



Third Edition **RISK MANAGEMENT**

Knowledge, Forecasting, Prevention,
Protection, Planning, Preparedness
20-27 July 2025



Manaus: un viaggio attraverso inondazioni e della siccità nei l'architettura di un mondo acquatico

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Nathyele de Souza Dias, Isabela Cavalcante.

Universidade Federal do Amazonas - UFAM

MANAUS, AM
July 2025

Modal Connections Points in Manaus: Enhancing River Mobility through Strategic Redevelopment

Project Summer School Alta Scuola

NAMA

Maps

Geographic Location

South America

Source: WebGIS Público – IPAAM



Geographic Location

Brazil

Source: WebGIS Público – IPAAM



Geographic Location

Amazonas

Fonte: WebGIS Público – IPAAM | Produção Autoral





Geographic Location

Amazonas



Geographic Location

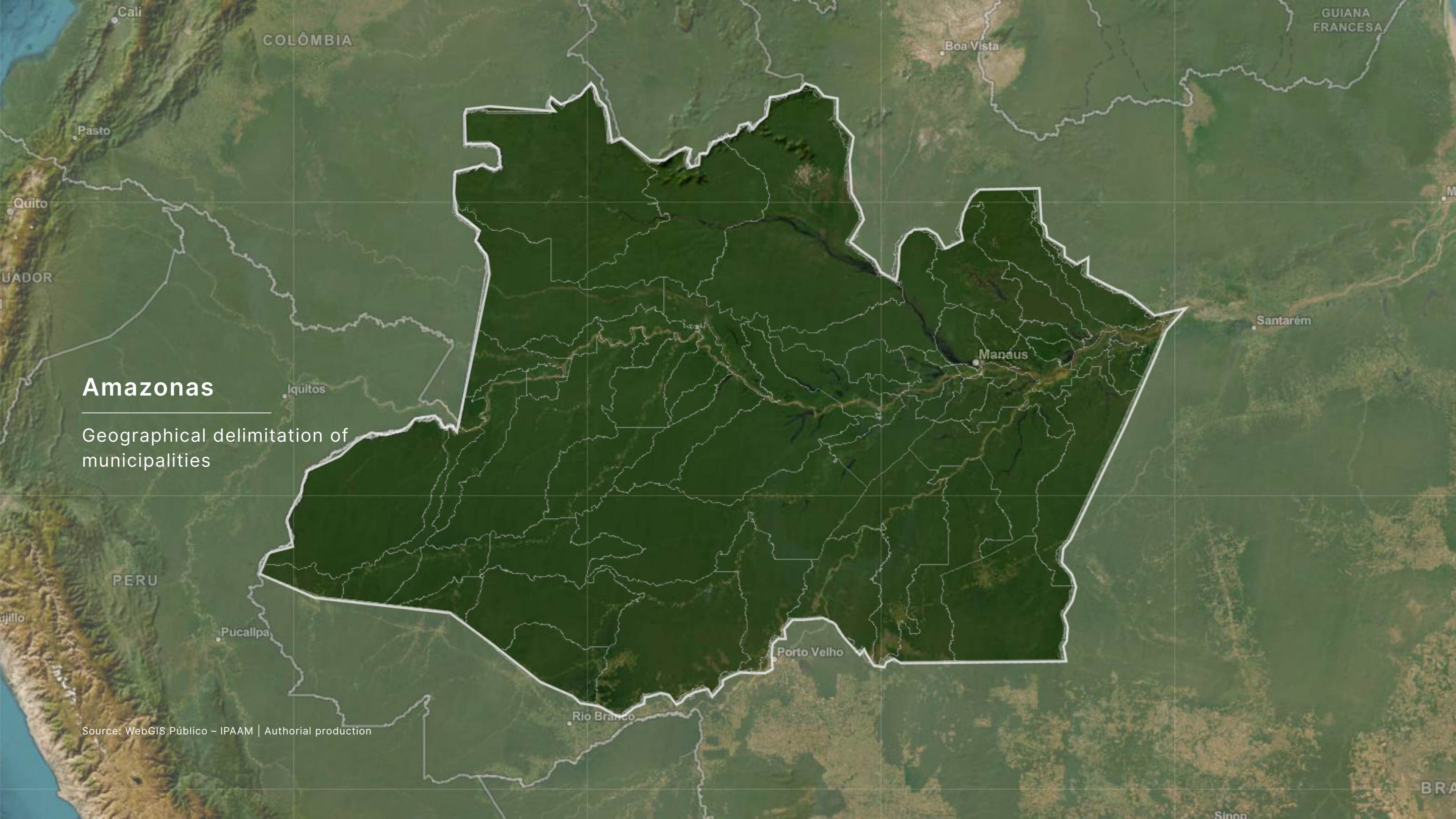
Amazonas

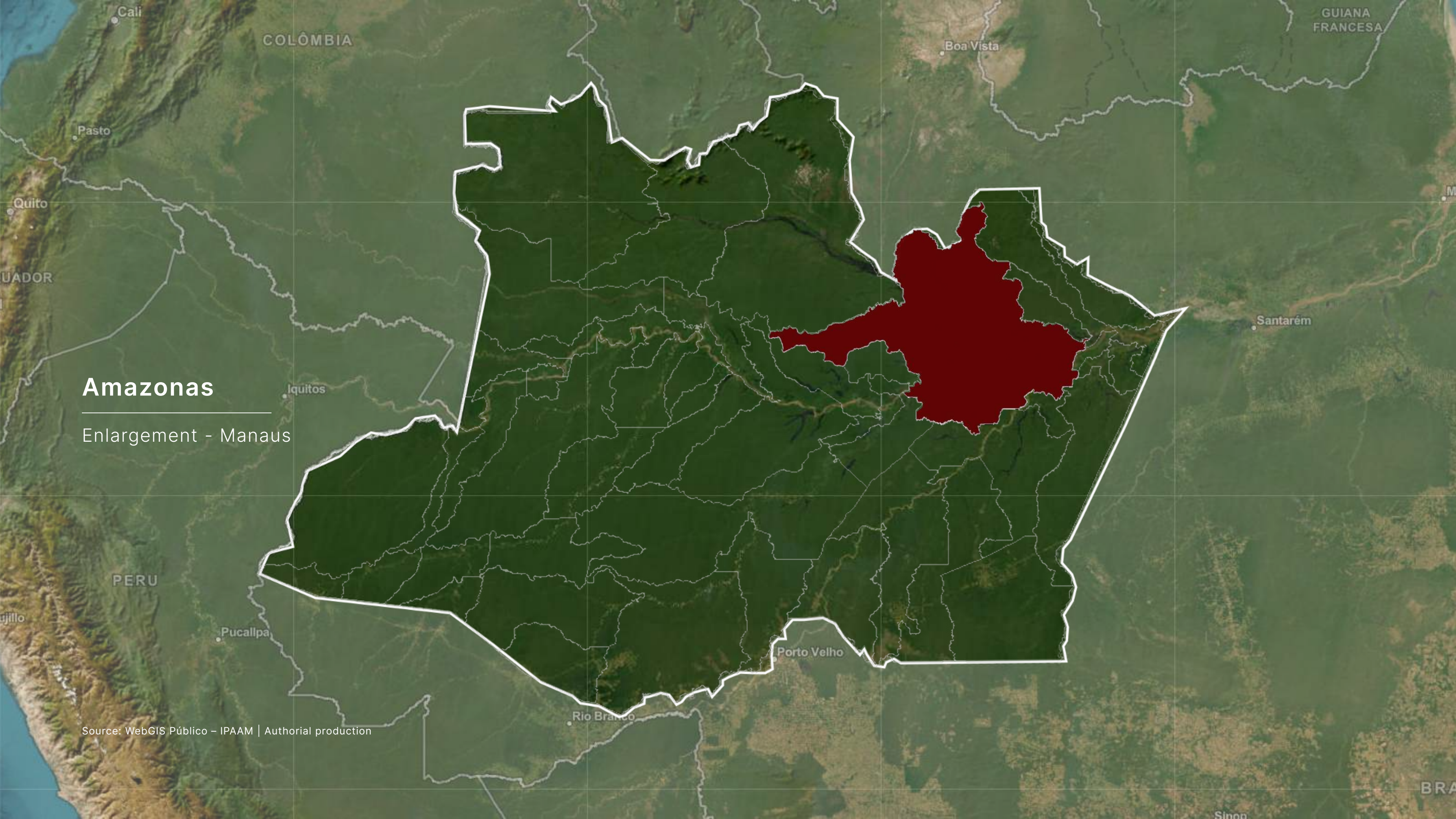
Source: WebGIS Público – IPAAM | Authorial production

