

# Elucidating ASF front wave progression in wild boar population of South Korea



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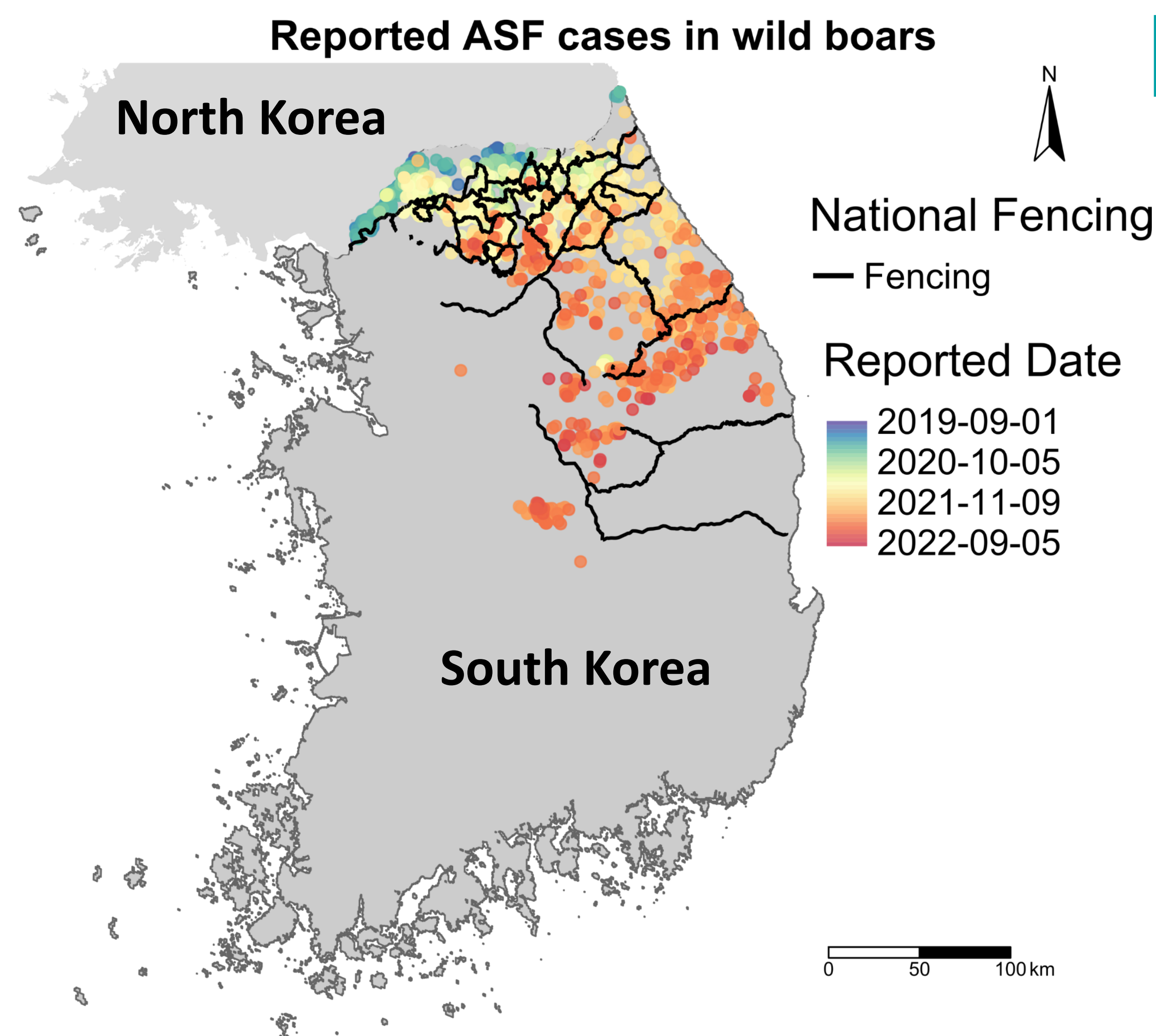
## ASF in South Korea

South Korea has experienced unprecedented ASF epidemic.  
 32 cases in domestic pig farms  
 Over 3,000 cases in wild boar  
 ASFV in wild boar self-sustain and spread to whole country.  
 Threatening all of the domestic pig farms

