Experimental Real-time Forecasting of Weather/Climate Conditions Potentially Favorable to COVID-19

** This product is experimental and addresses educational and research purposes only **

Forecasts initialized :

2020-05-10

Forecast Day 1:

2020-05-11

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Objectives:

- **Experimental forecasts of the combination of meteorological conditions favorable to SARS-CoV-2:**

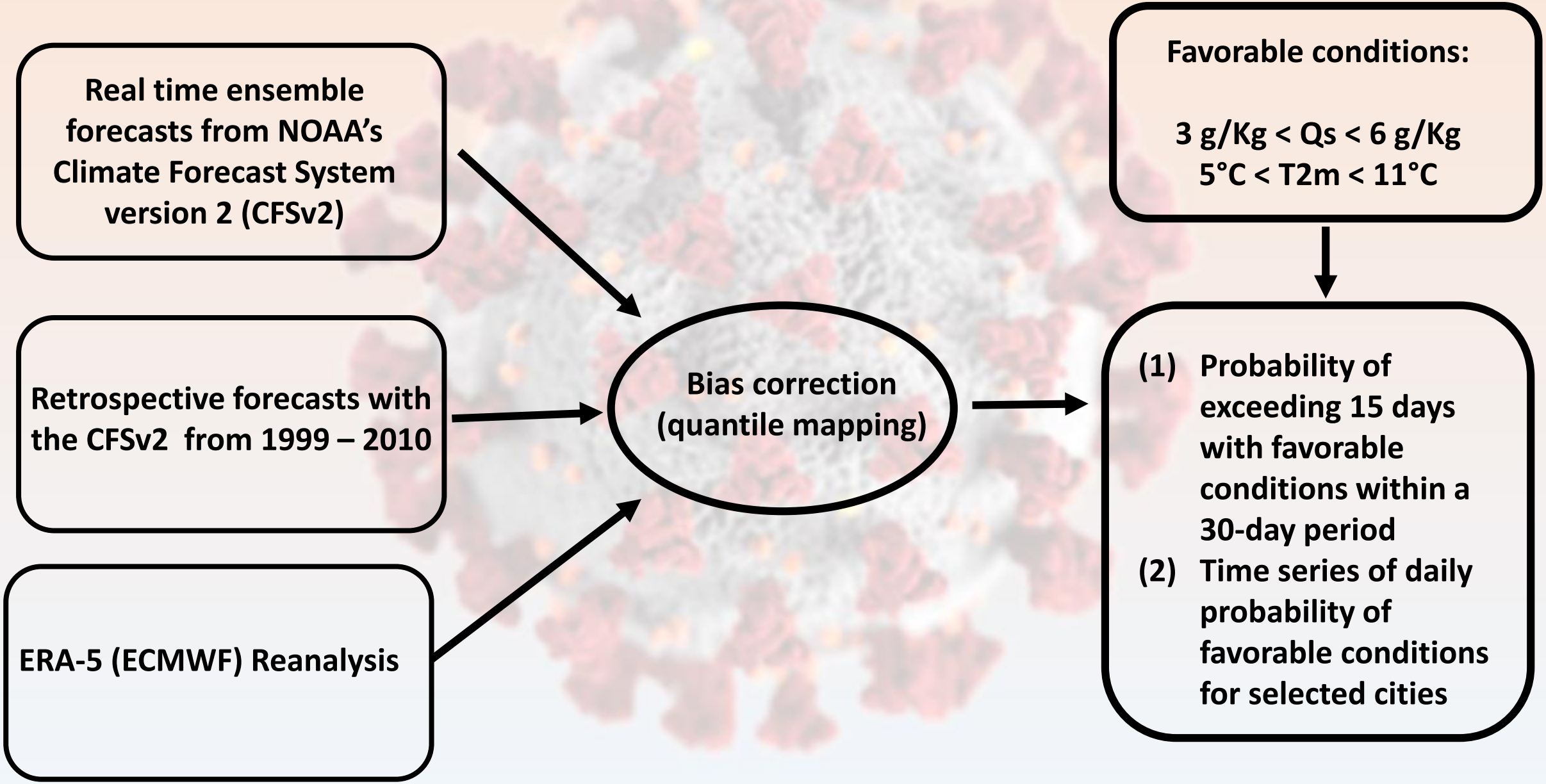
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3550308