Amazonas

Geographical delimitation of municipalities

Source: WebGIS Público – IPAAM | Authorial production





Amazonas

Enlargement - Manaus

Metropolitan region

Manaus

Amazonas

Source: WebGIS Público – IPAAM | Authorial production

Serrania La
Neblina
National Park

Estadual Serra
Do Aracá

Parque
Nacional Serra
da Mocidade

Parque
Nacional do Jauú

Parque
Nacional de
Anavilhanas

Manaus

Parintins

Santarém

Floresta
Nacional De
Itaituba II

Estação
Ecológica Alto
Maués

Parque
Nacional do
Jamanxim

Parque
Nacional
Nascentes do
Lago Jari

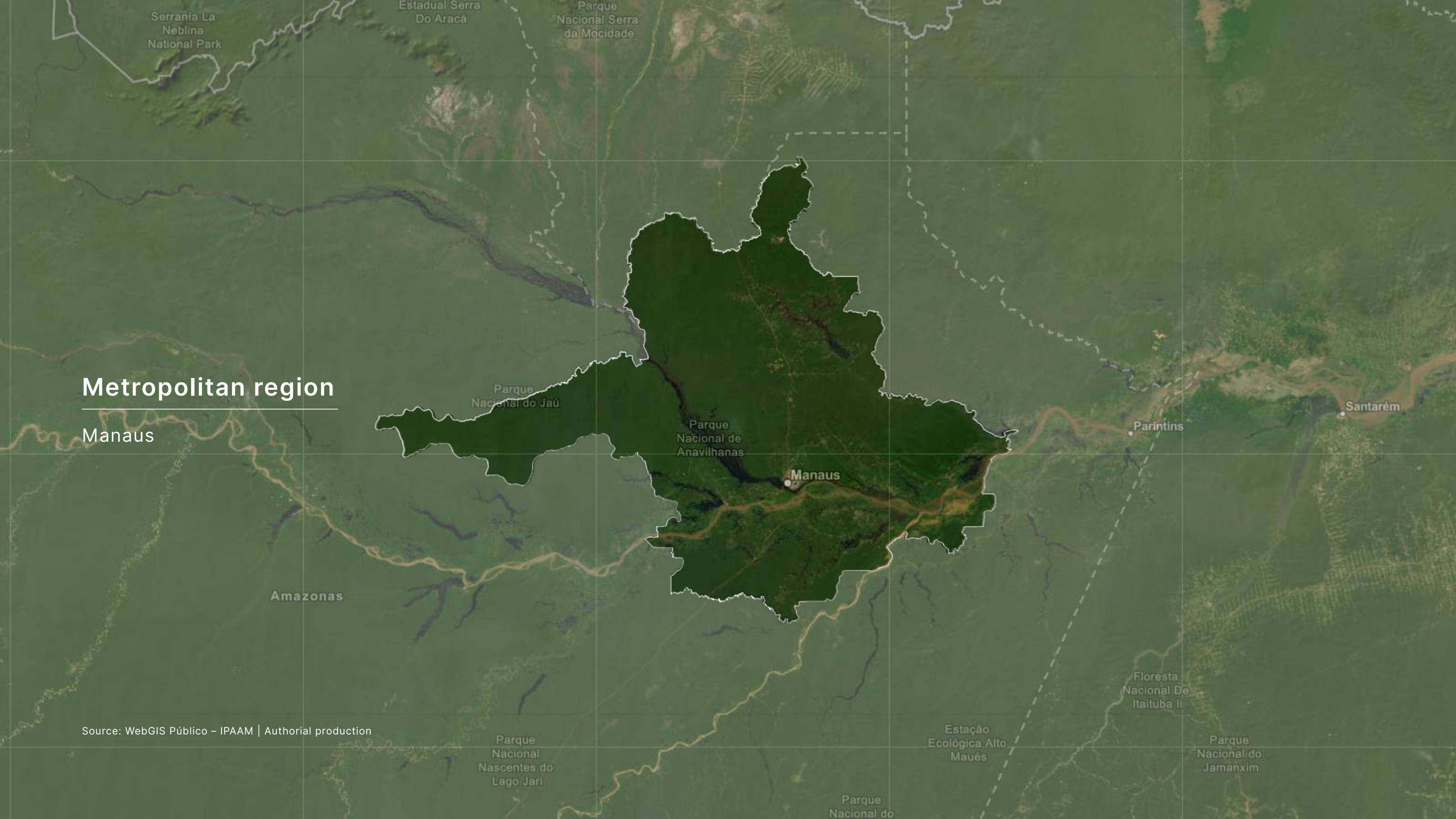
Parque
Nacional do

Metropolitan region

Manaus

Amazonas

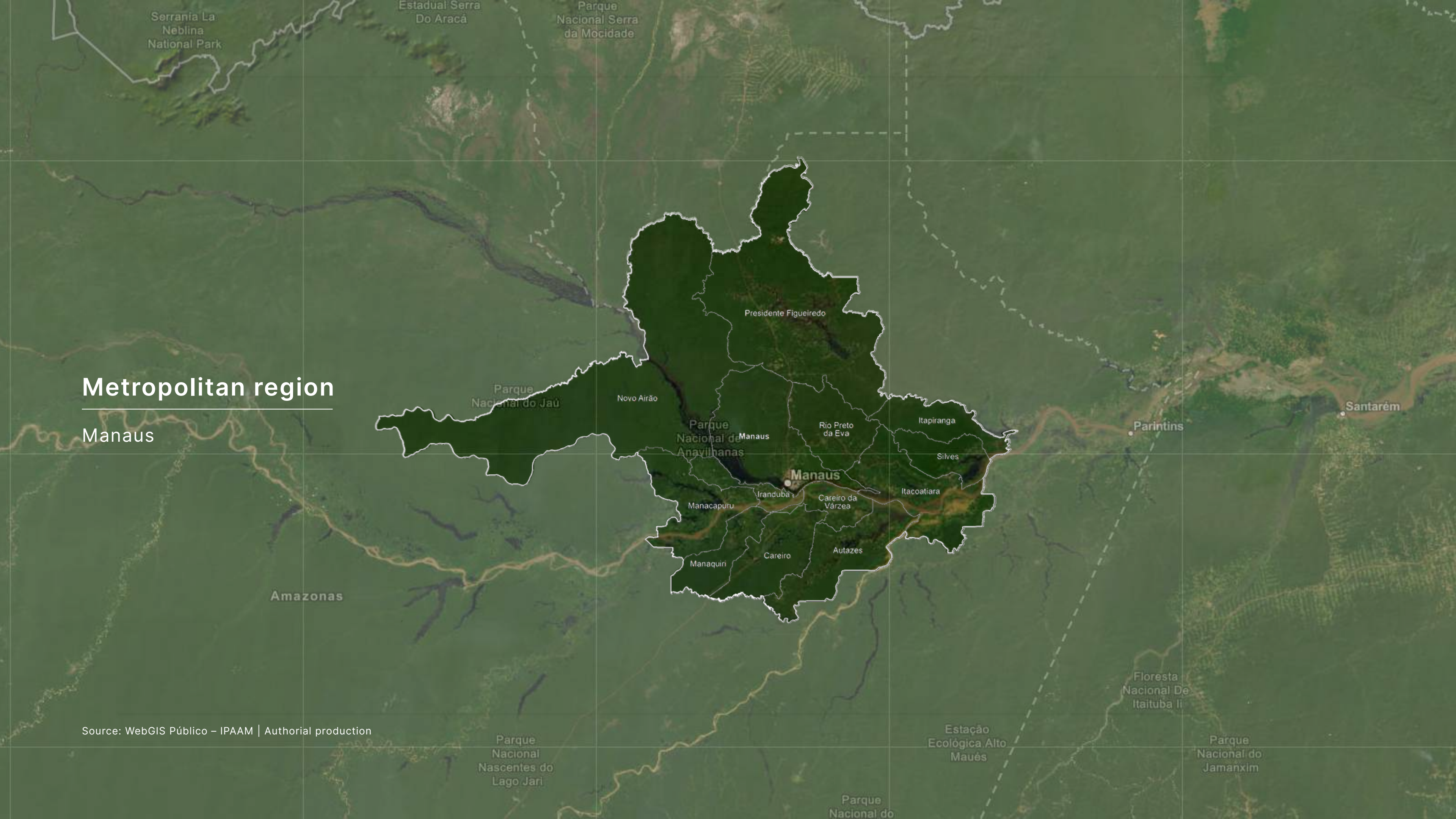
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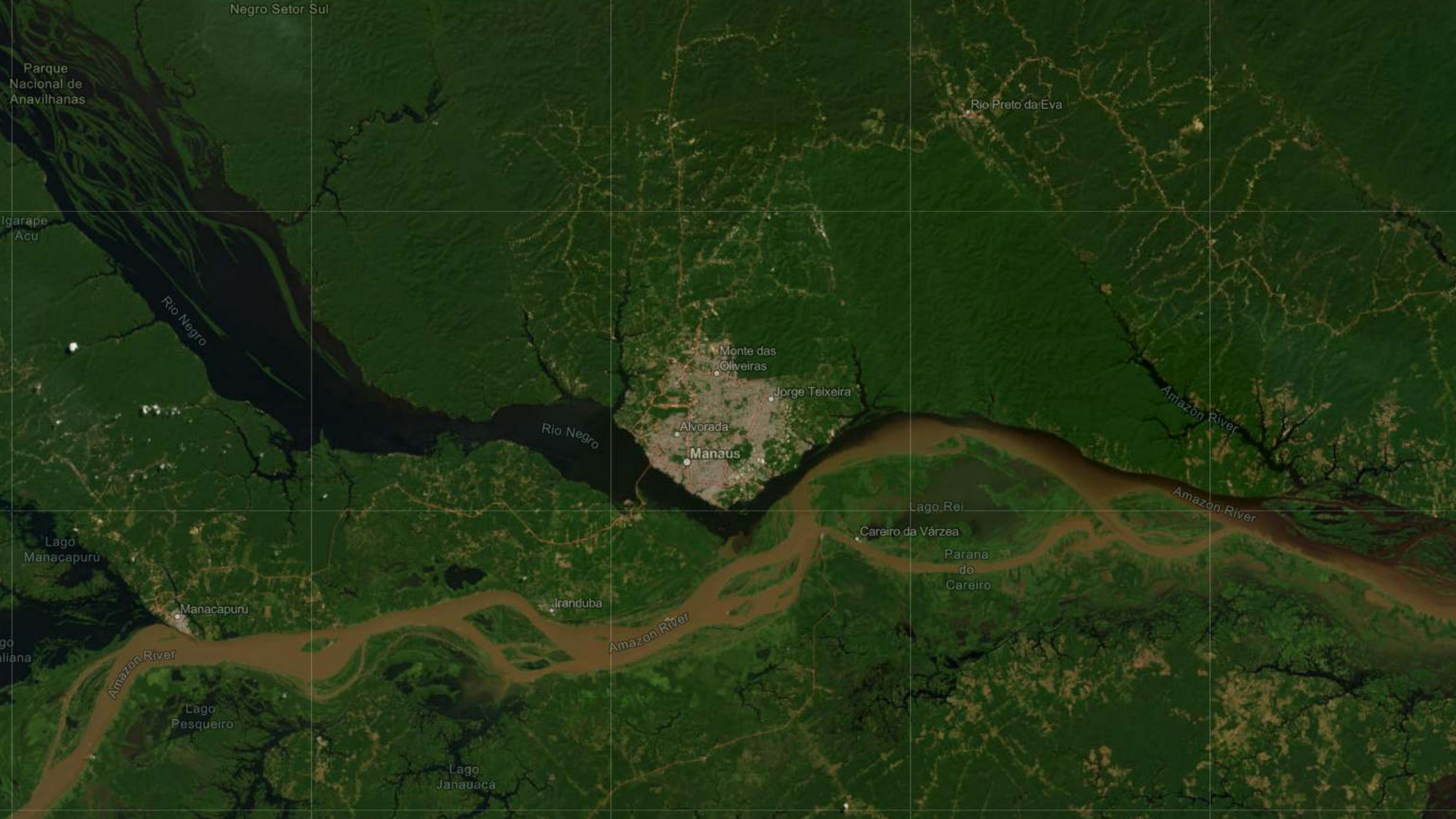


