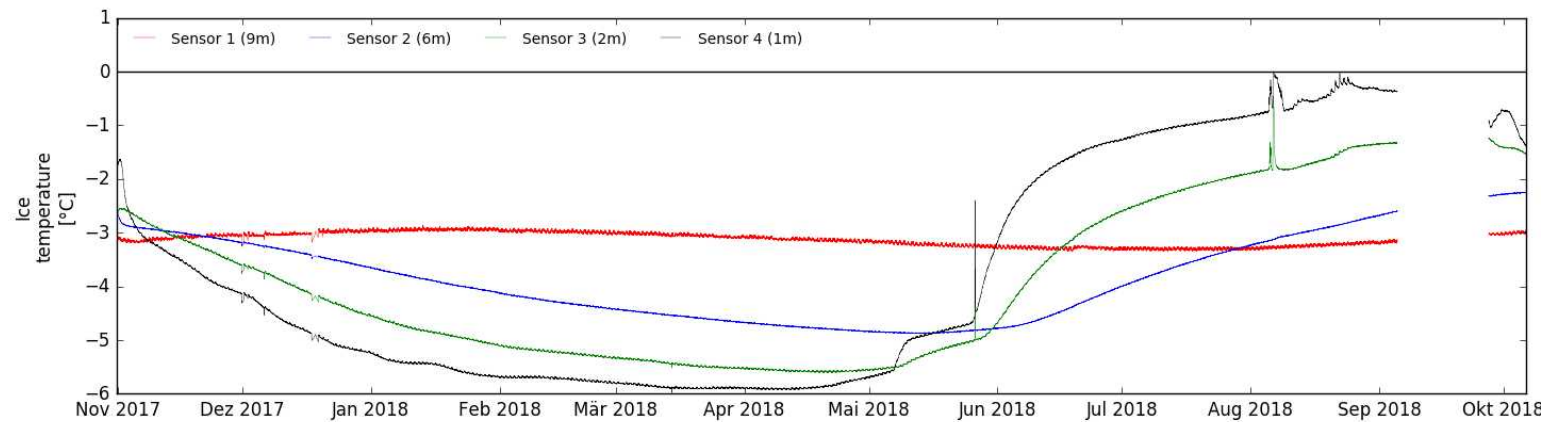
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Available data

- Ice temperatures
- Weather station (since Oct. 2017)
- Web cam
- (Short) ice cores → ice formation, age
- Aerial photography
- Elevation changes
- GPR → bedrock, surface



