

NAOYA MORISHITA

**LAND CHANGES IN FORMER ACTIVITY AREA
OF BLACK BEARS IN SOUTHERN FLORIDA**

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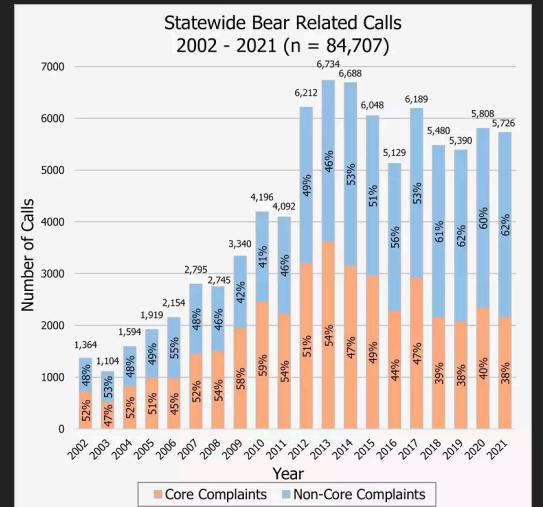
BACKGROUNDS

- ▶ Human's demand for space increase -> Human- Animal Conflict
- ▶ Even life loss both of animals and humans (and their livelihood)
- ▶ World Wildlife Fund "What is human-wildlife conflict and why is it more than just a conservation concern?" (Accessed on 07 Dec 2022) <https://www.worldwildlife.org/stories/what-is-human-wildlife-conflict-and-why-is-it-more-than-just-a-conservation-concern#:~:text=Why%20is%20human-wildlife%20conflict,to%20increased%20human-wildlife%20conflict>

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BACKGROUNDS

- ▶ In Florida, Bear Related Call had increased (2002~2021)
 - ▶ Core Complaints: Interaction
 - ▶ Non-Core Complaints: Unsure interaction or not



Retrieved from Florida Fish and Wildlife Conservation Commission "Bears by the Numbers"<https://myfwc.com/wildlifehabitats/wildlife/bear/numbers/>
(Downloaded on 07 Dec 2022)

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QUESTION

- ▶ Has the human's land use expanded into bears' home?
- ▶ How the land uses changed within former activity areas of black bears?
 - ▶ Could be used for preview of the development by the government
- ▶ 95% MCP home range analysis using Telemetry Data

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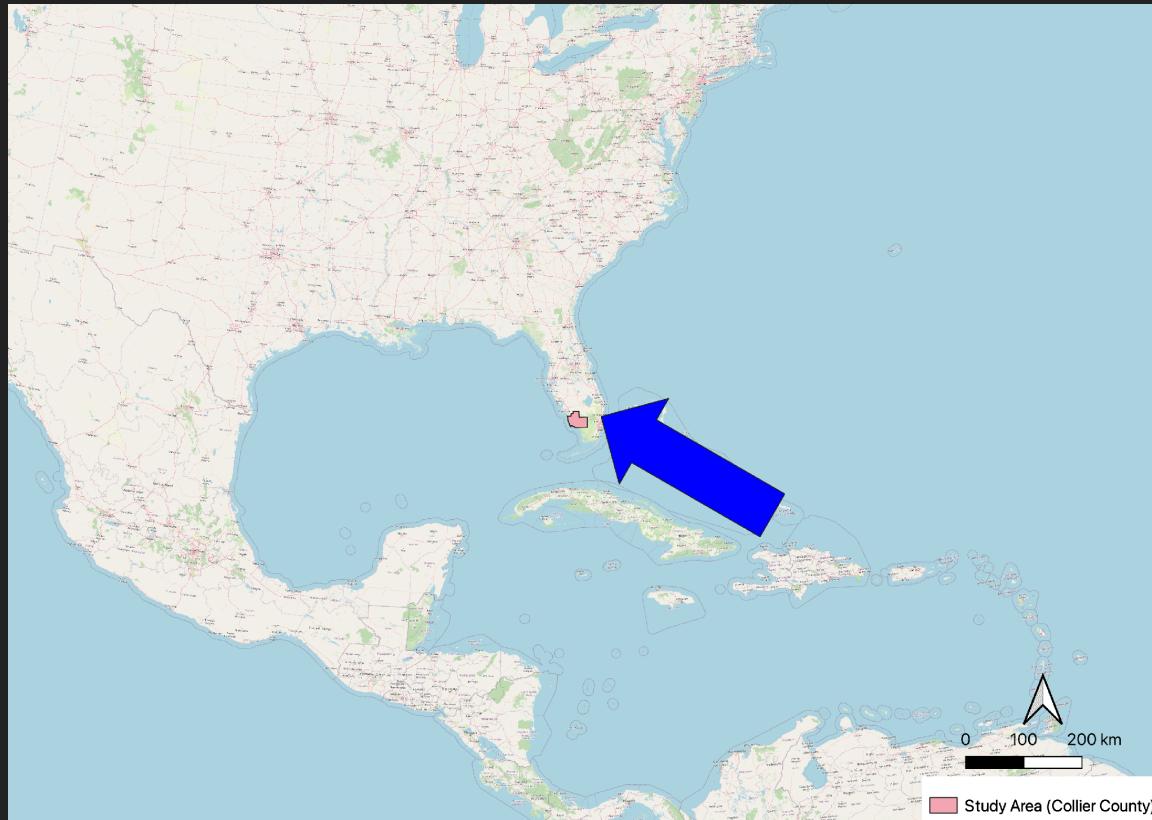
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DATASET & RESOURCE