Metropolitan region

Manaus

Source: WebGIS Público – IPAAM | Authorial production





Negro Setor Sul

Parque
Nacional de
Anavilhanas

Igarapé
Acu

Rio Negro

Rio Negro

Monte das
Oliveiras

Jorge Teixeira

Alvorada

Manaus

Iranduba

Amazon River

Lago Rei

Careiro da Várzea

Parana
do
Careiro

Amazon River

Amazon River

Lago
Manacapuru

Manacapuru

go
illiana

Amazon River

Lago
Pesqueiro

Lago
Janauacá



Cadastral Map of Manaus

2021

TARUMÃ AÇU BASIN

NEGRO RIVERS

ENVIRONMENTAL RESERVE
ADOLPHO DUCKE

Source: Cadastral Map of Manaus - 2021



Topography

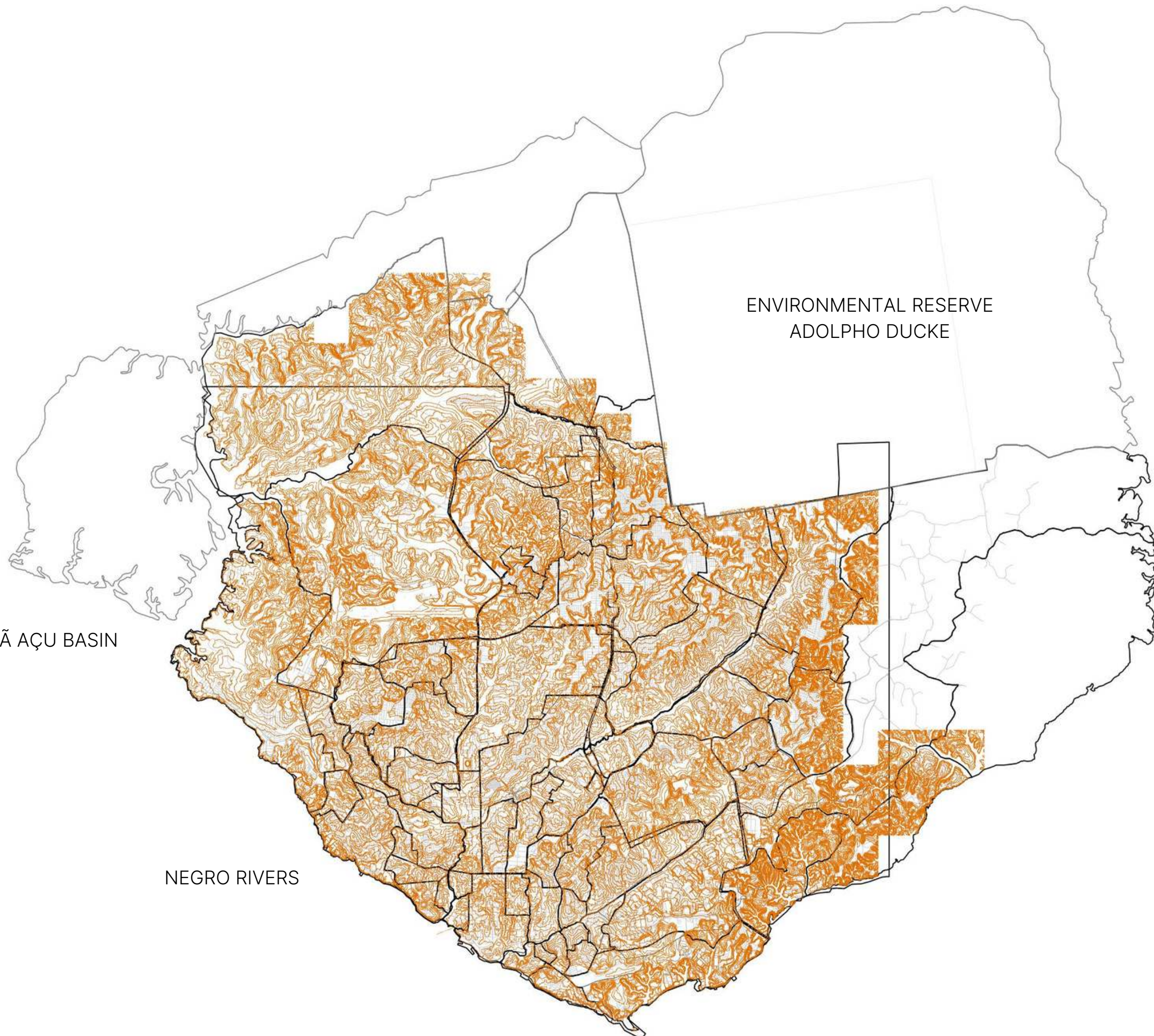
Level Curve 5-5m

TARUMÃ AÇU BASIN

NEGRO RIVERS

ENVIRONMENTAL RESERVE
ADOLPHO DUCKE

Source: Cadastral Map of Manaus - 2021



Hydrography

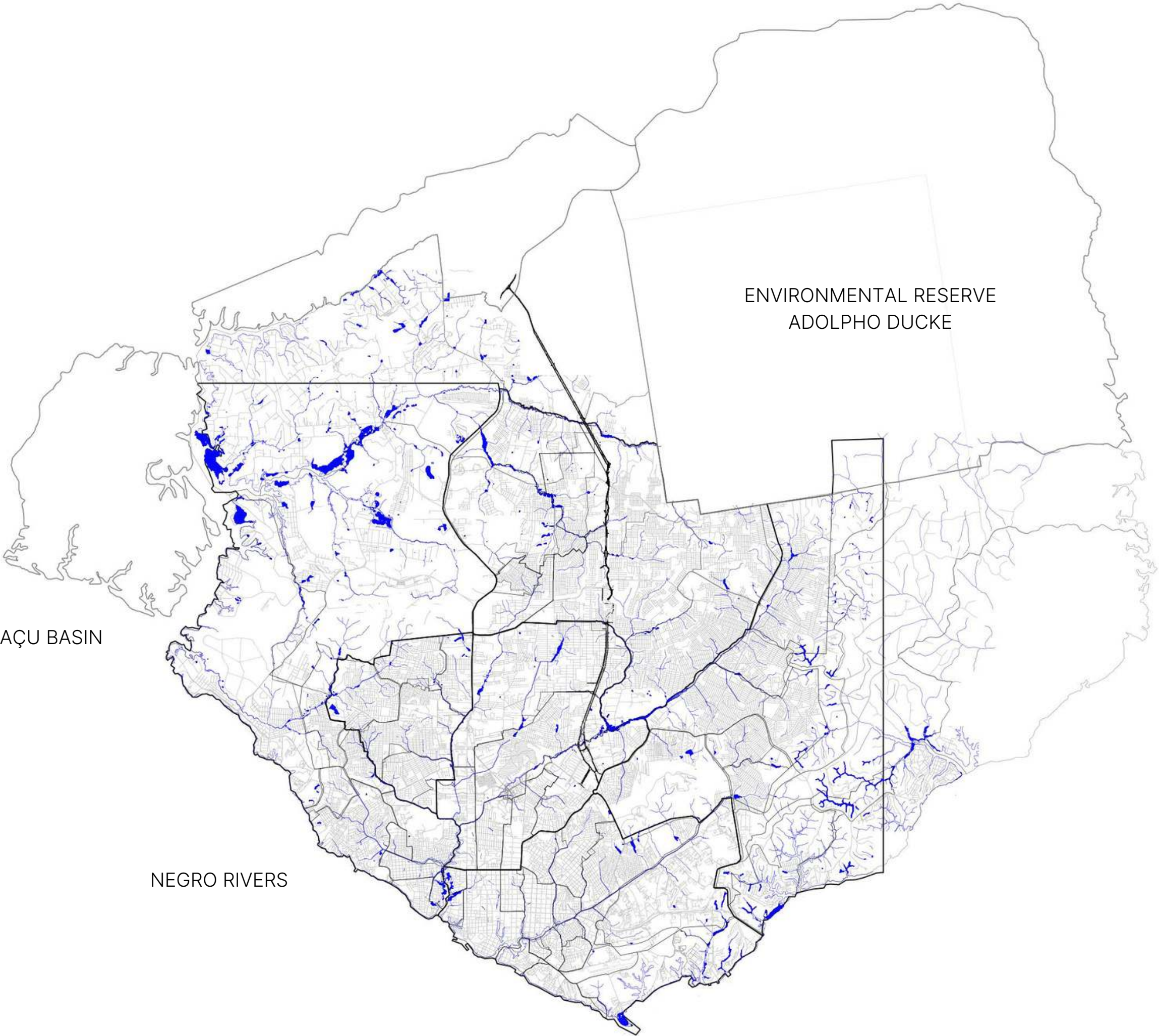
Hydrographic basin

TARUMÃ AÇU BASIN

ENVIRONMENTAL RESERVE
ADOLPHO DUCKE

NEGRO RIVERS

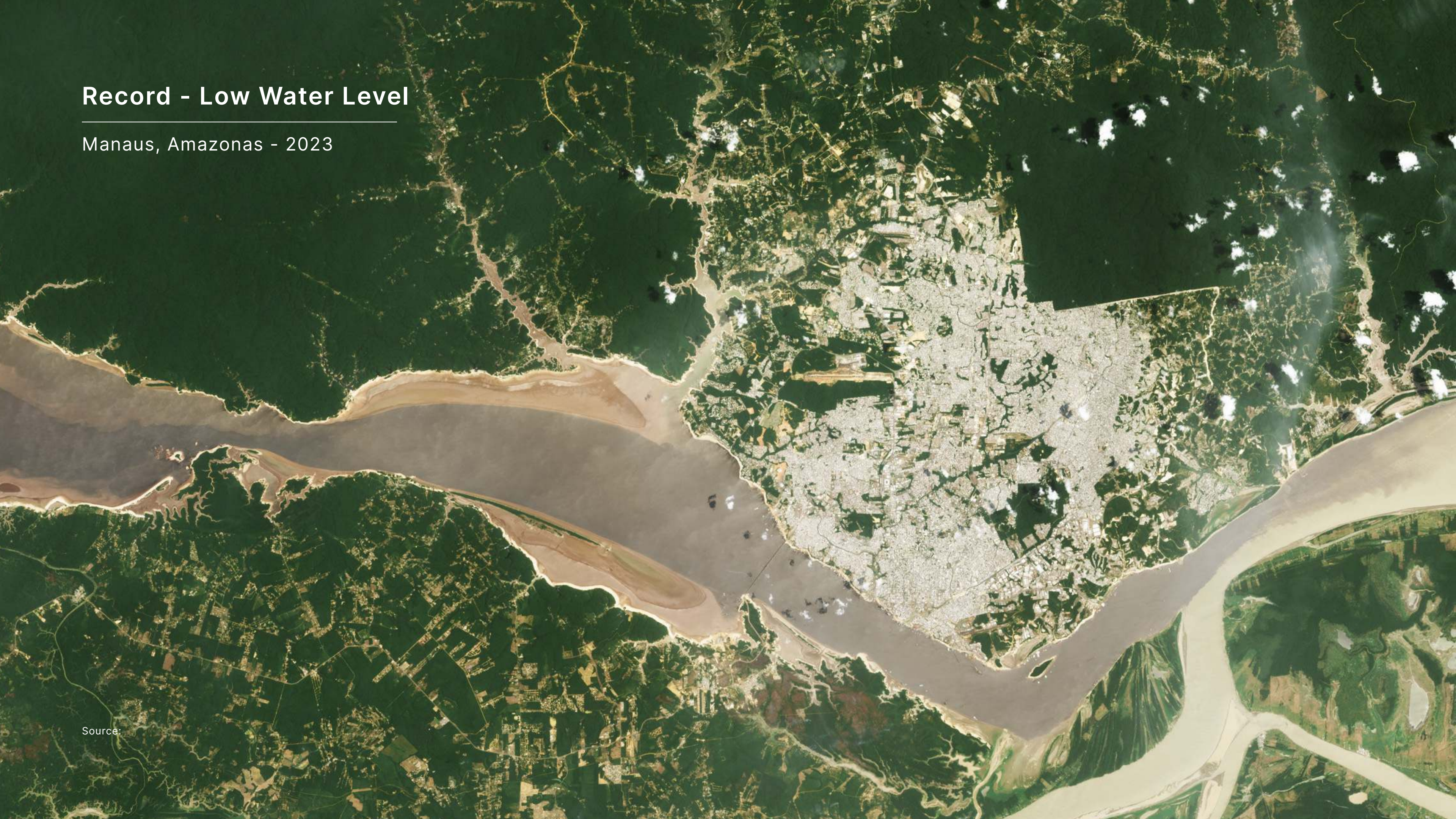
Source: Cadastral Map of Manaus - 2021



Record - Low Water Level

Manaus, Amazonas - 2023

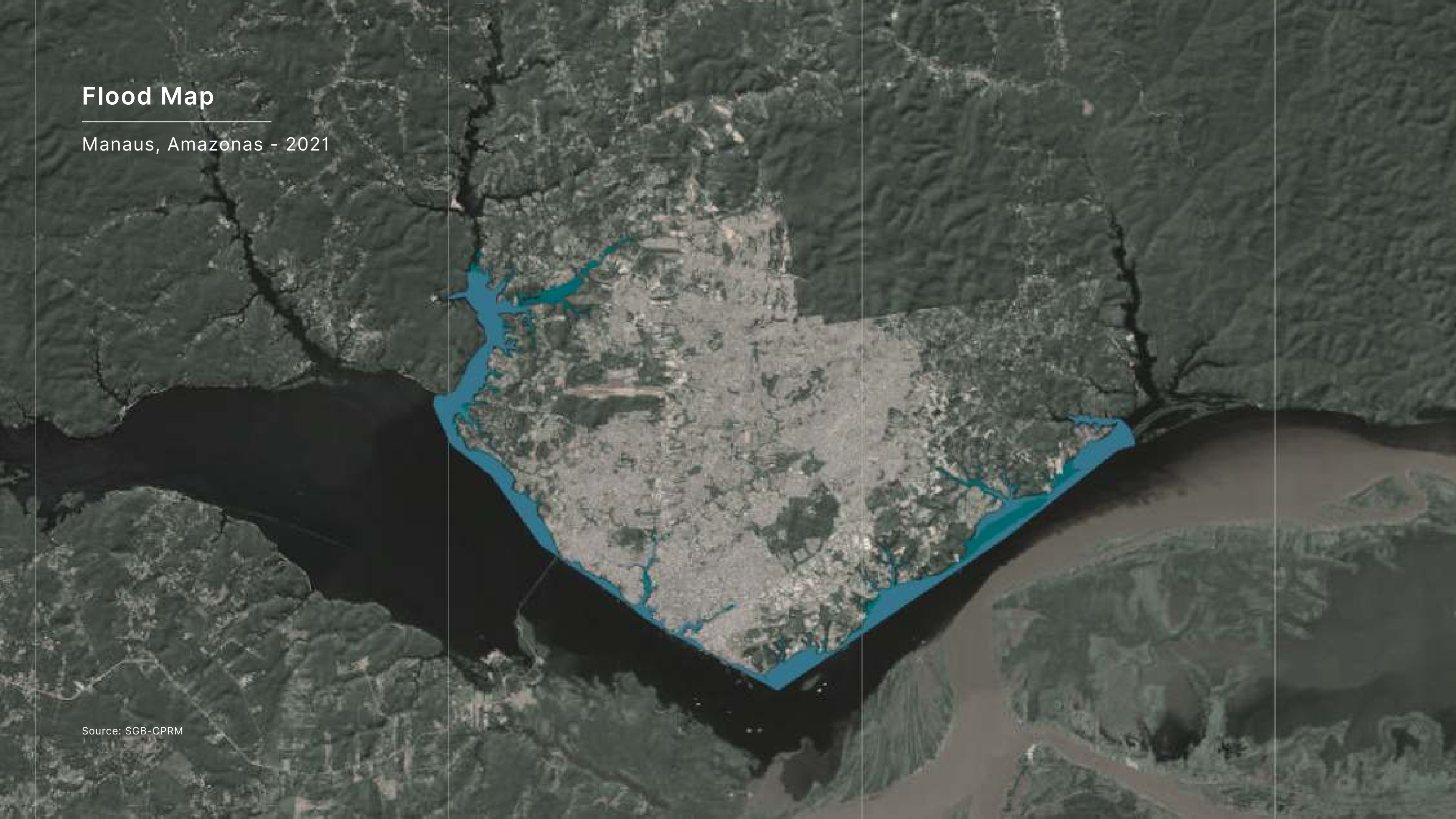
Source:



Flood Map

Manaus, Amazonas - 2021

Source: SGB-CPRM



Water Level

Manaus, Amazonas - 2021

Source: MapBiomas

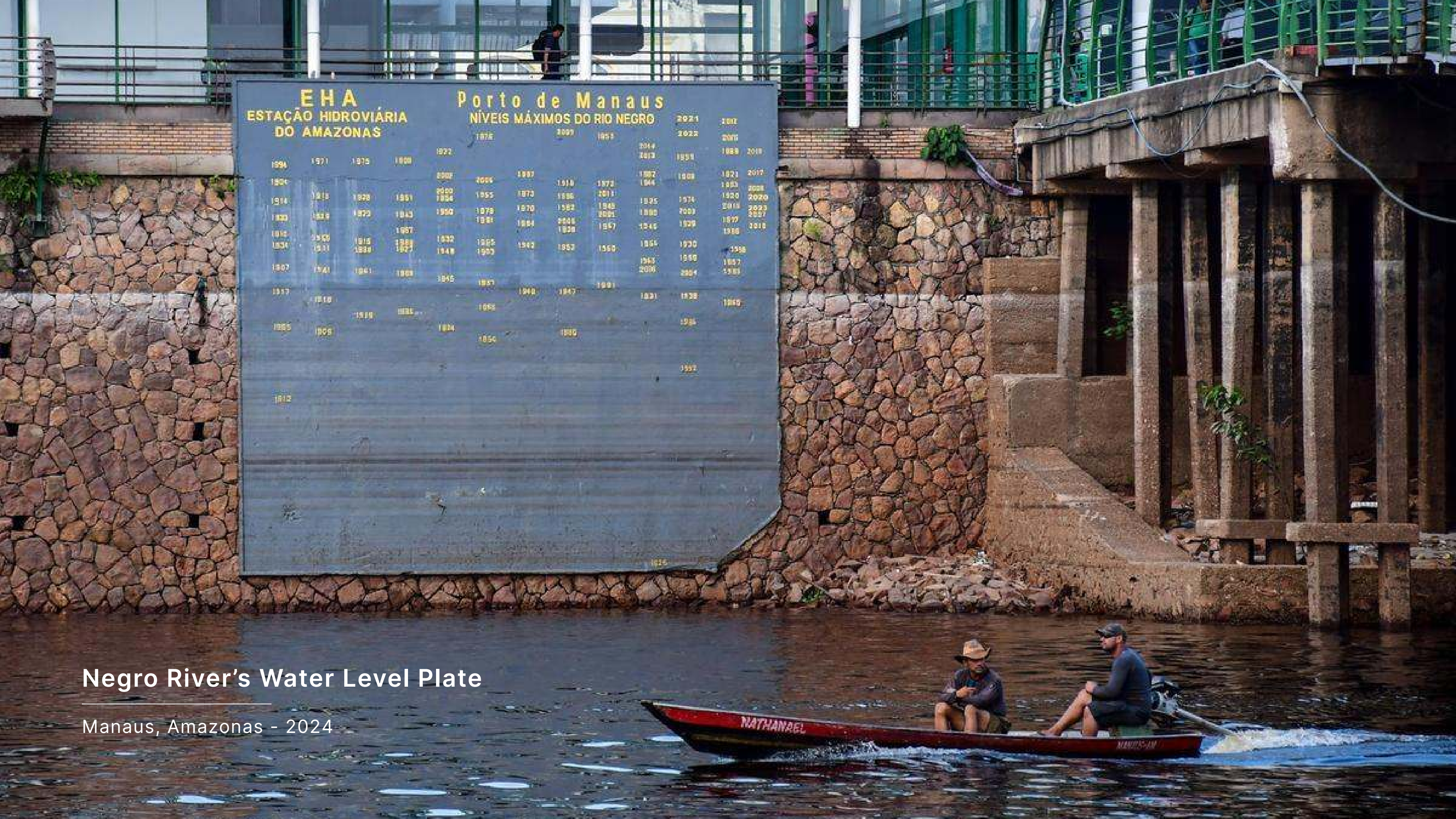


Water Level

Manaus, Amazonas - 2024

Source: MapBiomas





EHA					Porto de Manaus									
ESTAÇÃO HIDROVIÁRIA DO AMAZONAS					NÍVEIS MÁXIMOS DO RIO NEGRO									
1894	1971	1975	1988	1992	1976	2009	1953	2014	2021	2022	1981	2016	2018	2019
1904	1915	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1914	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1924	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1934	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1944	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1954	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1964	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1974	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1984	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
1994	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
2004	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
2014	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021
2024	1918	1928	1951	2000	2006	1987	1918	1972	1982	1988	1921	2017	2020	2021