- **We expect that these experimental forecasts will familiarize the health community with probabilistic forecasts of meteorological conditions relevant to the proliferation of the virus.**

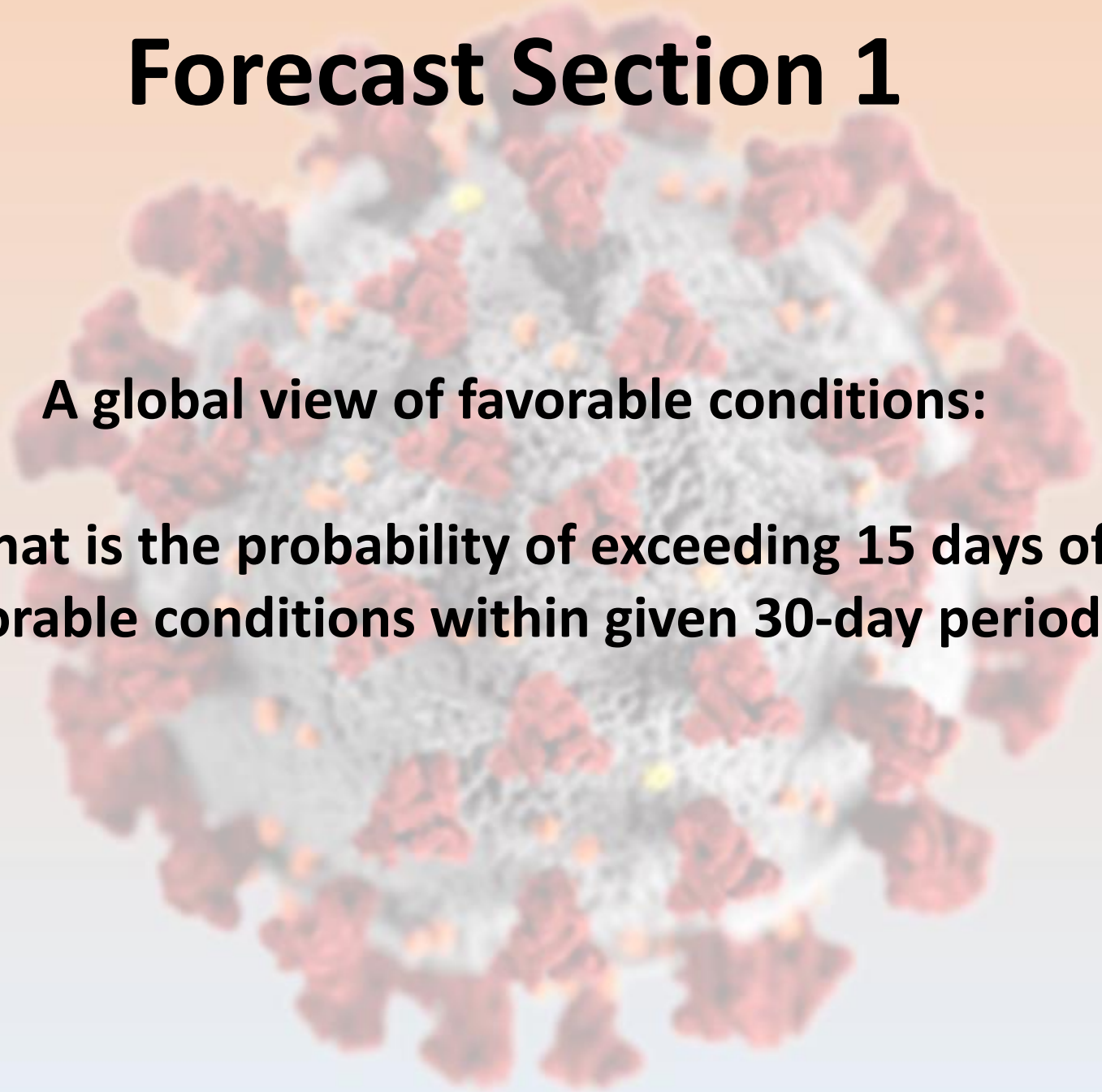
- **These forecasts may also stimulate feedback from the health community that will help us refining the criteria of favorability e.g., laboratory experiments of virus life span as a function of temperature and humidity.**

- **We hope to initiate collaboration with epidemiological modelers in order to introduce meteorological drivers in early warning prediction systems.**

