



# Group of Experts on Climate Change Impacts and Adaptation for Transport Networks and Nodes

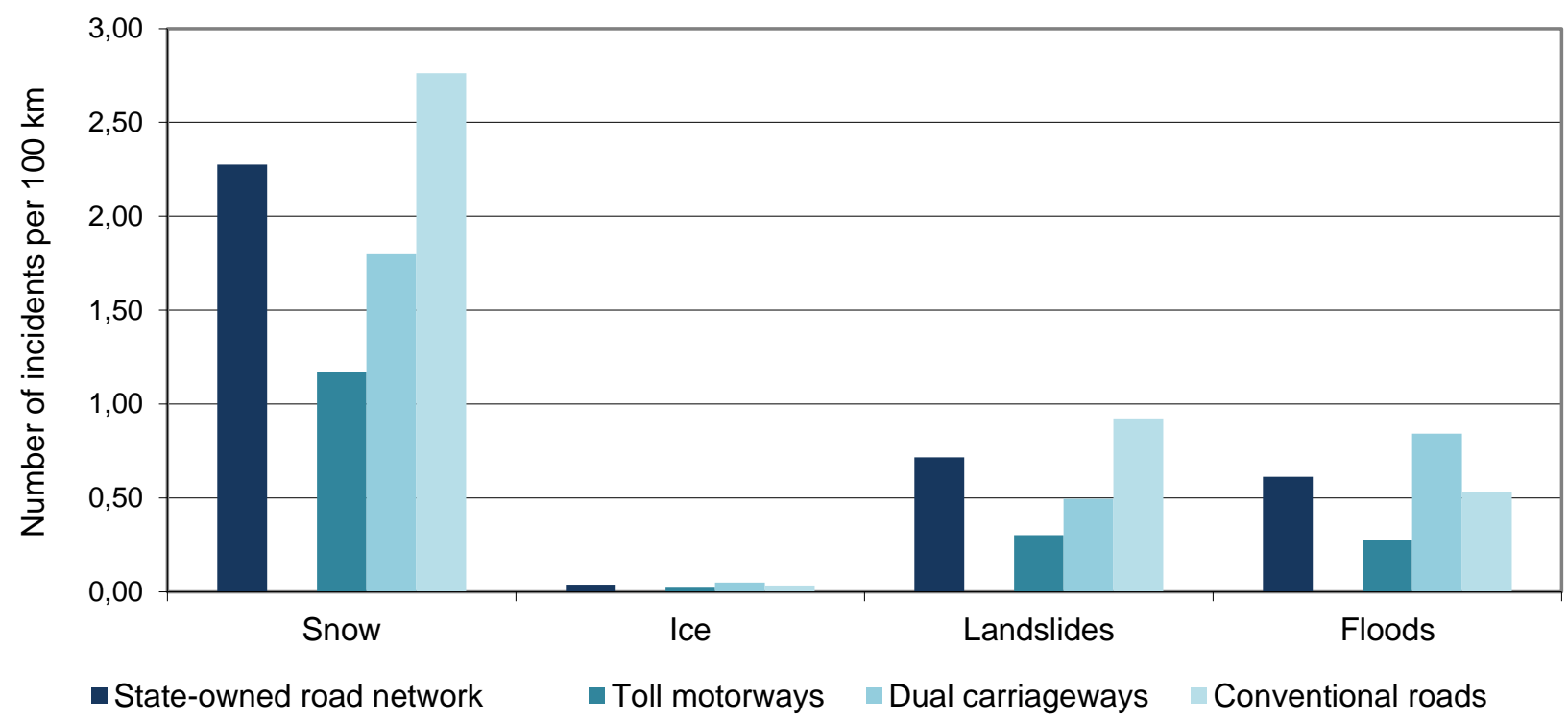
Geneva, 14-15 January 2016

## Climate change adaptation needs of the core transport network in Spain

Alberto Compte

