A Spatial Risk Assessment on the impact of emergency vaccination to control rabies outbreaks: *case study from the Philippines*

RONELLO ABILA
OIE Sub-Regional Representative for South-East Asia

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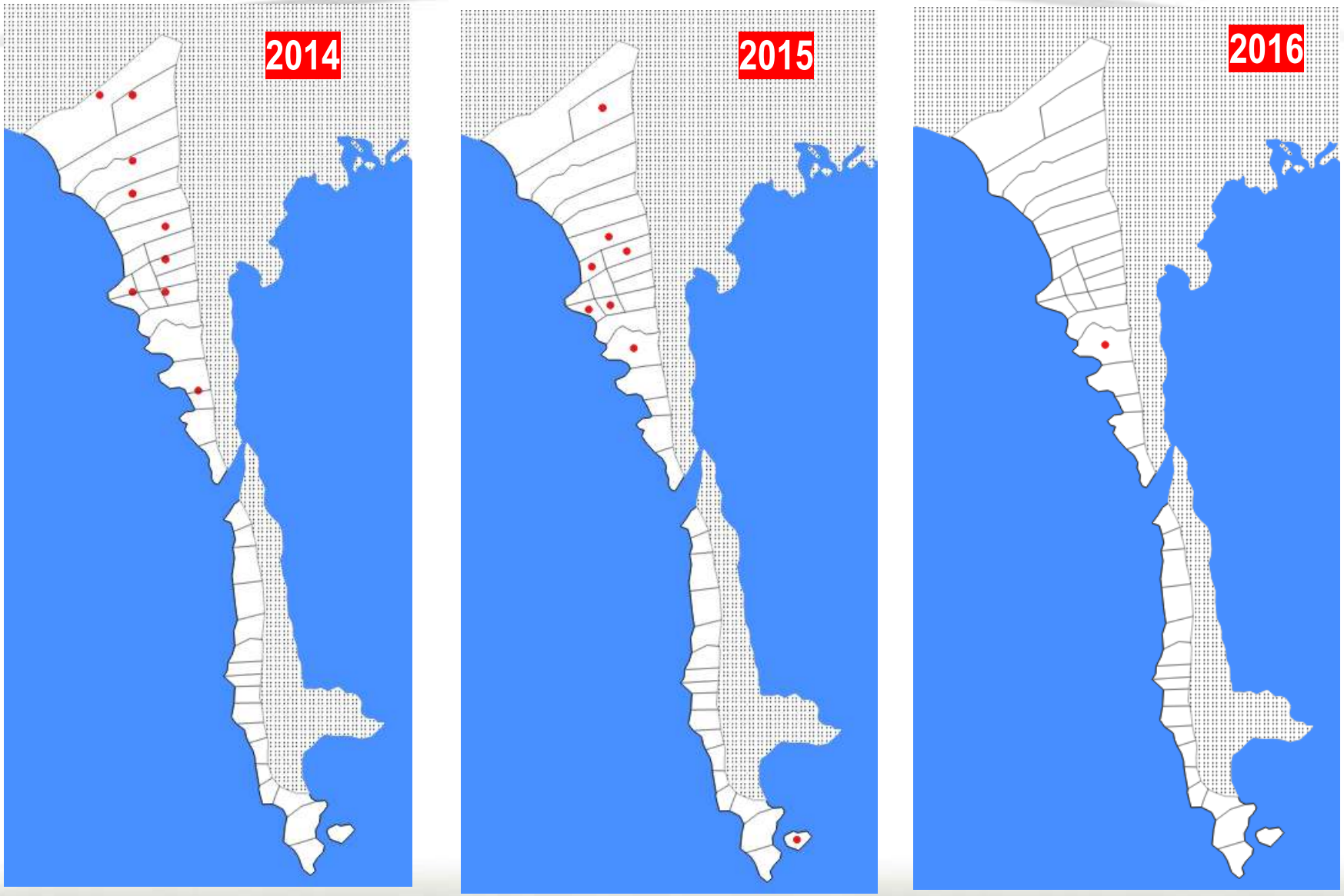
Case Study in Binangonan, Rizal