Methodology:



Forecast Section 1



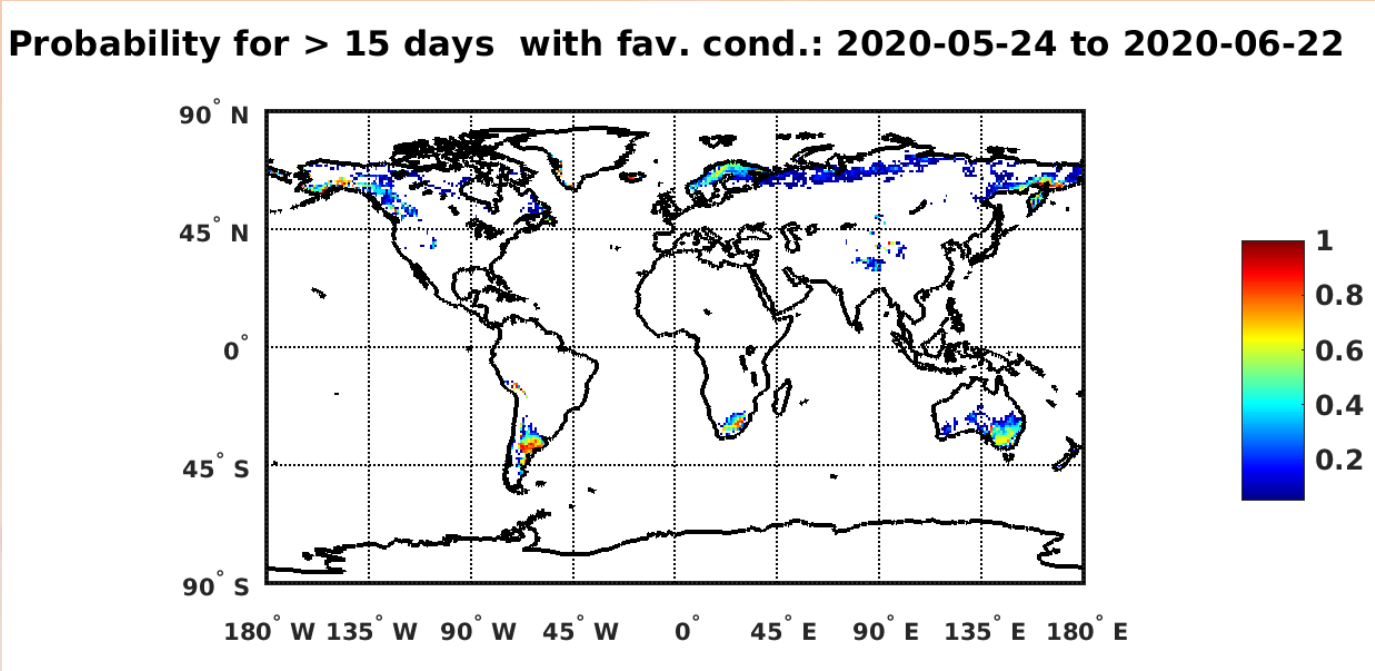
A global view of favorable conditions:

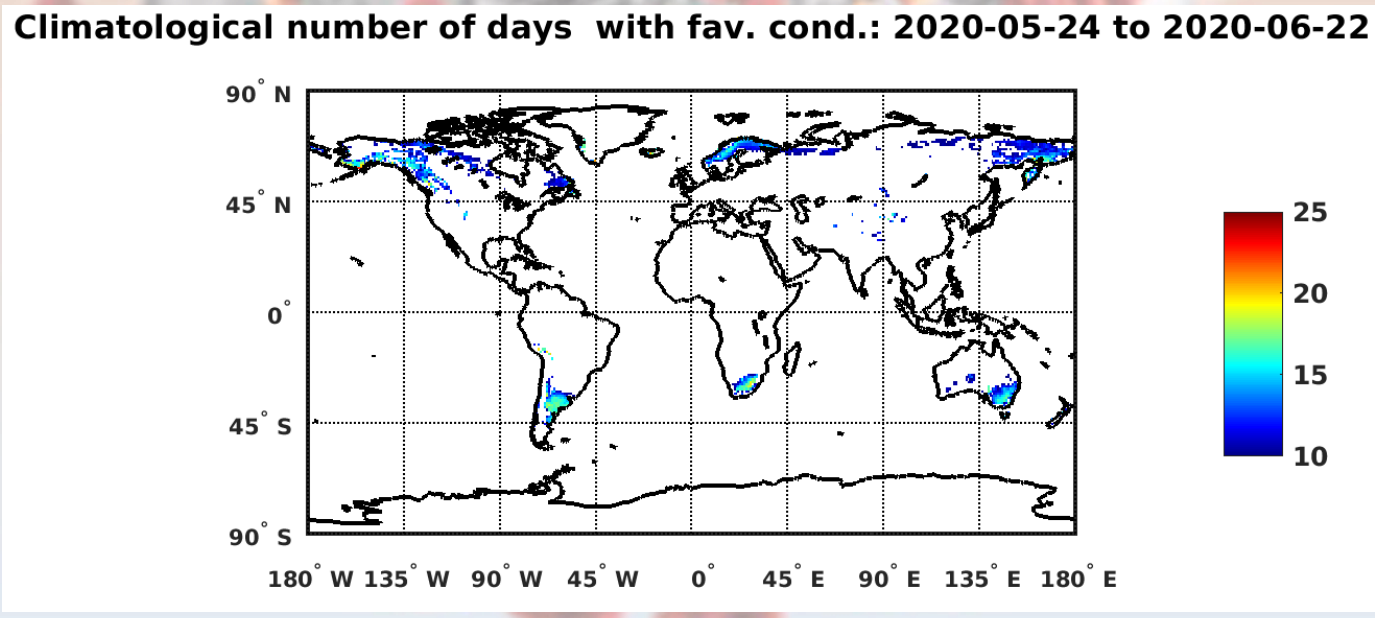
What is the probability of exceeding 15 days of favorable conditions within given 30-day periods

Favorable daily mean conditions:

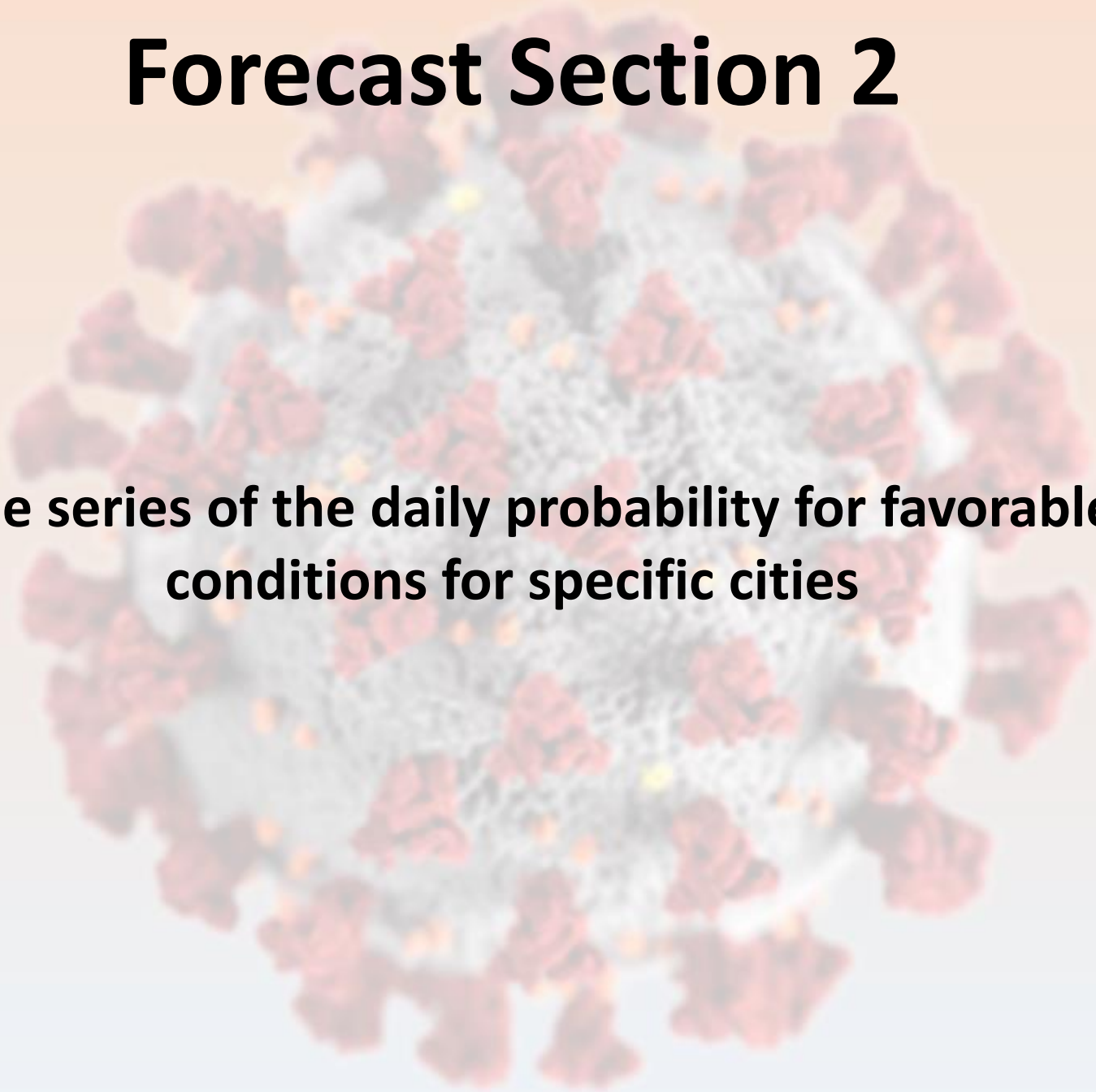
3 g/Kg < Qs < 6 g/Kg
5°C < T2m < 11°C

At this moment we are not accounting for the number of successive days with favorable or unfavorable conditions.

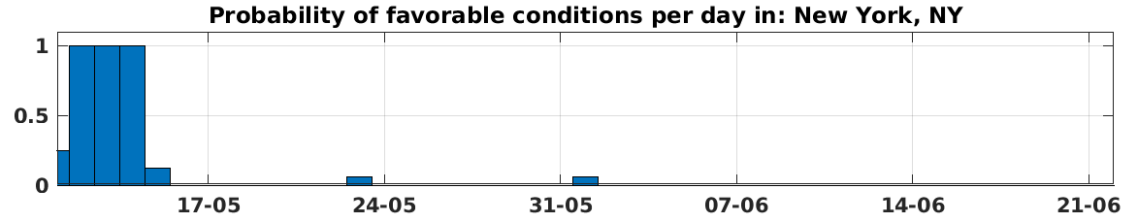


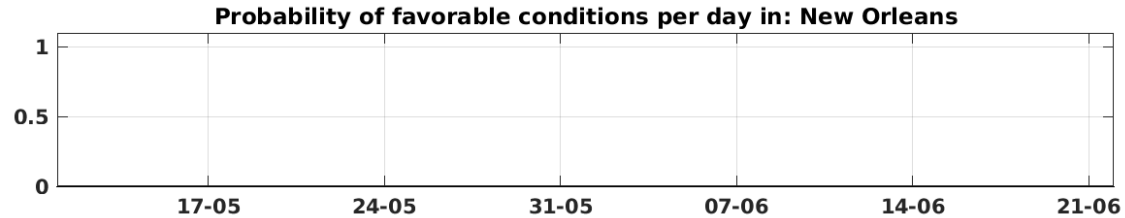


Forecast Section 2



Time series of the daily probability for favorable conditions for specific cities


Probability of favorable conditions per day in: New York, NY
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06