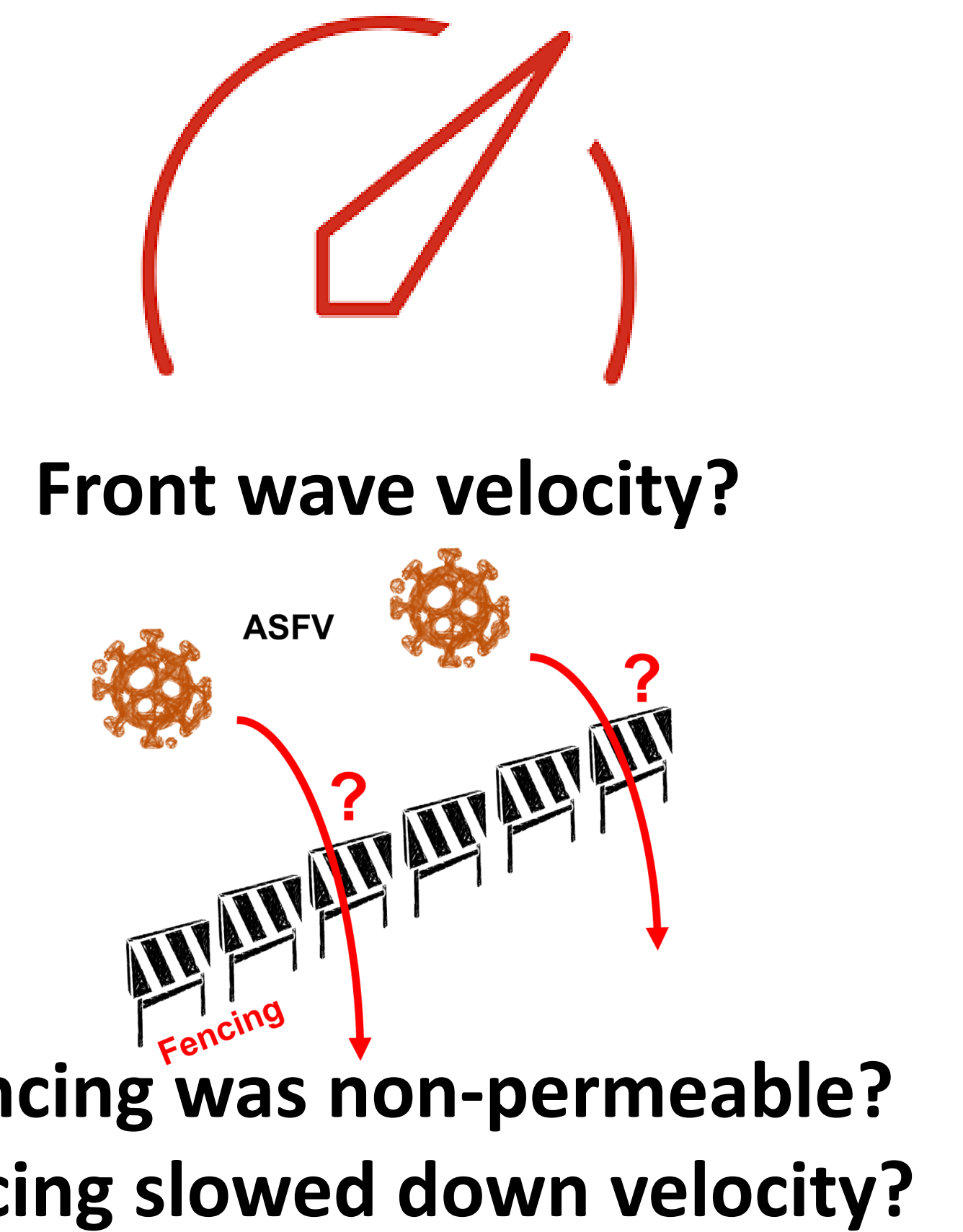
## Why Front wave?

