May Assessment of Brazil Floods: May 2024 – OPP AAR

Query requirements

Heavy rainfall in Brazil has caused detrimental flooding since February. However, flooding continues to negatively impact the communities. Please provide analysis on the locations provided, focusing on critical infrastructure and before and after imagery.

Product Release Data/Time

10 May 2024 / 1400 PT

Product Overview –

- Damage assessment and evac locations for Porto Alegre, Santa Maria, Lajeado, Canoas Air Base, Belem Novo Water Treatment Plant, US Consulate, and Florianopolis Airport.
- Assessment shows flooded areas and estimated structures damaged, and impact to roads leading in and out of the Consulate
  - Approximately 159,000 structures affected in Porto Alegre
  - Approximately 11,500 structures affected in Lajeado
  - Partial flooding of Belem Novo water treatment facility

The imagery data and assessment provided in this operational planning product (OPP) is for informational purposes only. The assessment was conducted using commercially available information and has not been vetted. OPPs are unclassified and releasable pending your organization's Foreign Disclosure Office (FDO) process. Space Systems Command is not responsible for the further release or dissemination of this information after delivery.

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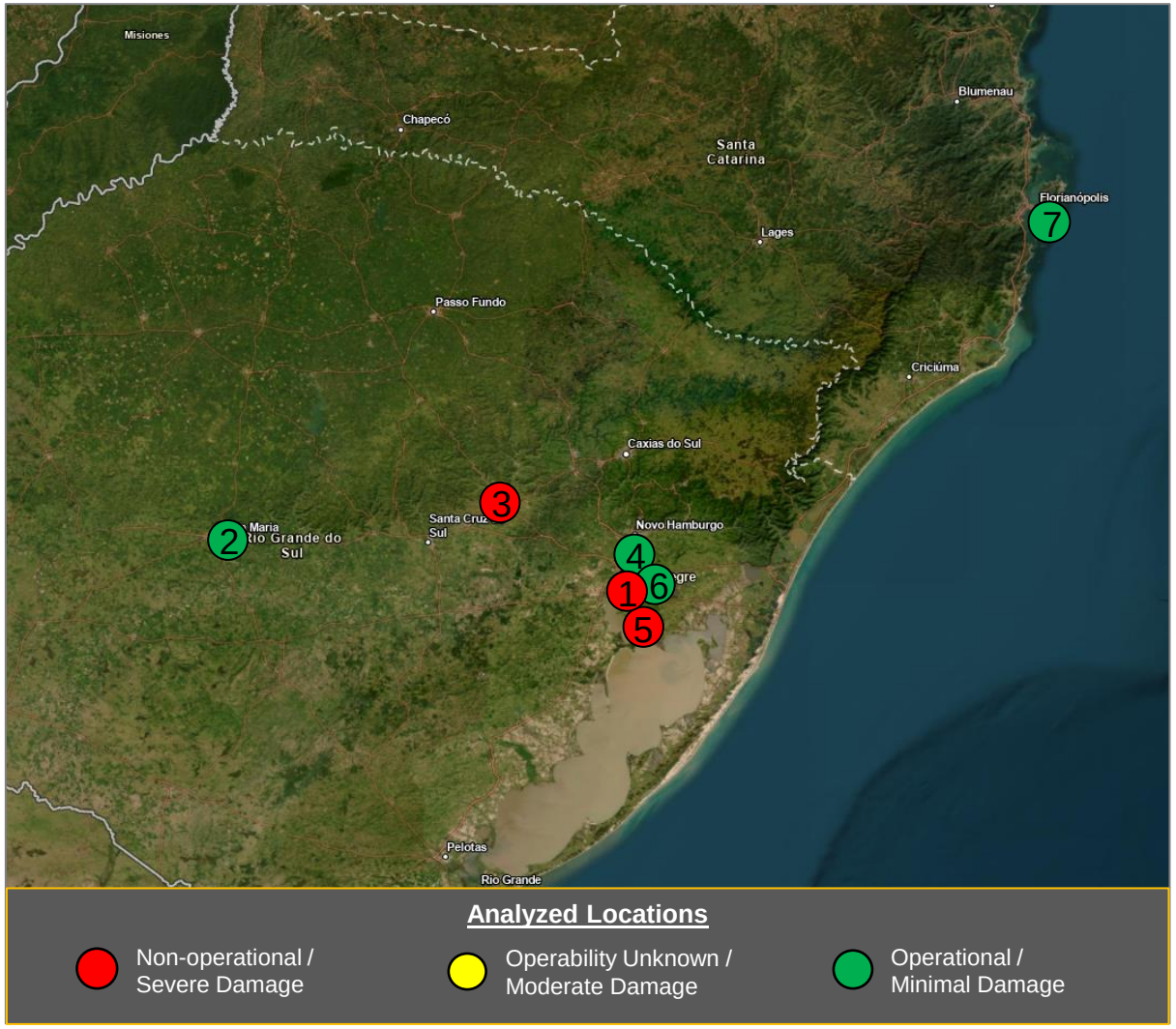
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Key Activity: BLUF - May 9, 2024



Priority	COUNTRY	AREA / ACTIVITY	Feature Name	Coordinates	MGRS
1	Brazil	Brazil Flooding / Damaged Area	Porto Alegre (City Center + Broader Metropolitan Area)	-30.07321, -51.18112	22JDM8254373088
2	Brazil	Camobi, Santa Maria	Base Aérea de Santa Maria (Brazilian Air Force Base)	-29.70270, -53.69462	22JBN3928911116
3	Brazil	Rio Grande do Sul	Lajeado	-29.44595, -51.99351	22JDN0364742193
4	Brazil	Brazil Flooding / Evac Location	Canoas Air Base (Base Aérea de Canoas (Brazilian Air Force Base))	-29.94010, -51.14870	22JDM8564987842
5	Brazil	Of the six water treatment plants (ETAs), the only one in operation	Belém Novo Water Treatment Plant (ETA)	-30.21411, -51.18028	22JDM8264957474
6	Brazil	Brazil Flooding / R. Bezerra de Menezes, 82 - Stella Maris, Alvorada - RS, 94856-040, Brazil	US Consulate	-30.01217, -51.16854	22JDM8374679854
7	Brazil	Brazil Flooding / Evac Location	Florianopolis International Airport	-27.67454, -48.54615	22JGQ4203136441