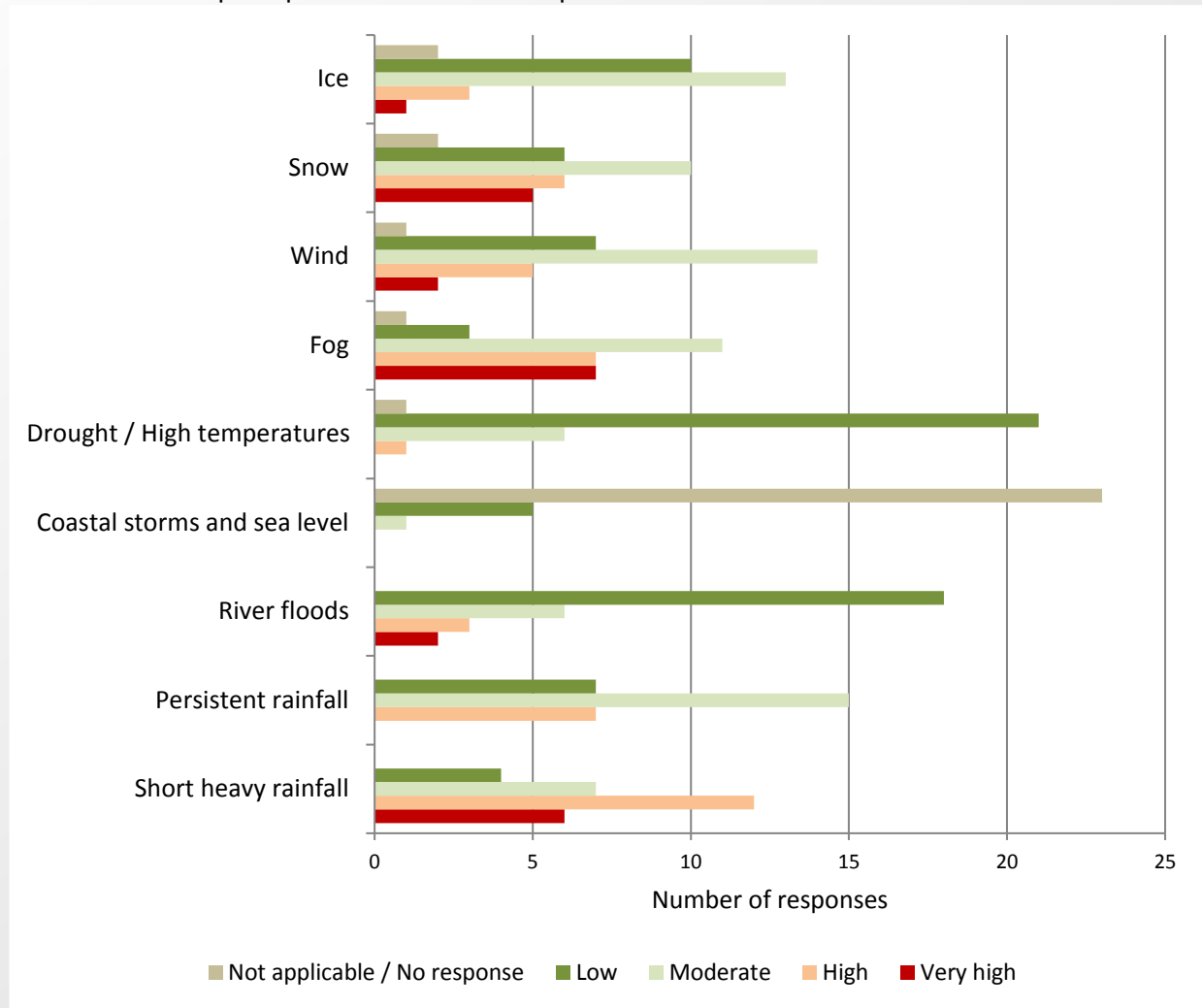
# Current vulnerability of the road network to climate

Number of incidents per year recorded in the Tele-Ruta Service per 100 km, depending on road type (Data from 2010 to 2012)