Rabies Outbreaks in Binangonan



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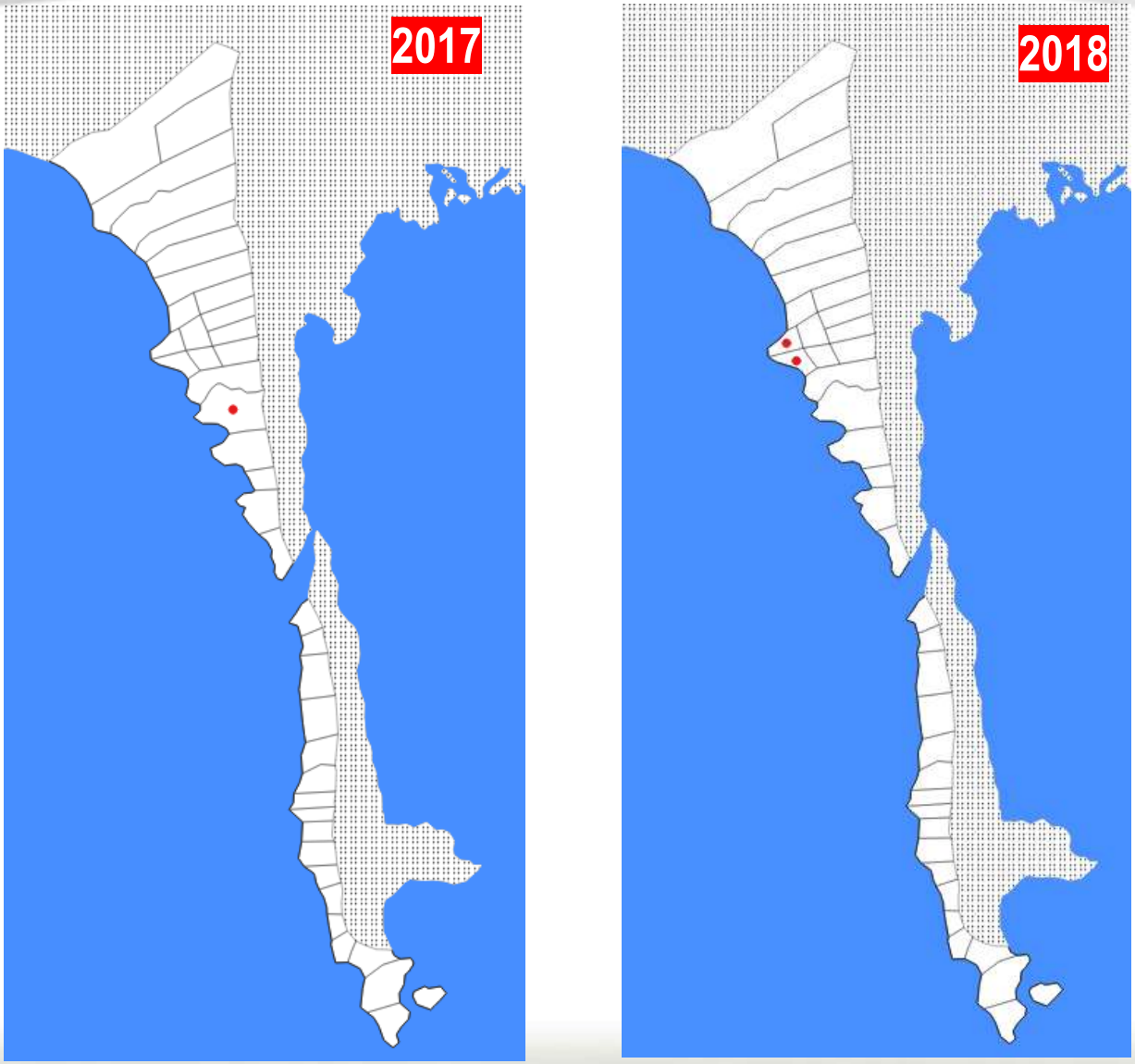
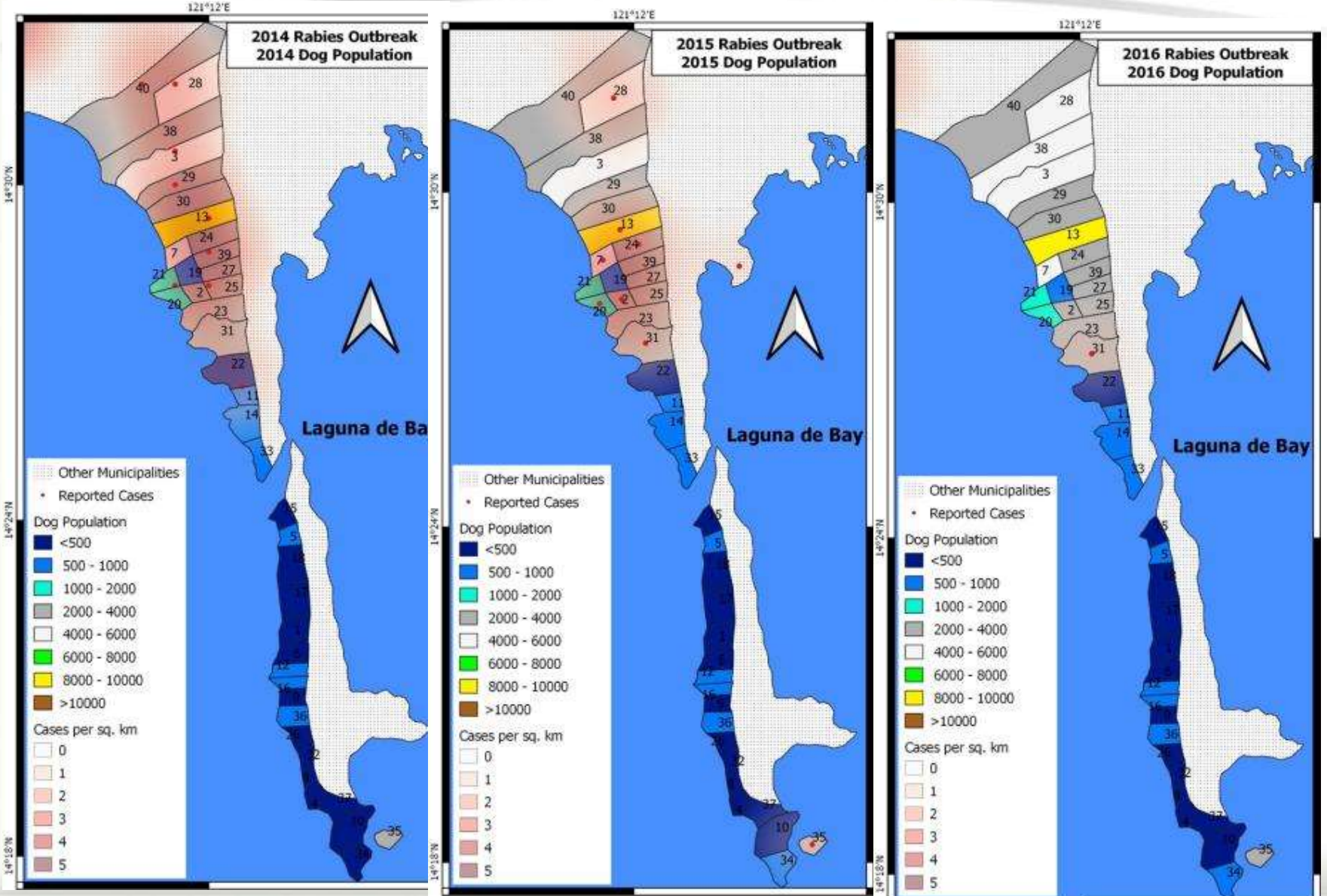