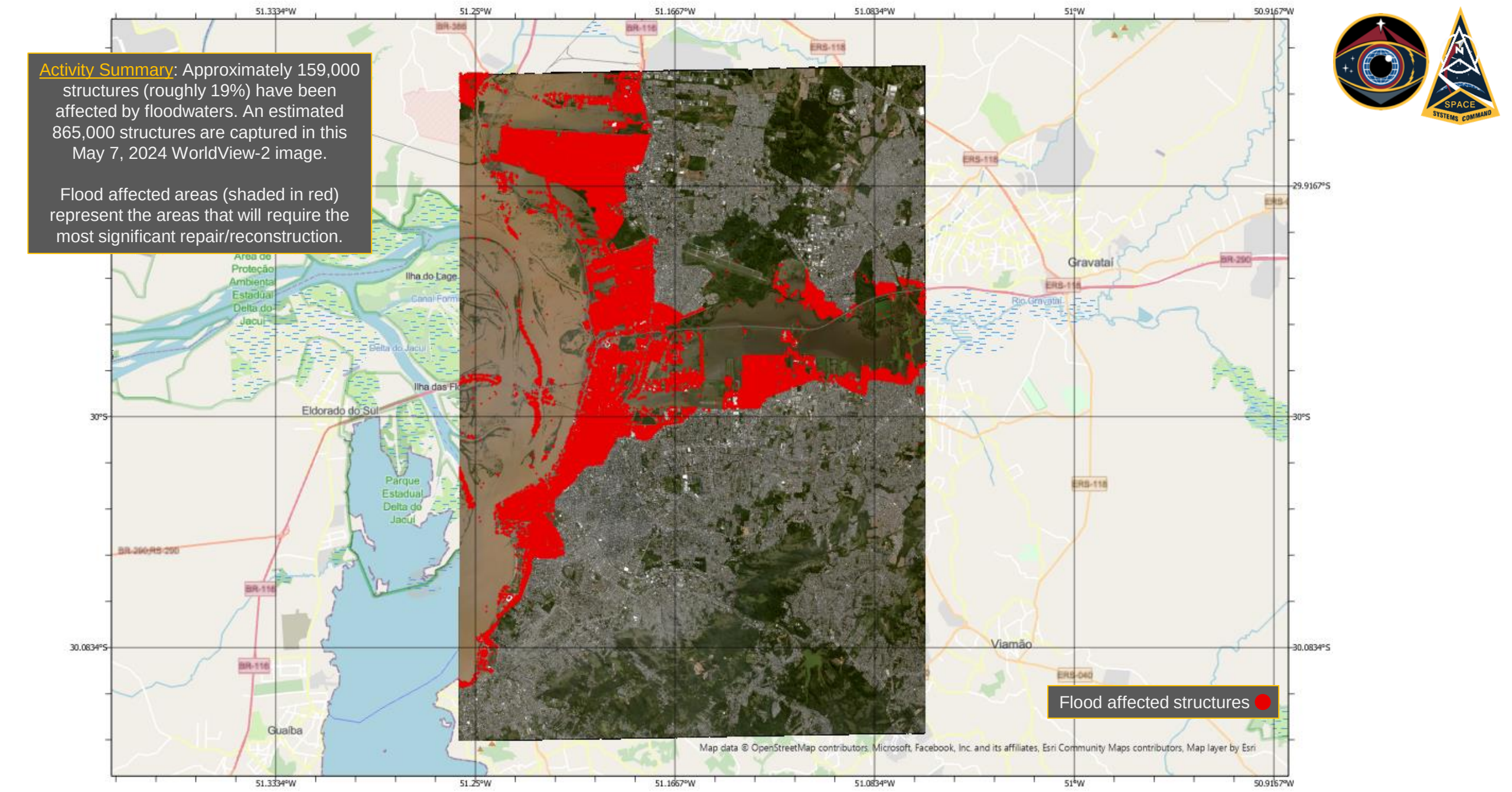


Overview of Flood Damage | Rio Grande Do Sul, Brazil | May 6, 2024 | Sentinel-2 Image @ 1340 UTC | Location: -29.71801, -52.29801

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Section 2

Porto Alegre, Brazil



Flood Affected Structures | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.99210, -51.15356



Flood Affected Structures – Centro Historico | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -30.03631, -51.23137



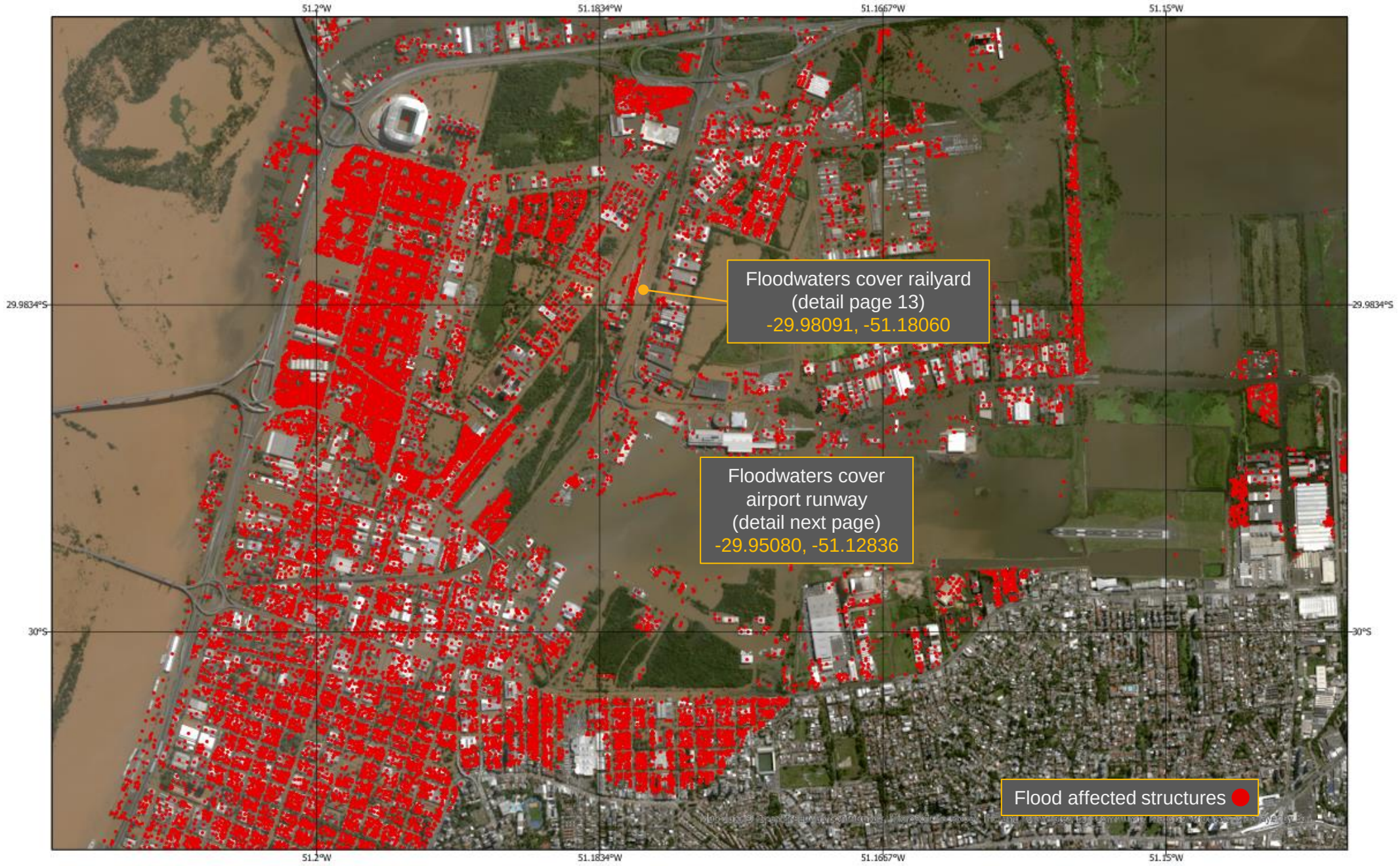
Flood Affected Structures – Santa Tereza | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -30.06227, -51.23202



Flood Affected Structures – Arquipelago | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.99563, -51.23126



Floodwaters Cover Part of Highway 116 | West of Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.99400, -51.21949