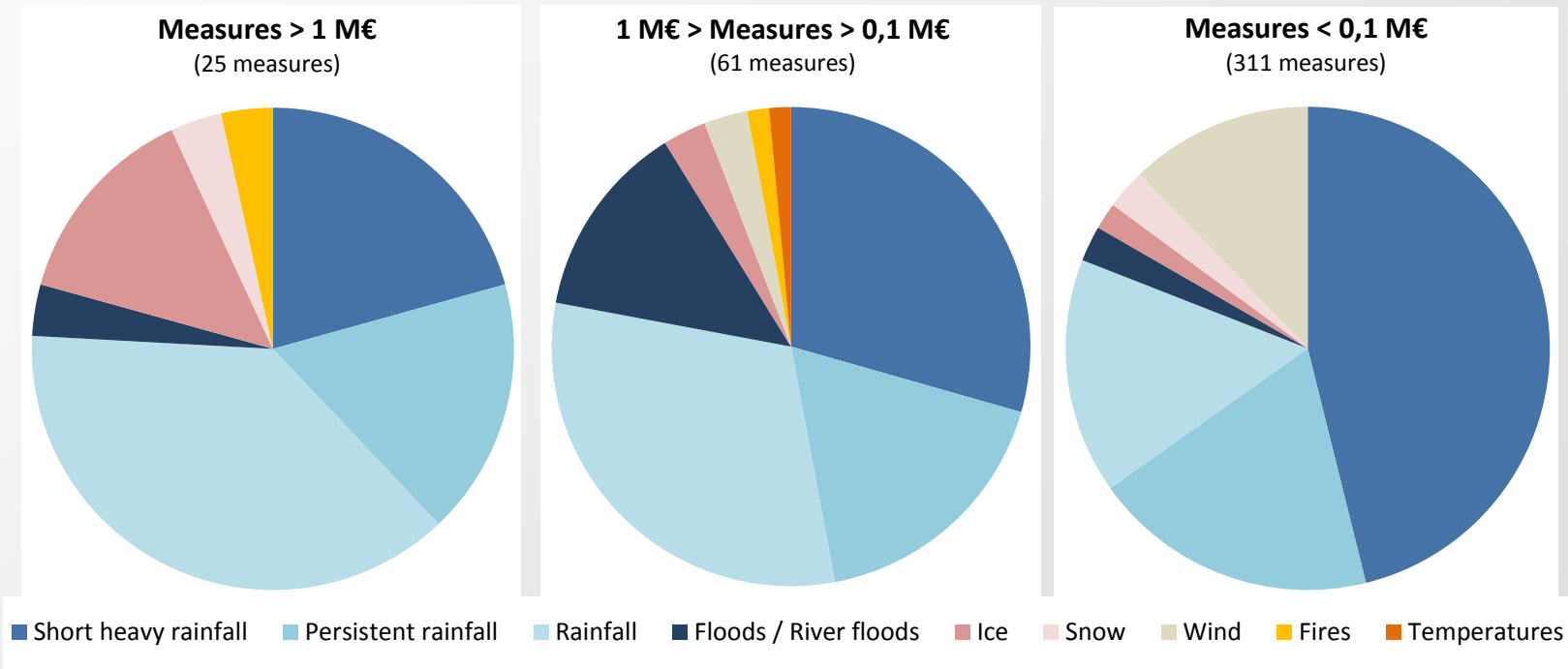
# Current vulnerability of the road network to climate

The Road Units' perception of the current impact of different climatic factors on traffic conditions