Negro River's Water Level Plate

Manaus, Amazonas - 2024



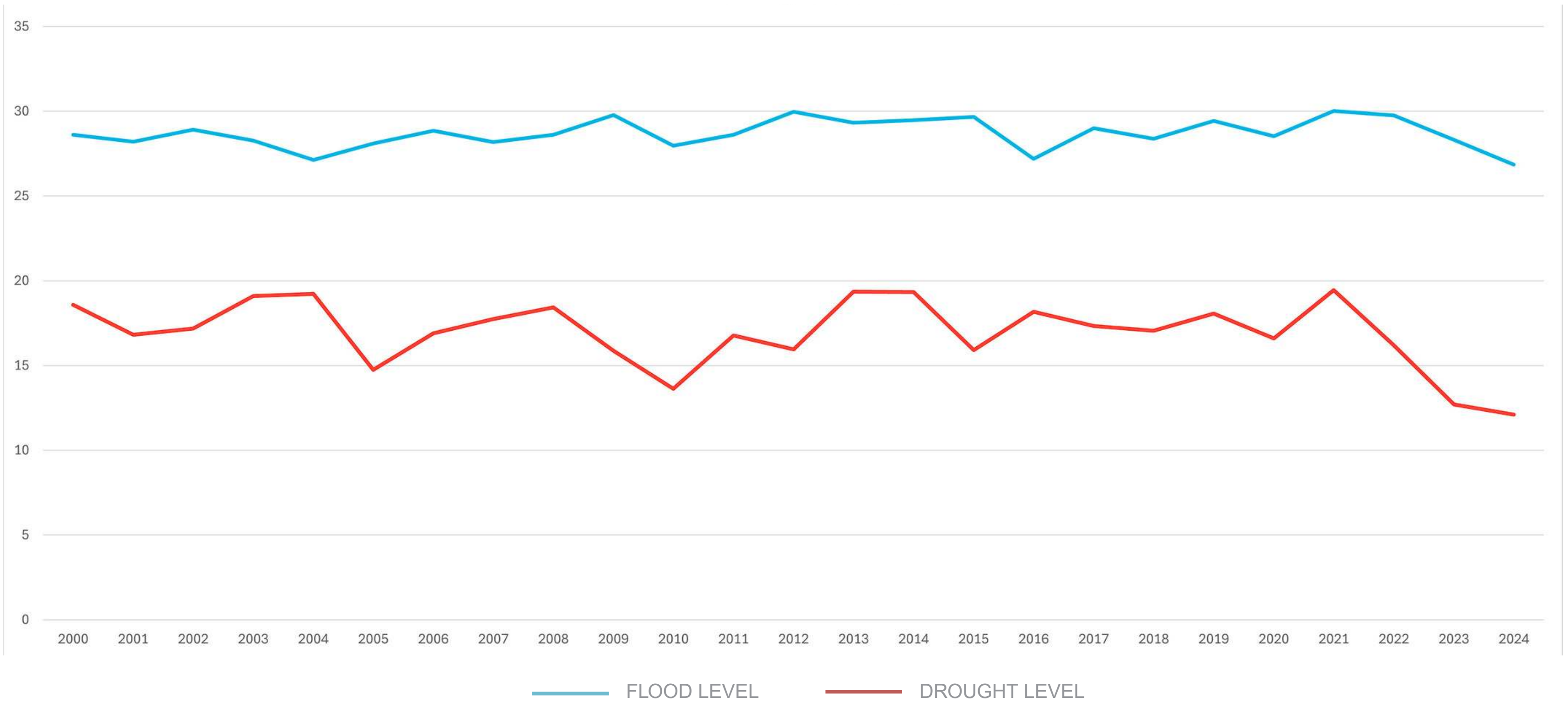
Historic drought: Amazon rivers reach record lows

“Where is the river that ran through here?”