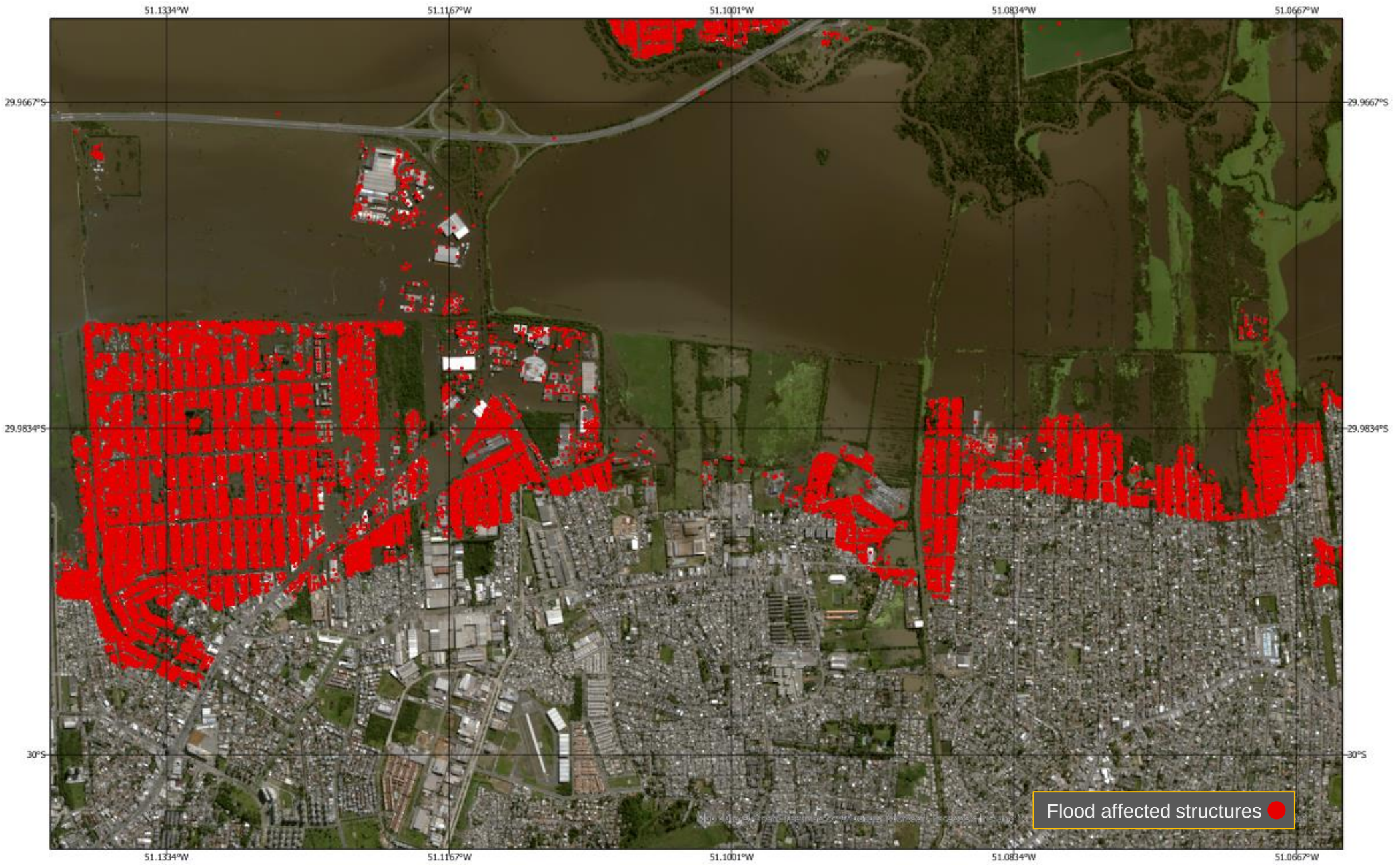
Flood Affected Structures – Salgado Filho International Airport| Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.98928, -51.17784



Floodwaters Salgado Filho Airport | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.95080, -51.12836



Floodwaters Cover Rail Station | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.98091, -51.18060

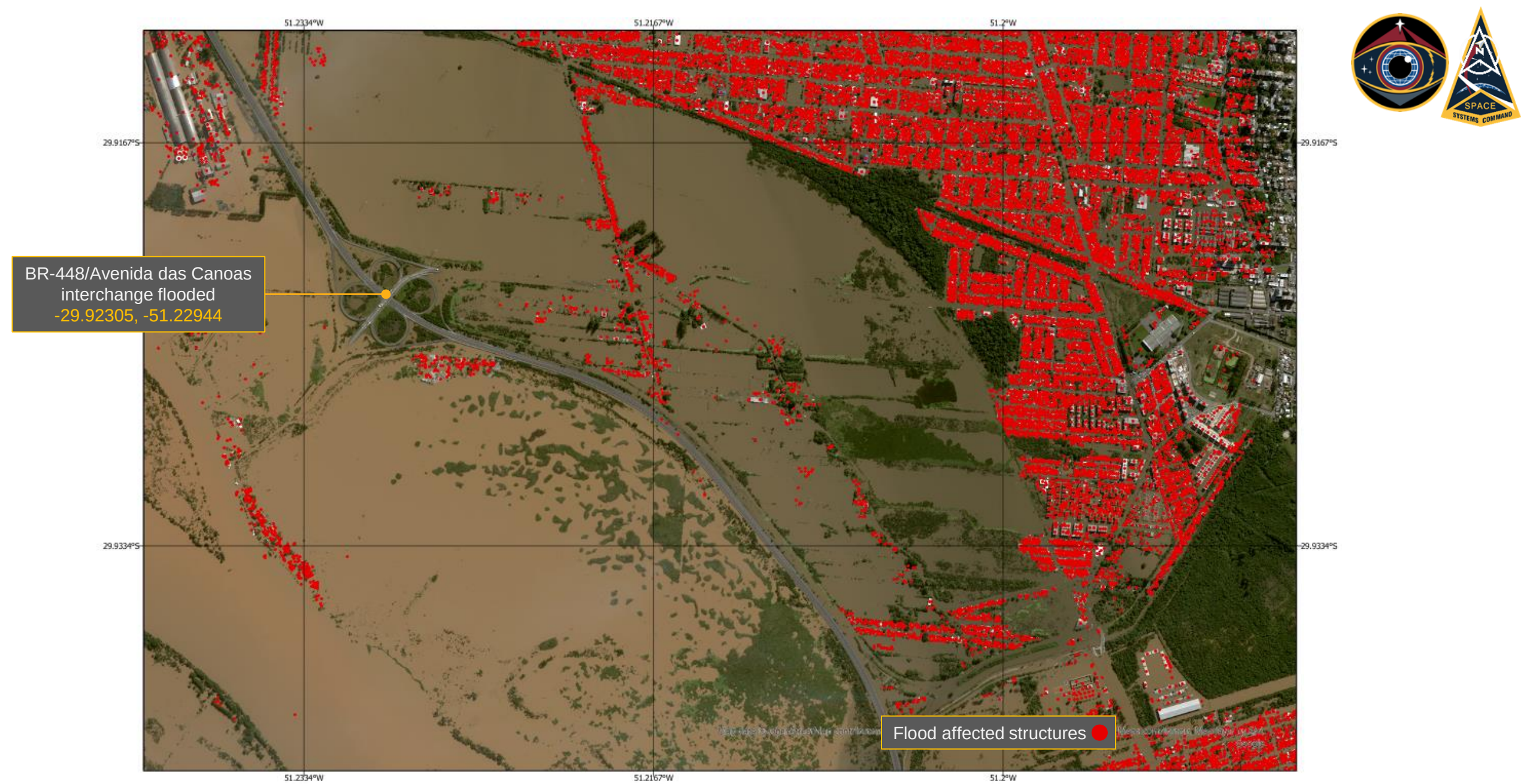


Flood Affected Structures – Santa Rosa de Lima | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.98388, -51.10123