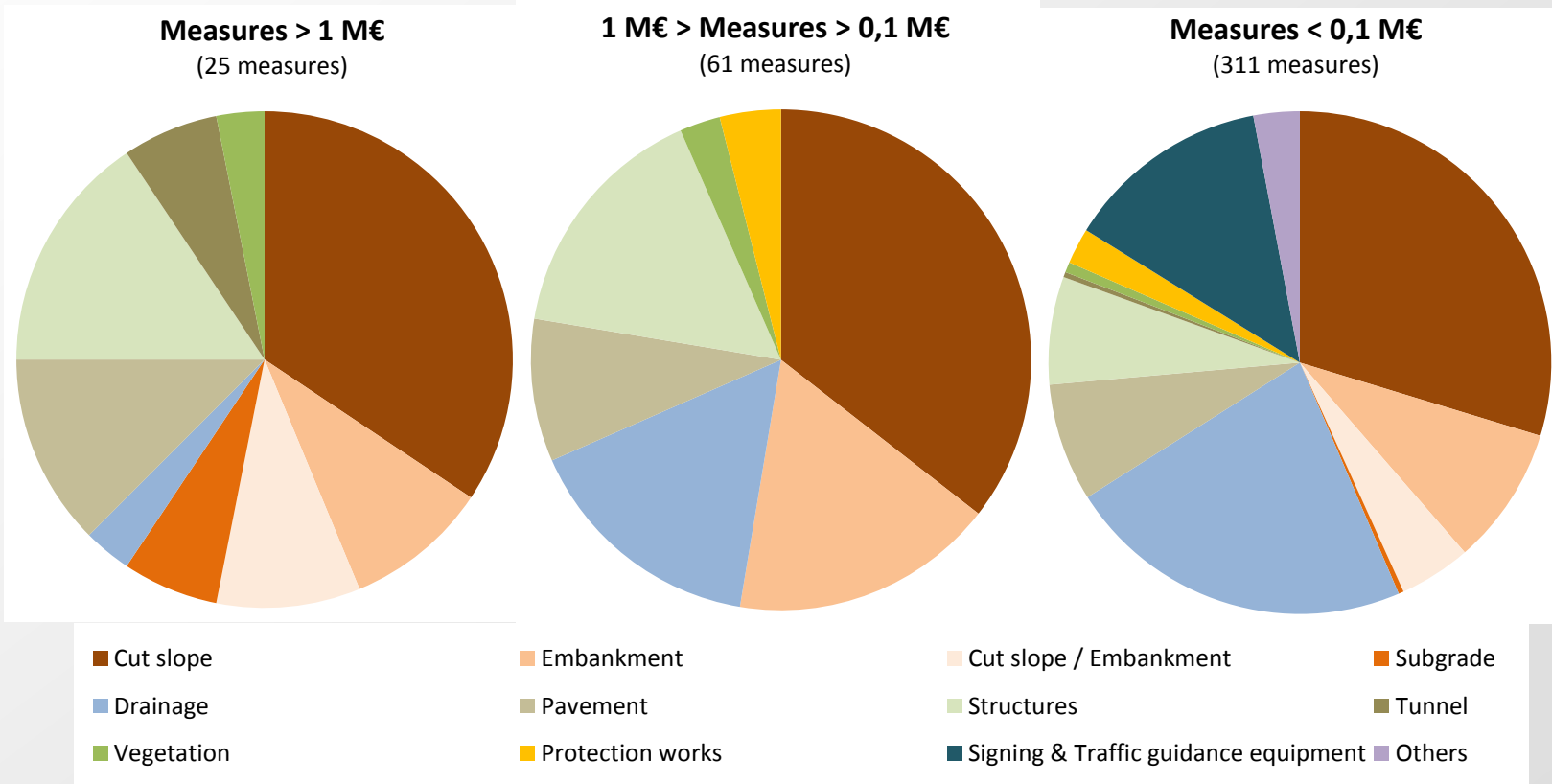
# Current vulnerability of the road network to climate

Main climatic events associated with remedial/rehabilitation measures on roads



# Current vulnerability of the road network to climate

Main road infrastructure assets on which remedial/rehabilitation measures have been performed due to climatic events



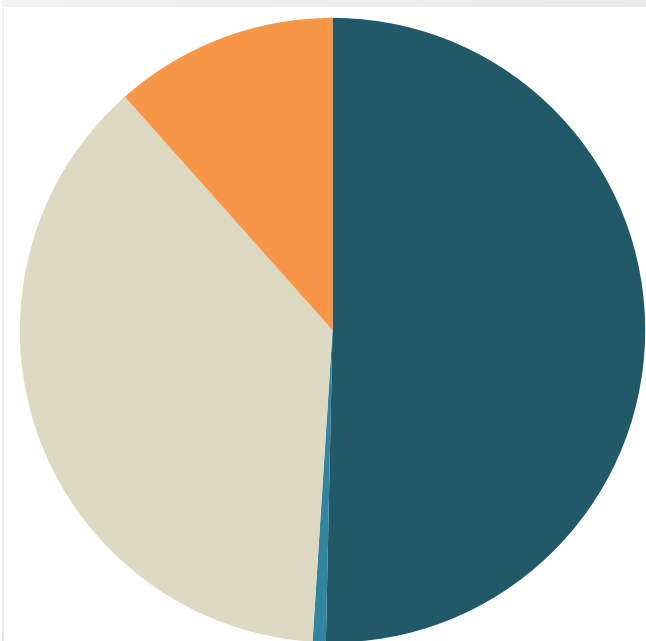
# Current vulnerability of the rail network to climate