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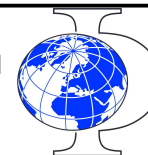
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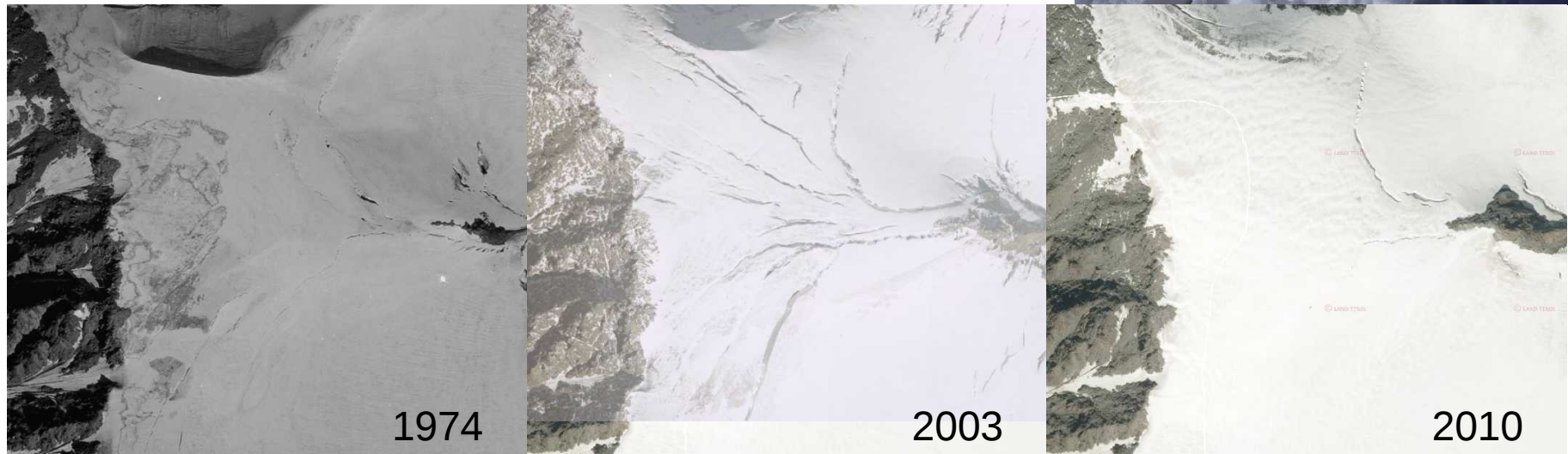
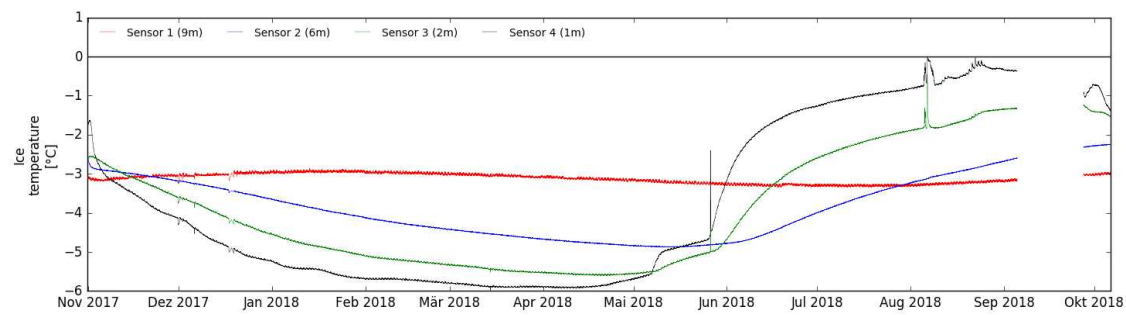
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First findings

- Cold ice at a certain depth
- No continuous snow ice transition
- Melt water in the snow layer → Snow hydrology
- Ice partly formed by firn densification, partly superimposed ice
- Crevasses form and vanish over time
- Flat bedrock, small ice thickness → we expect very small/no ice flow
- Tritium peak not found in the ice
→ surface ice older than ca. 1963



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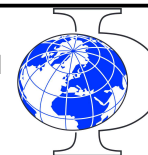
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Questions we want to answer

Processes

- What are the ablation processes? Flow? Melting?
- Processes of snow hydrology?
- Role of melt water? Where does it go?
- Impact of crevasses?
- When does sliding set in?

Climate

- Response to certain climate forcing?
- Model past, present and future

Age/Phases of growth & decline

- No continuous climate record possible **BUT**:
Phases of growth or decline are imprinted in the ice record
 - Which conditions lead to phases of growth or decline?
 - Can we model them?
- Phases of growth or decline only intelligible with mass- and energy balance

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Questions we want to answer

- Processes
- Climate
- Age/Phases of growth & decline

Where we hope **Elmer/Ice** can help us:

- Mass balance
- Energy balance
- Snow hydrology
- Simulate past, present and future and climate scenarios
- Dating Model ?
- Crevasses ?

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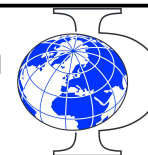
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Thank you for listening!



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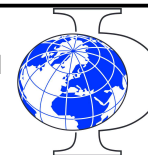
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