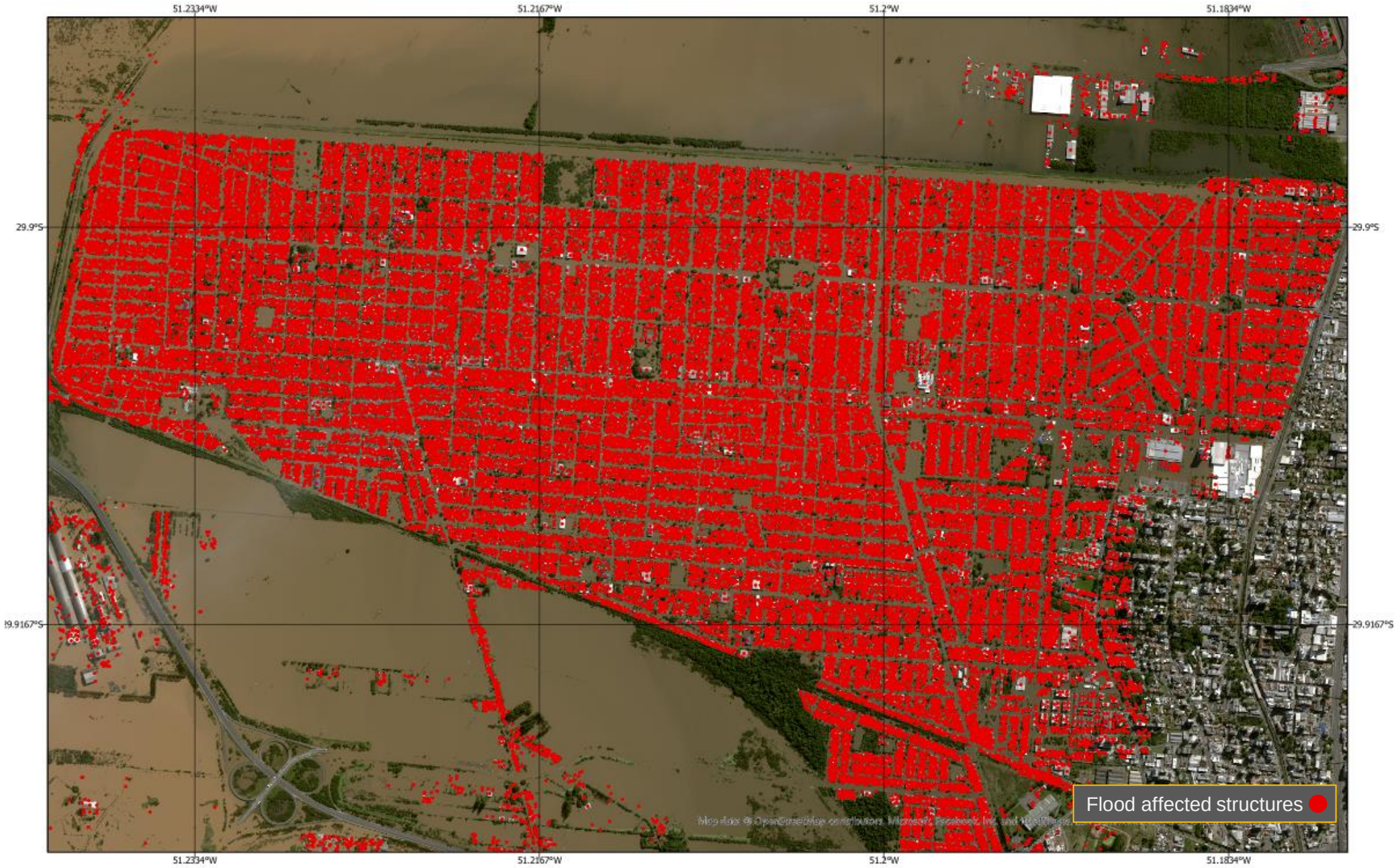

51.2°W
51.1834°W
51.1667°W
29.9667°S
Substation 9 flooded
-29.97109, -51.19639
Flood affected structures



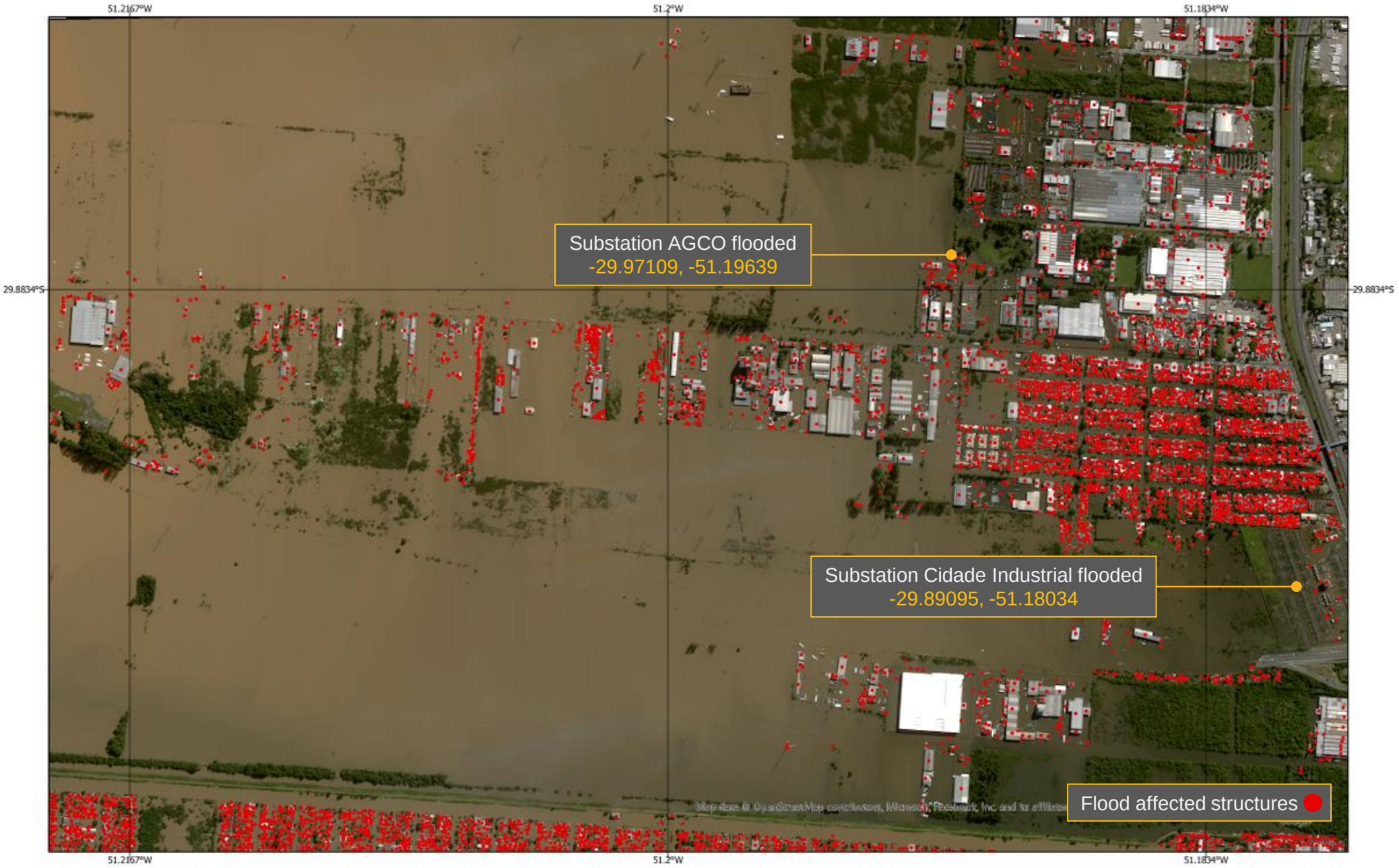
Flood Affected Structures – Fatima | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.94539, -51.19078



Flood Affected Structures – Villa Dona Maria Isabel | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.92623, -51.21559



Flood Affected Structures – Mathias Velho | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.90778, -51.21059



Flood Affected Structures – Moinho Estrela | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.88137, -51.19062



Flood Affected Structures – Cohab | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.96264, -51.10715



Flood Affected Structures – Americana/Sumare | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.98690, -51.08152