Rabies Outbreaks vis-à-vis Dog pop



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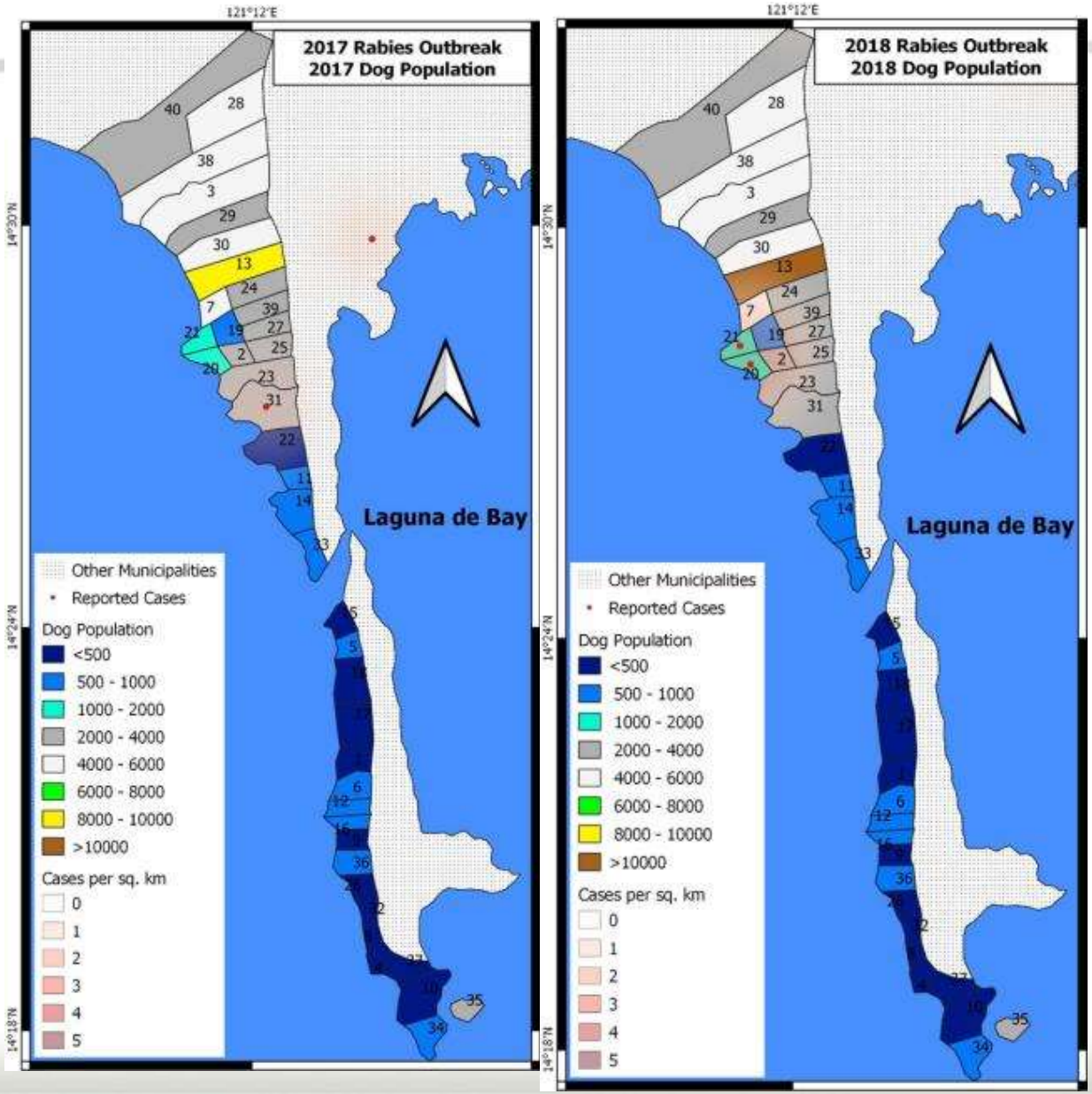
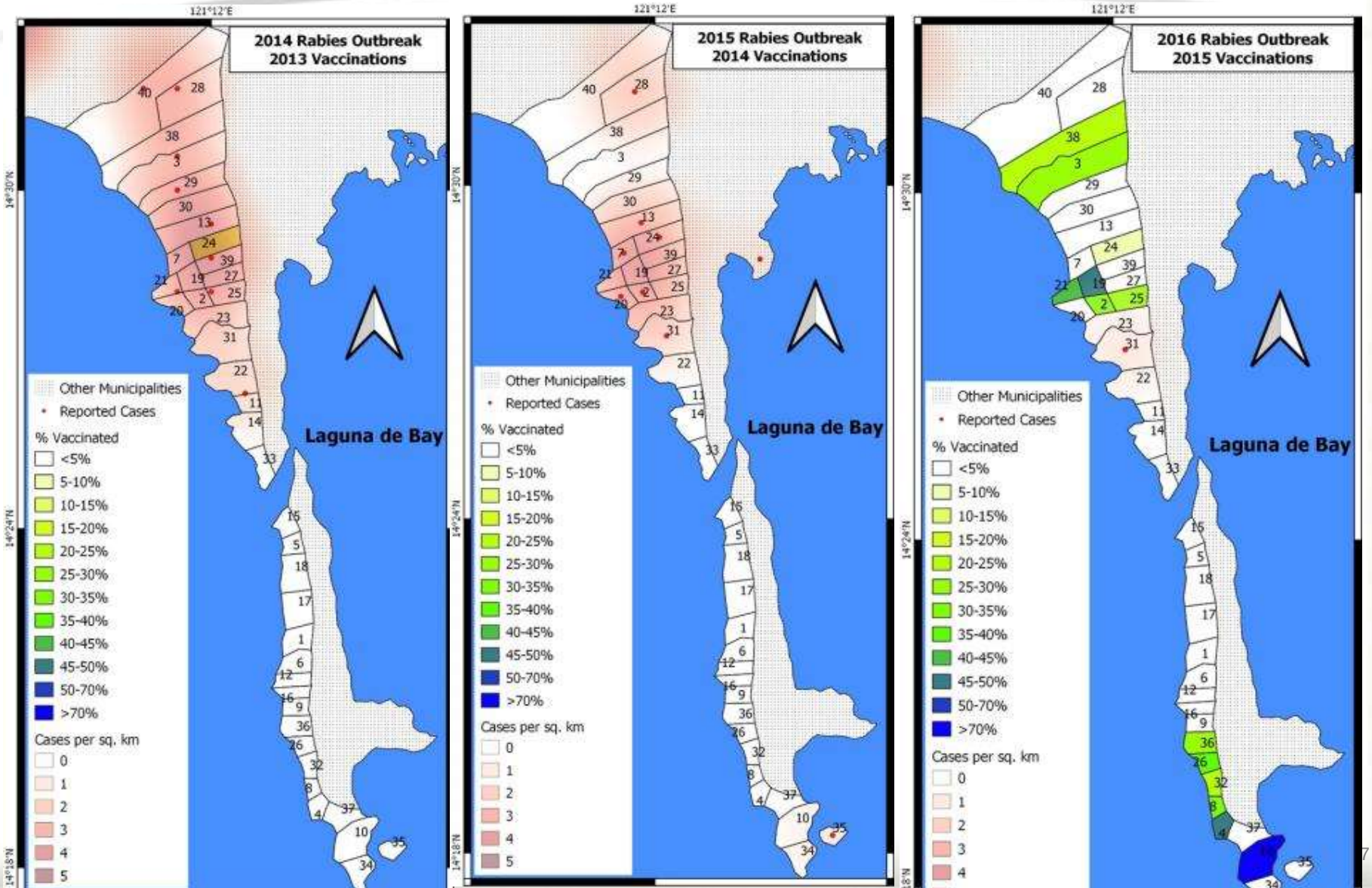
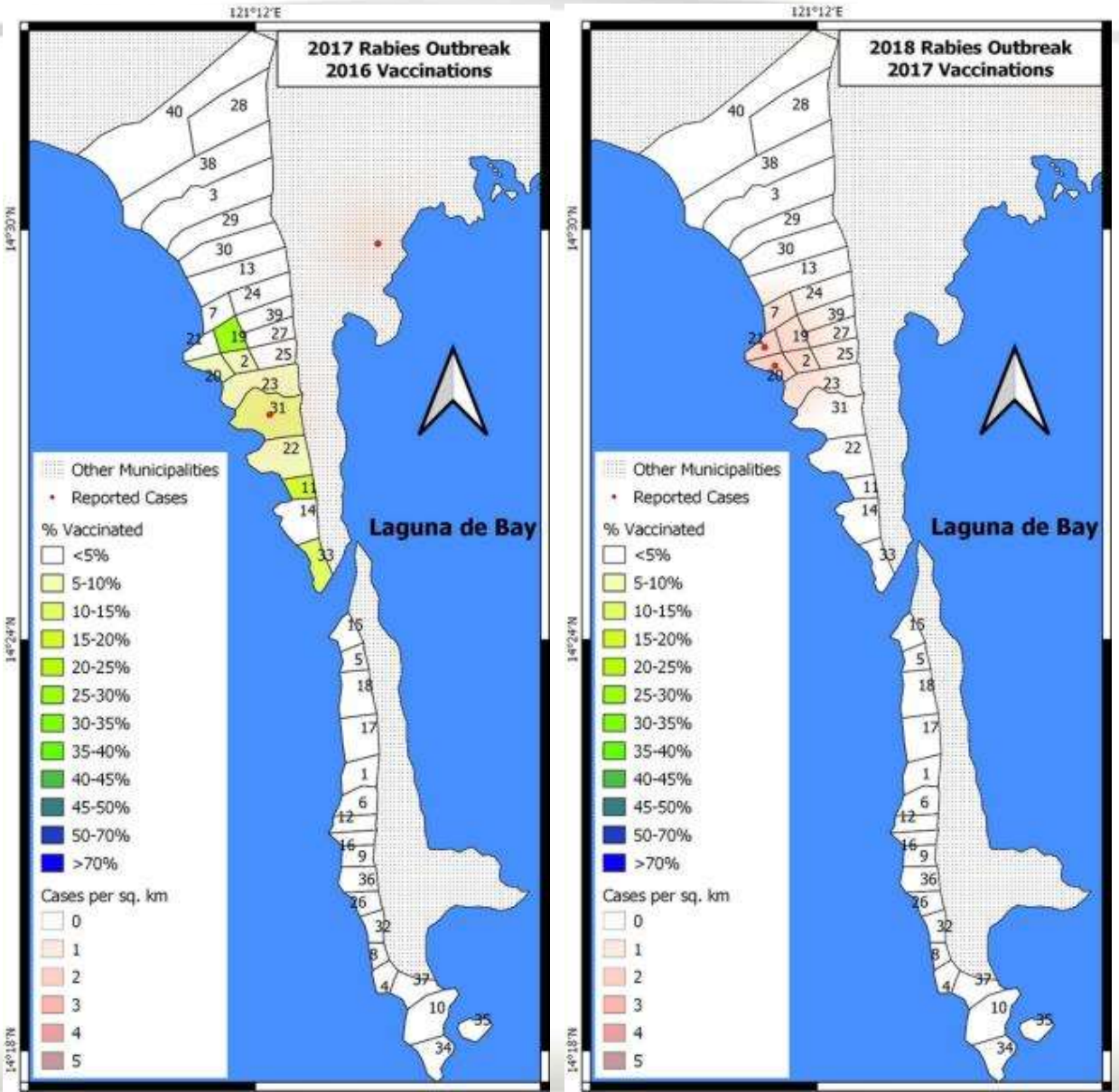