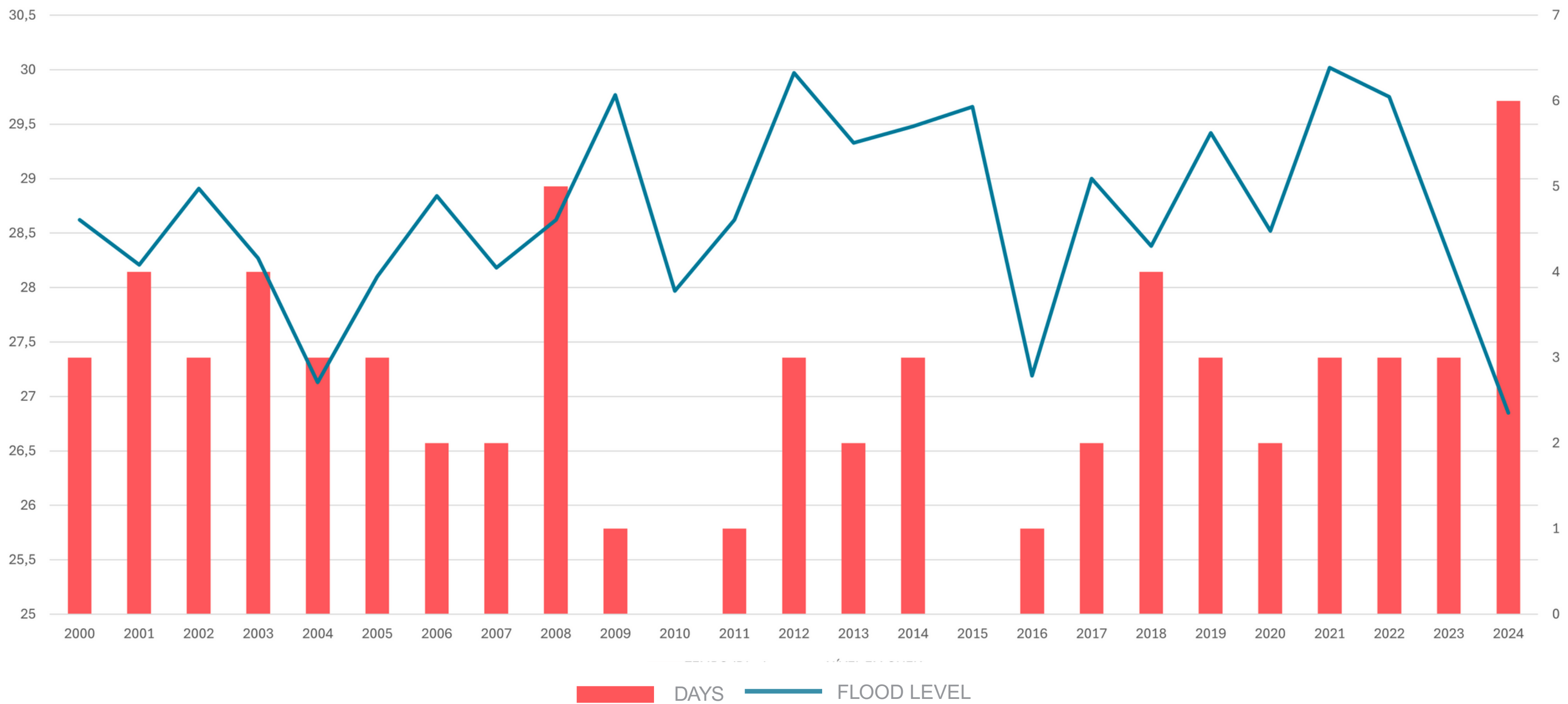
Green Peace, 2023



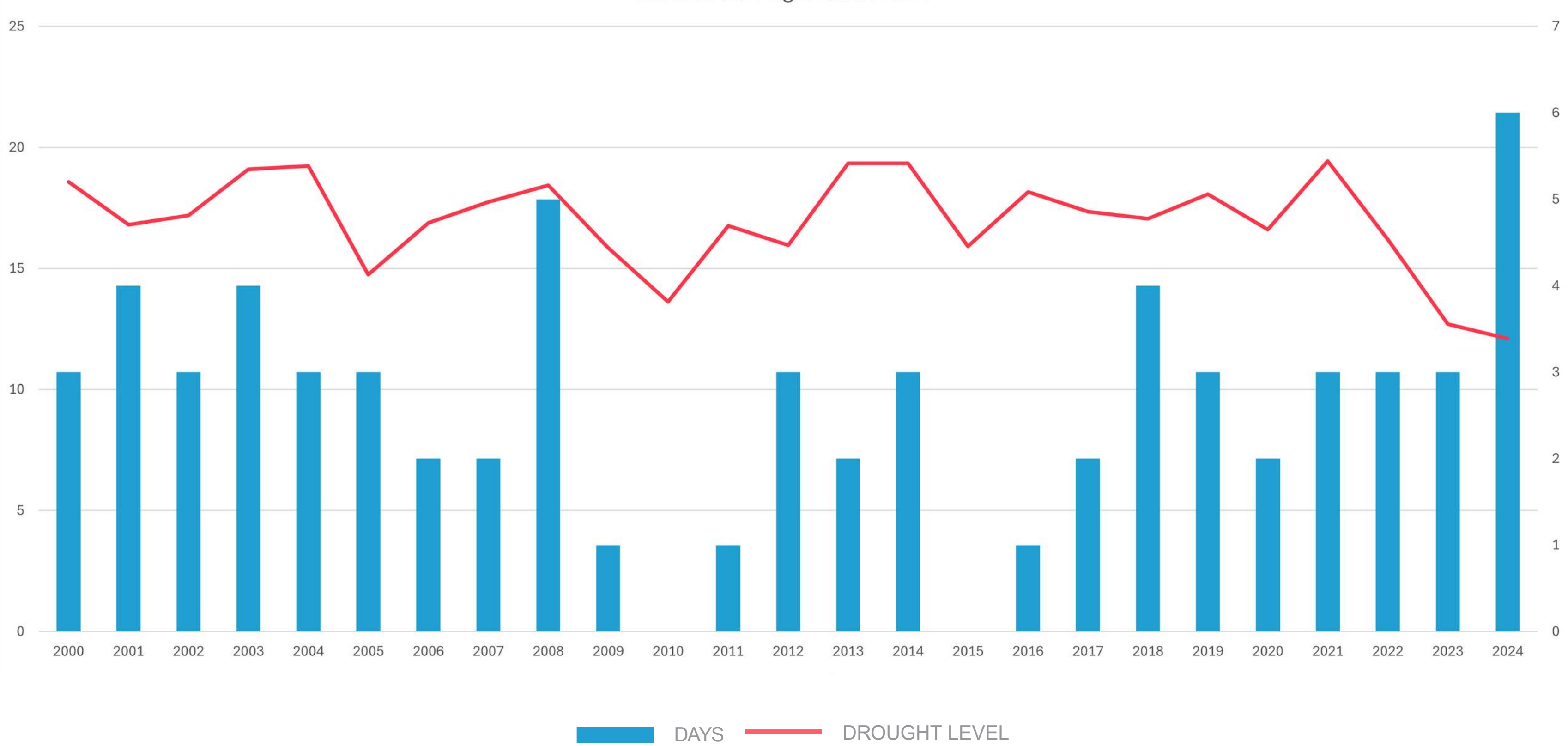
Negro River's Level 2000/2024



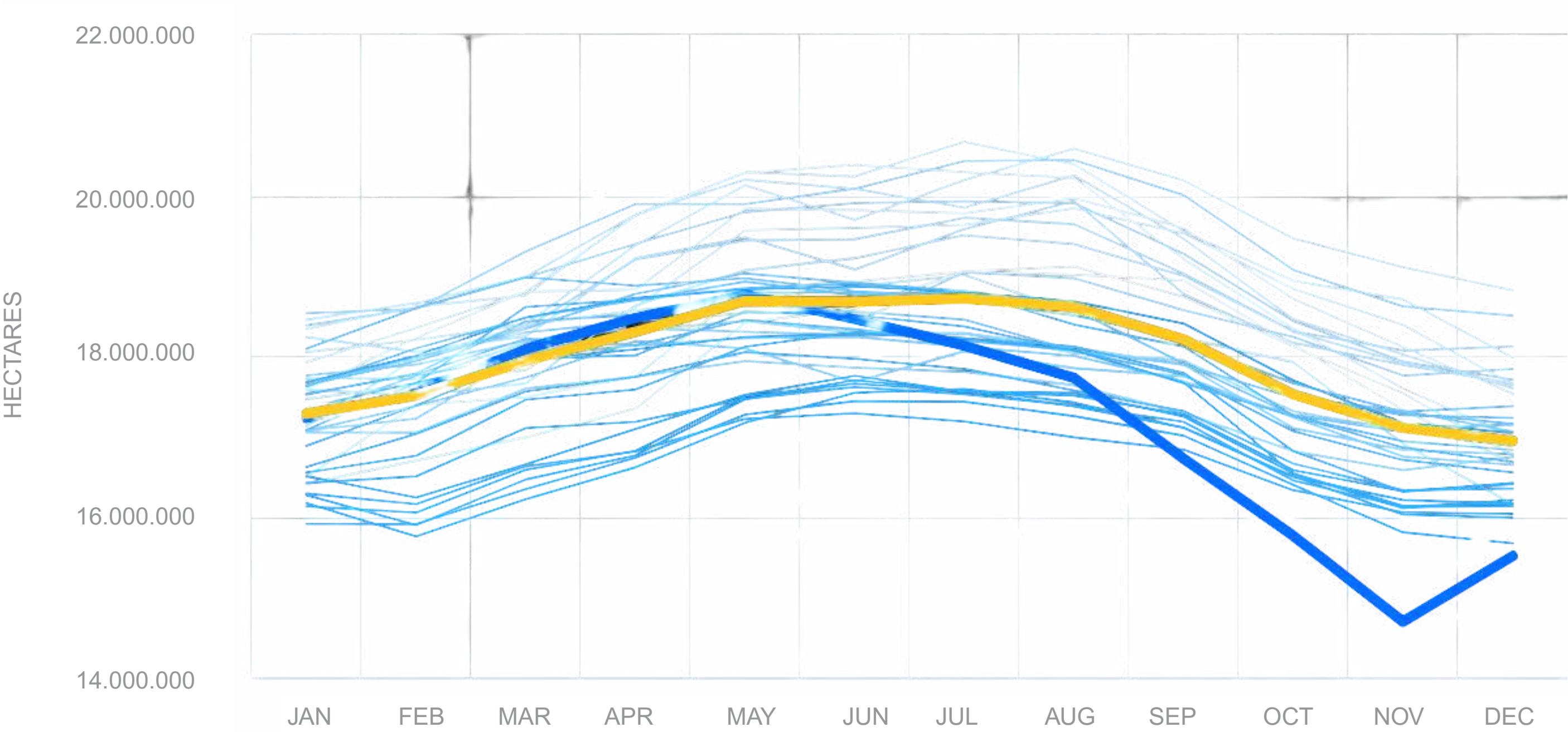
Negro River's Level 2000/2024



Negro River's Level 2000/2024



Monthly Water Surface Time Series - Brasil



MONTHLY WATER SURFACE OF 2024

AVERAGE MONTHLY WATER SURFACE OF 1985 TO 2024

MONTHLY WATER SURFACE OF 2024

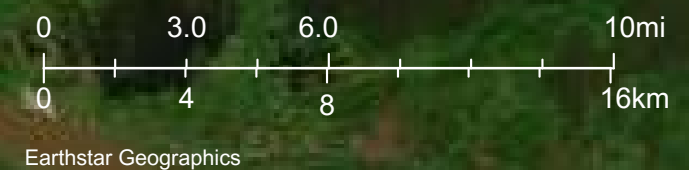
AVERAGE MONTHLY WATER SURFACE OF
1985 TO 2024

1985
2024

ADMINISTRATIVE DIVISION OF MANAUS



Cartographic Elaboration: Earth Geographics
Source: Arcgis - Administrative Division of Manaus



MODAL CONNECTIONS POINTS

A satellite map of Manaus, Amazonas, Brazil. The city is visible as a dense urban area in the center, surrounded by a vast expanse of green rainforest. A large river, the Negro River, flows through the city and into the Amazon River, which is visible in the lower right. The image is a mosaic of satellite tiles, showing some visible seams.

MANAUS

Amazonas, Brasil

Source: WebGIS Público – IPAAM

PUBLIC TRANSPORT TERMINALS

- T1- Centro
- T2- Cachoeirinha
- T3-Cidade Nova
- T4-Cidade De Deus
- T5-São Operário
- T6-Parque Das Tribos
- T7-Puraquequara



MODAL CONNECTIONS POINTS AND TERMINALS

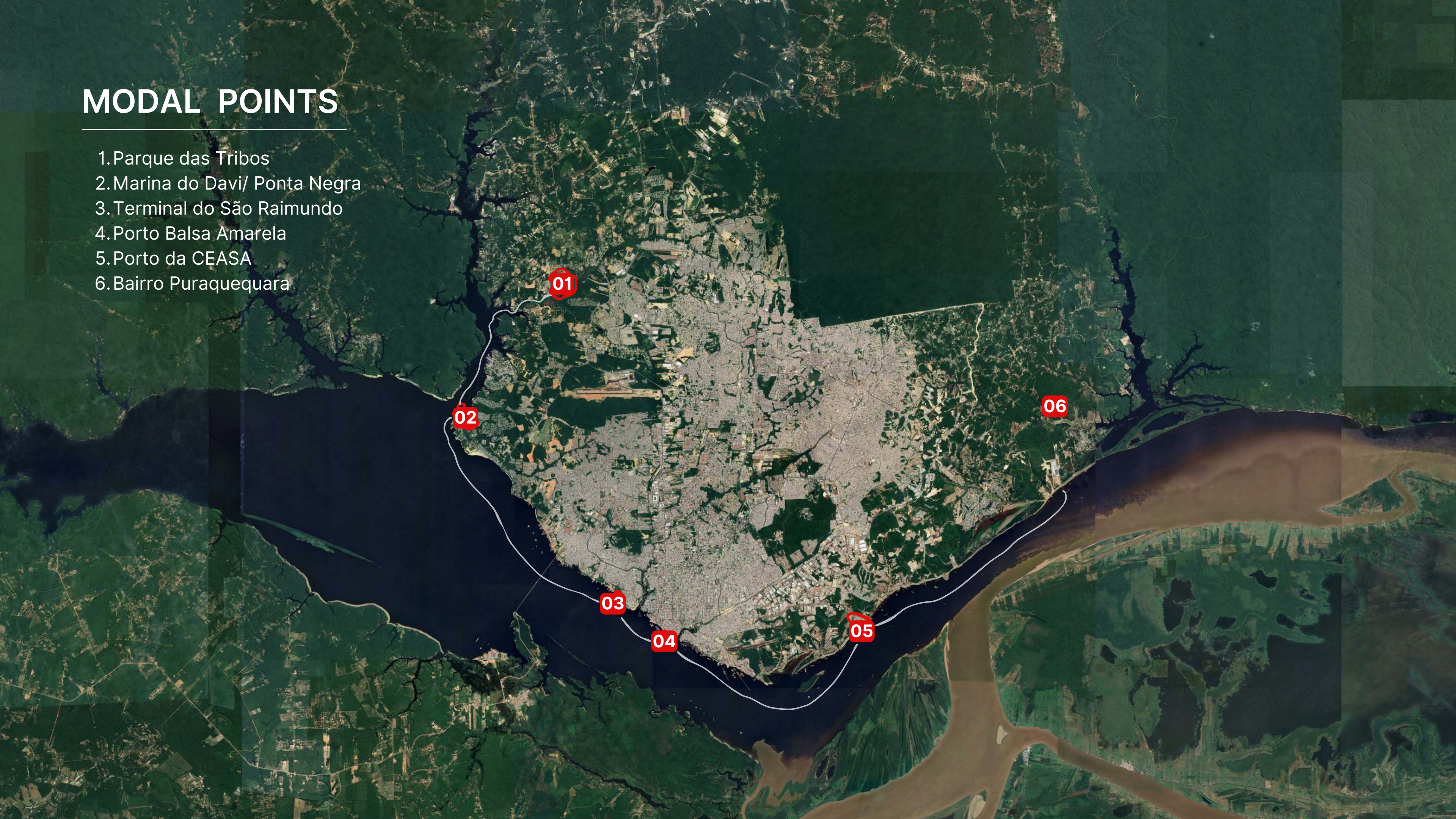
T1- Centro
T2- Cachoeirinha
T3-Cidade Nova
T4-Cidade De Deus
T5-São Operário
T6-Parque Das Tribos
T7-Puraquequara

1.Parque das Tribos
2.Marina do Davi/ Ponta Negra
3.Terminal do São Raimundo
4.Porto Balsa Amarela
5.Porto da CEASA
6.Bairro Puraquequara



MODAL POINTS

- 1.Parque das Tribos
- 2.Marina do Davi/ Ponta Negra
- 3.Terminal do São Raimundo
- 4.Porto Balsa Amarela
- 5.Porto da CEASA
- 6.Bairro Puraquequara