Average annual distribution of incidents caused by weather events recorded by ADIF

Conventional network



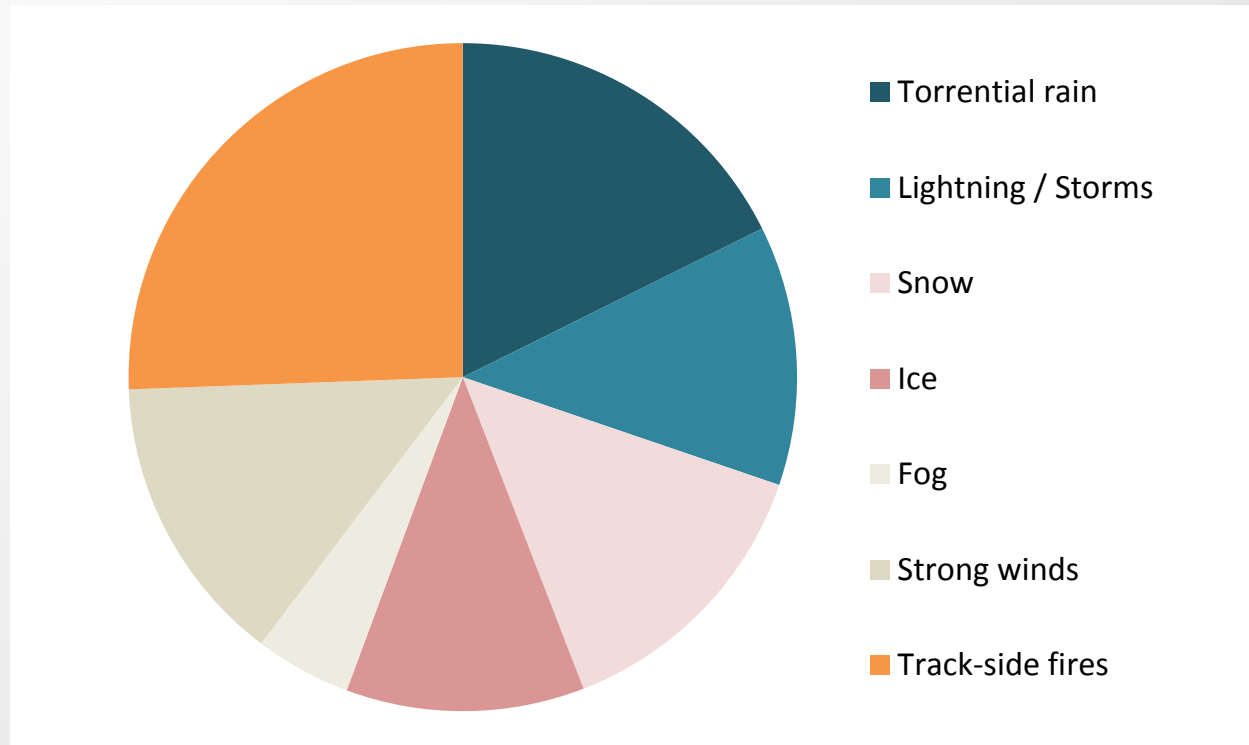
High-speed network



- Torrential rain
- Lightning / Storms
- Snow
- Ice
- Fog
- Strong winds
- Track-side fires