Rabies Outbreaks vis-à-vis Dog Vaccination



Rabies Outbreaks vis-à-vis Dog vaccination



Impact of vaccination

- Very few vaccination in 2013 and 2014, coinciding with the large number of outbreaks in 2014 (13 cases) to 2015 (9 cases).

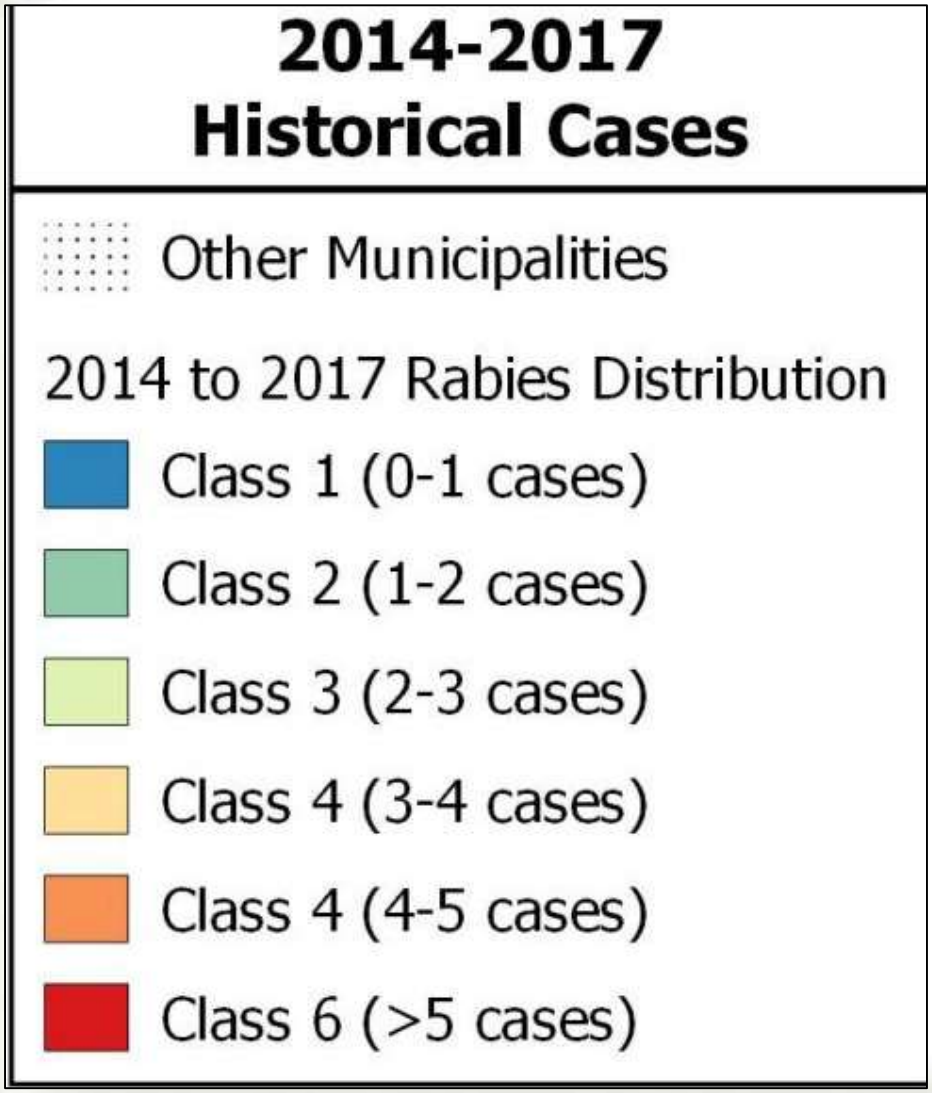
- Increase vaccination in Binangonan from 2015 to 2016, lead to immediate reduction of outbreaks, from 13 cases in 2014 and 9 cases in 2015 to 1 case each in 2016 and 2017