Main target of the ASF management measures  
 Distinct dynamics due to less disturbed population

Thus, there urgent need to understand the ASF front wave and effects of fencing on it



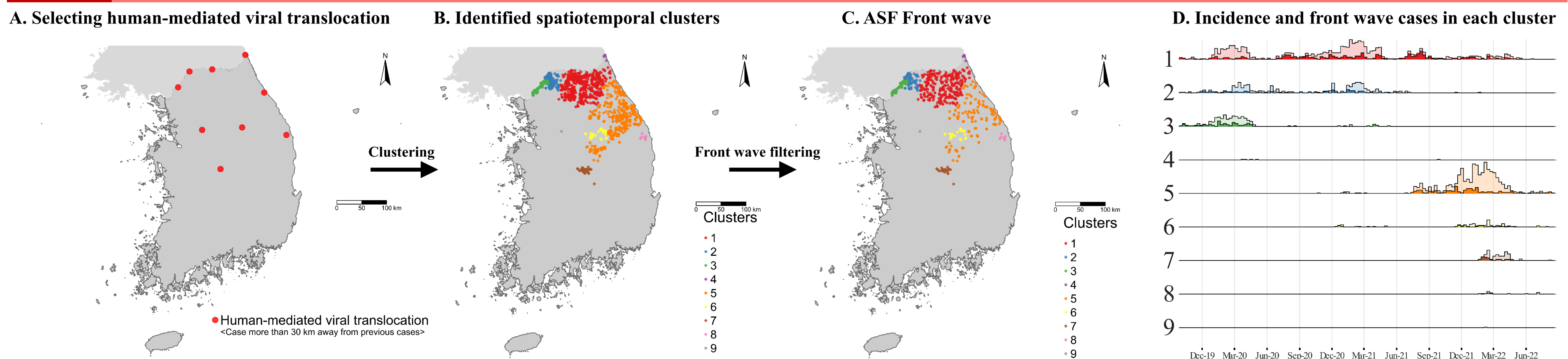
## Research questions



## Methods & Results

1

### Uncovering the wild boar-mediated front wave

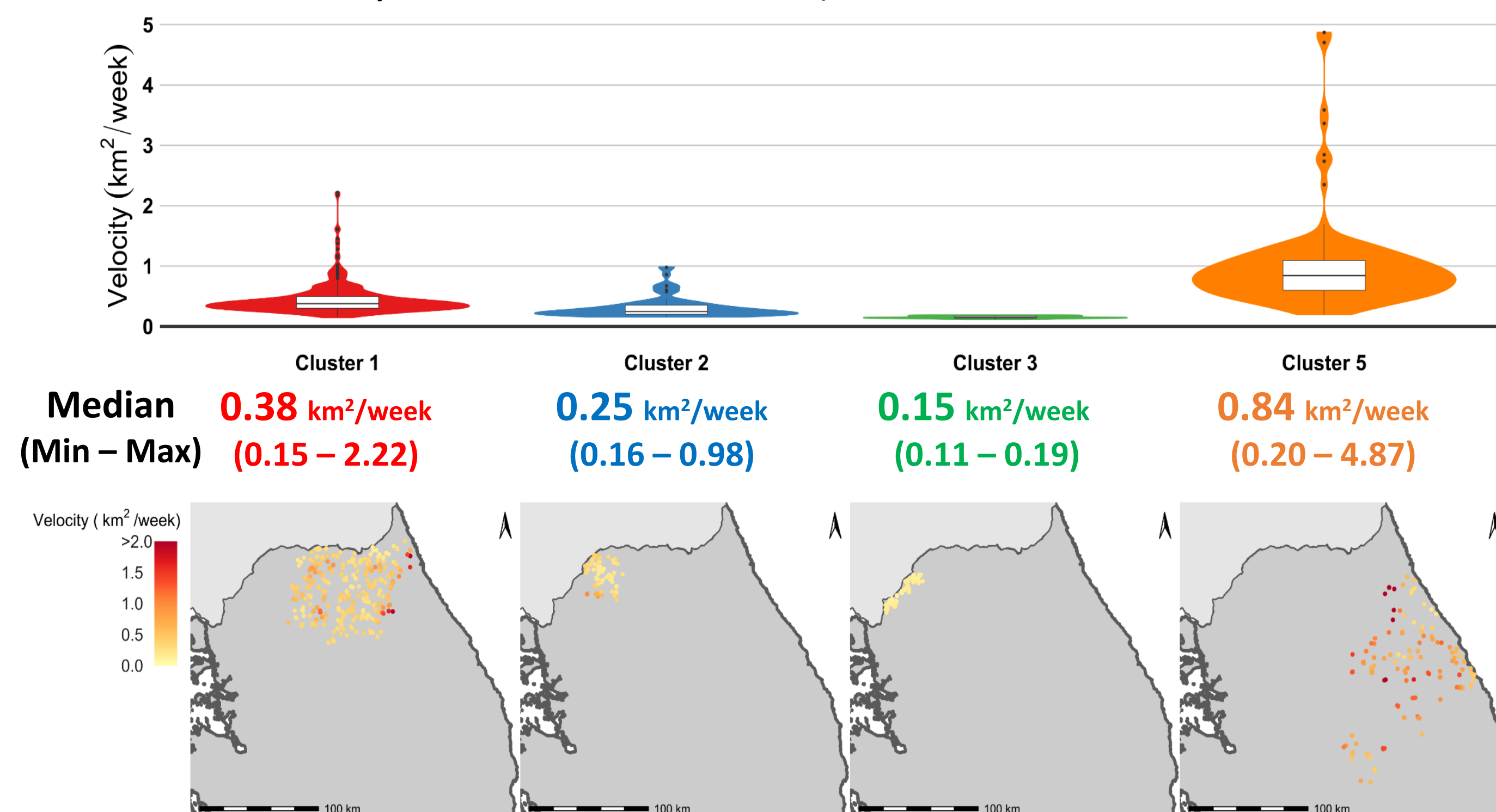


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### Estimating ASF front wave velocity

Spread rate analysis + Thin-plate spline

- Estimate local slope (week/km<sup>2</sup>) using the date of estimated death time
- Reverse the slope to calculate velocity (week/km<sup>2</sup> → km<sup>2</sup>/week)



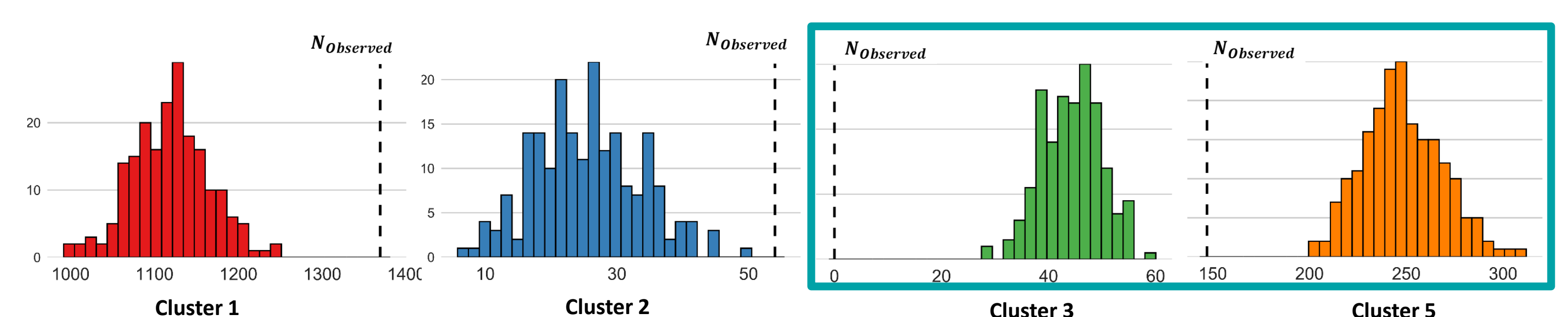
3

### Assessing the effects of fencing

**N statistics:** number of fence-crossing events  
 ⇒ Fence limited ASF-affected region?

**YES!**

But **HETEROGENEOUS** effects!



Only in Cluster 3 (*p*-value < 0.01) and 5 (*p*-value < 0.01)

**Q statistics:** whether fencing can demonstrate velocity more than null  
 ⇒ Fence slowed down ASF front wave velocity?

**Not significant (*p*-value = 0.51)**

## Discussion

### Heterogeneous front wave velocity

- Cluster 3 is located in highly fragmented area, which might decrease velocity
- Cluster 5 is located in highly forested area, which might increase velocity

### Heterogeneous effect of fencing on ASF front wave

Might be due to interaction with environmental factors (terrain roughness, river, etc), maintenance, and delayed decision.

Need to identify the factors for the effectiveness of fencing



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