PARQUE DAS TRIBOS

Manaus, Amazonas

TARUMÃ-AÇU REGION





PARQUE DAS TRIBOS

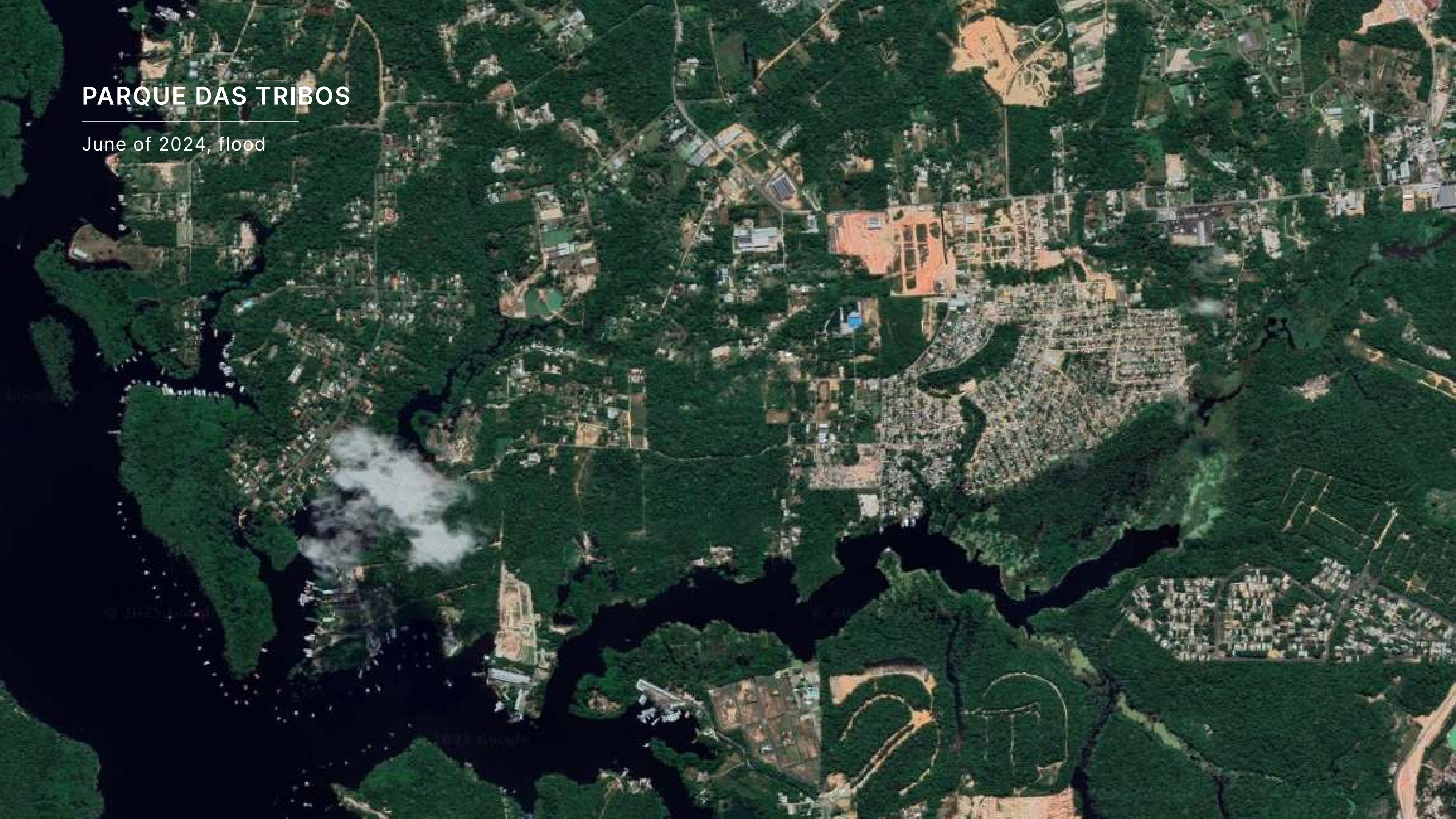
PARQUE DAS TRIBOS

June of 2021, flood



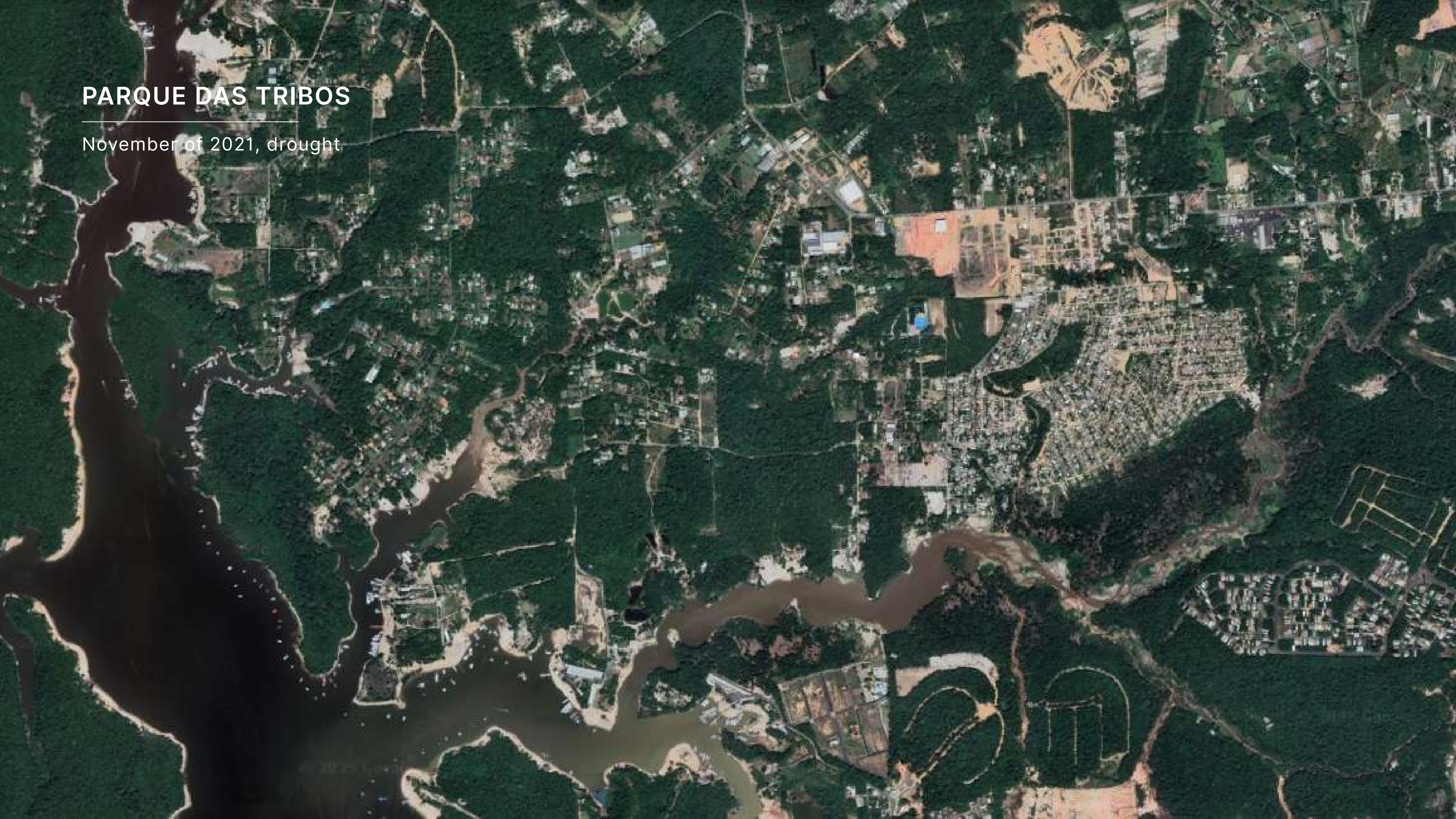
PARQUE DAS TRIBOS

June of 2024, flood



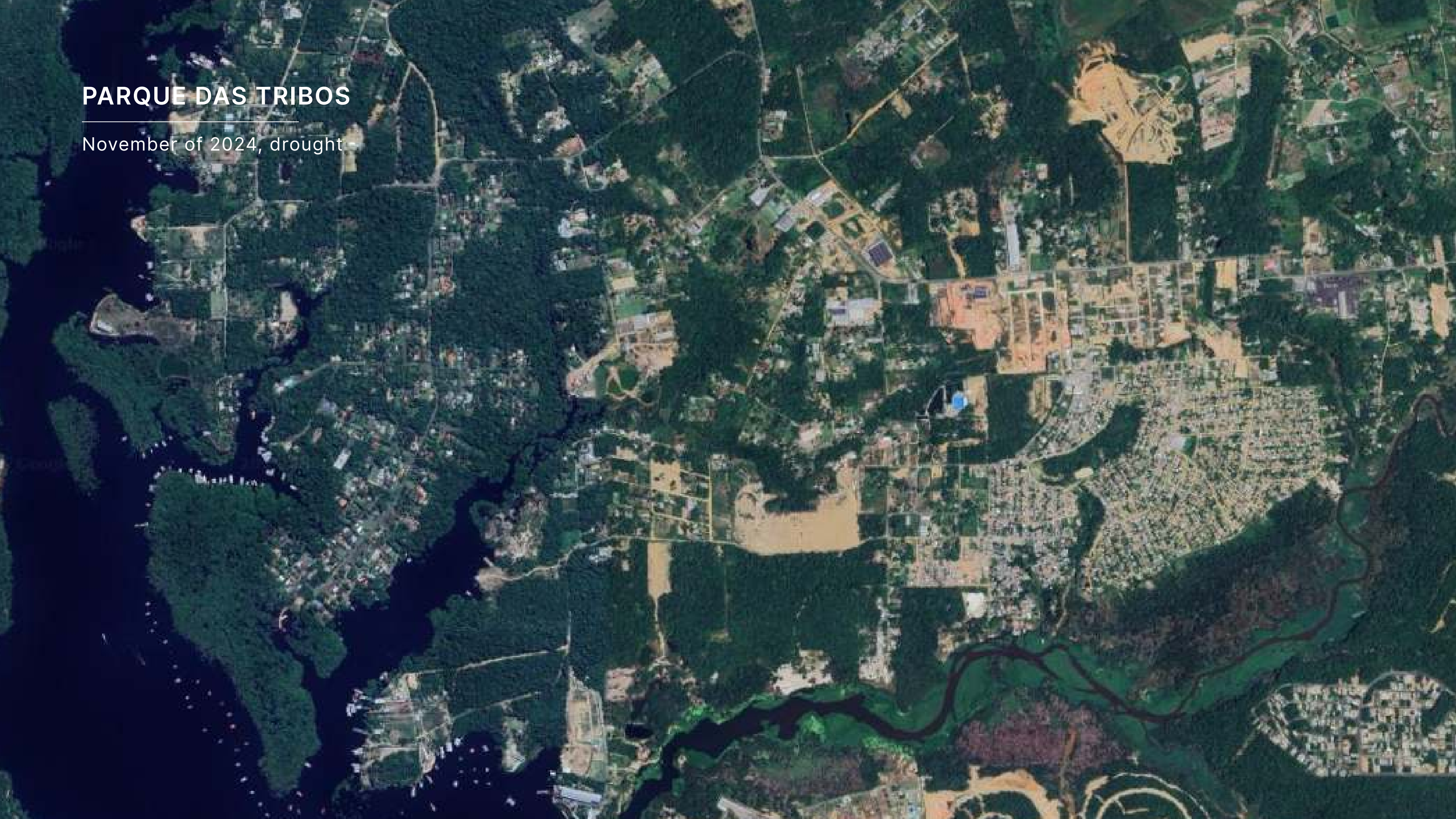
PARQUE DAS TRIBOS

November of 2021, drought



PARQUE DAS TRIBOS

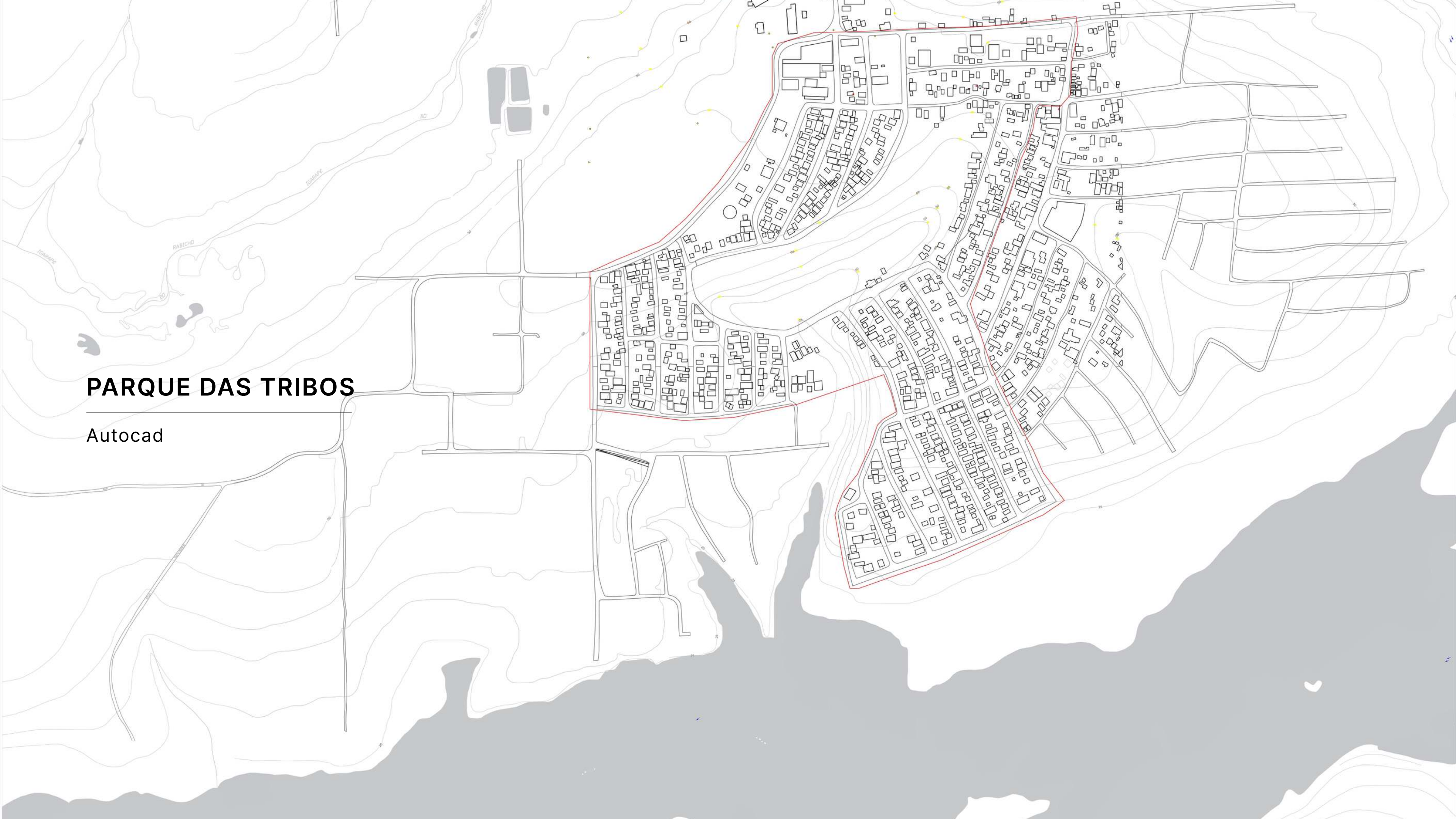
November of 2024, drought

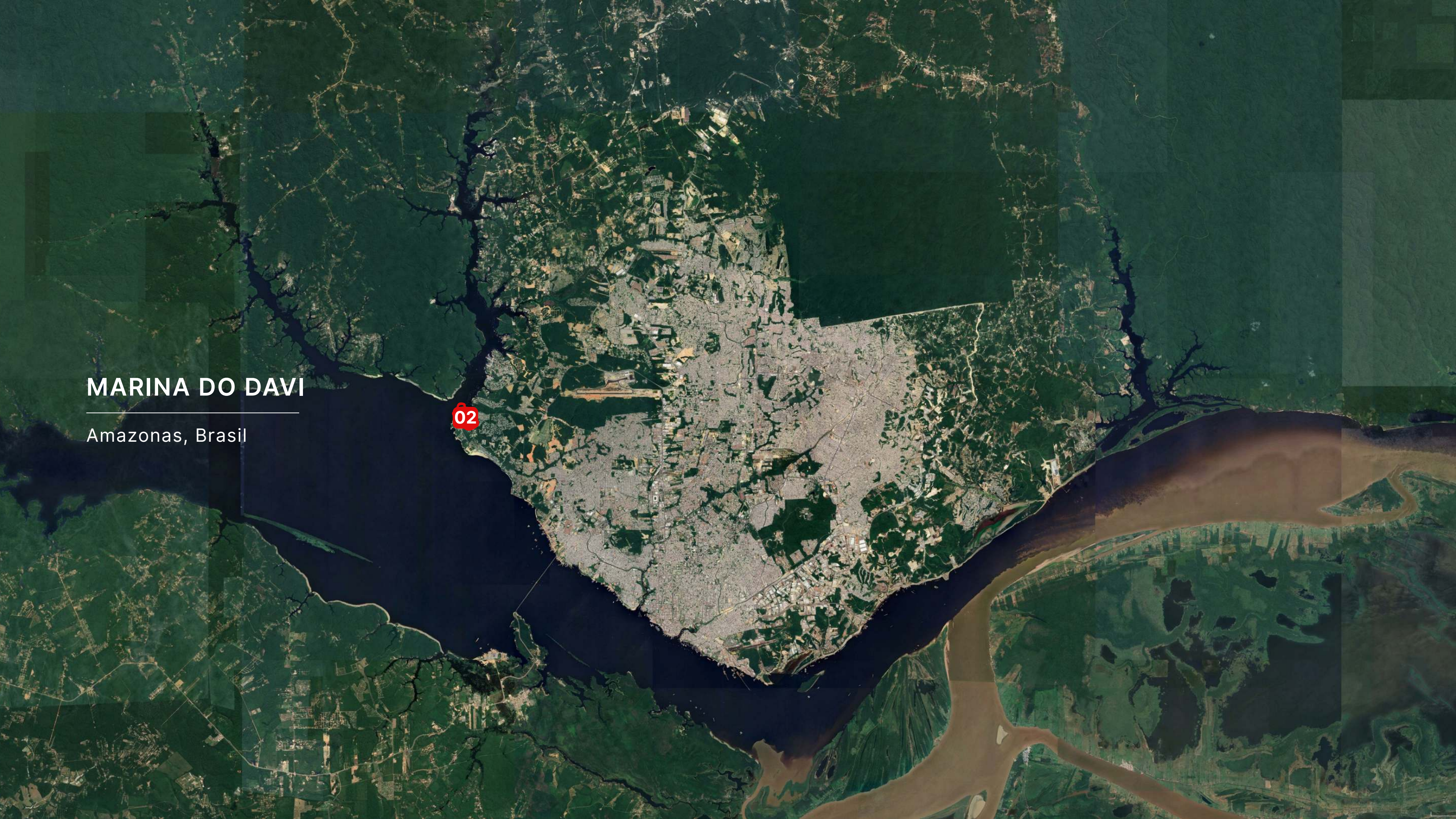




PARQUE DAS TRIBOS

Autocad



A satellite map of the Marina do Davi area in Amazonas, Brazil. The image shows a large, dark, irregularly shaped body of water (the marina) in the center. To the left of the marina is a dense, green forested area. To the right is a large, light-colored, sandy or silty area, possibly a beach or a large river delta. The background is a vast, dark green forested area. A red location pin with the number '02' is placed on the left side of the marina, near the forested area.