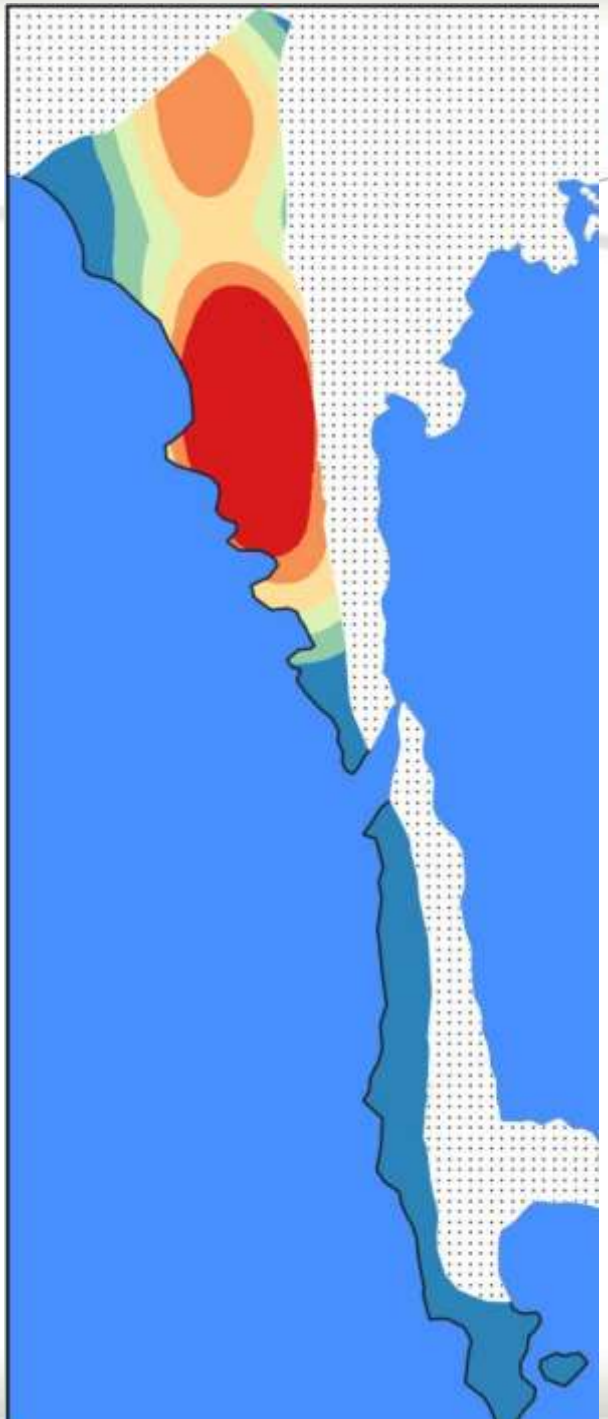
Spatial Risk Assessment to predict possible rabies hotspots

Risk-for-Outbreak and Risk-to-Population Analyses

- 3 types of risk maps were created: (a) component risks, (b) the risk of an outbreak, and (c) the risk to the human population
- Component risk – risk level based on 1 factor only (either rabies outbreak or population density)
- Risk for outbreak – risk level based on historical case heatmap, and the vaccination coverage (of the previous year),
- Risk to population – risk level based the population density, and vaccination coverage (of the previous year)

Heatmap of rabies cases





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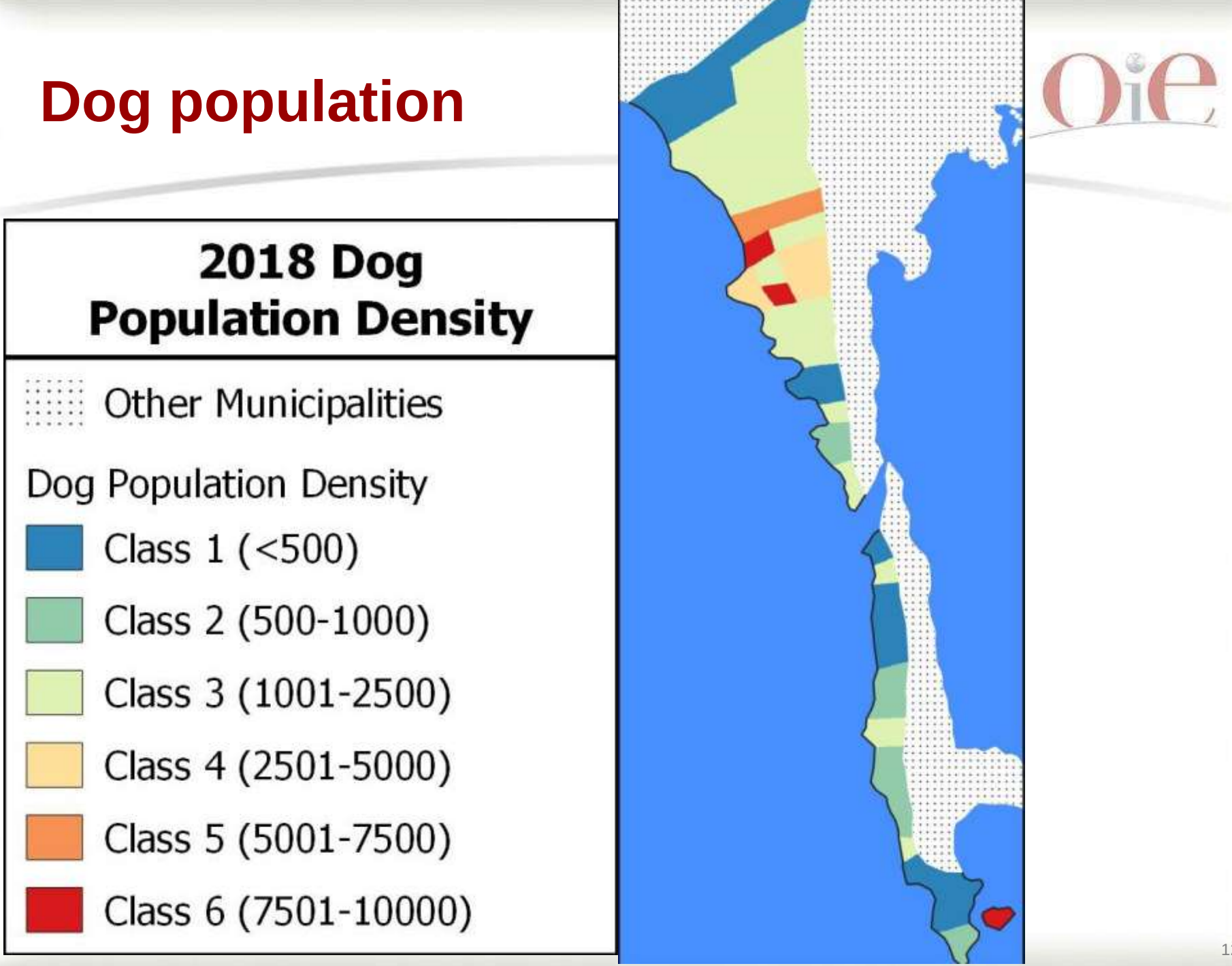
Dog population



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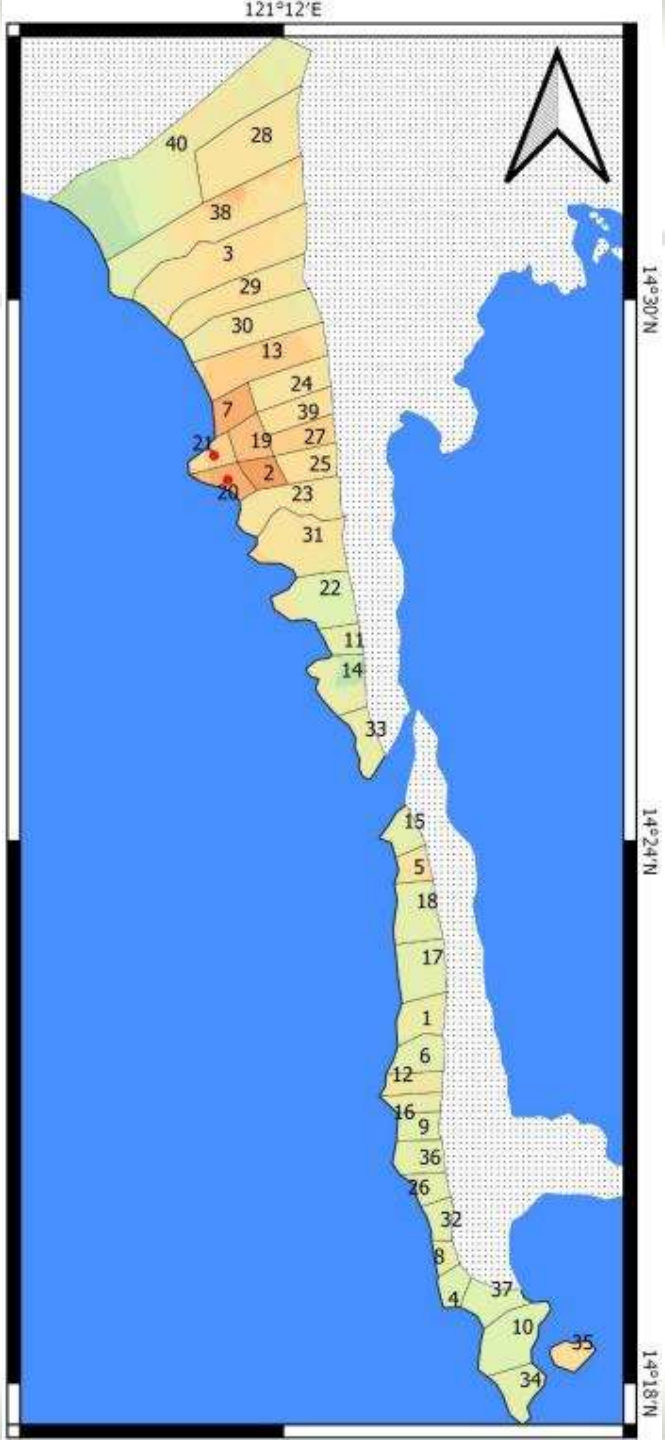

2018 Risk to Population

- Other Municipalities
- Reported Cases

Risk to Population

- Class 1 (very low risk)
- Class 2 (low risk)
- Class 3 (moderate risk)
- Class 4 (high risk)
- Class 5 (very high risk)
- Class 6 (extremely high risk)

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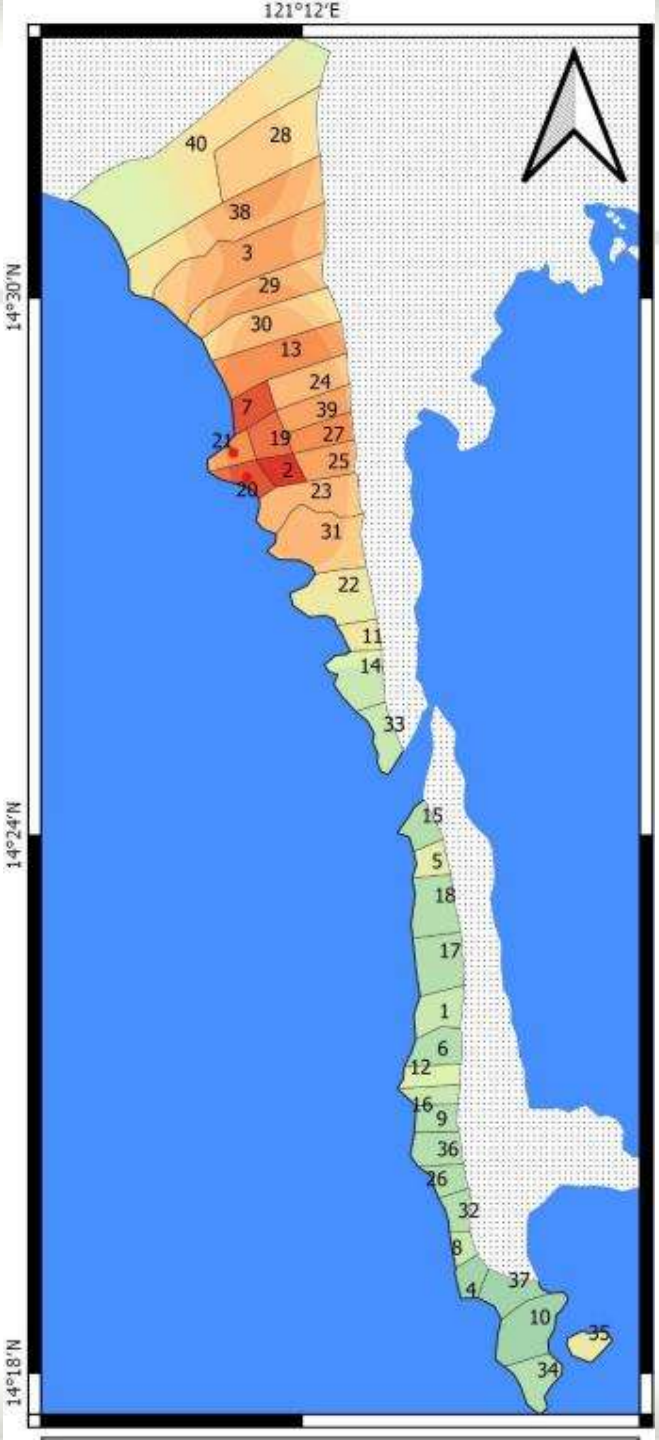

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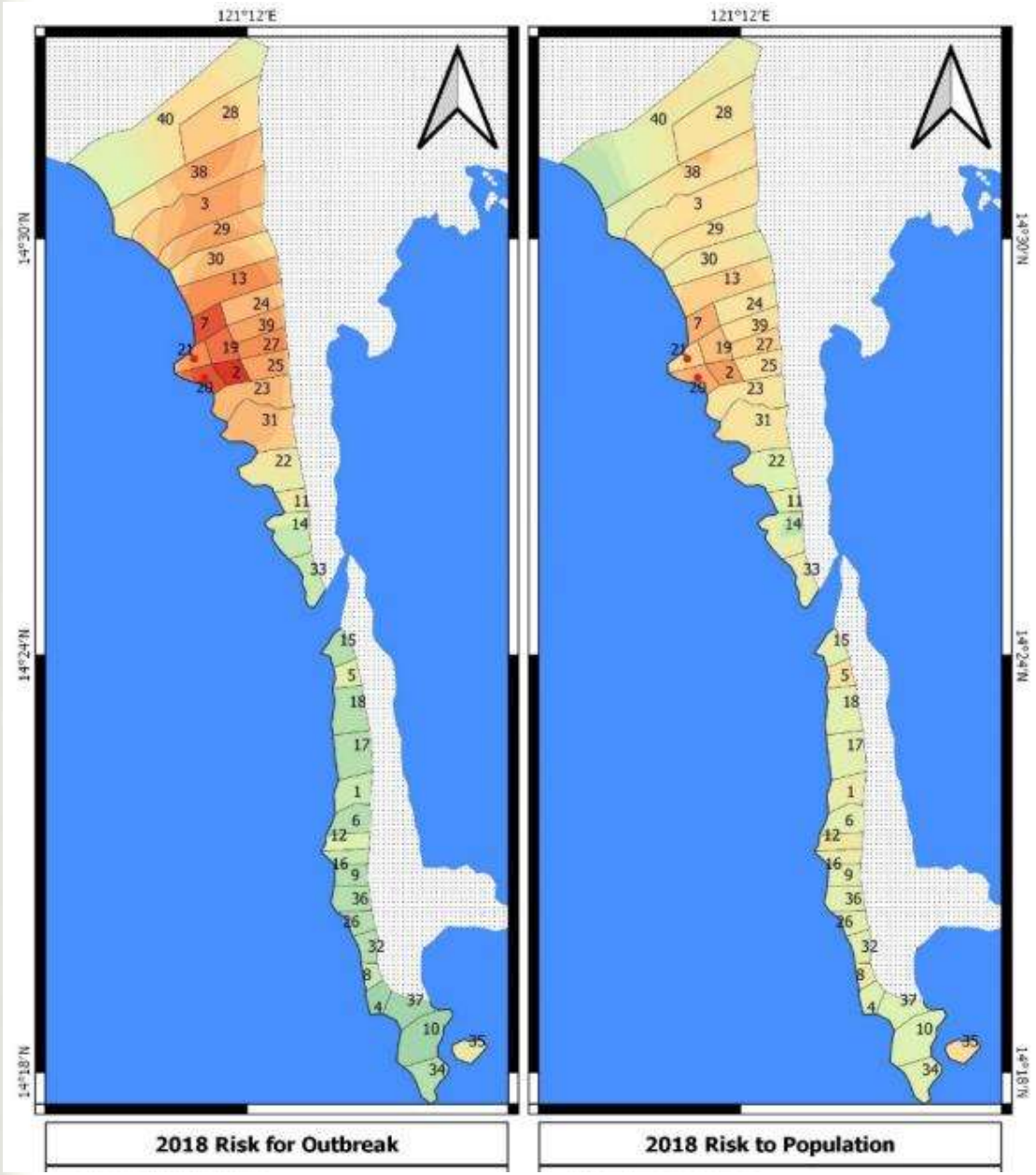

For 2018 (Risk for Outbreak)

- Mainland Binangonan appears to have a higher risk level compared to Talim Island
- Calumpang, Layunan, Batingan, Libis, and Libid have a noticeable higher risk compared to the rest of the barangays
- The 2018 outbreaks occurred within the high-risk areas

For 2018 (Risk to Population)

- Risk level in the mainland is lower while those in Talim Island is higher compared to the risk level for outbreaks
- Mainland Binangonan has good coverage in terms of health facilities, which is why the risk decreased in this area, while the opposite is true for Talim Island