Section 3

Santa Maria Air Force Base, Brazil


Activity Summary: Santa Maria Air Force Base is likely operational and no significant damage or flooding was observed. (May 6, 2024).
Status operational
Flooding of low-lying areas north of Santa Maria Air Force Base along the Vacacaí-mirim River
-29.70498, -53.6728
Avenida João Machado Soares
Rua Gonçalves Ledo
Rua Pedro Américo
Avenida Prefeito Evandro Behr
Faixa Nova
Rua 01A
Avenida Rodolfo Behr
Rua Ary Vieira
Avenida Roraima
Rua Leste 4
Rua Sul 15
Rua Sul 20
Rua Sul 25
Rua Sul 30
Rua Sul 35
Rua Sul 40
Rua Sul 45
Rua Sul 60
Rua Sul 70
Rua Sul 73
Rua Sul 75
Rua Oeste 30
Rua Leste 10
Santa Maria Airport
Estrada Pedro Fernandes da Silveira
Estrada dos Perrando
Estrada dos Tonettos
Rio Grande do Sul
Santa Maria Air Force Base | Camobi, Santa Maria, Brazil | May 6, 2024 | Sentinel-2 Image @ 1340 UTC | Location: -29.71048, -53.68982
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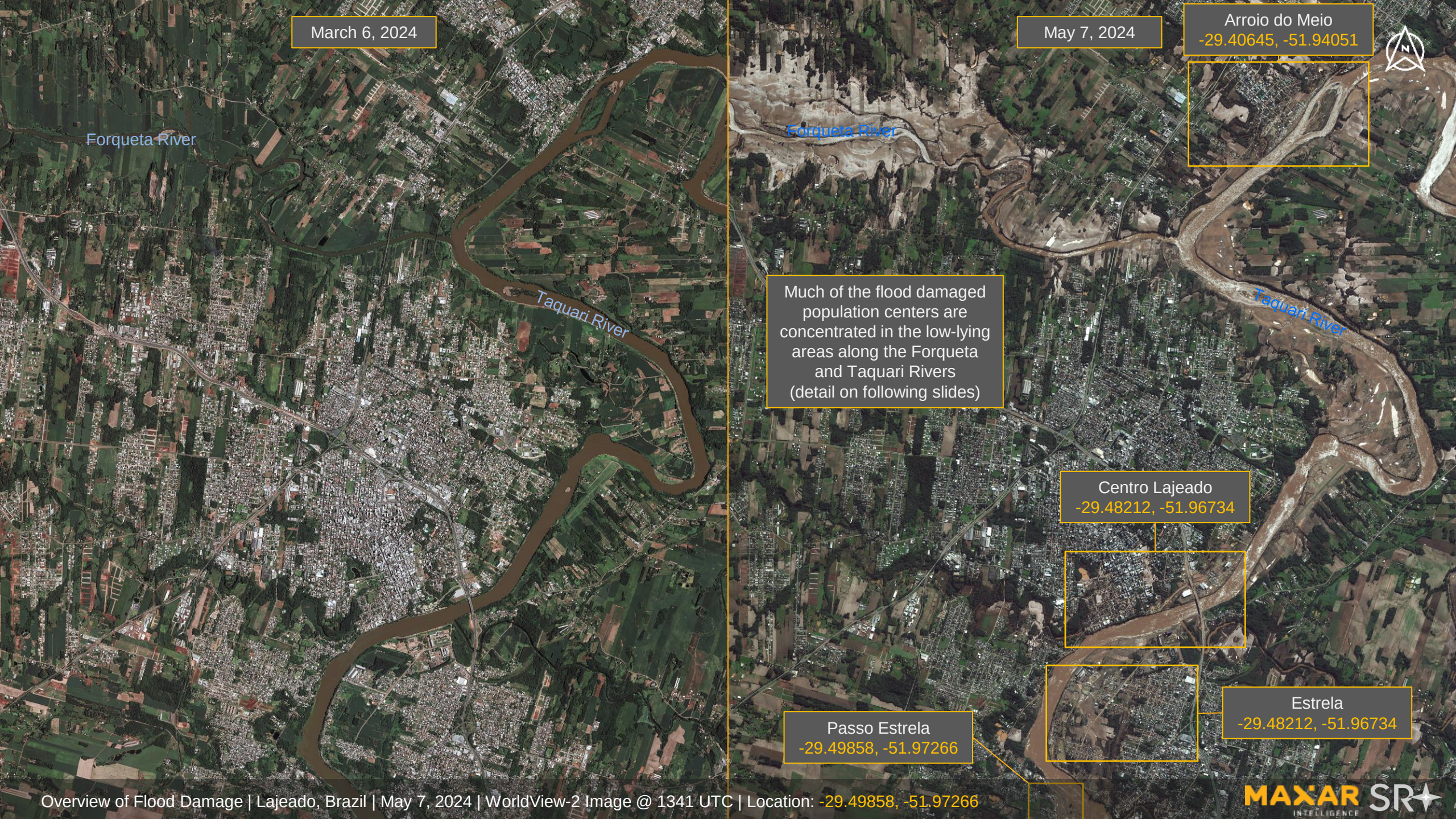
Section 4

Lajeado, Brazil



Flood Destroyed Neighborhood | Centro, Lajeado, Brazil | May 7, 2024 | WorldView-2 Image @ 1341 UTC | Location: -29.48212, -51.96734

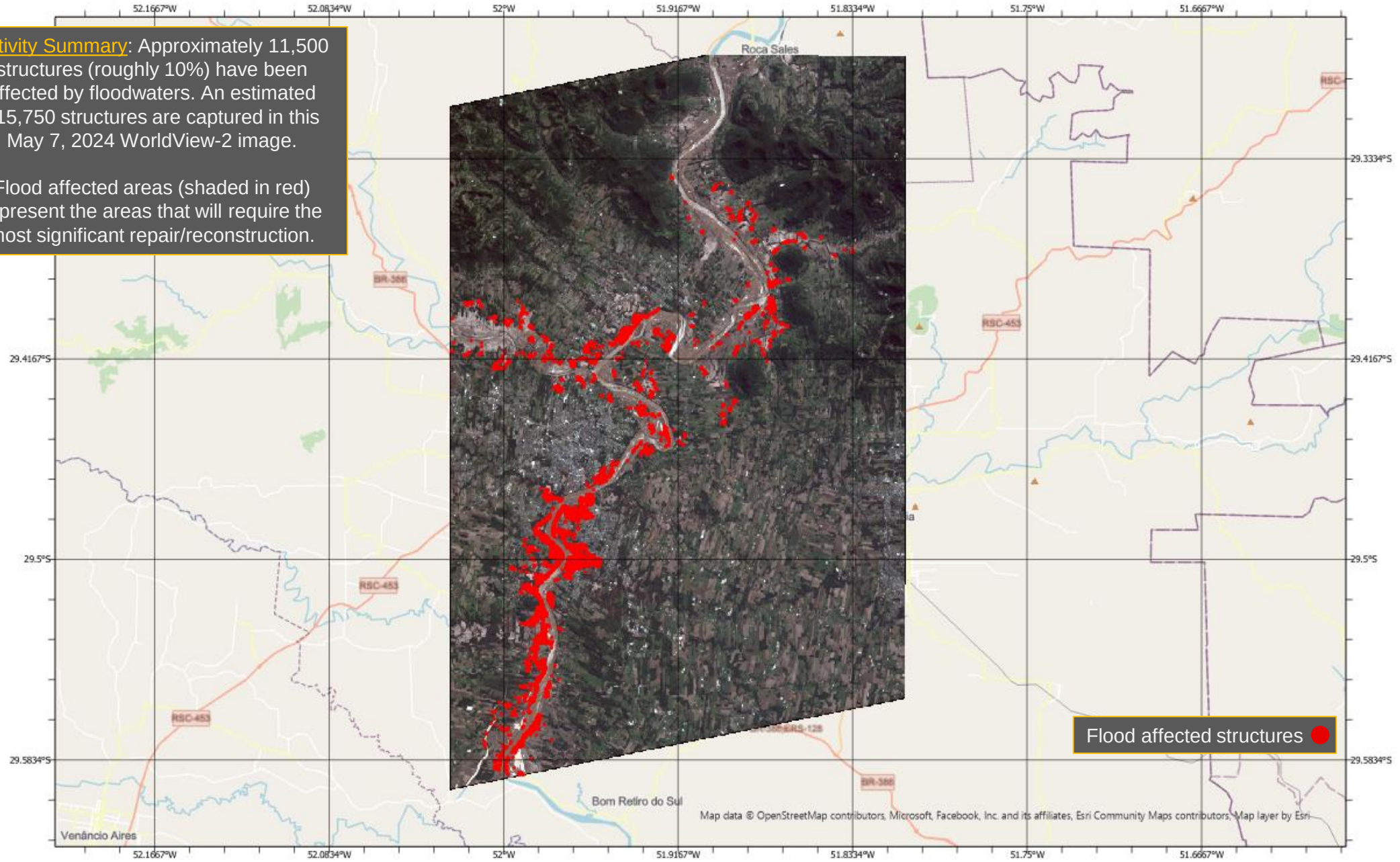
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Overview of Flood Damage | Lajeado, Brazil | May 7, 2024 | WorldView-2 Image @ 1341 UTC | Location: -29.49858, -51.97266

Activity Summary: Approximately 11,500 structures (roughly 10%) have been affected by floodwaters. An estimated 115,750 structures are captured in this May 7, 2024 WorldView-2 image.