- ▶ Black Bear Telemetry Data in 1986- 1998
- ▶ Land Use(LU) and Land Change (LC) Data in 1995
- ▶ LU LC Data in 2014-2016
- ▶ County Boundary Data
- ▶ All Downloaded from Florida's Geospatial Open Data on 30 Nov 2022 (<https://geodata.floridagio.gov>)
- ▶ Base Map: Open Street Map (<https://www.openstreetmap.org/>)
- ▶ Software: QGIS 3.28 & Python 3.11.1

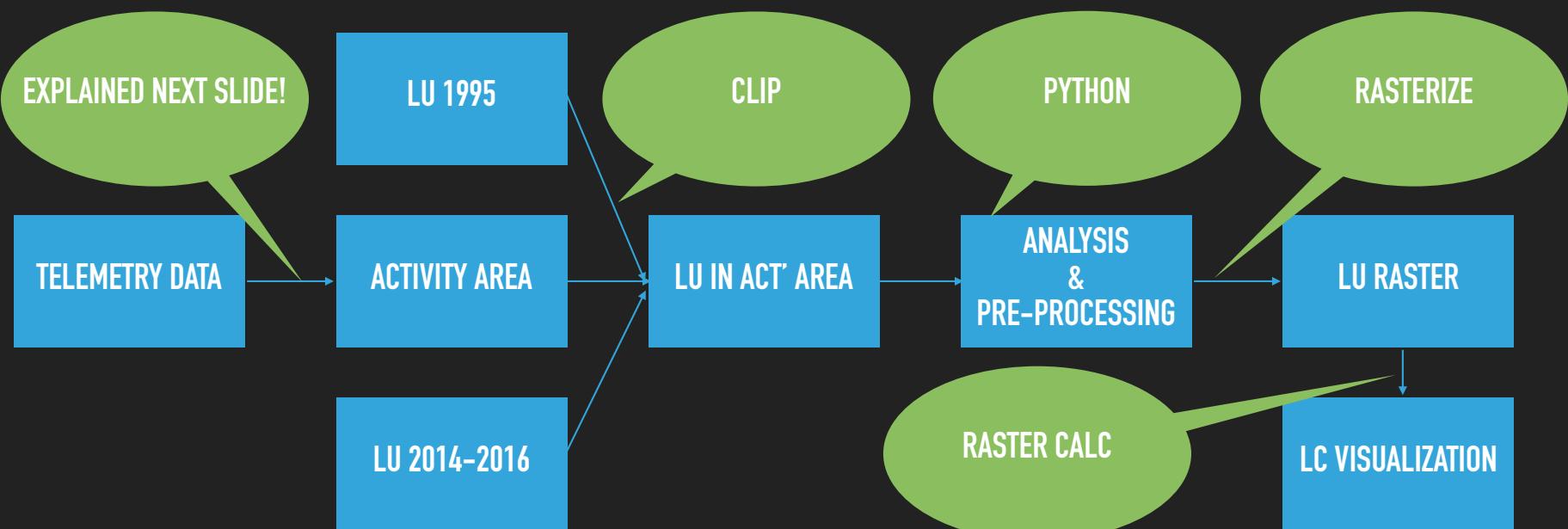
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FIG1: STUDY AREA (COLLIER COUNTY IN FL)