Probability of favorable conditions per day in: New Orleans
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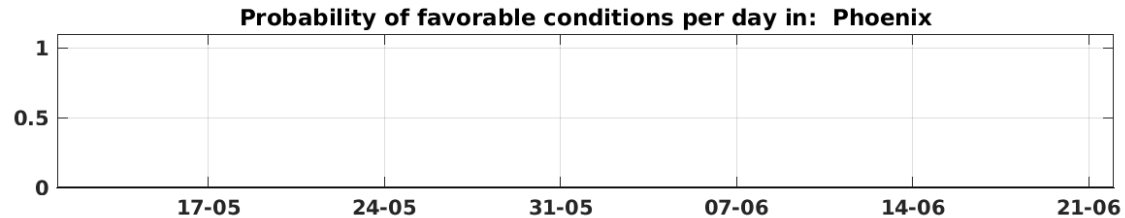
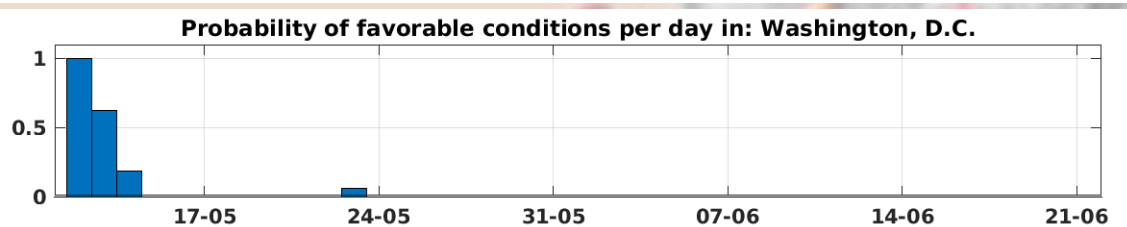
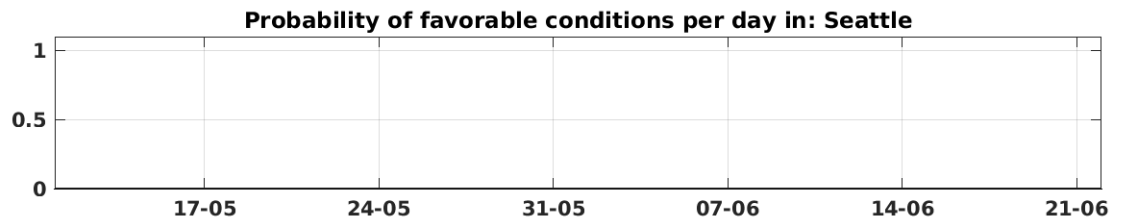
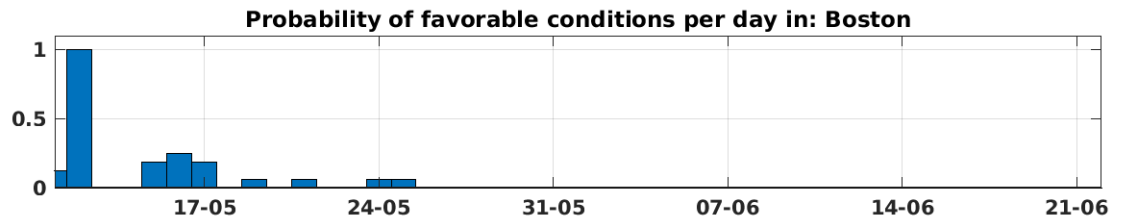
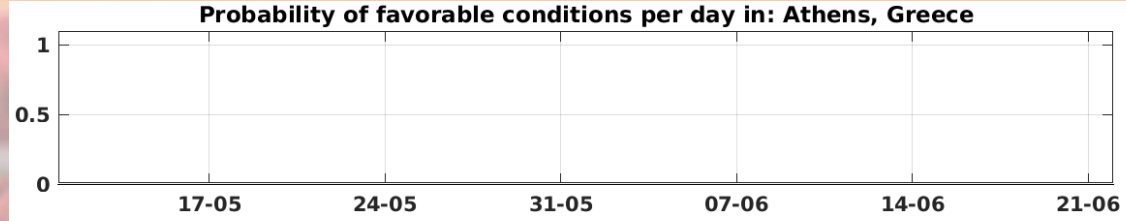
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06

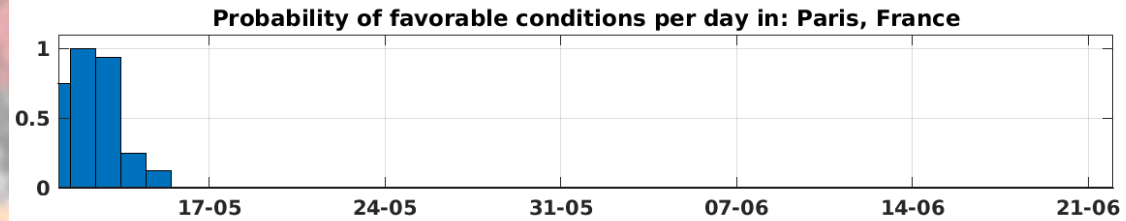

Probability of favorable conditions per day in: Phoenix
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06