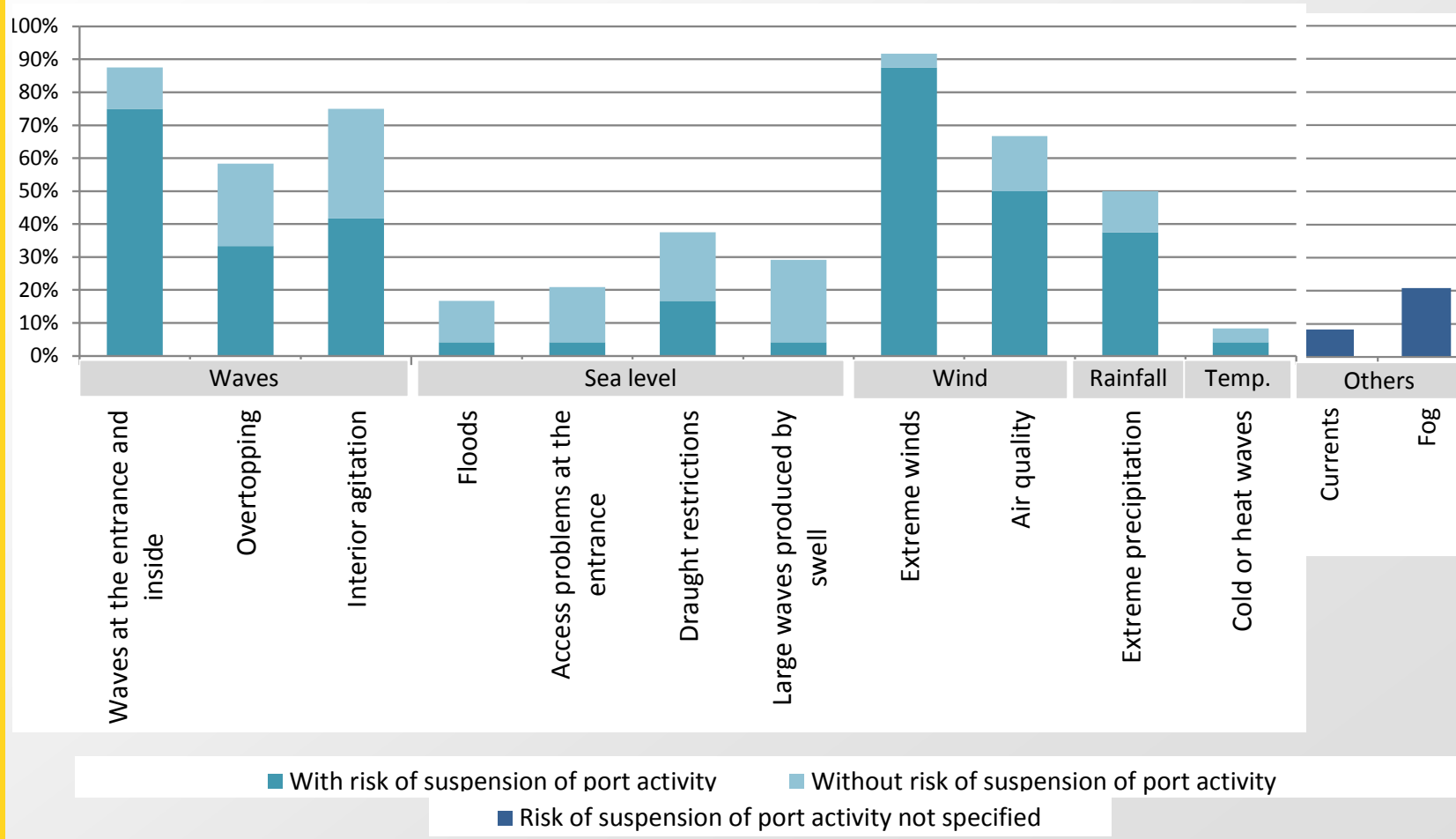
# Current vulnerability of the rail network to climate

Average annual distribution of weather-related incidents affecting train movement recorded by Renfe Operadora (data from 2010-2011)



# Current vulnerability of the port network to climate

Percentage of Port Authorities with port operation problems due to climatic variables





# Current vulnerability of the airport network to climate

Number of level-1 incidents by airport and type  
(Period analysed: 2007-2011 - Sample: 119 incidents)