MARINA DO DAVI

Amazonas, Brasil

MARINA DO DAVI

Amazonas, Brasil

MARINA DO DAVI

June of 2021, flood



MARINA DO DAVI

February of 2024, drought





MARINA DO DAVI

June of 2021, flood

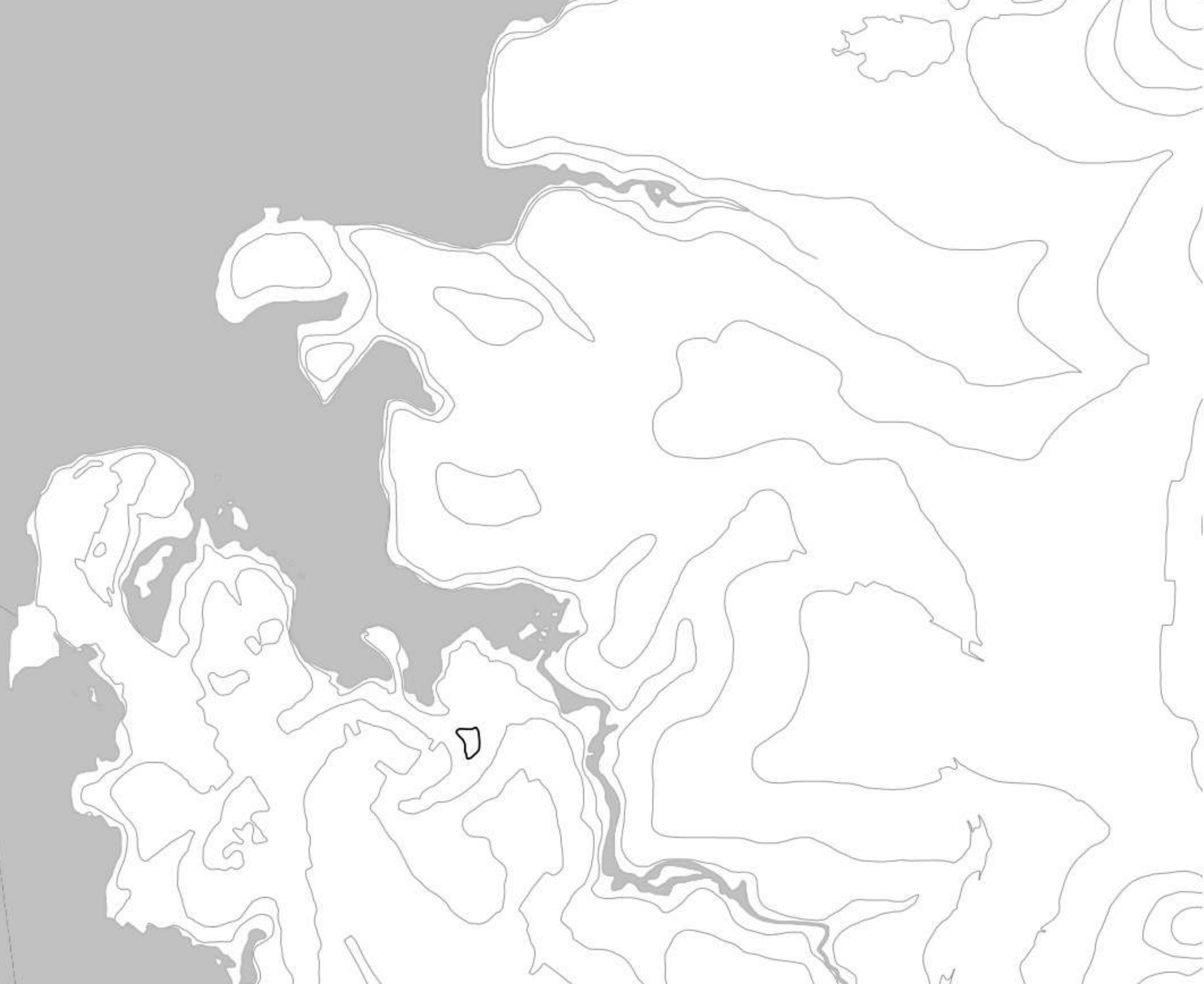
MARINA DO DAVI

February 2024, drought



MARINA DO DAVI

Topographic Map - Autocad



PORTO DO SÃO RAIMUNDO

Amazonas, Brasil

03



PORTO SÃO RAIMUNDO

June of 2021, flood



PORTO SÃO RAIMUNDO

Outubro de 2021, drought



PORTO SÃO RAIMUNDO

PORTO SÃO RAIMUNDO

September of 2023, drought



PORTO SÃO RAIMUNDO

November of 2024, drought



PORTO SÃO RAIMUNDO

Autocad Map



PORTO SÃO RAIMUNDO

Roads and Buildings Map - Autocad



PORTO SÃO RAIMUNDO

Topographic Map - Autocad



PORTO DE MANAUS

Amazonas, Brasil

04



PORTO DE MANAUS

Amazonas, Brasil



PORTO DE MANAUS

June of 2021, flood



PORTO DE MANAUS

September of 2021, drought



PORTO DE MANAUS

June of 2024, flood



PORTO DE MANAUS

March of 2023



PORTO DE MANAUS

March of 2022



PORTO DE MANAUS

September of 2023



PORTO DE MANAUS

Autocad Map



PORTO DE MANAUS

Roads and Buildings Map - Autocad

PORTO DE MANAUS

Topographic Map - Autocad



PORTO DA CEASA

Amazonas, Brasil





PORTO DA CEASA

Amazonas, Brasil



PORTO DA CEASA

June of 2021, flood



PORTO DA CEASA
September of 2024, drought



COMUNIDADE VILA NOVA

June of 2021, flood



COMUNIDADE VILA NOVA

September of 2024, drought



COMUNIDADE VILA NOVA

