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ML MODEL FOR TRANSPORT RISK MITIGATION

OCEAN PROTOCOL DATA CHALLENGE

CONTENTS

▸ Context

▸ The question and its interpretation

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▸ Temporal prediction model

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▸ Axes of improvement

CONTEXT

▸ Ocean Data Challenge

  ▸ During transportation of high velue doos

  ▸ Prevent risk of

    ▸ maximum temperature or humidity overshoot

▸ Data used:

  ▸ Timeseries data of

    ▸ vehicle

    ▸ weather

    ▸ indoor sensors

THE QUESTION AND ITS INTERPRETATION

▸ Find correlations between geolocation, external weather, timestamp, and internal microclimate data. How are these pillars interconnected?

    ▸ **latitude, clouds, hour must impact sunlight => impact external temperature and humidity at first order**

    ▸ **and internal condition will be affected also.**

▸ How does this interconnectedness influence the risk of dangerous temperatures or humidity?

    ▸ **Internal conditions can be impact by external condition like : temperature , speed (vehicle and wind) external sunlight effect**

▸ How do specific weather events (like high winds) or variables such as the proximity of farms to roads contribute to temperature risk?

▸ How can the risk of temperature or humidity-related issues be minimized for long-distance transportation events?

▸ What combination of internal and external weather factors conclude an ideal temperature that is less than 25 degree celsius and less than 80% humidity?

▸

EXPLORATION :

▶ Find correlations
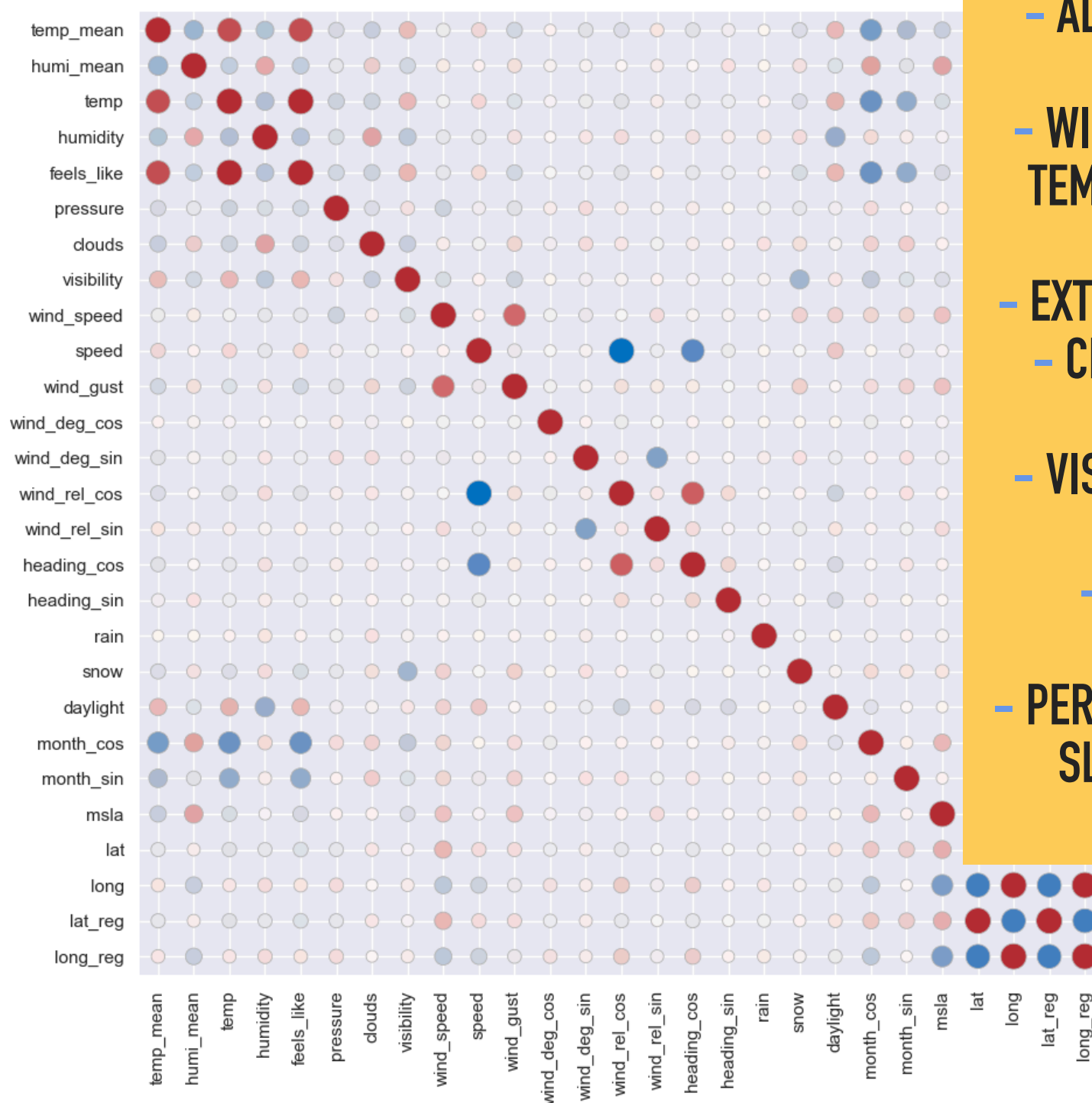
– OF COURSE, EXTERNAL TEMPERATURE INCREASES INTERNAL TEMPERATURE
– DAYLIGHT INCREASES INTERNAL & EXTERNAL TEMPERATURES
– ALTITUDE INCREASES INTERNAL HUMIDITY & WIND SPEED
– WINTER MONTHS DECREASE INTERNAL & EXTERNAL TEMPERATURES BUT INCREASE INTERNAL HUMIDITY
– MORE WIND AT HIGH LATITUDES
– EXTERNAL HUMIDITY INCREASES INTERNAL HUMIDITY
– CLOUDS DECREASE TEMPERATURE BUT INCREASE HUMIDITY
– VISIBILITY INCREASE TEMPERATURE BUT DECREASE HUMIDITY
– MAYBE SPEED SLIGHTLY INCREASE INERNAL TEMPERATURE
– PERHAPS THE RELATIVE HEADWIND (WIND_REL_COS) SLIGHTLY LOWERS THE INTERNAL TEMPERATURE
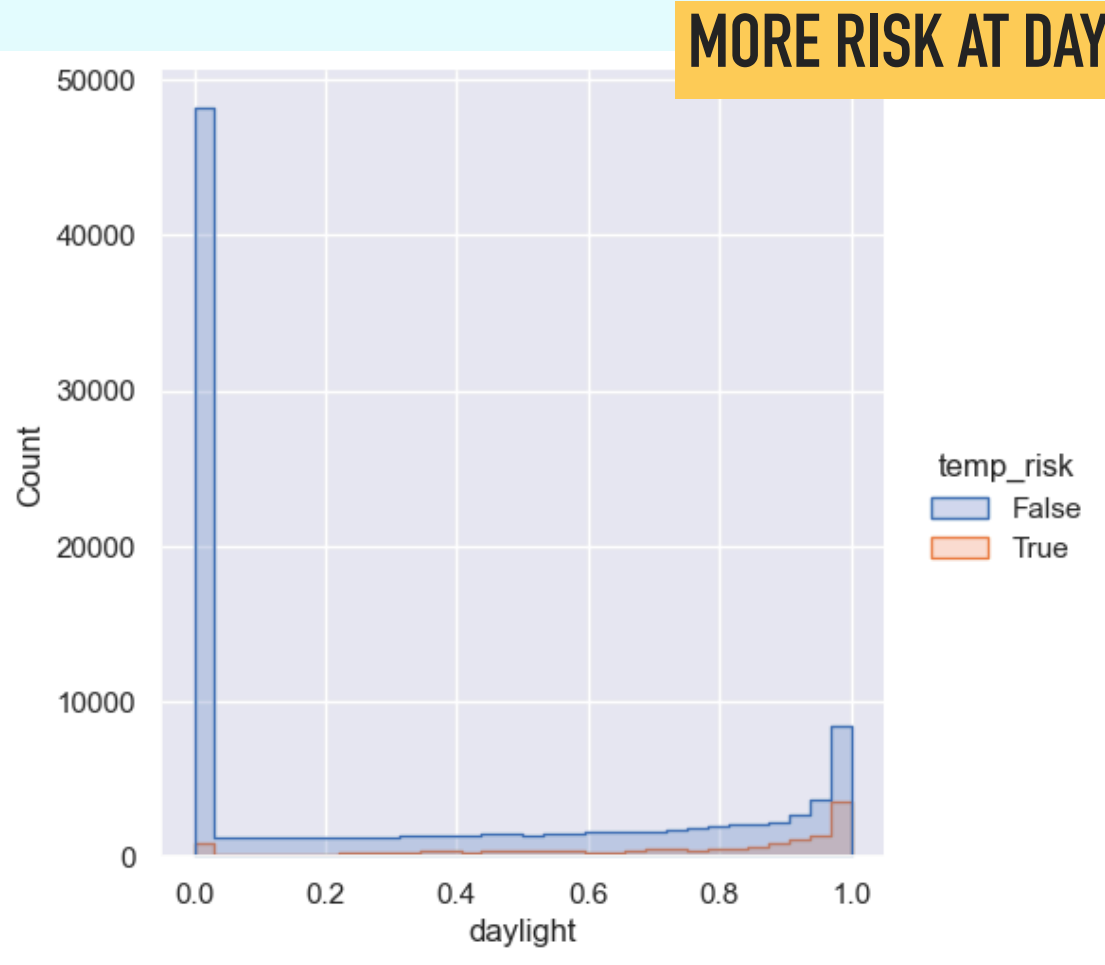
EXPLORATION :
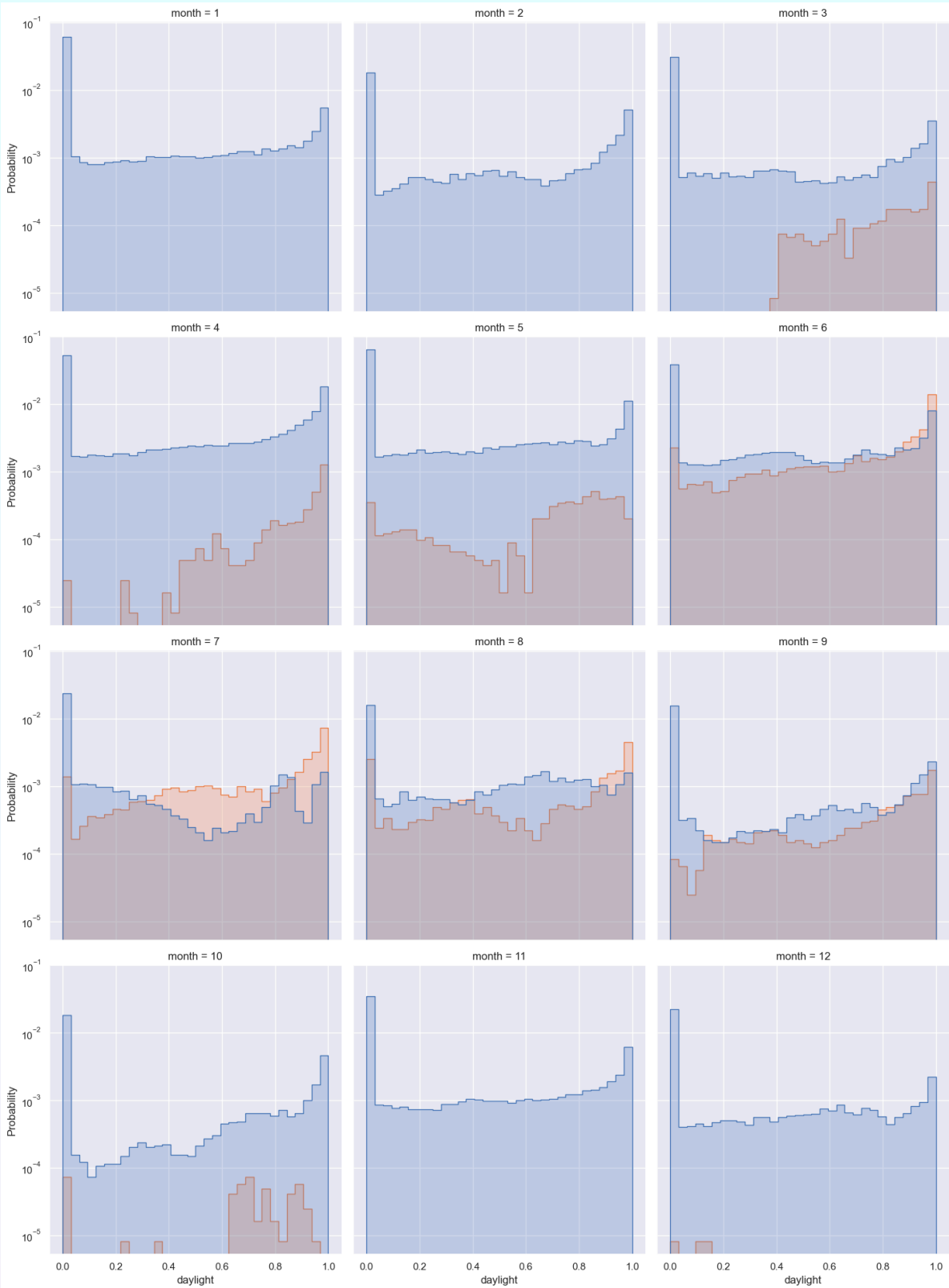
▸ How does this interconnectedness influence the risk?
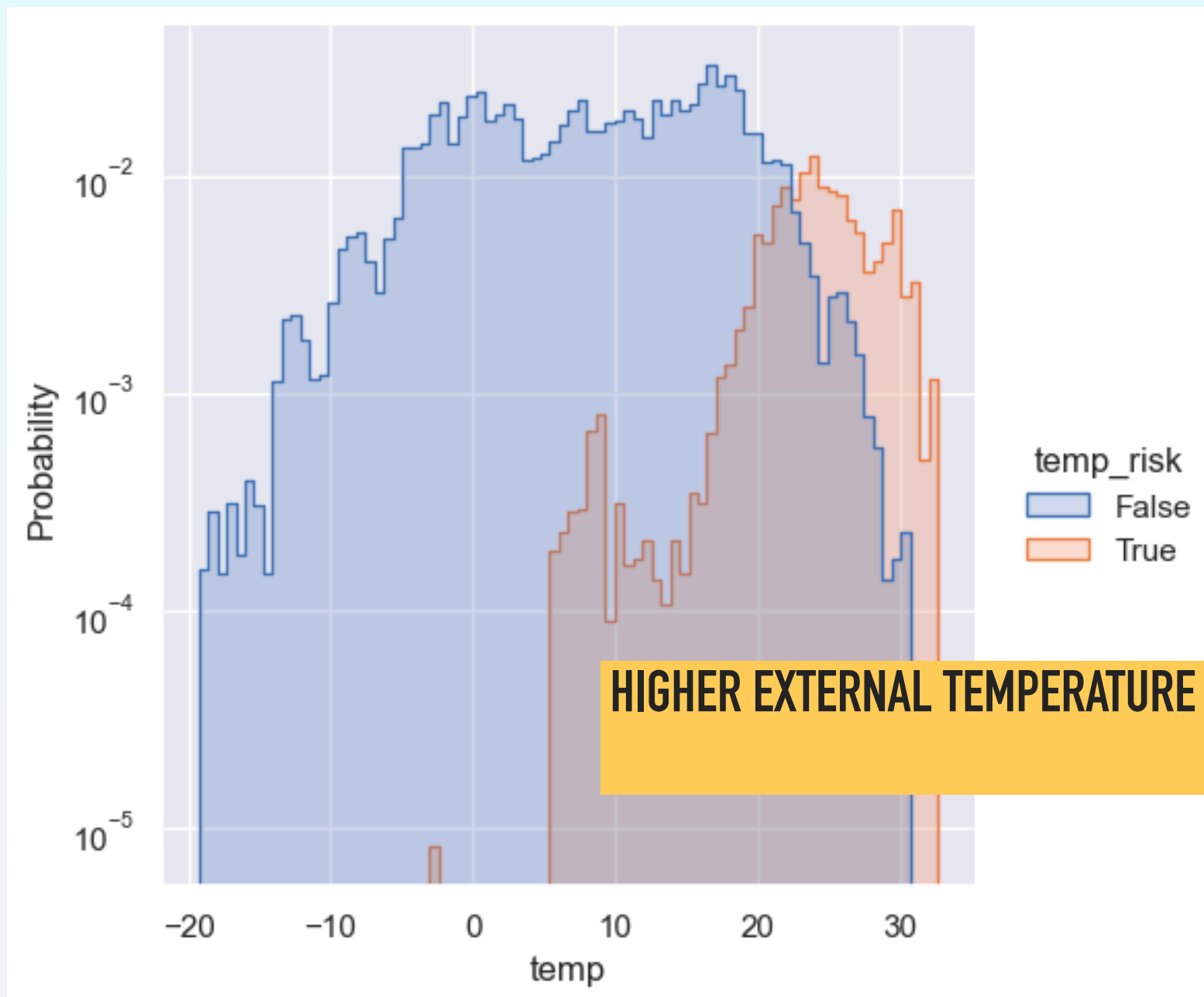
HIGHER EXTERNAL TEMPERATURE => HIGHER RISK OF INTERNAL TEMPERATURE
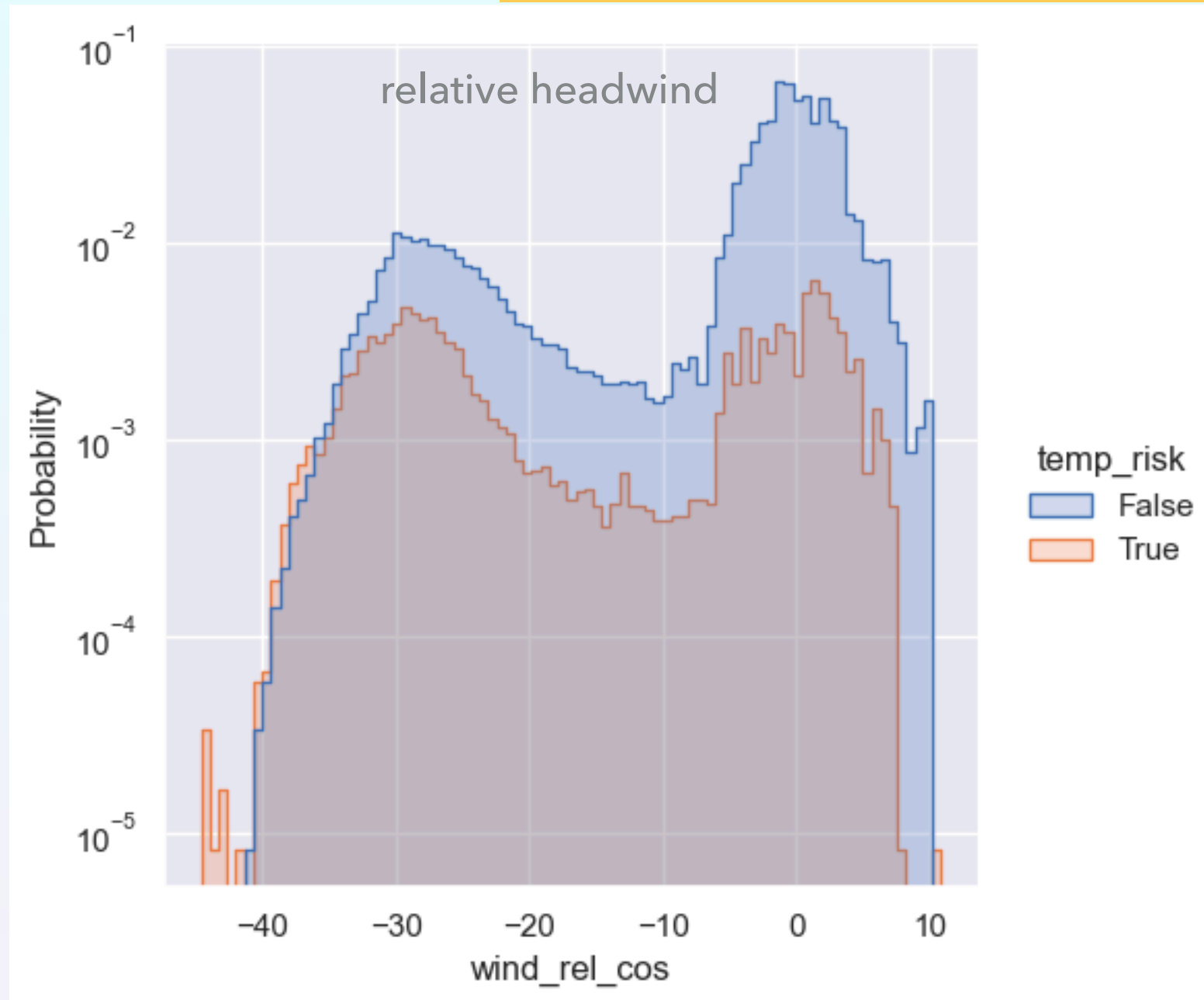
EXPLORATION :

MORE RISK AT DAYLIGHT

MORE ON FALL AND SUMMER

EXPLORATION :

– THE RELATIVE HEADWIND SLIGHTLY INCREASES THE INTERNAL TEMPERATURE
– BUT LATERAL WIND HAS NO BIG IMPACT

EXPLORATION :

– HUMIDITY RISK IS HIGHER FROM DECEMBER TO MARCH.
– ALTITUDE BETWEEN 200 AND 400 M HAVE HIGHER RISK

EXPLORATION :

Cf notebook 01_Exploration on GitHub :

https://github.com/jeugregg/transport-risk-mitigation/blob/main/01_Exploration.ipynb