

MAPPING CLIMATE STORIES WITH **sf**

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Layers

☒ Protected Natural Areas

☒ Indigenous Lands

Legend

Oil blocks in the Amazon

Awarded
(exploration or production)

Offer

Study or reserved



WHAT STORY IS HIDING IN THIS MAP?

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THE PROBLEM

JOURNALISTS HAVE GEODATA.

**WE JUST DON'T HAVE GEOSPATIAL
HABITS.**

EVERY LAST DROP



Fifty years of damage isn't enough. A new race for oil is underway in the Amazon

EVERY LAST DROP

- A year-long, cross-border investigation
- 5 countries: Brazil, Colombia, Ecuador, Guyana, Peru
- Journalists, photographers, data analysts, designers, scientists
- My role: data analysis — and this is where `{sf}` came in

FALLING IN LOVE WITH **sf**

THREE CORE IDEAS.

1. THE GEOMETRY COLUMN

A data frame that happens to also be a map.

```
1 library(sf)
2
3 oil_blocks <- st_read("oil_blocks.shp")
4 class(oil_blocks)
5 #> [1] "sf"          "data.frame"
```

2. CRS — COORDINATE REFERENCE SYSTEMS

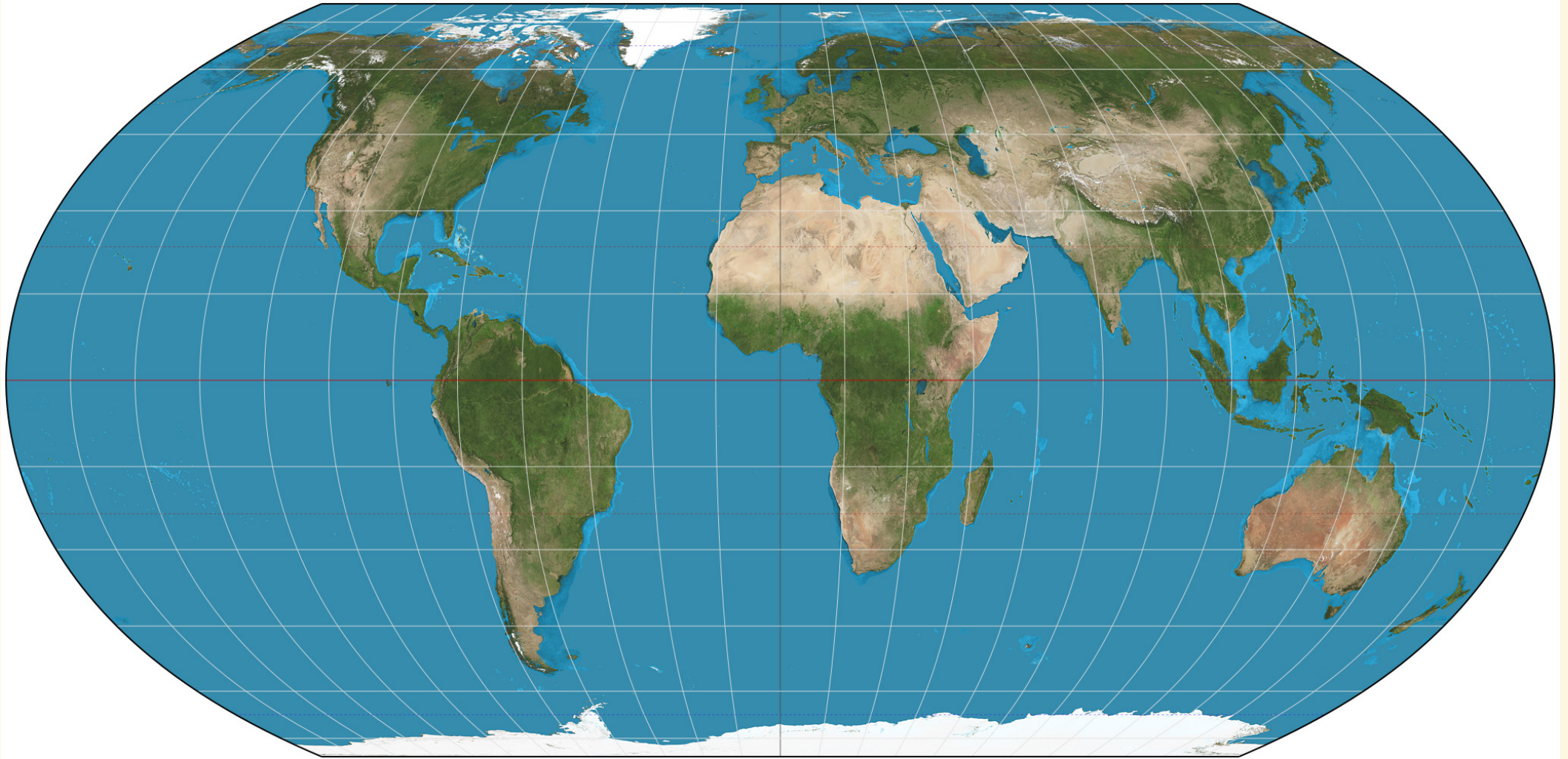
Make sure everyone's using the same ruler.

```
1 st_crs(oil_blocks)
2 oil_blocks <- st_transform(oil_blocks, crs = 4326)
```