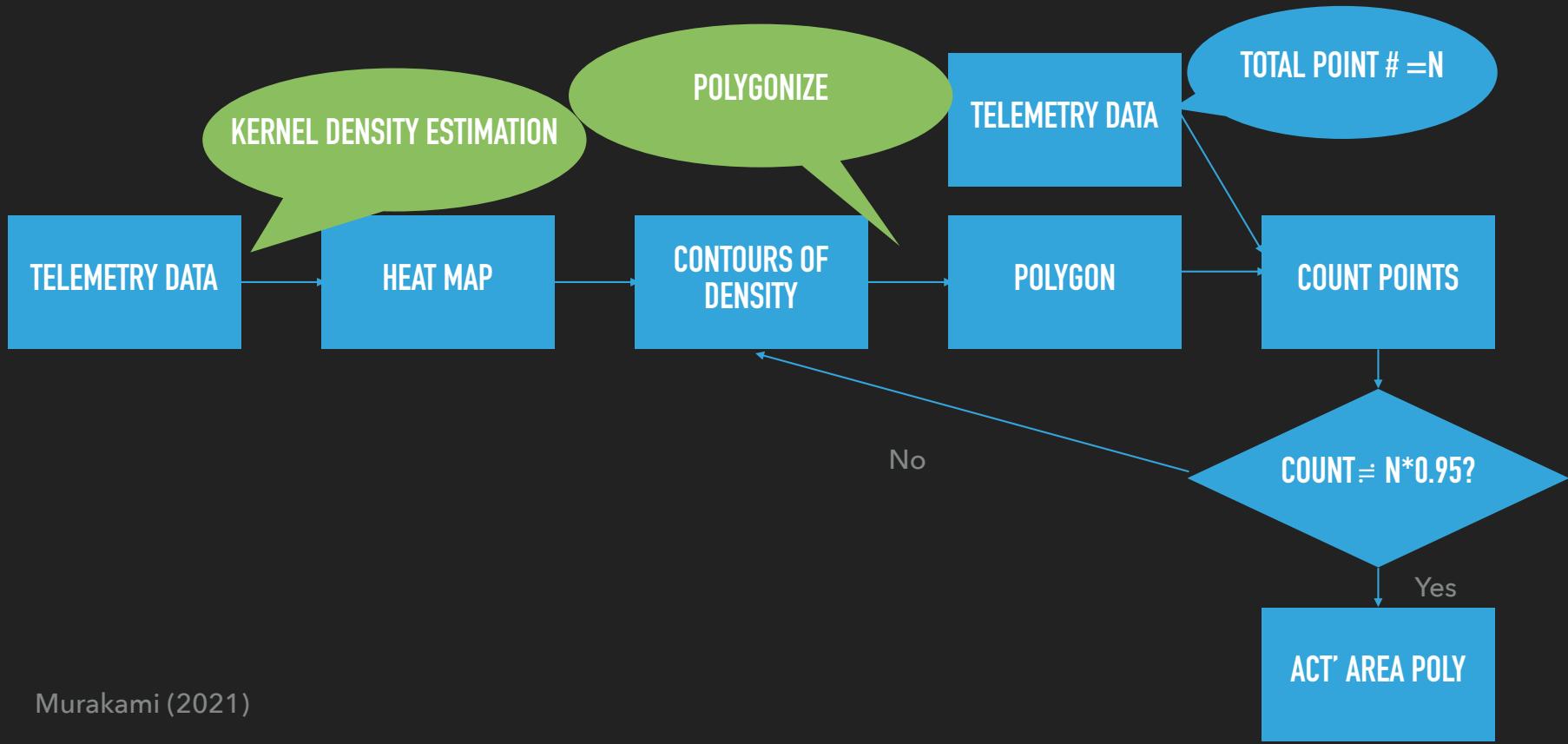
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WORKFLOW



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ACTIVITY AREA ANALYSIS: 95% MINIMUM CONVEX POLYGONS (MCP)



Murakami (2021)