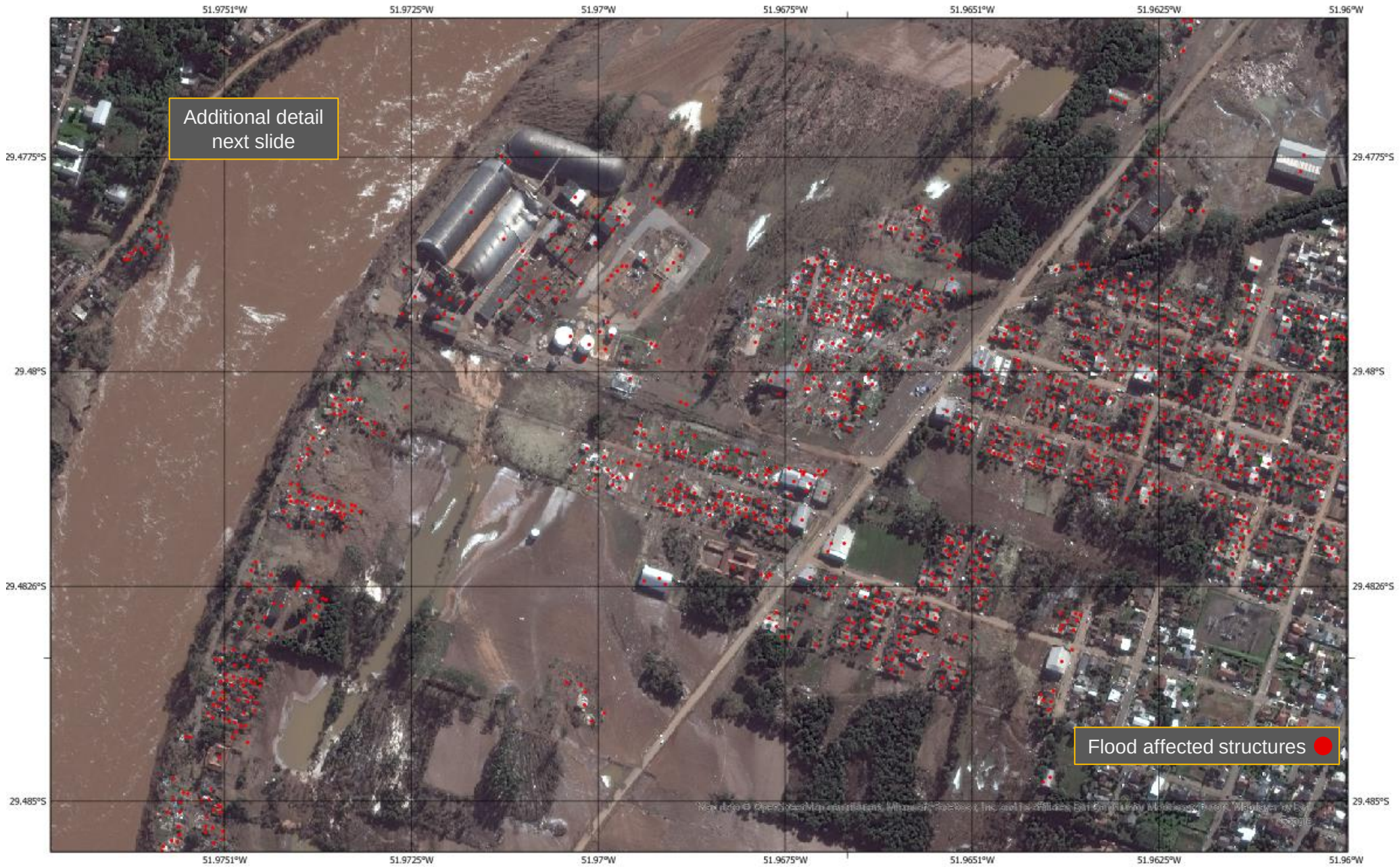
Flood affected areas (shaded in red) represent the areas that will require the most significant repair/reconstruction.

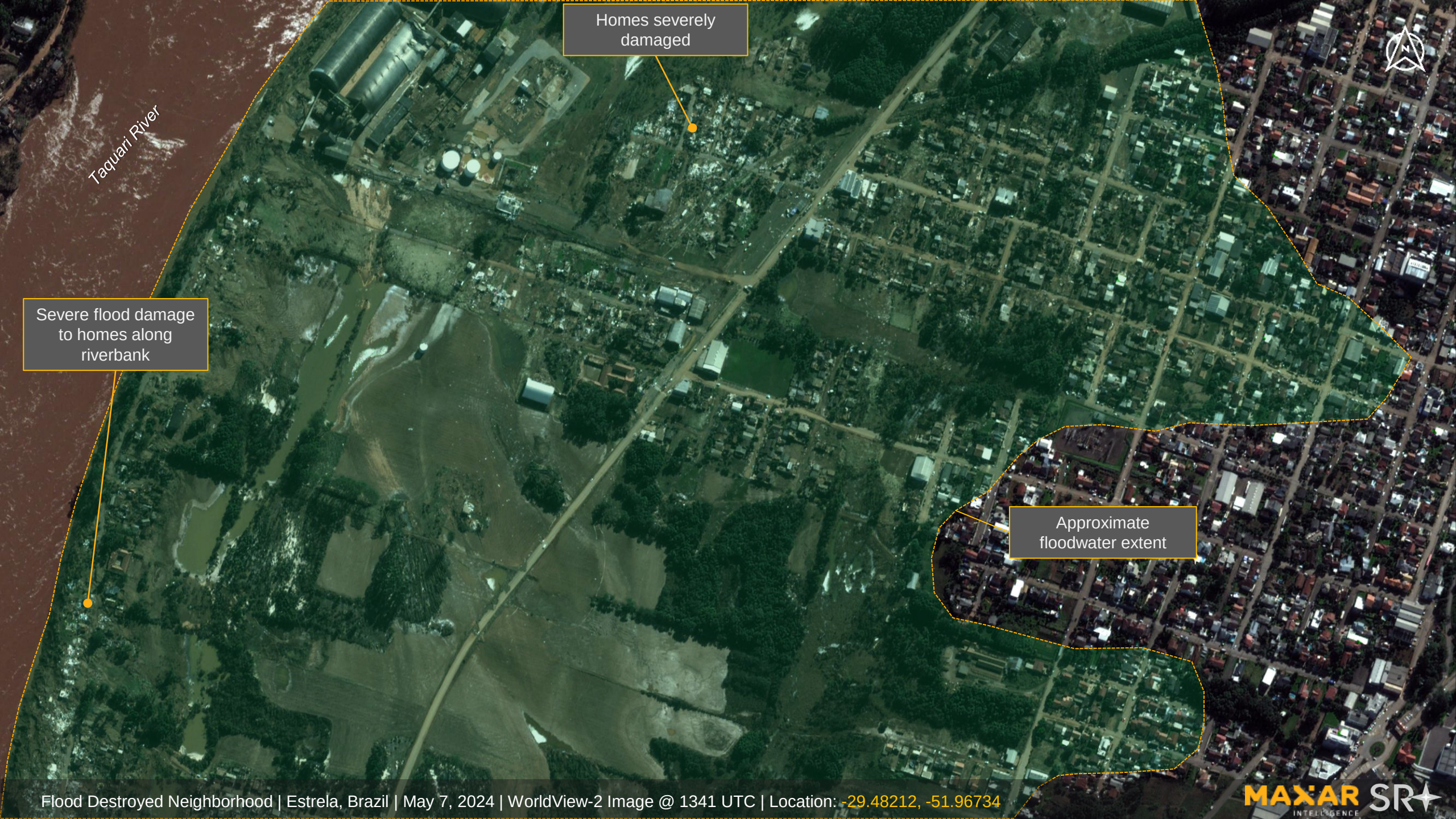



51.9459°W
51.9445°W
51.9431°W
51.9417°W
51.9403°W
51.9389°W
51.9375°W
51.9362°W
29.4028°S
29.4042°S
29.4056°S
29.407°S
29.4084°S
Additional detail next slide
Flood affected structures