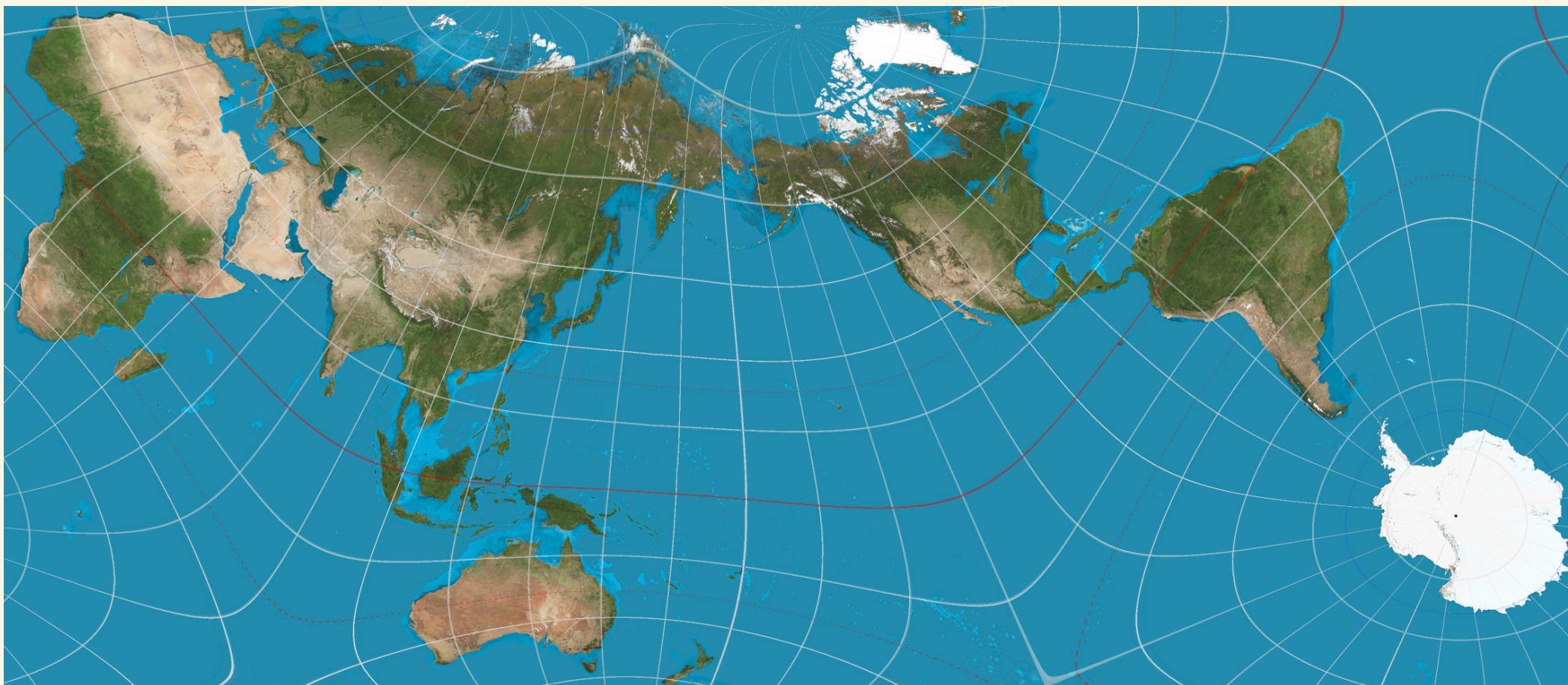
MERCATOR PROJECTION



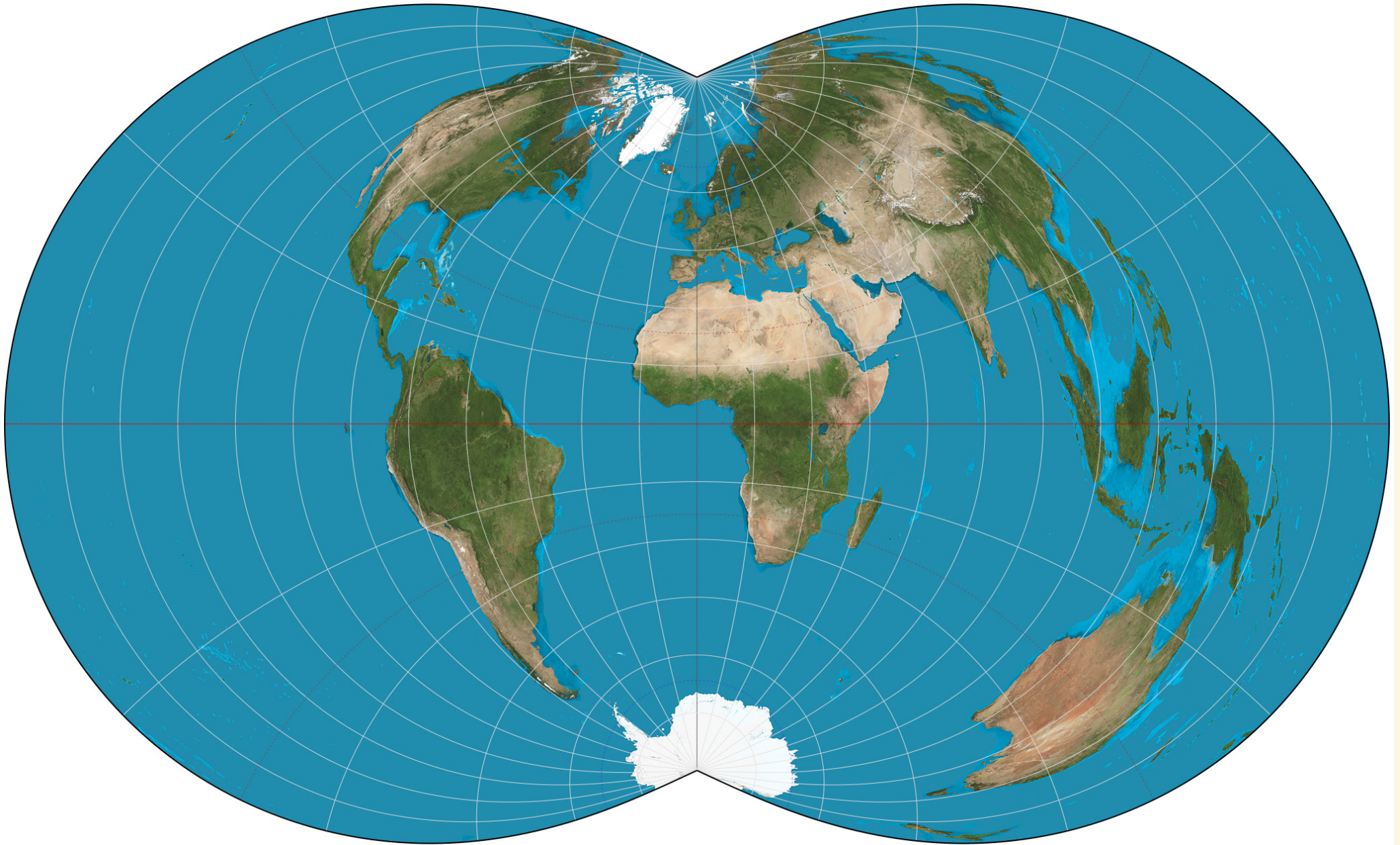
EQUAL EARTH PROJECTION



AUTHAGRAPH PROJECTION



RECTANGULAR POLYCONIC PROJECTION



3. SPATIAL PREDICATES

Where the actual stories emerge.

- `st_intersects()` — does this overlap that?
- `st_within()` — is this fully inside that?
- `st_distance()` — how close is this to that?