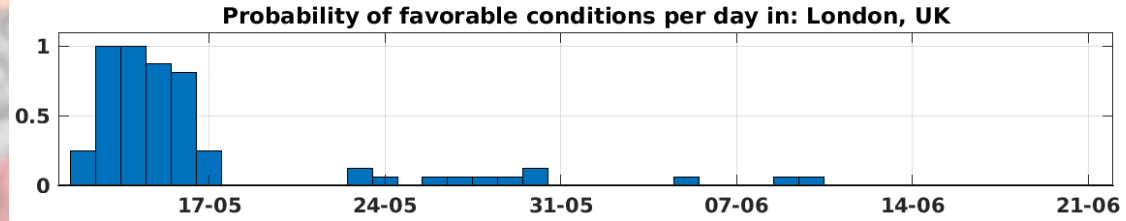

Probability of favorable conditions per day in: Washington, D.C.
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06

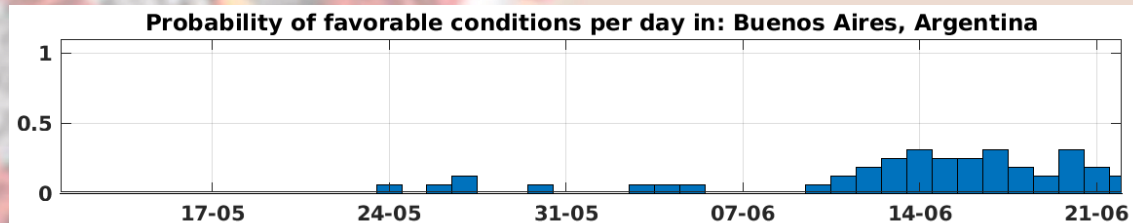

Probability of favorable conditions per day in: Seattle
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06

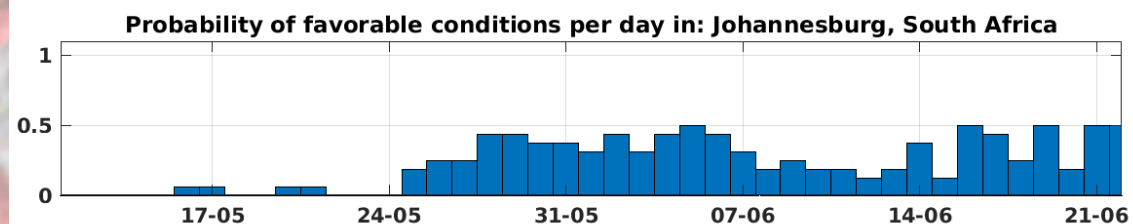

Probability of favorable conditions per day in: Boston
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06

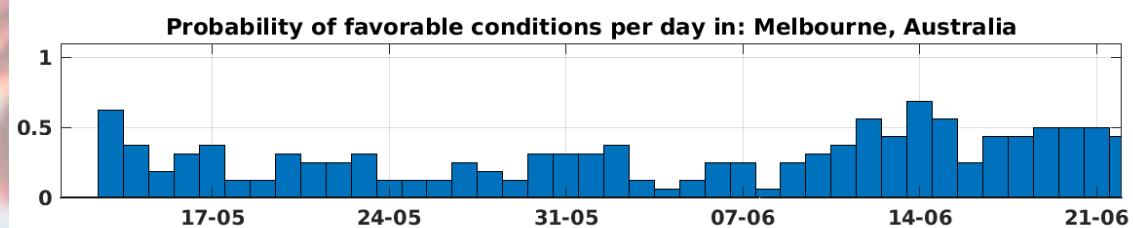

Probability of favorable conditions per day in: Athens, Greece
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06