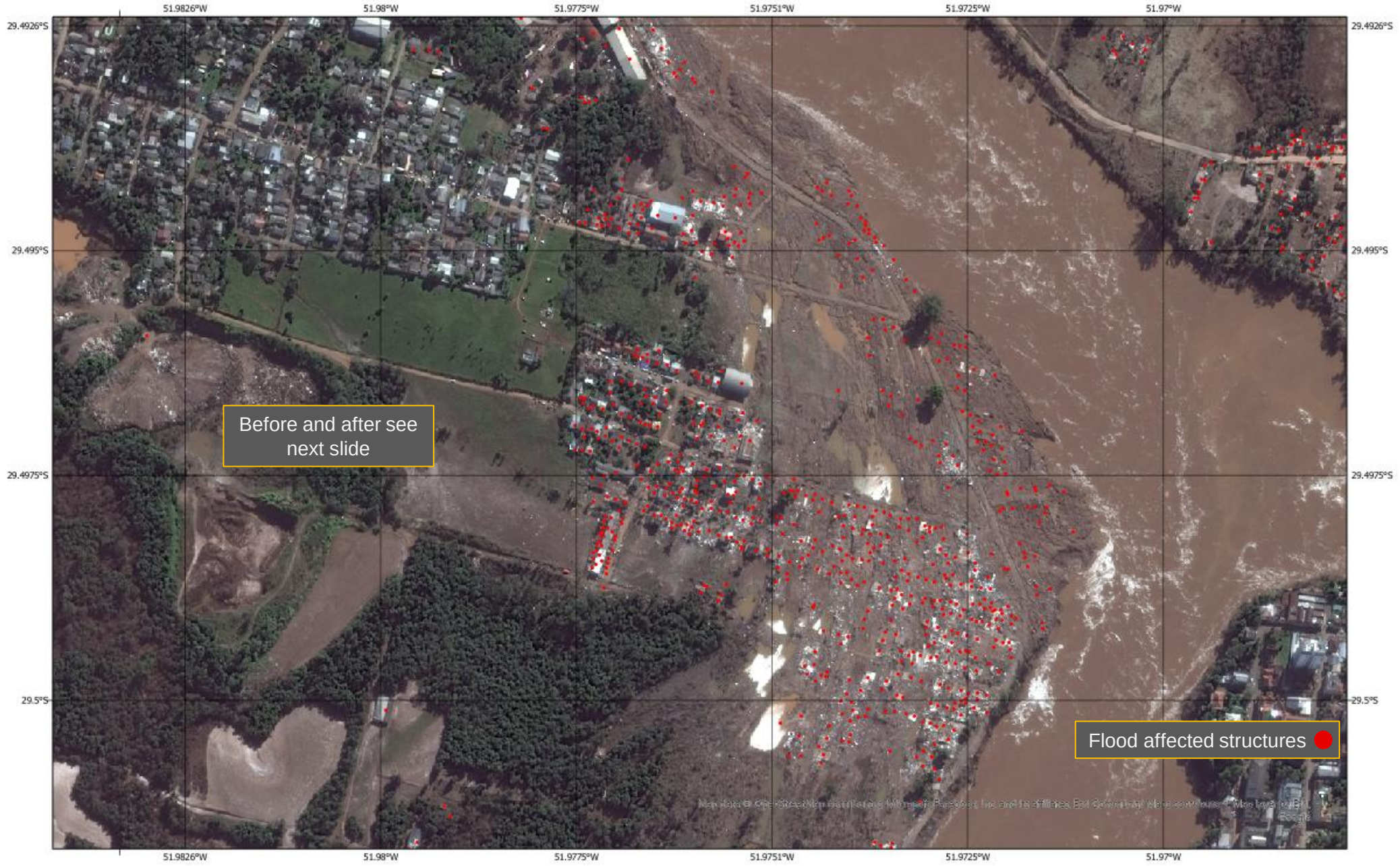


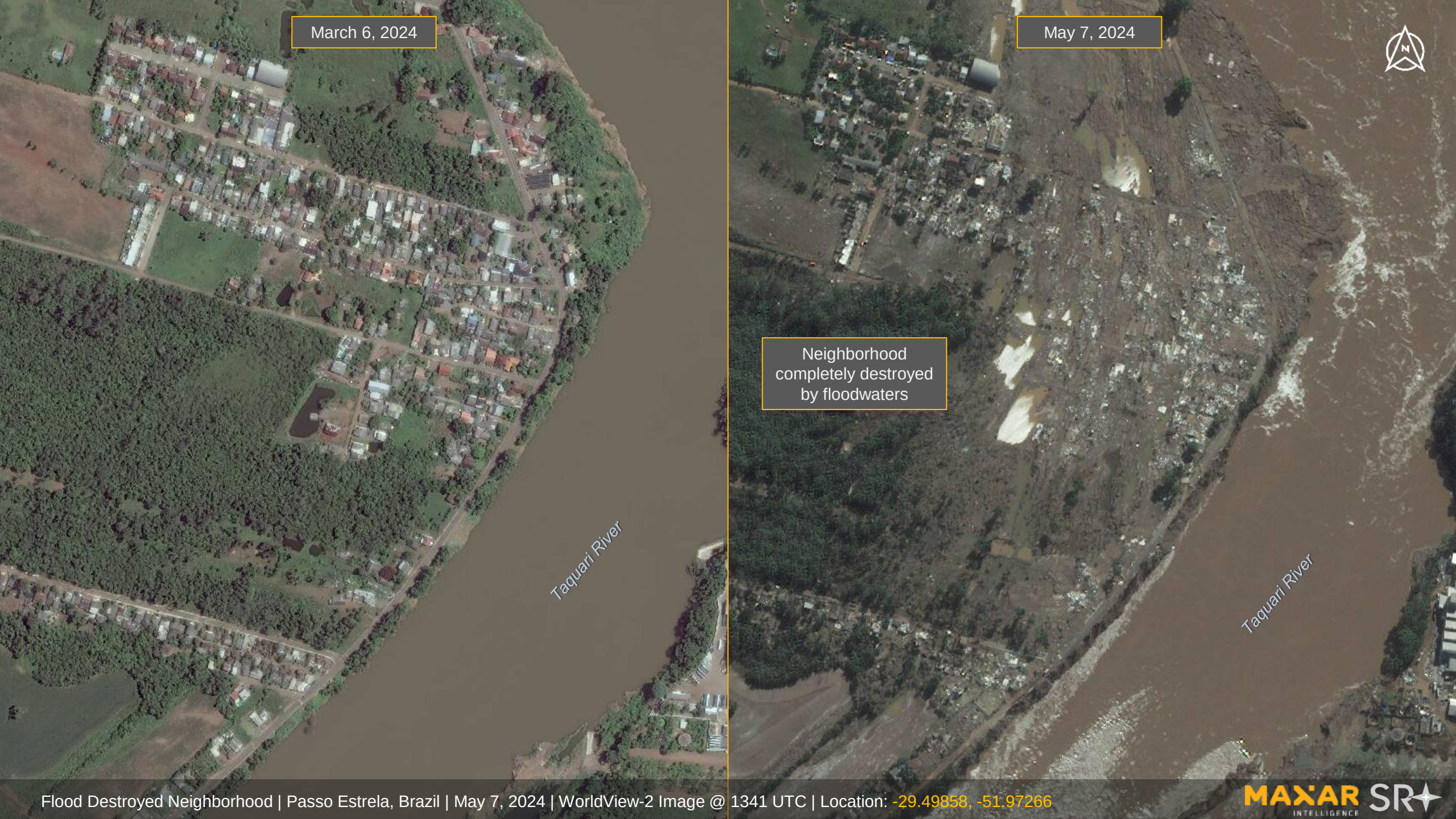
Flood Destroyed Neighborhood | Arroio do Meio, Brazil | May 7, 2024 | WorldView-2 Image @ 1341 UTC | Location: -29.40645, -51.94051


51.9751°W
51.9725°W
51.97°W
51.9675°W
51.9651°W
51.9625°W
51.96°W
29.4775°S
29.48°S
29.4826°S
29.485°S
Additional detail next slide
Flood affected structures