2019 Risk to Population

Other Municipalities

Risk to Population

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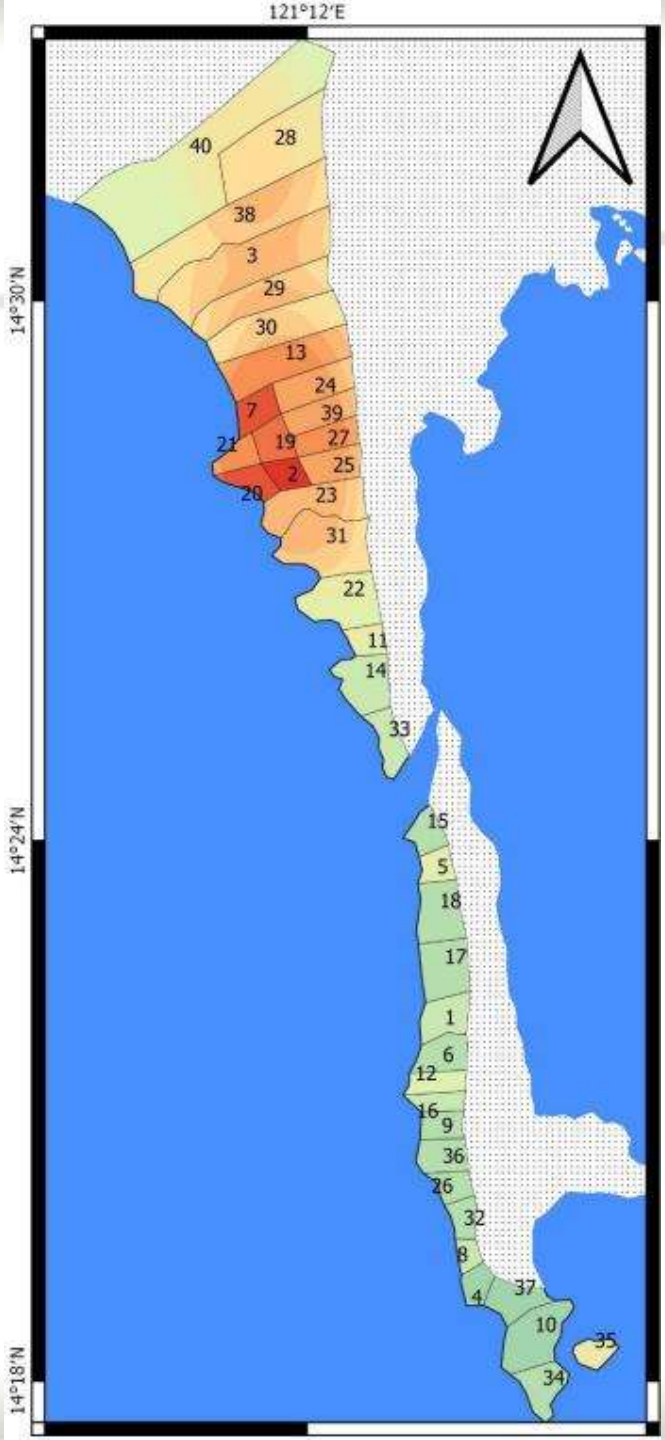

2019 Risk for Outbreak

Other Municipalities

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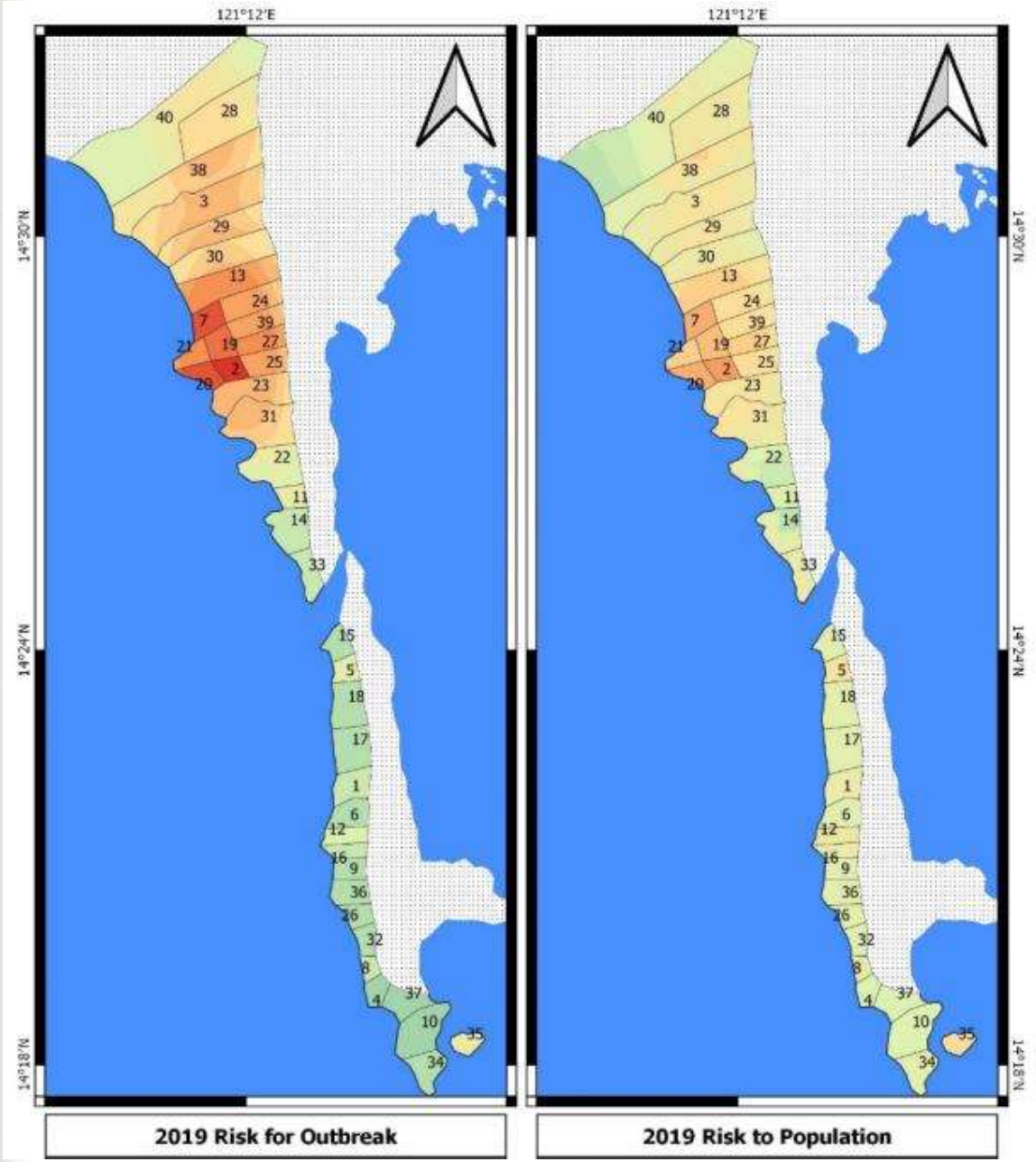

For 2019 (for both types of risk maps)

- The five barangays with the highest risk in 2018 (Calumpang, Layunan, Batingan, Libis, and Libid) maintained their status for 2019
- It is recommended that there be a vaccination program in mainland Binangonan, especially in these 5 barangays **(Calumpang, Layunan, Batingan, Libis, and Libid**),

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Conclusion

- Knowledge of dog population density, and historical data on rabies incidence could be used to predict possible hotspots of rabies.
- Dog vaccination is the most important measure to immediately control rabies outbreaks

Acknowledgement

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Thank you for your kind attention !

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