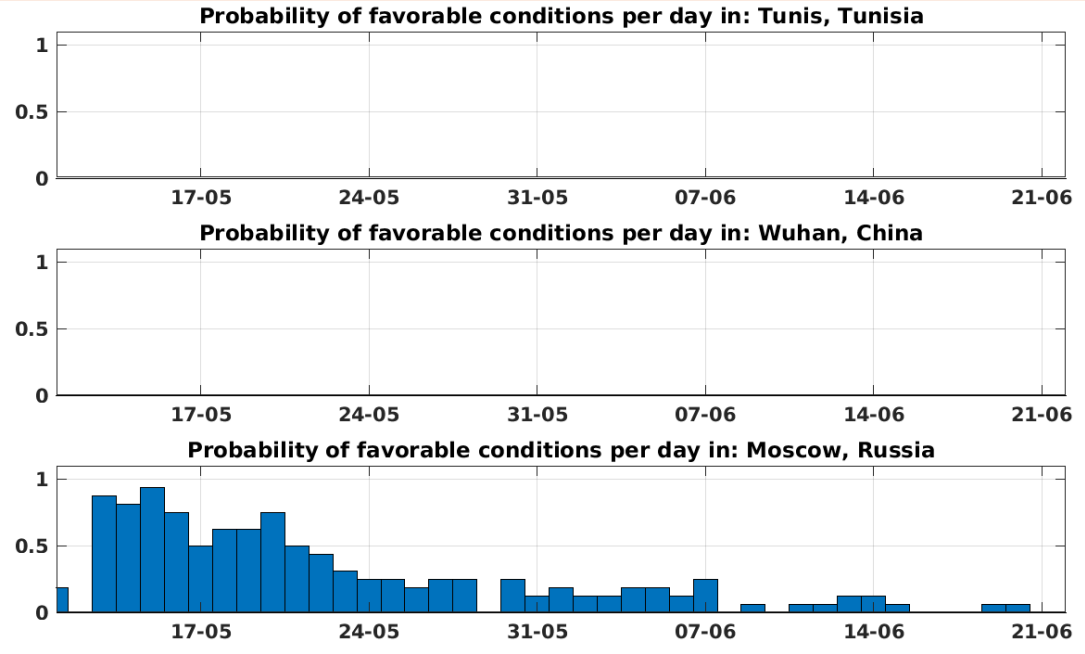

Probability of favorable conditions per day in: Paris, France
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06

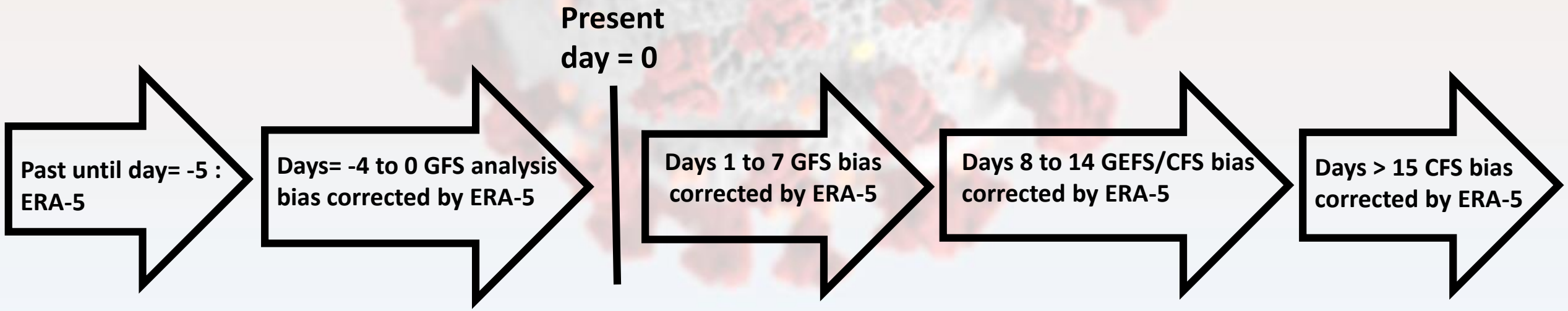

Probability of favorable conditions per day in: London, UK
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06


Probability of favorable conditions per day in: Buenos Aires, Argentina
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06


Probability of favorable conditions per day in: Johannesburg, South Africa
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06


Probability of favorable conditions per day in: Melbourne, Australia
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06


Probability of favorable conditions per day in: Tunis, Tunisia
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06
Probability of favorable conditions per day in: Wuhan, China
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06
Probability of favorable conditions per day in: Moscow, Russia
1
0.5
0
17-05
24-05
31-05
07-06
14-06
21-06

Current and future work (pending funding):

- Refine definition of favorable atmospheric conditions as new data arrive
- Establish predictability of the combination of weather/climate conditions that are potentially favorable to SARS-CoV-2.
- Compute reliability and introduce relevant ensemble calibration techniques if necessary.
- Develop a seamless suite of products with downscaling where necessary: