



ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

DustClim



European Research Area
for Climate Services



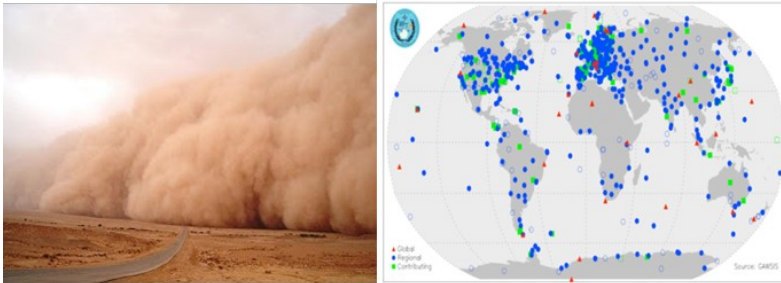
ERA4CS DustClim: Products for the Aviation Sector

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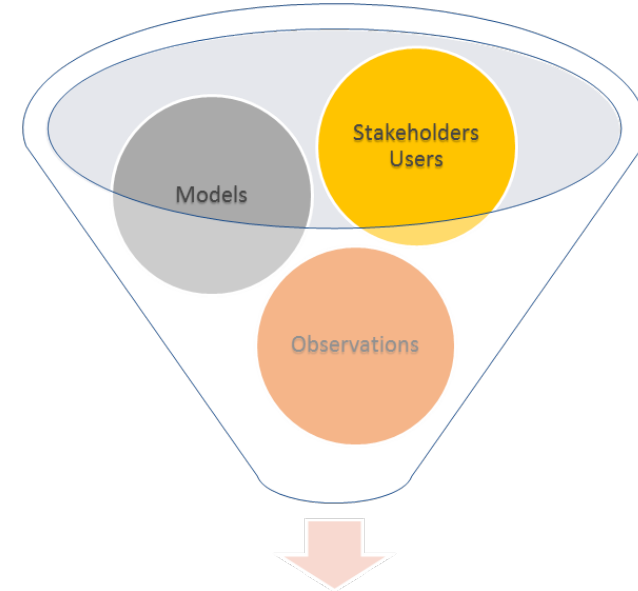
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IMAA), Francesca Barnaba (CNR-ISAC), Paola Formenti
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Dust Storms Assessment for the development of user-oriented **C**limate Services in Northern Africa, Middle East and Europe

- SDS is a serious hazard for life, health, environment and economy
- Lack of dust observations (past trends and current conditions)



GOAL: Develop **dust-related services** to specific socio-economic sectors based on an advanced **dust reanalysis** for the NAMEE region

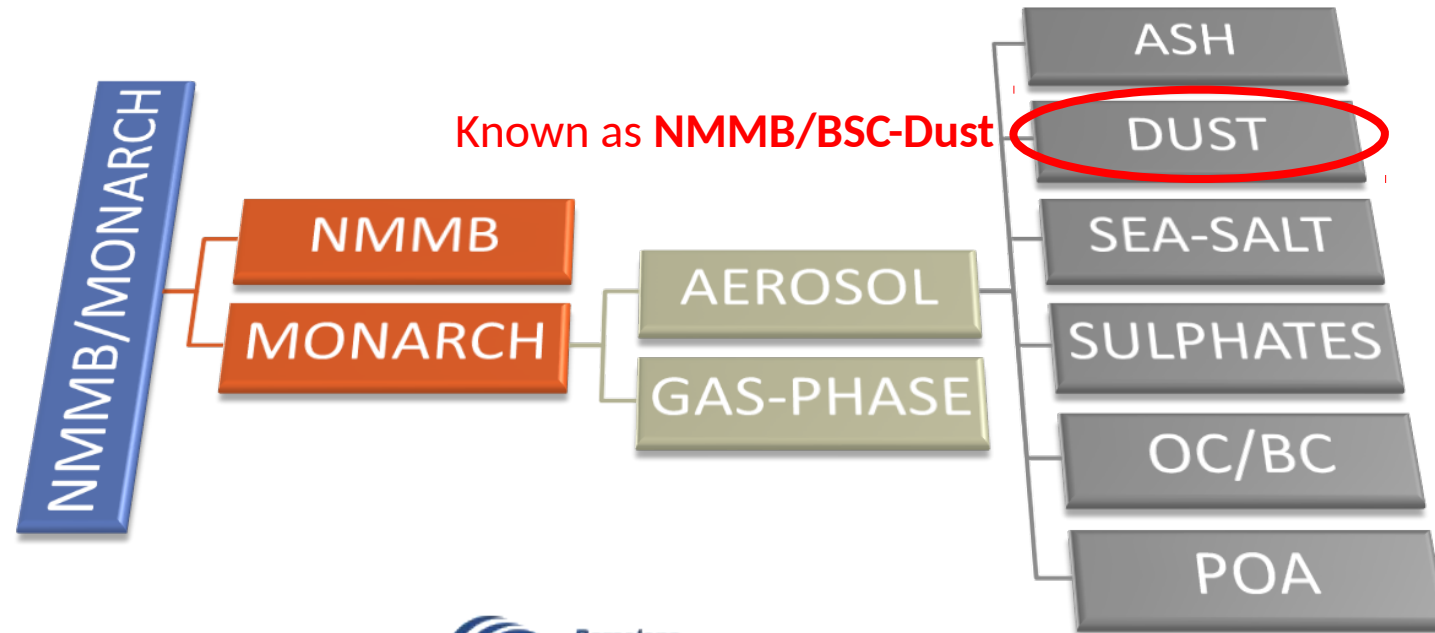


Dust-related Climate Services



NMMB-MONARCH: Atmospheric Composition and Air Quality

- The main system is build on the **meteorological driver NMMB**
- **Multiscale**: global to regional scales allowed (nesting capabilities)
- **Nonhydrostatic** dynamical core: single digit kilometre resolution allowed
- Fully **on-line** coupling: weather-chemistry feedback processes allowed
- Enhancement with a **data assimilation** system

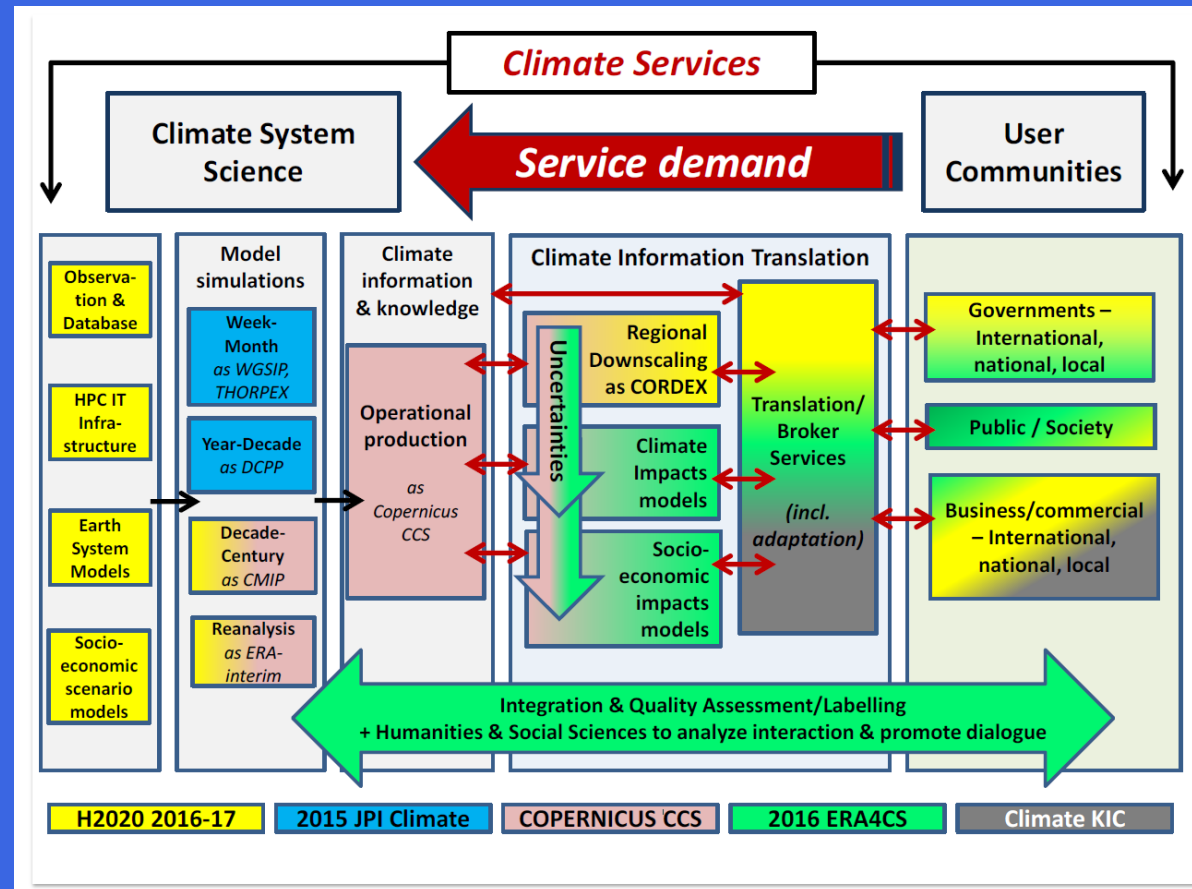


My Objectives

1. Understand **what climate services are on offer** by DustClim.
2. Understand **how to shape** our initial (research) ideas into something relevant to (specific parts of) the Aviation Sector.

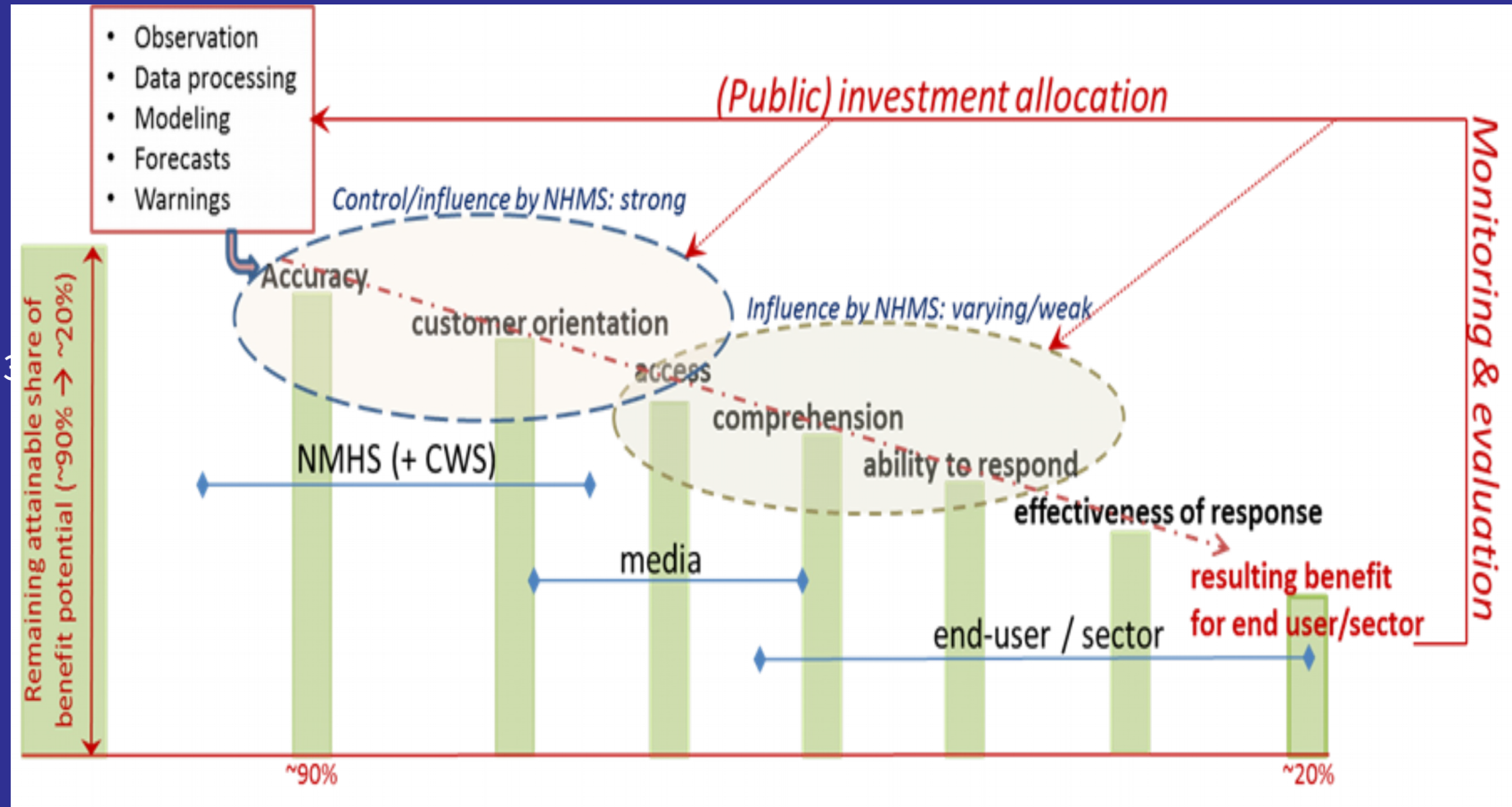


Our funder's view of climate services



Guidance for product design [1/3]

Source:
Perrels et al. (2013)

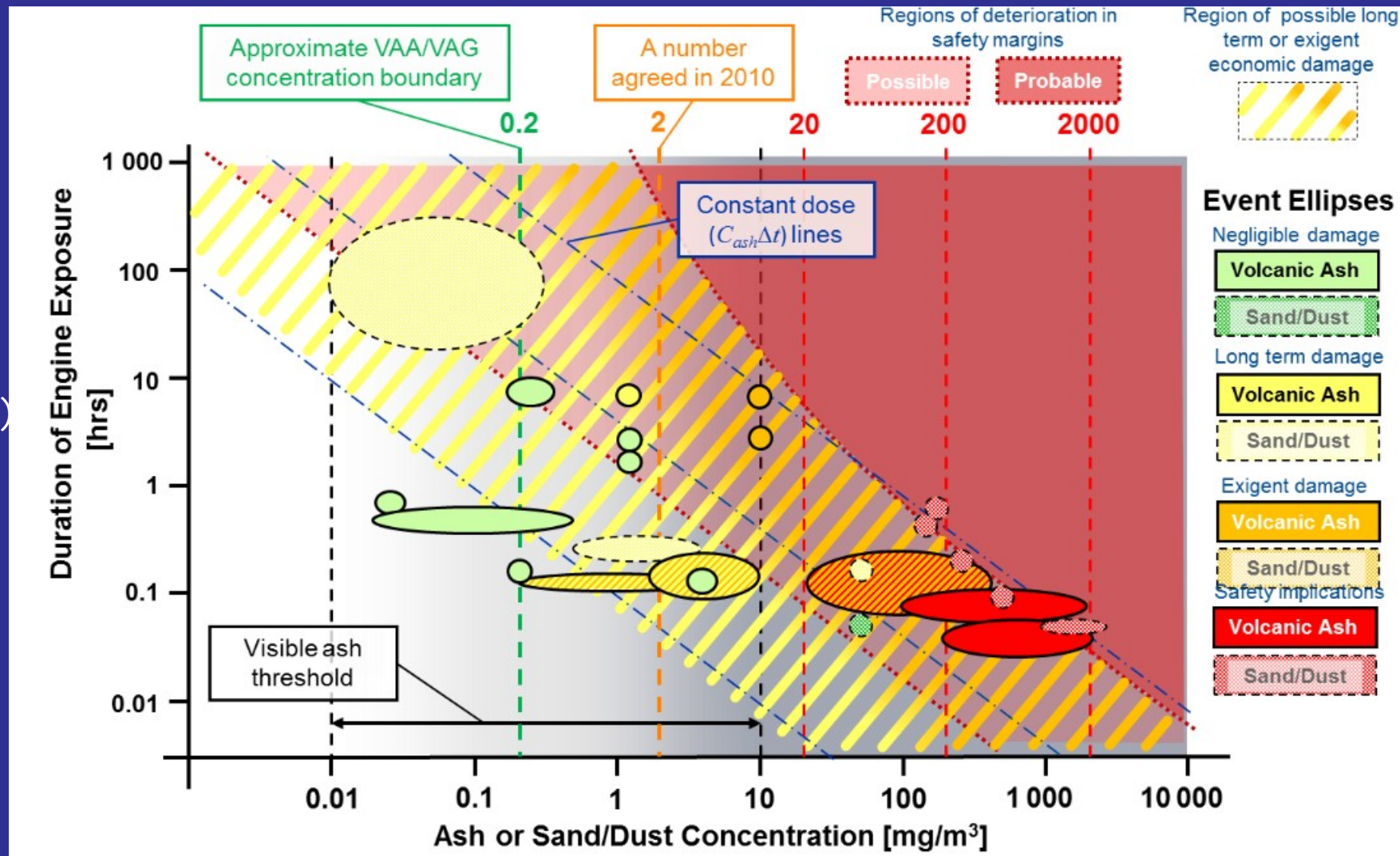


Guidance for product design [2/3]



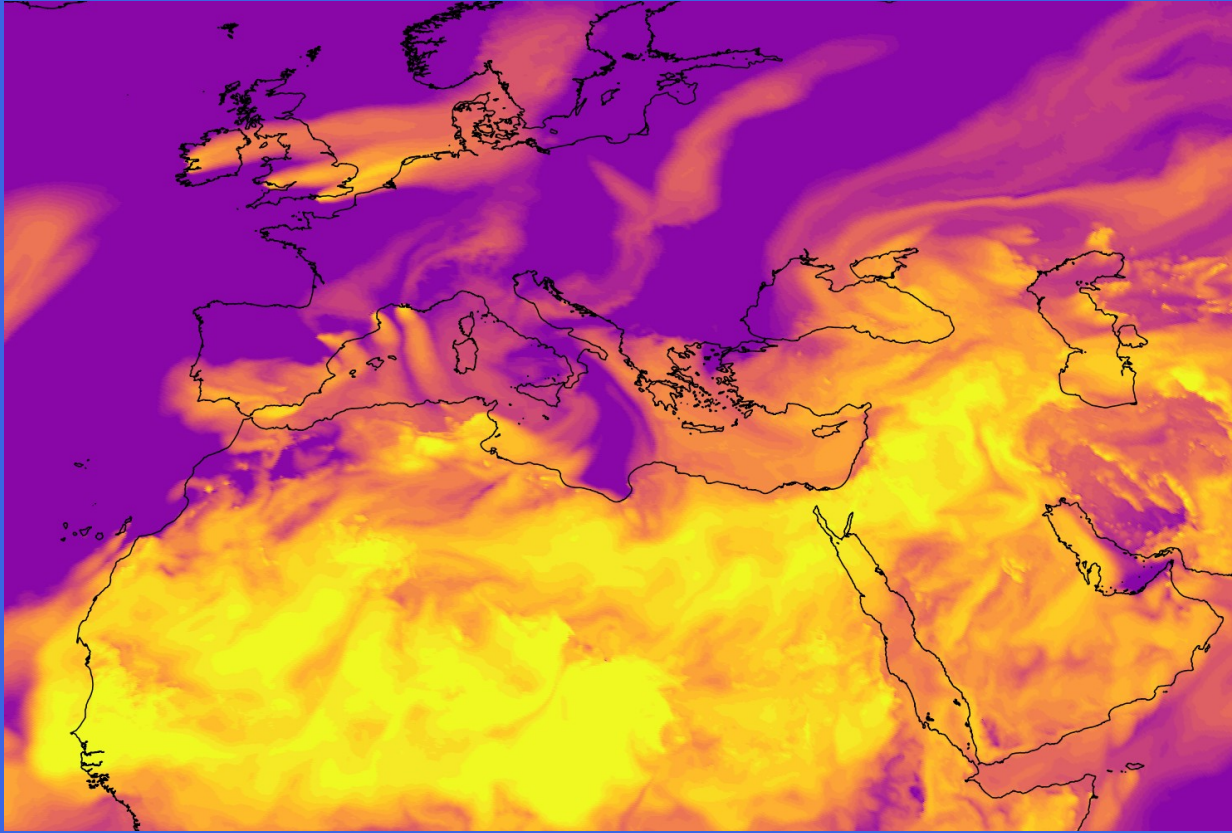
Guidance for product design [3/3]

Source:
Clarkson (2017)



What DustClim can offer [1/2]

Climatology of sand and dust storms (SDS) in high spatial-temporal detail



Domain: Europe, Mid. East, N. Africa

Period: 2000-2017

Time: every 3 hours

Space: 10km x 10 km

Pressure levels: FL10 – FL480

Variables (examples)

Visibility (Extinction aerosol and fog)

3D Concentration of dust/sand

Deposition of dust/sand

...



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What DustClim can offer [2/2]

1

DUST MAPS

(ground, various FLs)

Visibility

Concentration

Duration of exposure to concentrations

2

THRESHOLD MAPS

(ground, various FLs)

For engines
(accumulation of exposure over a threshold)

Visibility
(accumulation of exposure over a threshold)

3

HOT & COLD SPOTS

(ground, various FLs)

Hotspot analysis on dust and threshold maps

Hotspot analysis on airport traffic

4

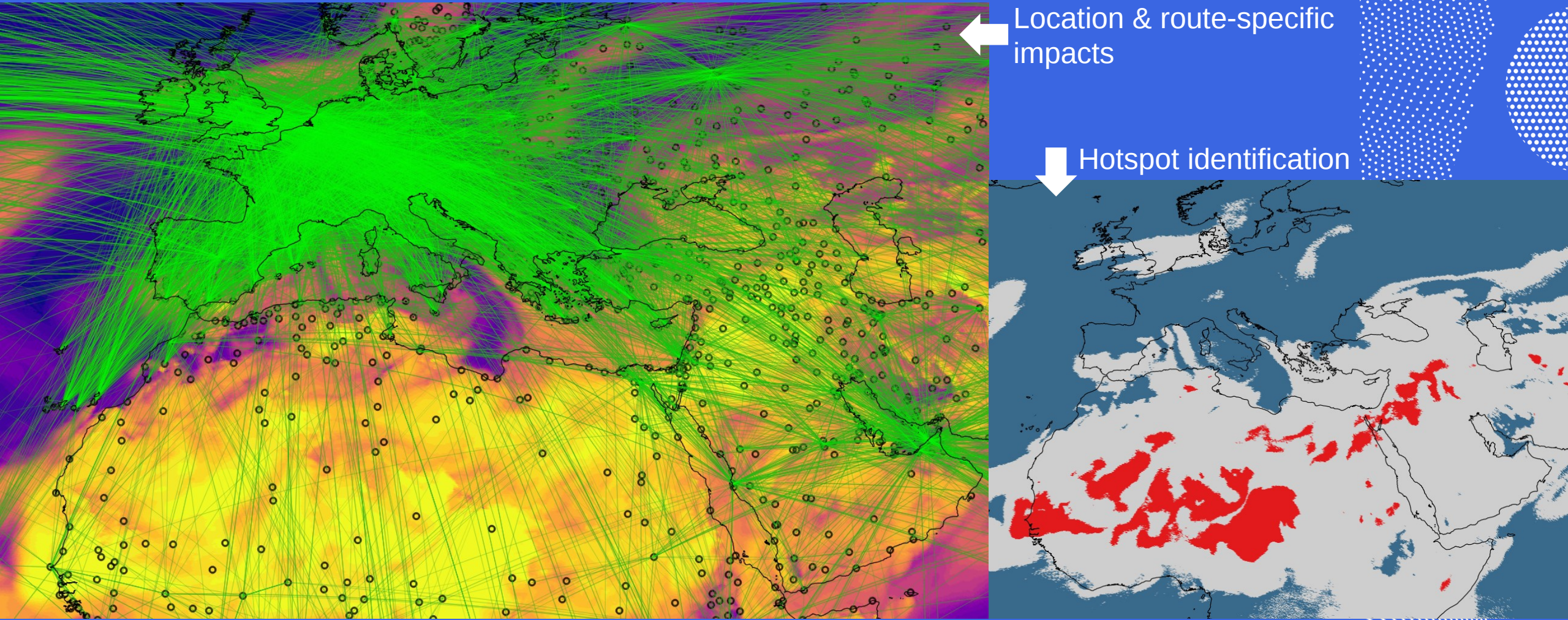
SCHEDULE IMPACTS

Strategic planning of airport ILS/CAT equipment

Maintenance costs
Delay costs



Examples





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Thank you ◀◀

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