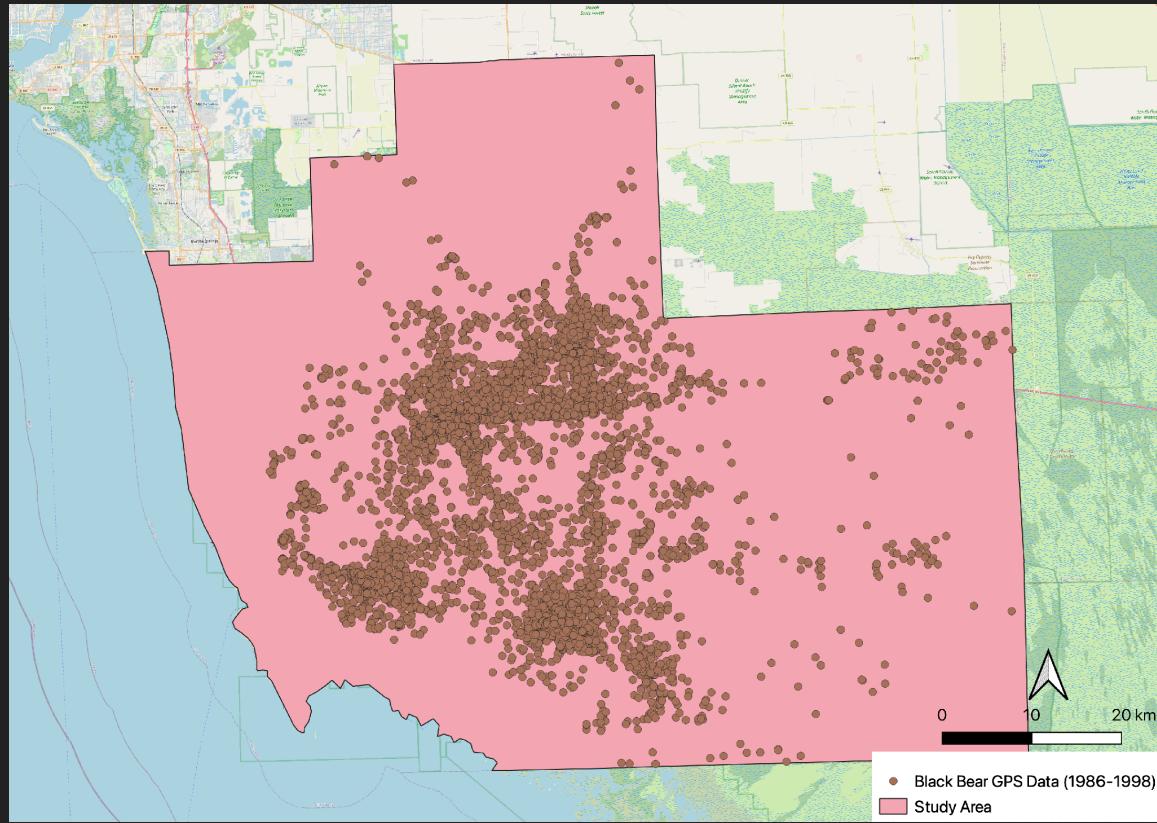
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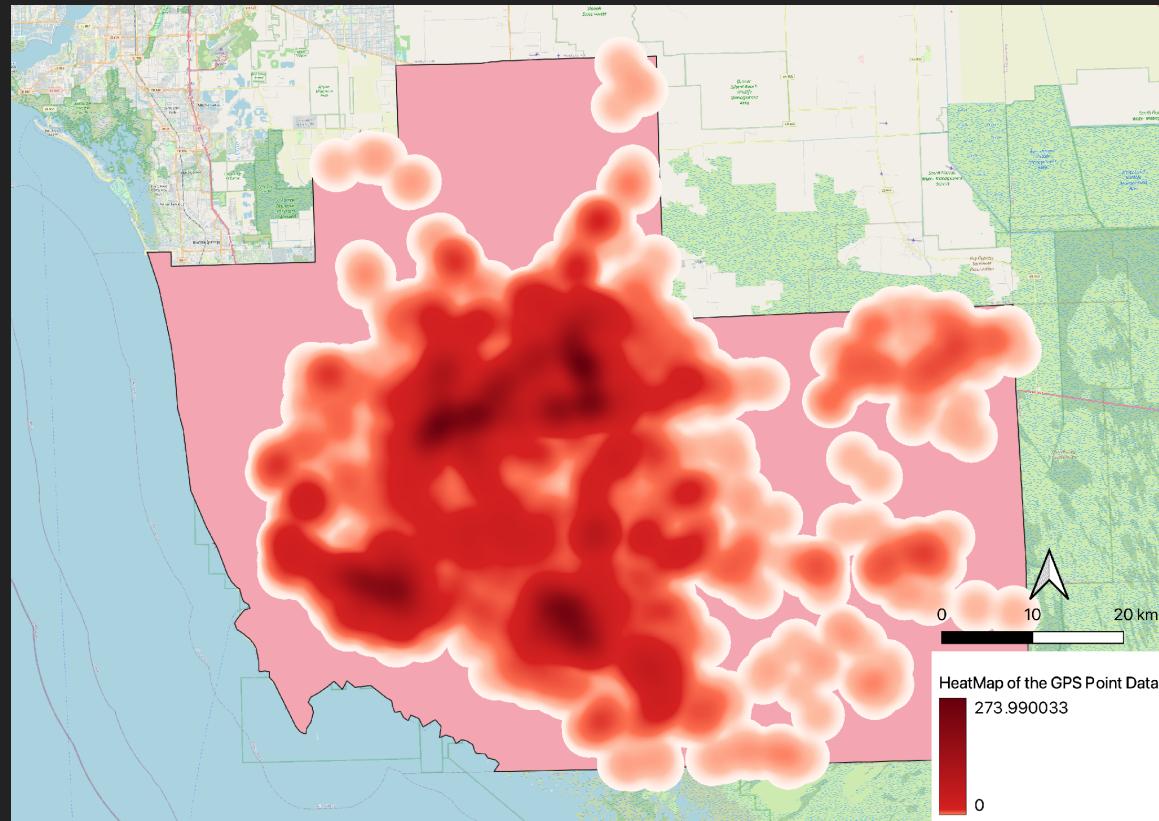
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FIG2: ROW TELEMETRY DATA



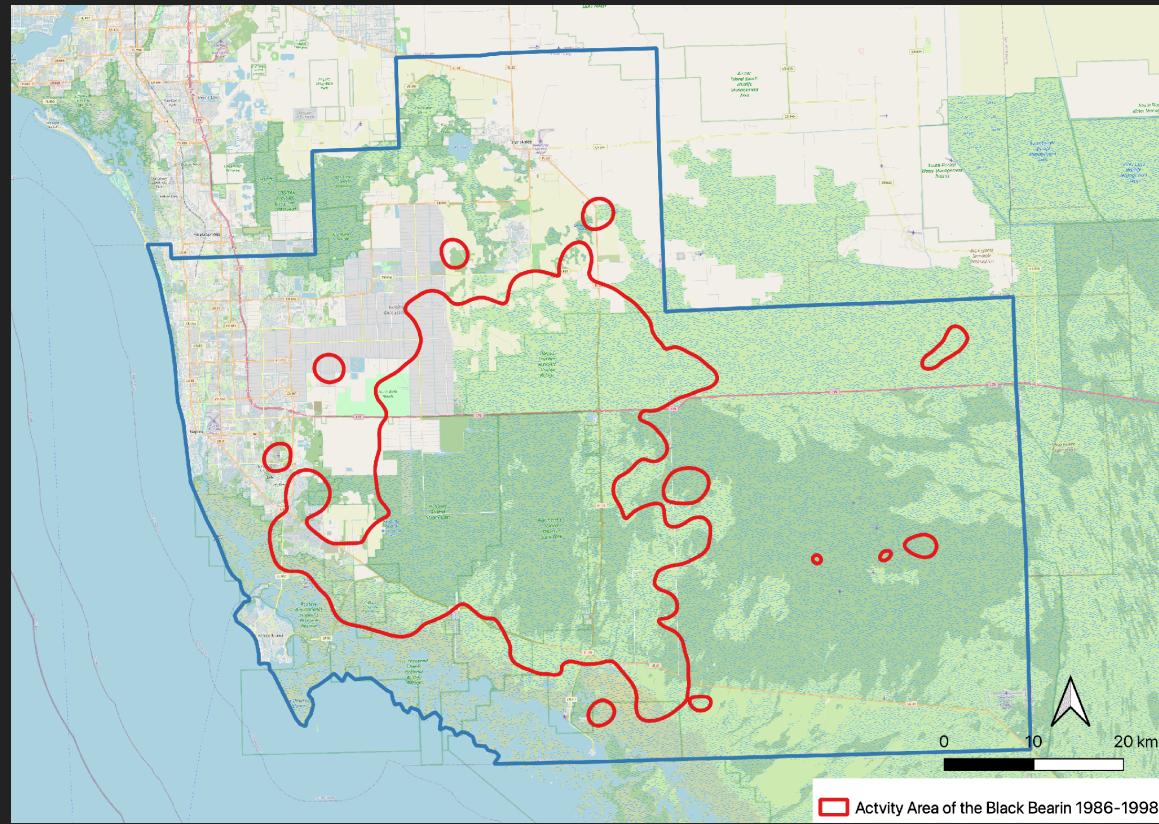
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FIG3: HEAT MAP OF THE POINT DISTRIBUTION



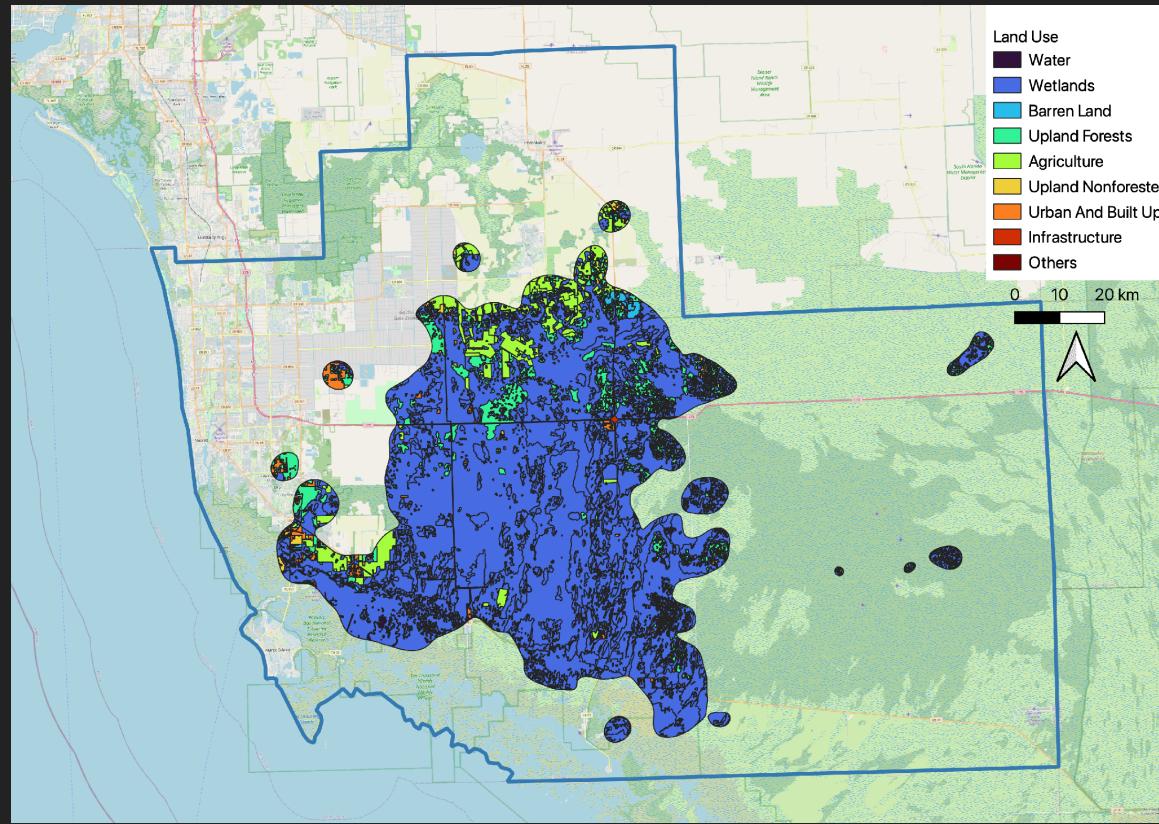
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FIG4: ACTIVITY AREA 1986-1997 (POINT #=6683-> 94.9% OF N ARE INCLUDED)



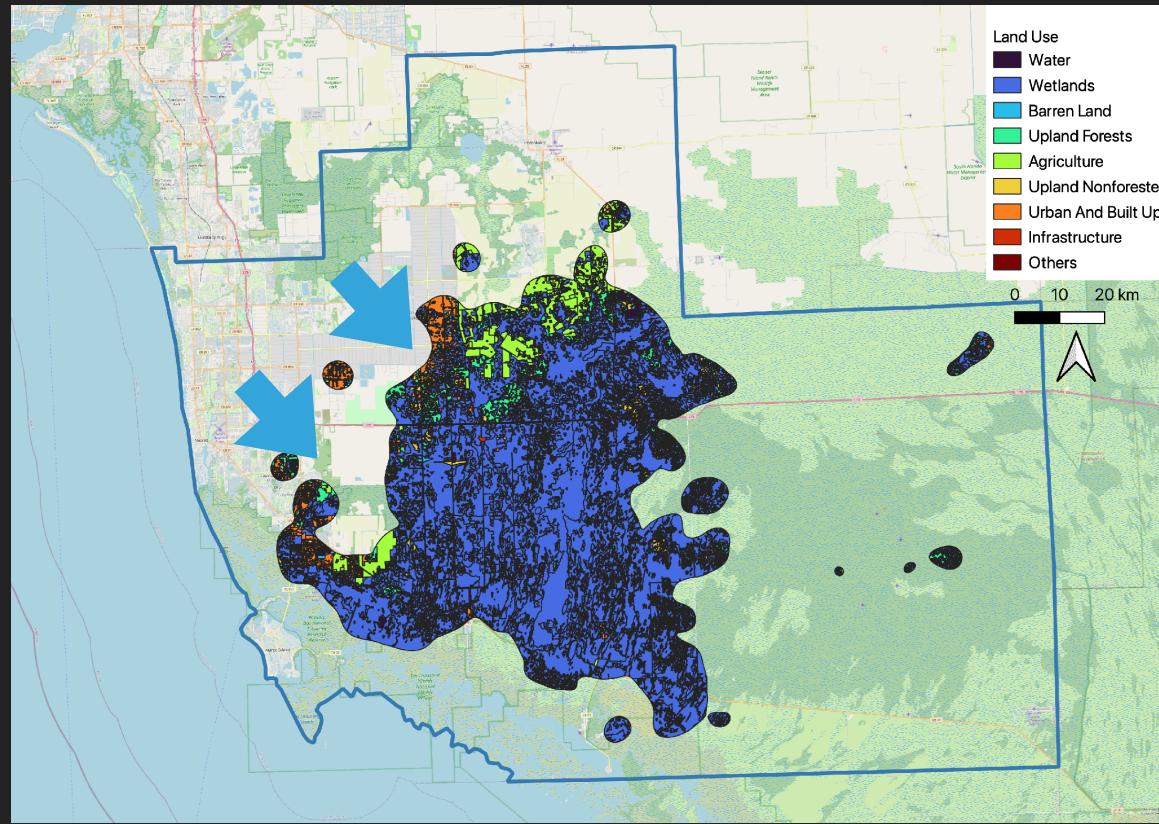
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FIG5: LAND USE IN 1995



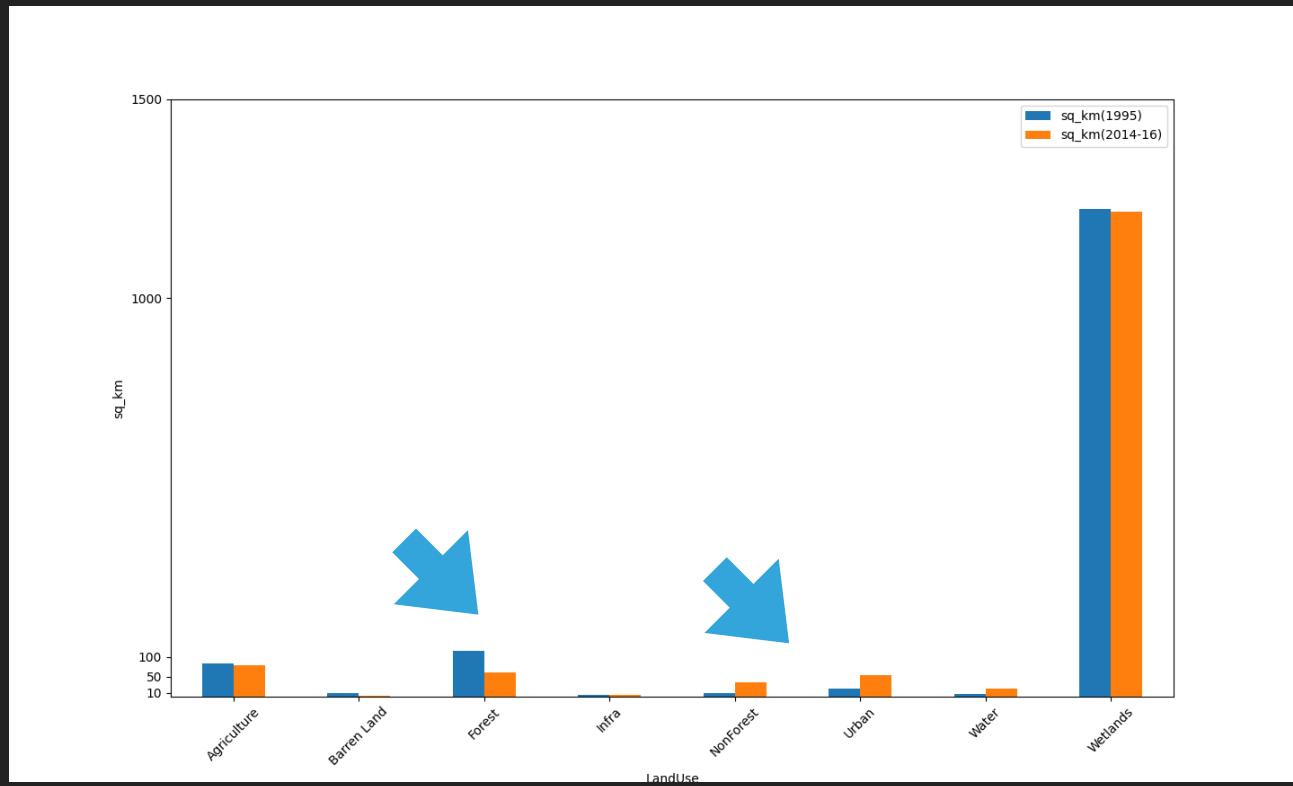
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FIG6: LAND USE IN 2014-16



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FIG7: SCALE OF LAND USE CHANGE (IN BARCHART)



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FIG8: SCALE OF LAND USE CHANGE (IN TABLE)

	sq_km(1995)	sq_km(2014-16)
Agriculture	83.039764	78.008935
Barren Land	8.891379	2.818986
Forest	114.604627	61.868135
Infra	4.827564	4.294474
NonForest	9.707987	35.239246
Urban	20.77195	52.94068
Water	5.61528	19.153193
Wetlands	1225.163466	1218.500994

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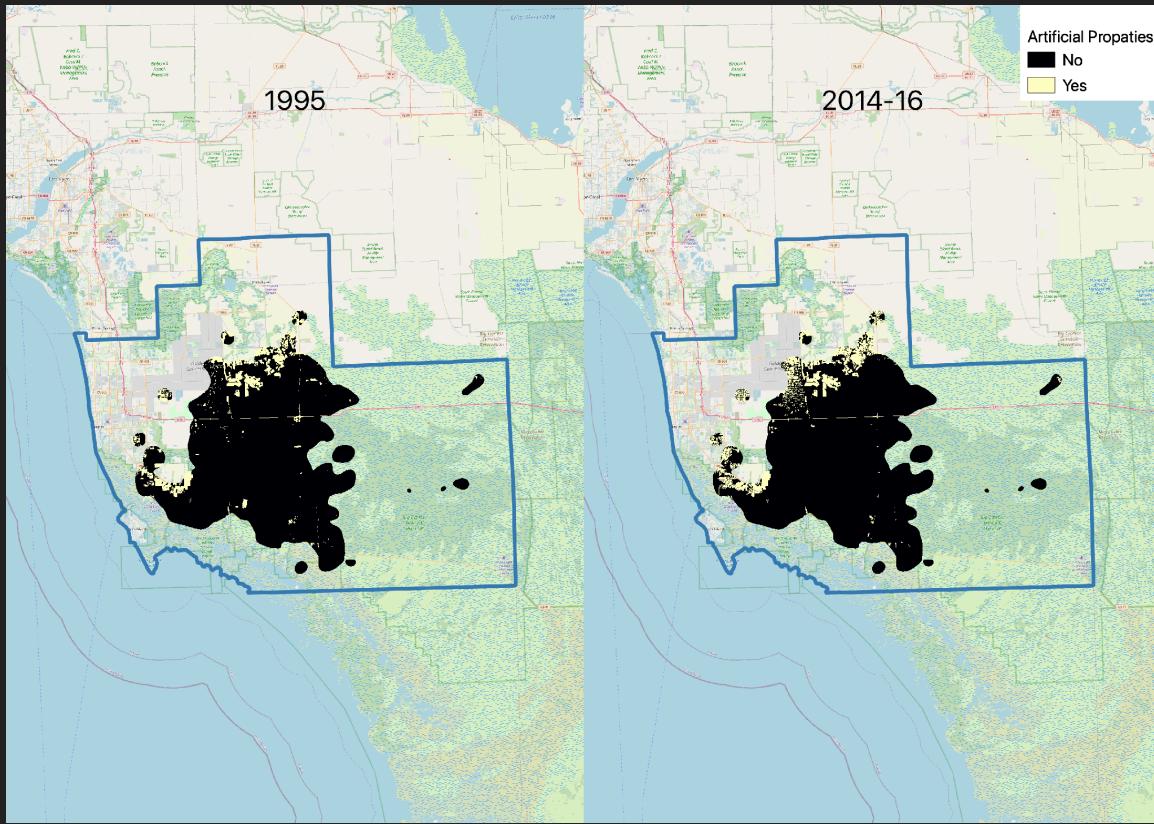
FIG9:RECLASSIFICATION FOR RASTERIZE