June of 2021, flood



PORTO DA CEASA

April of 2023



PORTO DA CEASA

October of 2023







PORTO DA CEASA

Autocad Map

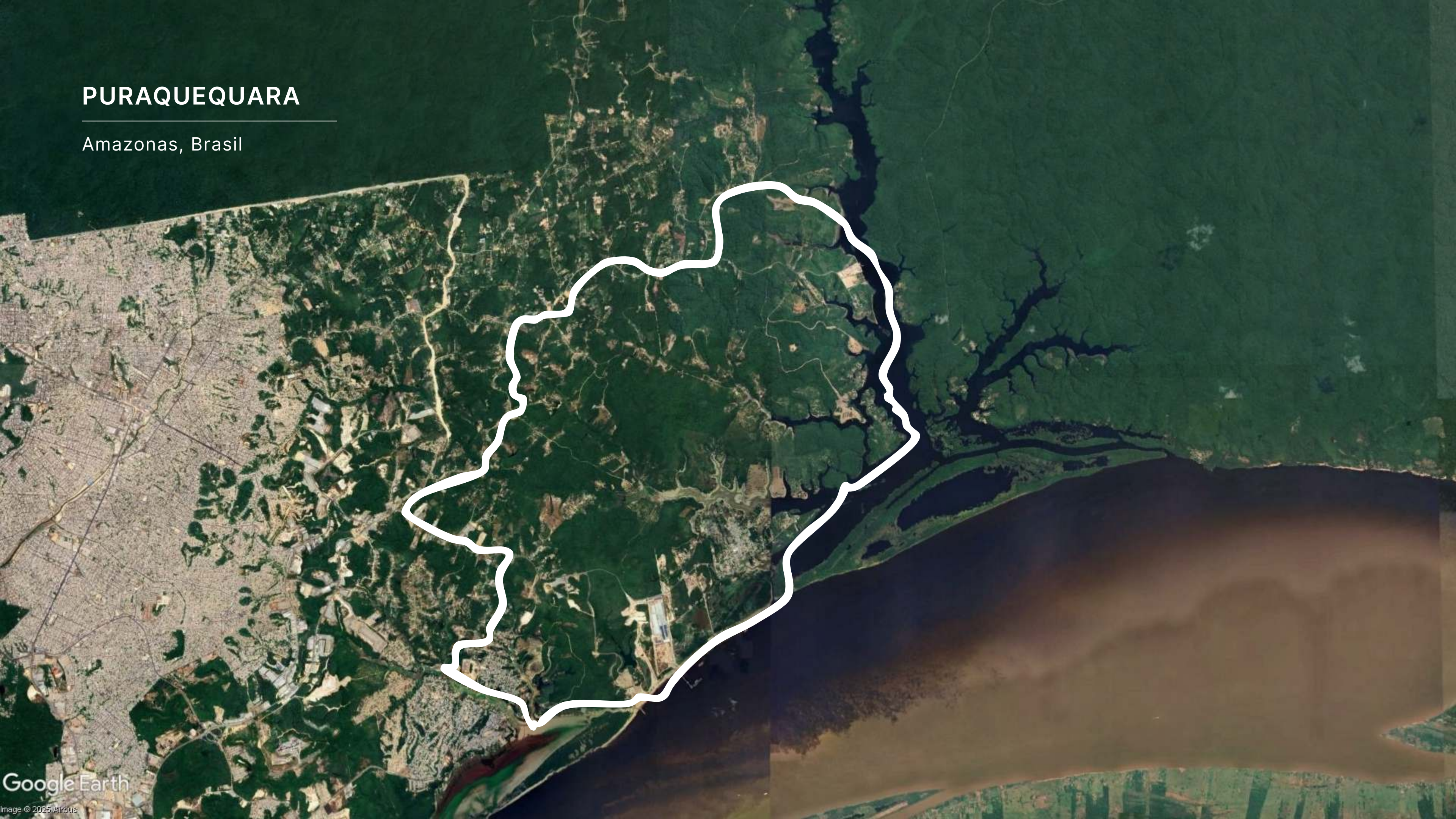
PURAQUEQUARA

Amazonas, Brasil

06

PURAQUEQUARA

Amazonas, Brasil





PURAQUEQUARA

June of 2021, flood



PURQUEQUARA

September of 2024, drought



PURAQUEQUARA

June of 2021, flood





PURAQUEQUARA

September of 2024, drought





PURAQUEQUARA

June of 2021, flood



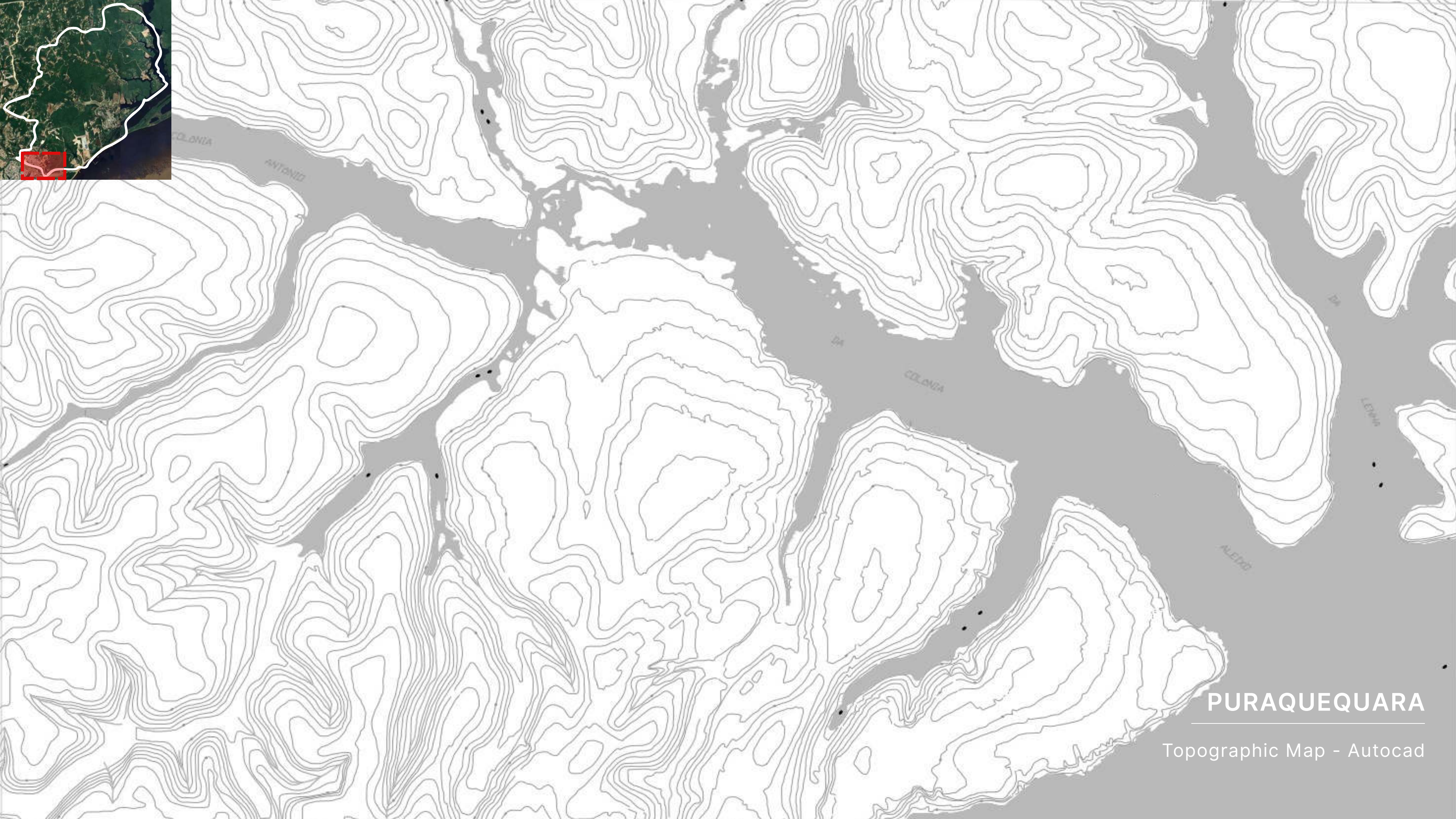
PURAQUEQUARA

September of 2024, drought



PURAQUEQUARA

Autocad Map



PURAQUEQUARA

Topographic Map - Autocad



PURAQUEQUARA

Roads and Buildings Map -
Autocad

PURAQUEQUARA LAKE

May of 2023



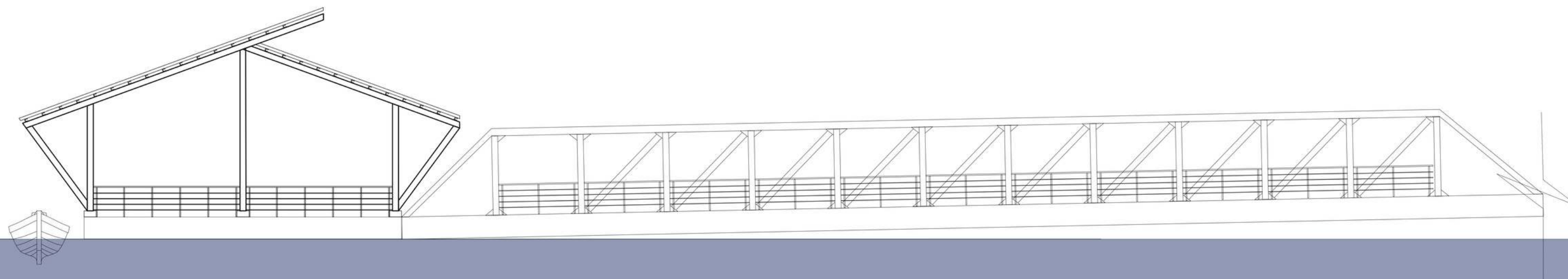


PURAQUEQUARA LAKE

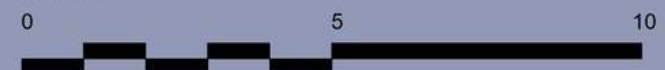
October of 2023

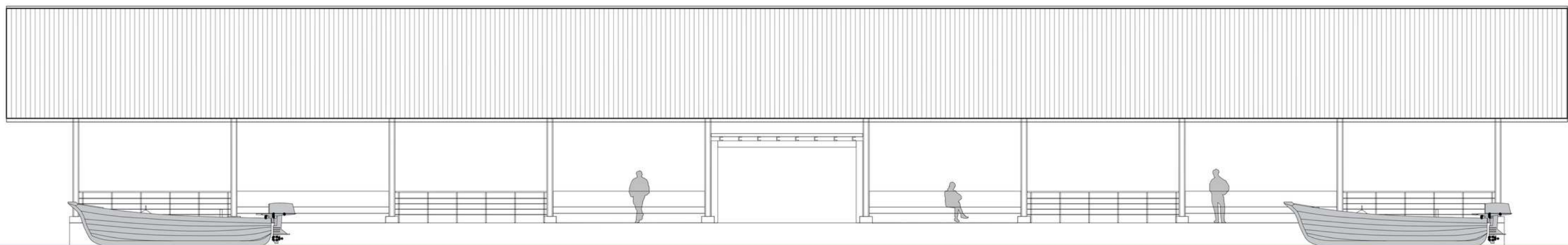
MODAL CONNECTIONS POINTS





SCALE





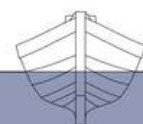
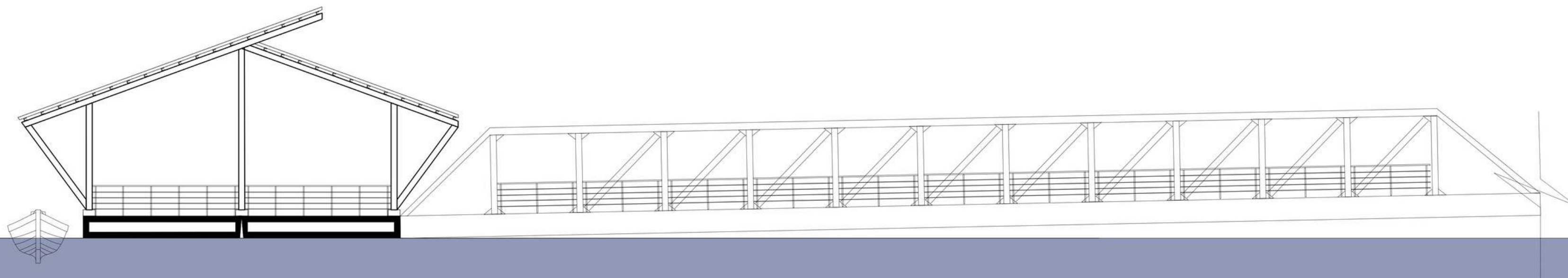
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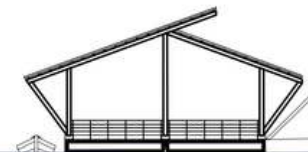
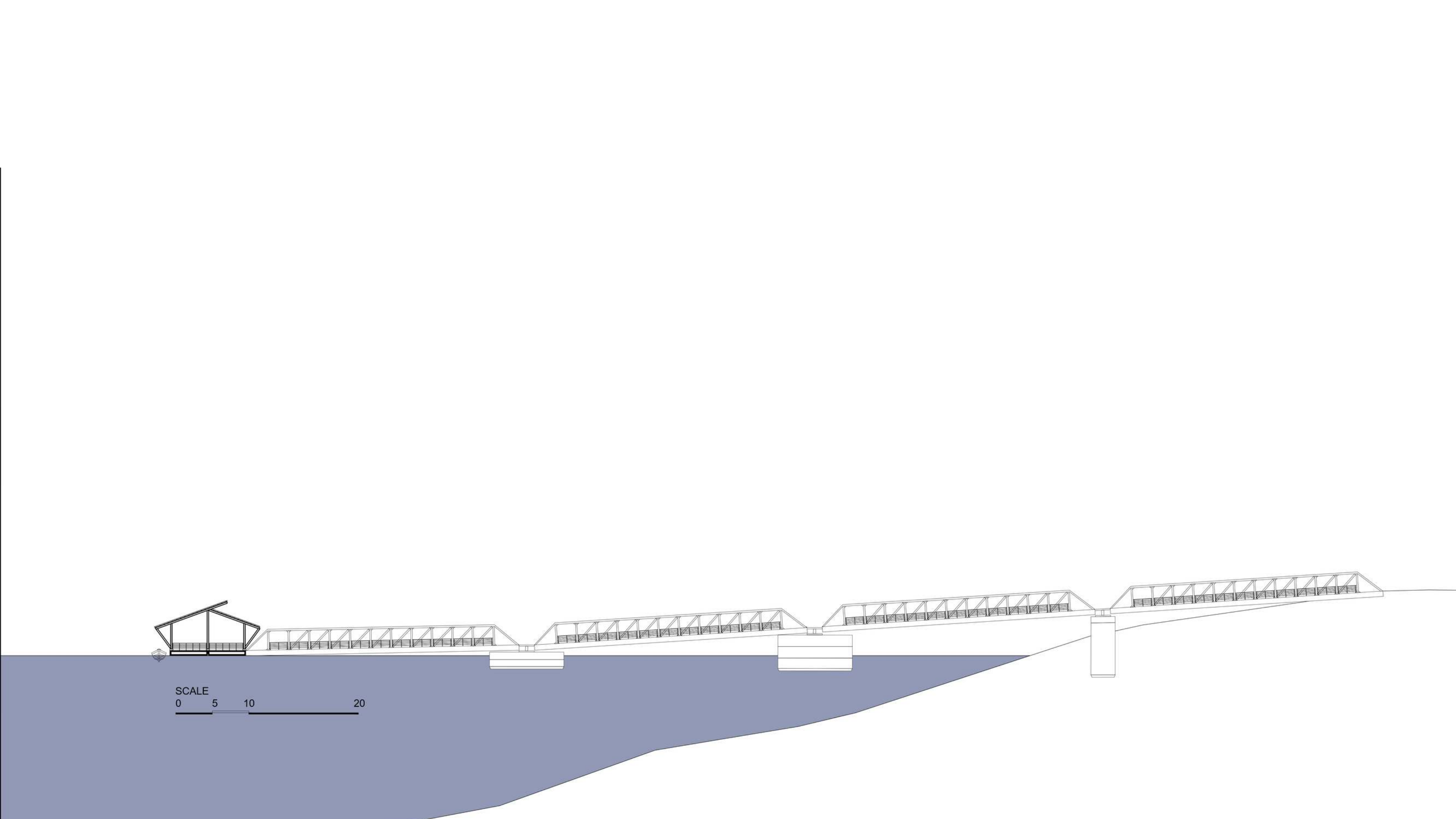
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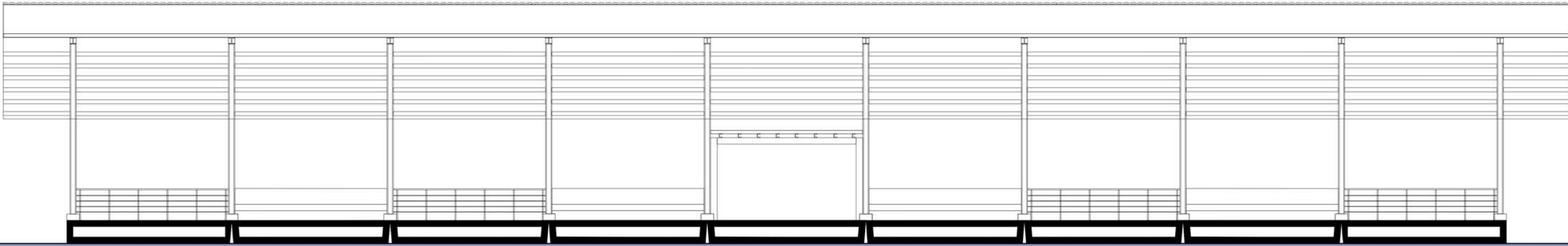
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SCALE
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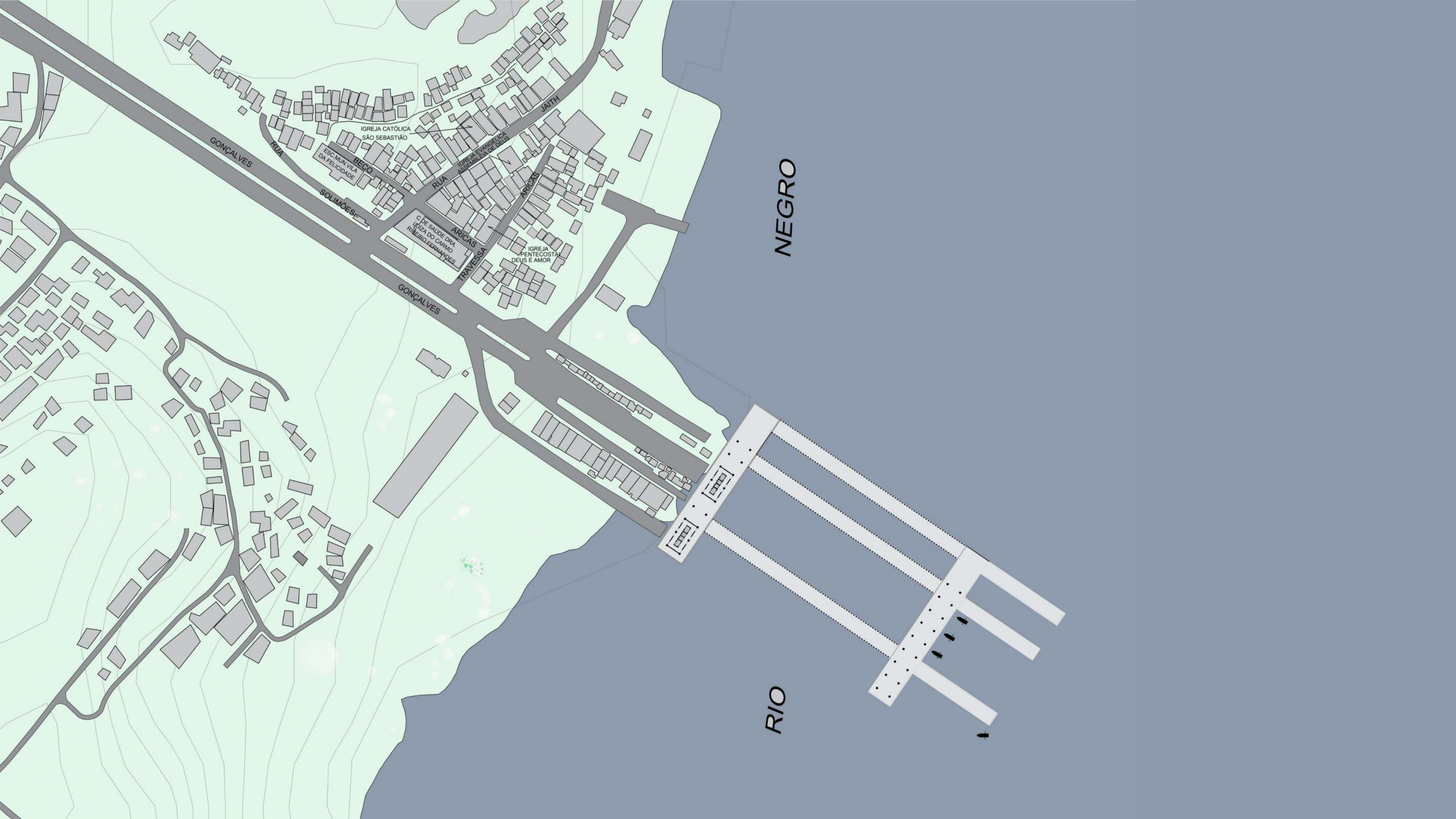
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10







NEGRO

RIO



