

Icing precipitation in Finland

Kari Ahti

Finnish Meteorological Institute

2007 SAE Aircraft and Engine Icing International Conference
September 24-27, 2007 Sevilla, Spain

Introduction

- In 1990's it was studied ice loads of icing precipitation and these results have been published in 1995 (Makkonen & Ahti) in the Atmospheric Research 36.
- A lot of information of icing drizzle and icing rain was not presented in this publication.
- Purpose of this paper is to present unpublished part of those icing studies before my retirement.

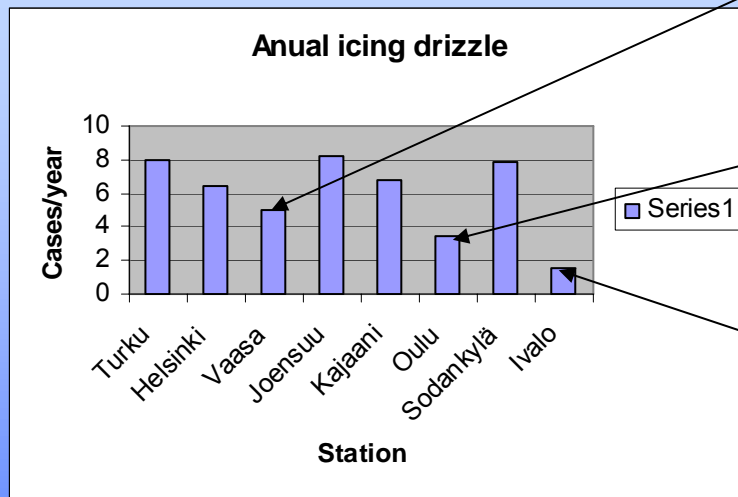
Observations

- Observation period 1965 – 1988
- 8 stations
- 1333 icing precipitation cases were found

Items

- Annual average of icing drizzle
- Average annual icing rain
- Intensity of icing drizzle
- Intensity of light icing rain
- Intensity of icing rain
- Tops and lopes of the mountains are sinks of liquid water drops

Annual average of icing drizzle



On the costal area of
Golf of Bothnia
there are less icing drizzle
than in other parts of Finland

Explanation of low existence
of icing drizzle at Ivalo airport
will be explained later.