0 Barren Land, Upland Forest, Upland Un-forest,
(Non-artificial) Water, Wetlands

1 Agriculture, Infrastructure, Urban & Built-up
(Artificial)

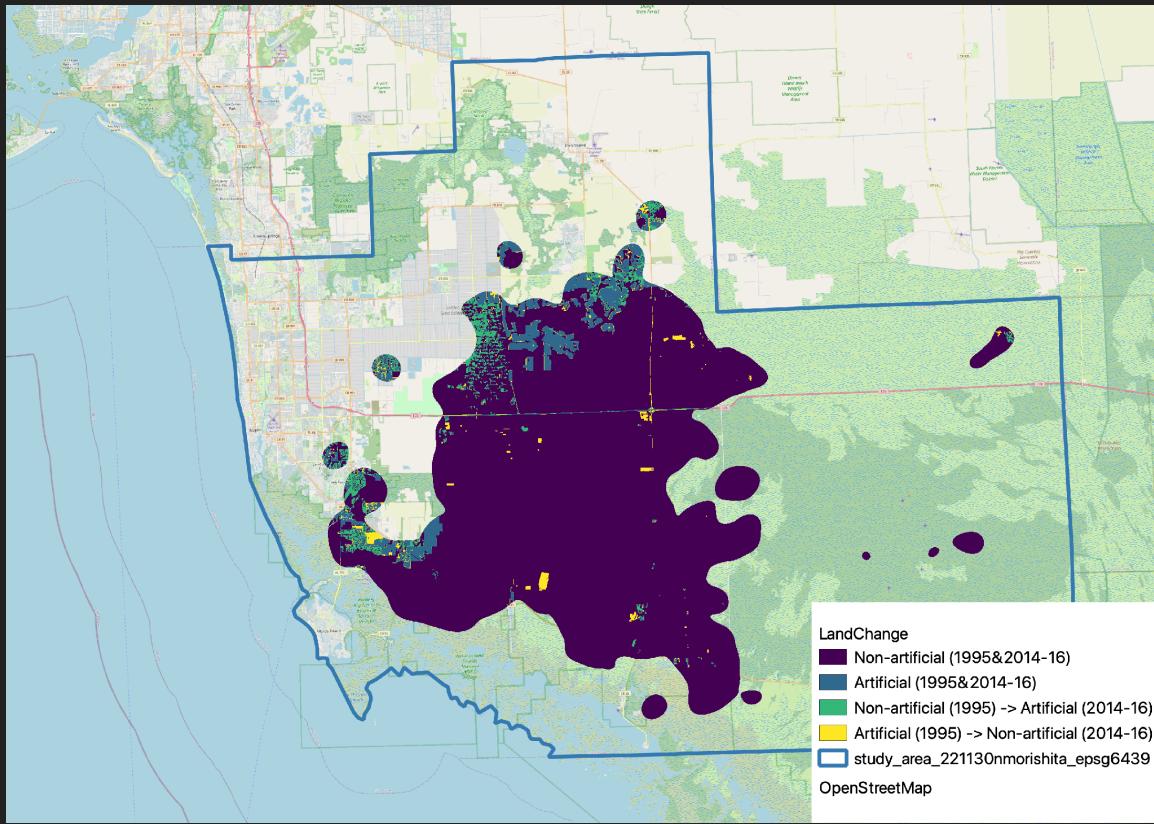
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FIG10: ARTIFICIAL & NON ARTIFICIAL PROPERTIES



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FIG11:LAND CHANGE



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FINDINGS

- ▶ Black bears' activity areas were largely distributed to wetlands
- ▶ Non-artificial properties had been largely preserved
- ▶ However Forest in black bears' activity areas decreased & Urban increased

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FURTHER RESEARCHES???

- ▶ **Activity area changed now? If yes, any relations with the LU?**
- ▶ What were (and are) in the activity areas? More fruits, for example?
- ▶ Significantly more interaction (call, car accident etc) in the land changed areas?
- ▶ Home range analysis methods: MCP vs Kernel. The activity areas change?
 - ▶ Can be done with R (Calenge, 2006).
- ▶ Really changed? Especially urban-> nature areas for real?
 - ▶ Remote Sensing?: Supervised Classification? Change Detection?

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