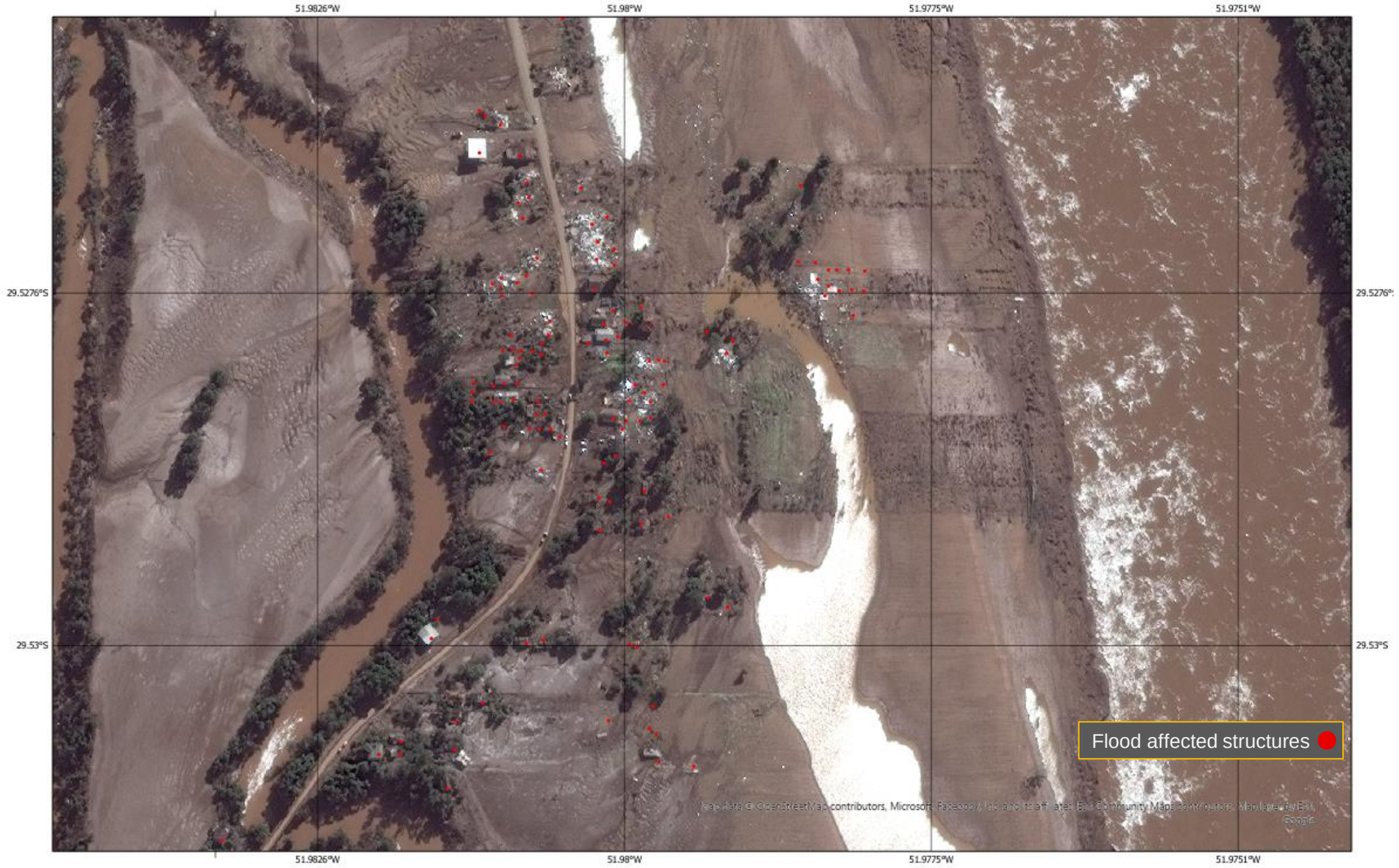


Flood Destroyed Neighborhood | Estrela, Brazil | May 7, 2024 | WorldView-2 Image @ 1341 UTC | Location: -29.48212, -51.96734


51.9826°W
51.98°W
51.9775°W
51.9751°W
51.9725°W
51.97°W
29.4926°S
29.495°S
29.4975°S
29.5°S
Before and after see next slide
Flood affected structures



Flood Destroyed Neighborhood | Passo Estrela, Brazil | May 7, 2024 | WorldView-2 Image @ 1341 UTC | Location: -29.49858, -51.97266



Flood Affected Structures | Lajeado, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.52839, -51.97938

Section 5

Canoas Air Force Base, Brazil

Activity Summary: Canoas Air Base is operational and no significant damage or flooding was observed. Some standing water seen at eastern end of runway. (May 7, 2024).

Press reports state base has limited capacity.

Status operational



GENERAL RIO GRANDE DO SUL

Canoas air base has limited capacity, general warns

admin2 May 7, 2024

Source: https://tapejaraagora.com.br/base-aerea-de-canoas-esta-com-capacidade-limitada-alerta-general/

Floodwater at eastern end of runway
-29.95080, -51.12836

Canoas Air Base | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 Image @ 1340 UTC | Location: -29.94010, -51.14870

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Flood Affected Structures –Canoas Airbase | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 @ 0853 UTC | -29.94524, -51.13848

Section 6

Belém Novo Water Treatment Plant, Brazil



Before floods—February 2, 2024
-30.21436, -51.18017

Activity Summary: Belem Novo pumping station is partially submerged from floodwaters of Guaiba River (May 7, 2024).

Status likely non-operational

Guaiba River

Belem Novo Water Treatment Plant | Belem Novo, Brazil | May 7, 2024 | WorldView-1 Image @ 0426 UTC | Location: -30.21436, -51.18017

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Belem Novo Water Treatment Plant | Belem Novo, Brazil | May 7, 2024 | WorldView-1 Image @ 0426 UTC | Location: -30.21619, -51.17013

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Section 7

US Consulate, Porto Alegre, Brazil



U.S. Consulate | Porto Alegre, Brazil | May 7, 2024 | WorldView-2 Image @ 1340 UTC | Location: -30.01217, -51.16854


Av. Brasilano indio de Moraes
U.S. Consulate
-30.01217, -51.16854
Activity Summary: The roads and neighborhoods around the U.S. Consulate are dry and open to traffic. No signs of flooding at or immediately next to the Consulate building is observed.
Floodwaters block most of the roads approximately 2.3 km to the west of the Consulate
Status operational
U.S. Consulate | Porto Alegre, Brazil | May 8, 2024 | WorldView-3 Image @ 1324 UTC | Location: -30.01217, -51.16854
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51.1976°W
51.195°W
51.1925°W
51.19°W
51.1875°W
51.185°W
51.1825°W
51.1801°W
51.1775°W
51.175°W
51.1725°W
51.1701°W
51.1675°W
51.165°W
51.1626°W
51.16°W
30.0025°S
30.005°S
30.0075°S
30.0101°S
30.0125°S
30.015°S
30.0175°S
30.0201°S
U.S. Consulate
-30.01217, -51.16854
Flood affected structures

Section 8

Florianopolis Intl. Airport, Carianos, Brazil


Activity Summary: Florianopolis International Airport is operational and no significant damage or flooding was observed (May 8, 2024).
Status operational
Search and rescue aircraft on the apron
Florianopolis International Airport | Carianos, Brazil | May 8, 2024 | WorldView-2 with Atmospheric Compensation @ 1304 UTC | Location: -27.67148, -48.54073
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Section 9

Satellite Imagery Collection

Satellite Imagery Collection

Date	Vendor	Type	Image ID
05/08/2024	Maxar	WorldView-3 @ 1324 UTC	1040010095844900 1040010096551700
05/08/2024	Maxar	WorldView-2 @ 0359 UTC	10300100FB26AC00
05/07/2024	Maxar	WorldView-2 @ 1340 UTC WorldView-1 @ 1626 UTC	10300100FACC3E00 10200100EF1B0400
05/06/2024	Copernicus	Sentinel-2 @ 1340 UTC	s3://sentinel-s2-l2a/tiles/22/J/BM/2024/5/6/0/
04/21/2024	Maxar	WorldView-2 @ 1320 UTC	10300100F940A500
03/06/2024	Maxar	WorldView-3 @ 0137 UTC	104001009372EC00