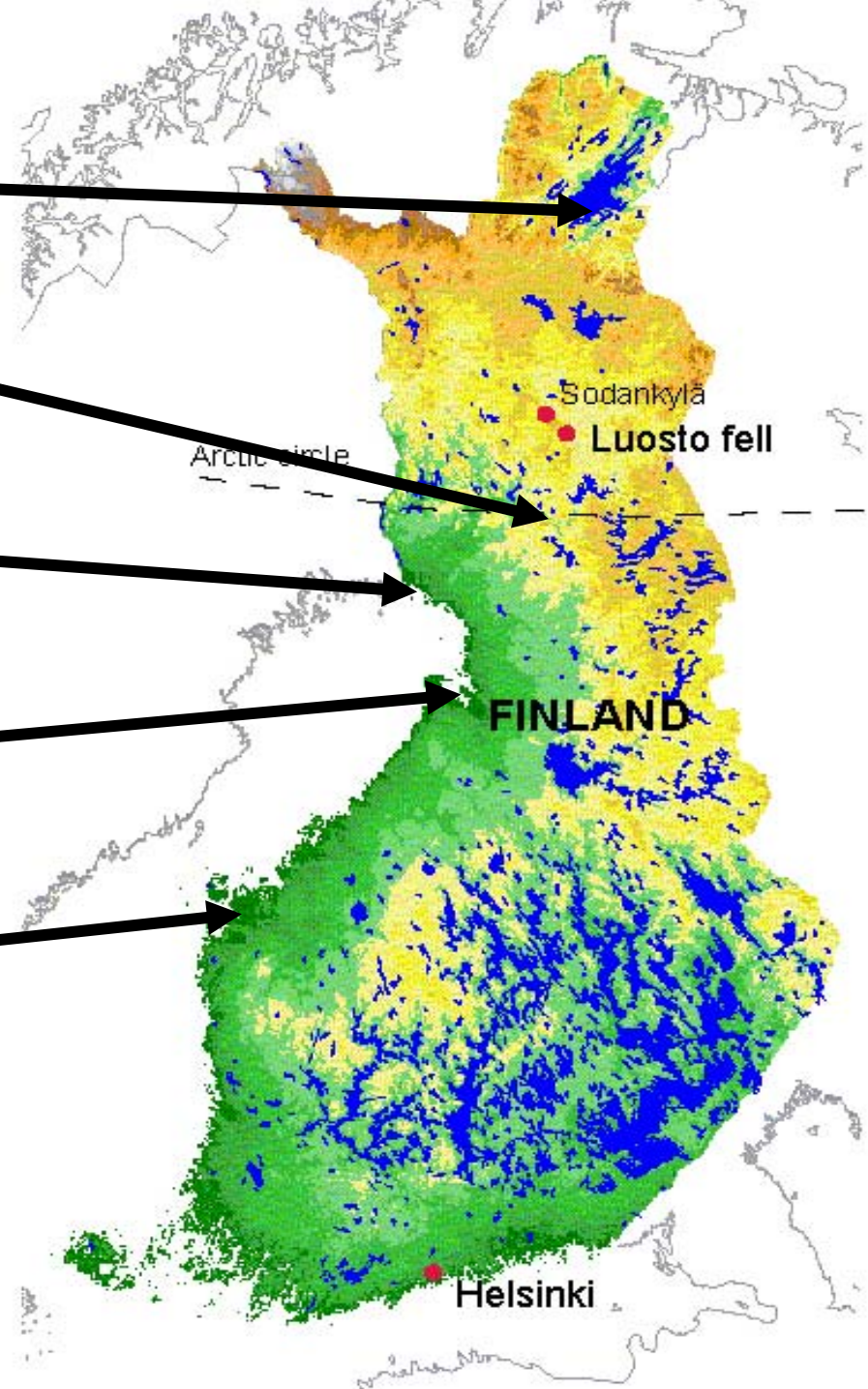
IVALO

ROVANIEMI

KEMI

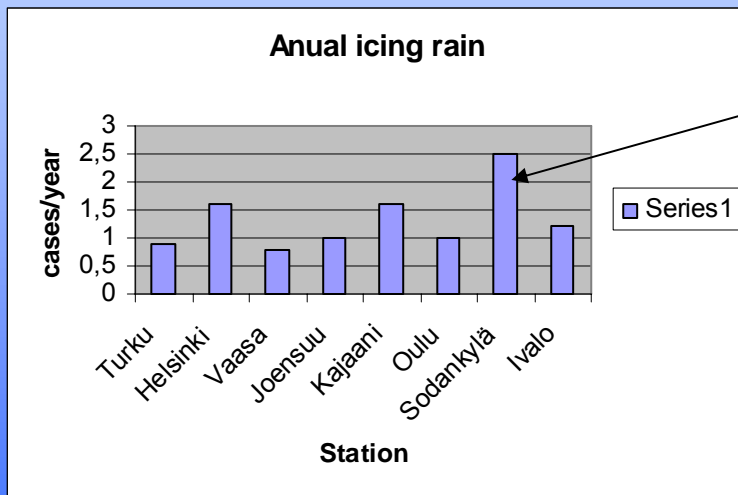
OULU

VAASA



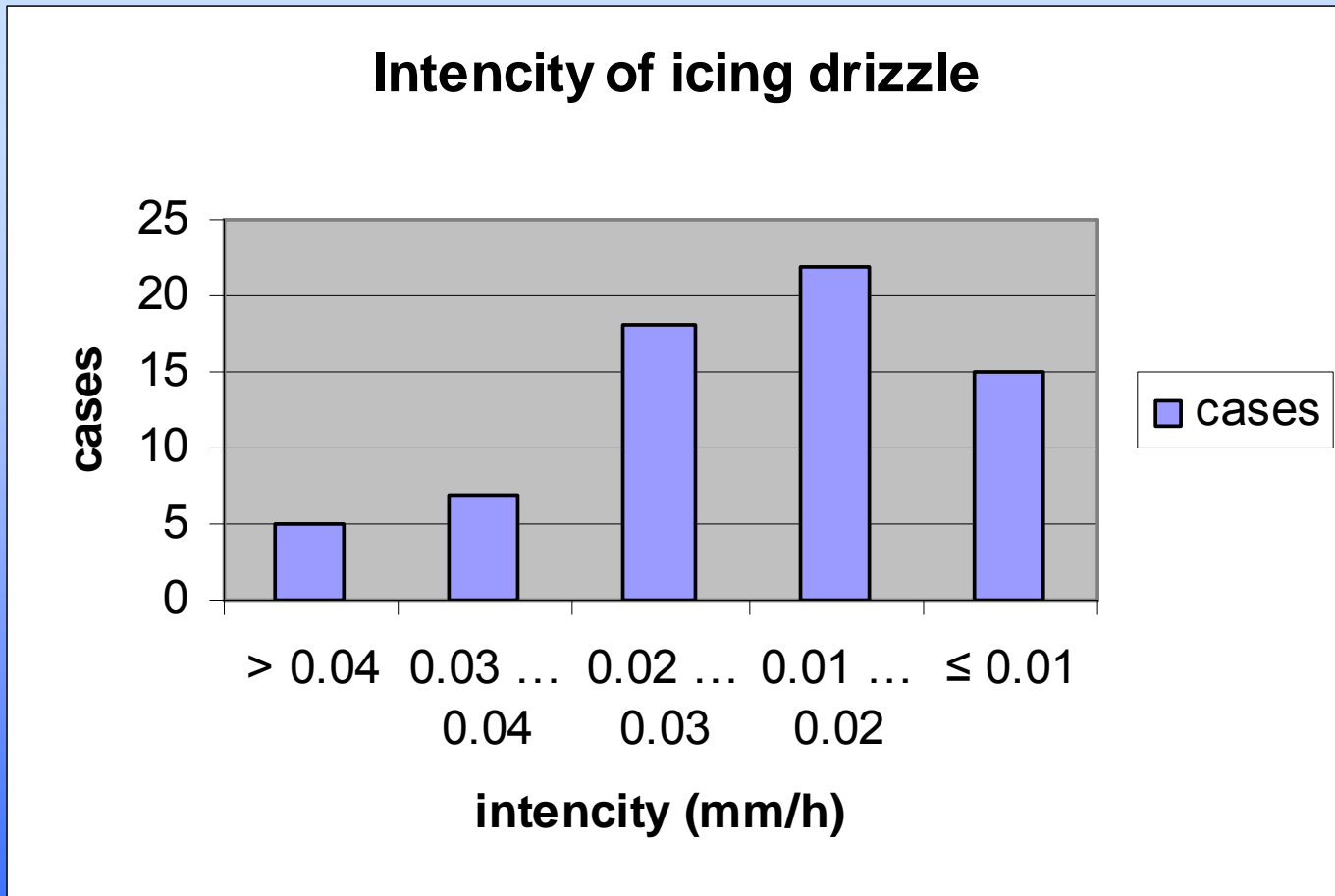
Average annual icing rain

- It is difficult to see any area differences in icing rain in Finland also Ivalo has the same annual average as other stations

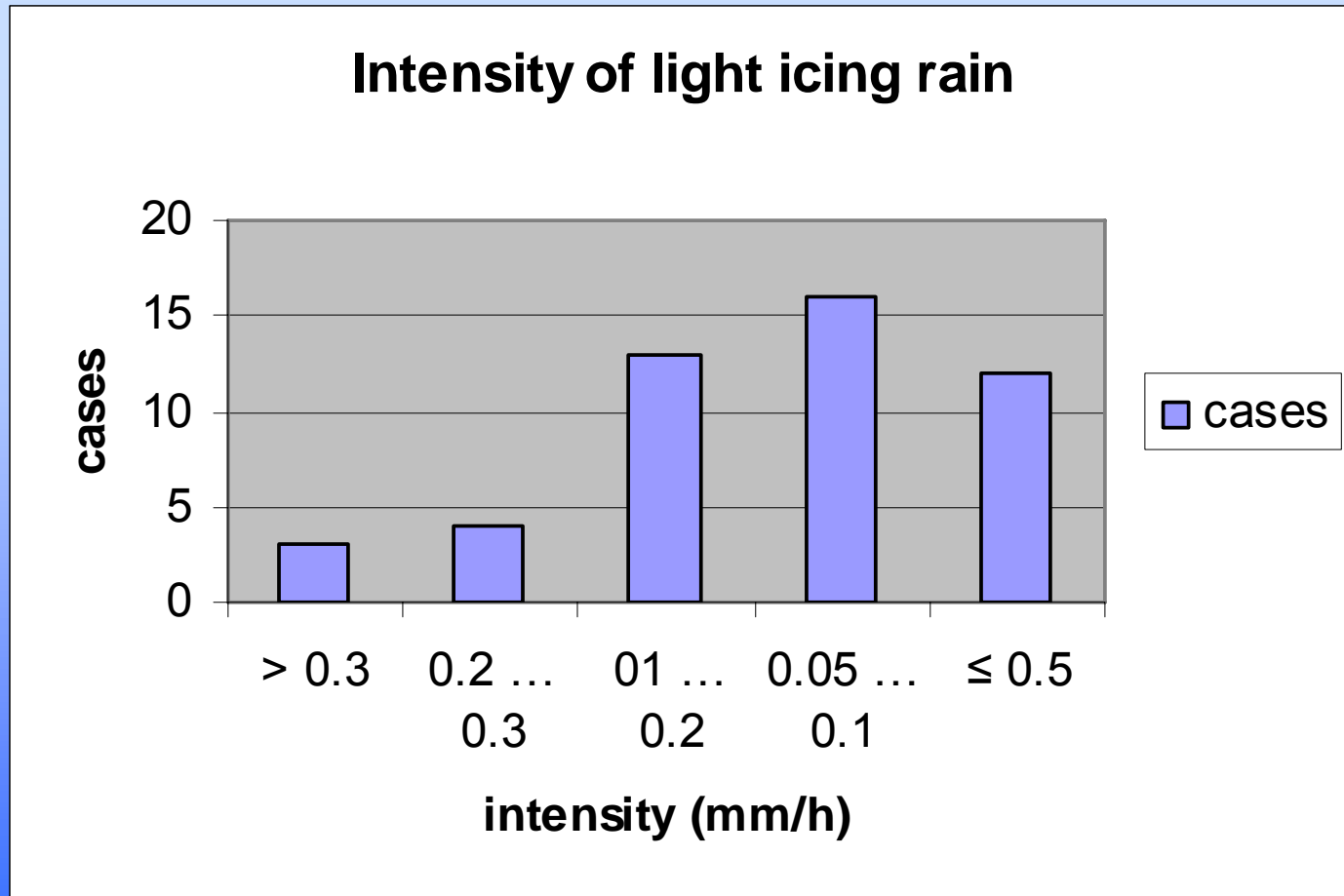


Sodankylä was the meteorological observatory and others aviation meteorological stations