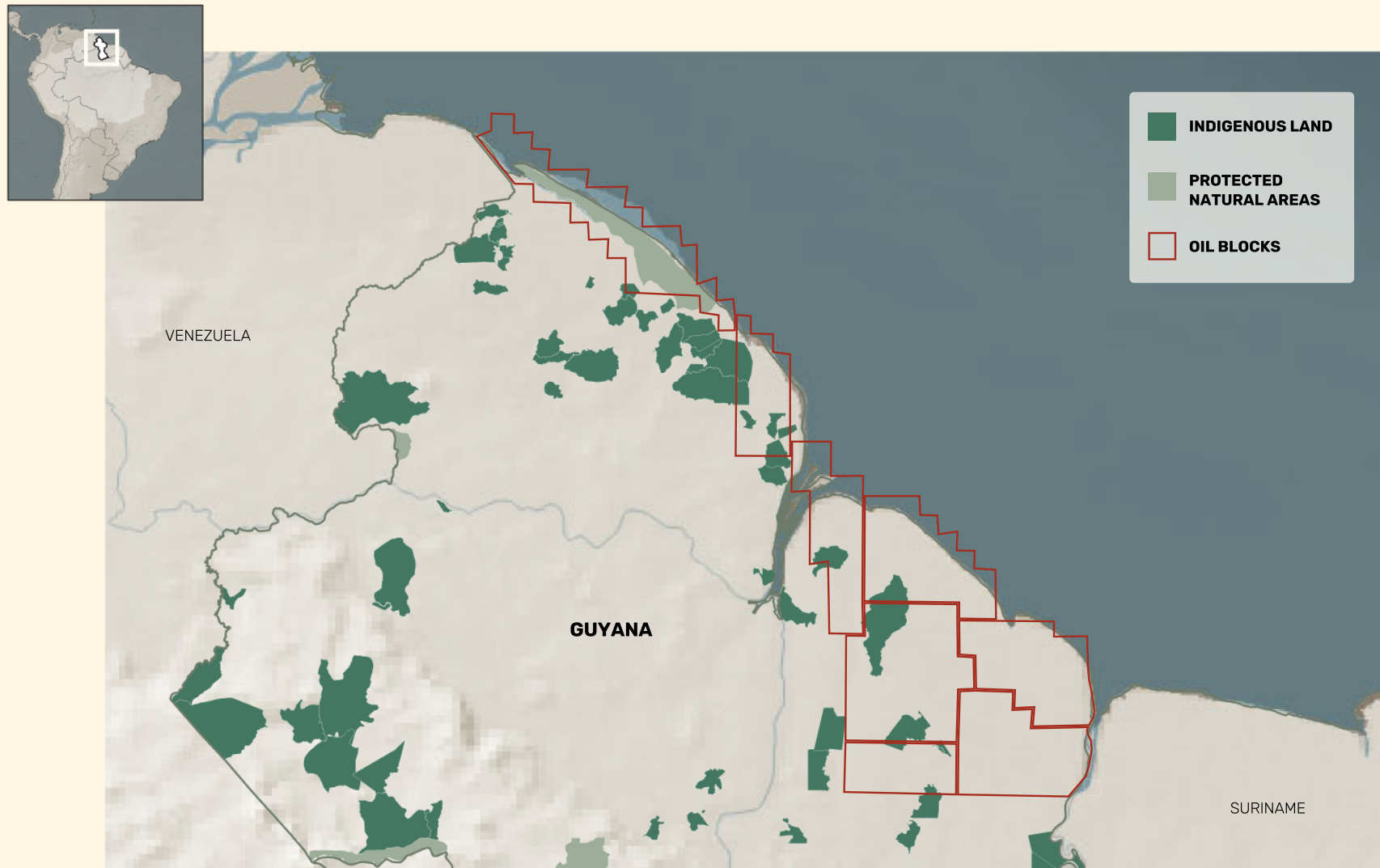
FROM FUNCTIONS TO FINDINGS

“WHICH OIL BLOCKS OVERLAP PROTECTED AREAS?”

```
1 overlap <- st_intersects(oil_blocks, protected_areas)
2 oil_blocks[lengths(overlap) > 0, ]
```

OIL BLOCKS OVERLAPPING WITH PROTECTED AREAS IN GUYANA

Areas reserved for onshore oil exploration overlap with 13 Indigenous lands and one protected natural area



SOURCE ARAYARA, RAISG

“WHAT’S THE AFFECTED AREA?”

```
1 oil_blocks |>  
2   mutate(area_km2 = st_area(geometry) / 1e6)
```

“HOW CLOSE IS DRILLING TO A COMMUNITY?”

```
1 oil_blocks |>  
2   mutate(dist_to_village = st_distance(geometry, village_point))
```

TAKEAWAY

IF YOU CAN USE **dplyr**, YOU CAN USE **sf**.



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THANK YOU!

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Every Last Drop →