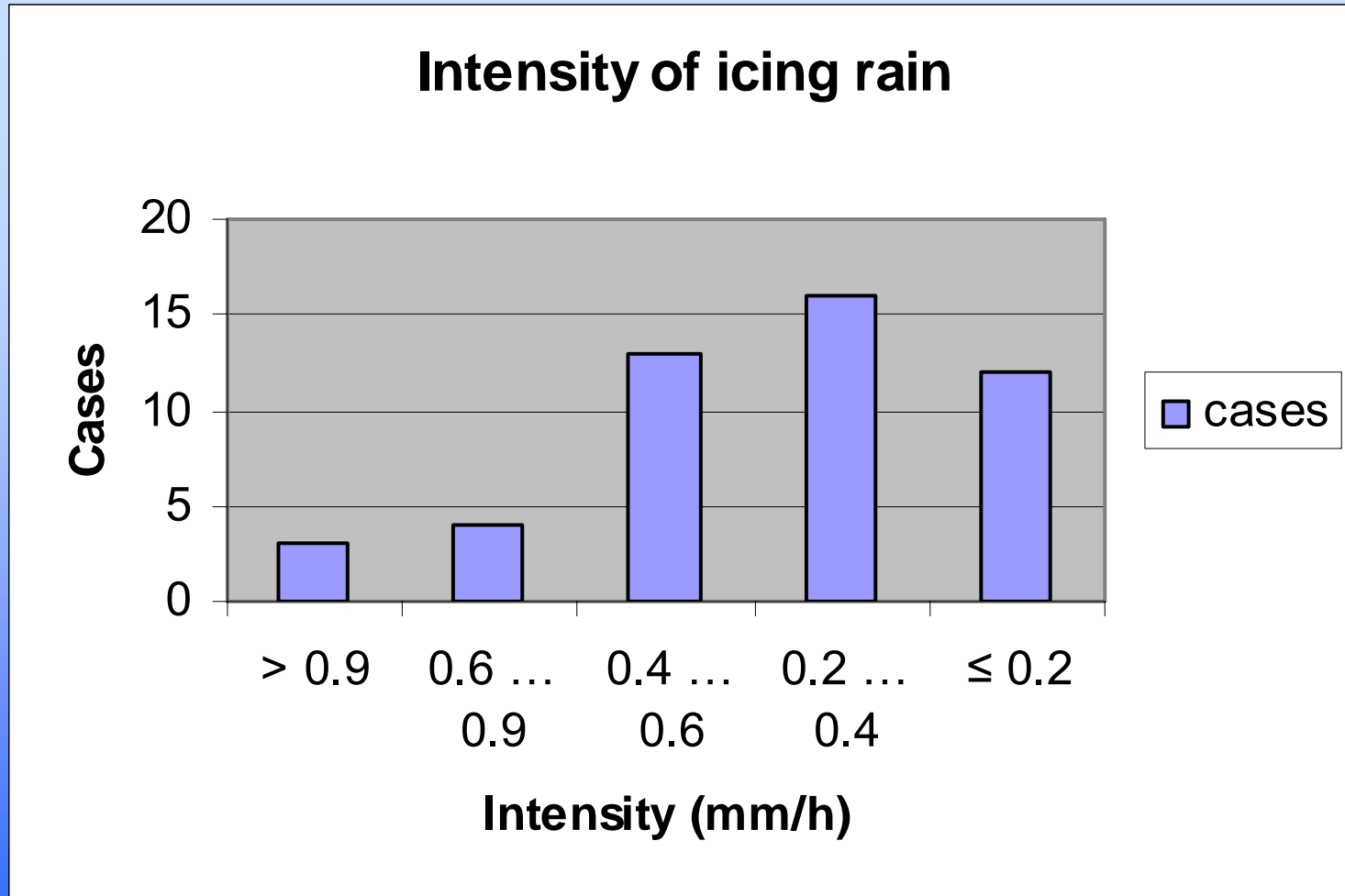
Intensity of icing drizzle



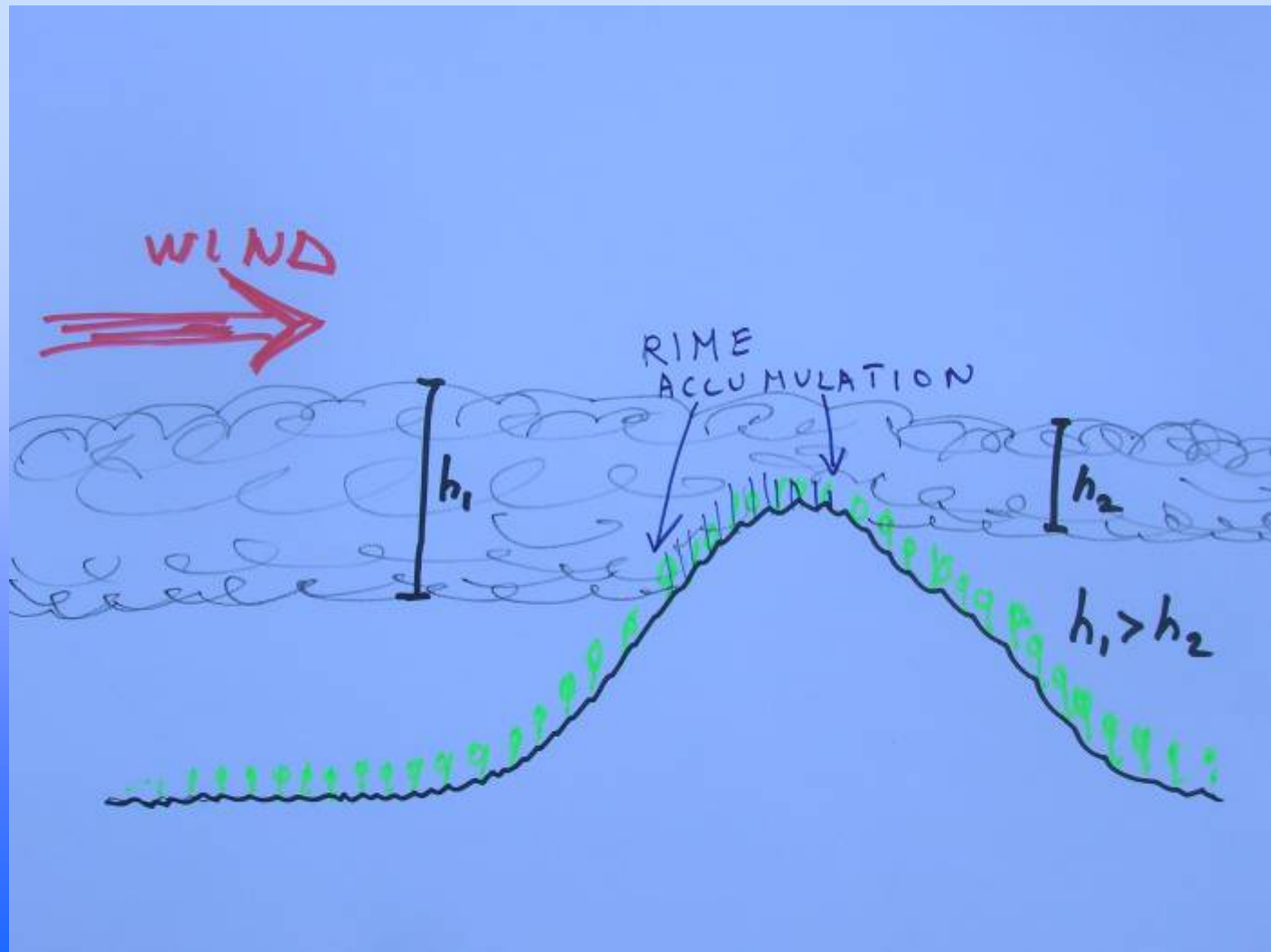
Intensity of light icing rain



Intensity of icing rain



Tops and lopes of the mountains are sinks of liquid water drops



How we know this?

- Good explanation for low icing drizzle average at Ivalo airport
- Old method to forecast fog at Rovaniemi airport if Kemi (30 a.s.l.) cloud base is 400 ft or less and wind is from south west Rovaniemi (600 a.s.l.) will be in fog after some hours
- Rime measurements prove that this really happens in the nature

Where sink of liquid water should be remembered

- Mesoscale modeling
- Aviation forecasts
- Airport planning

Conclusions

- In Finland there are 1... 2 icing rain cases in one location in a winter
- There are 4 ... 10 icing drizzle cases in one location in a winter
- Intensities are low
- In Finland (Northern Europe) for aviation the most important icing event is in cloud icing

**THANK
YOU !**



Cessna 208B hajosi pahoin, mutta ohjaamo säilyi suhteellisen ehjänä. Kuva Tero Tuominen

