

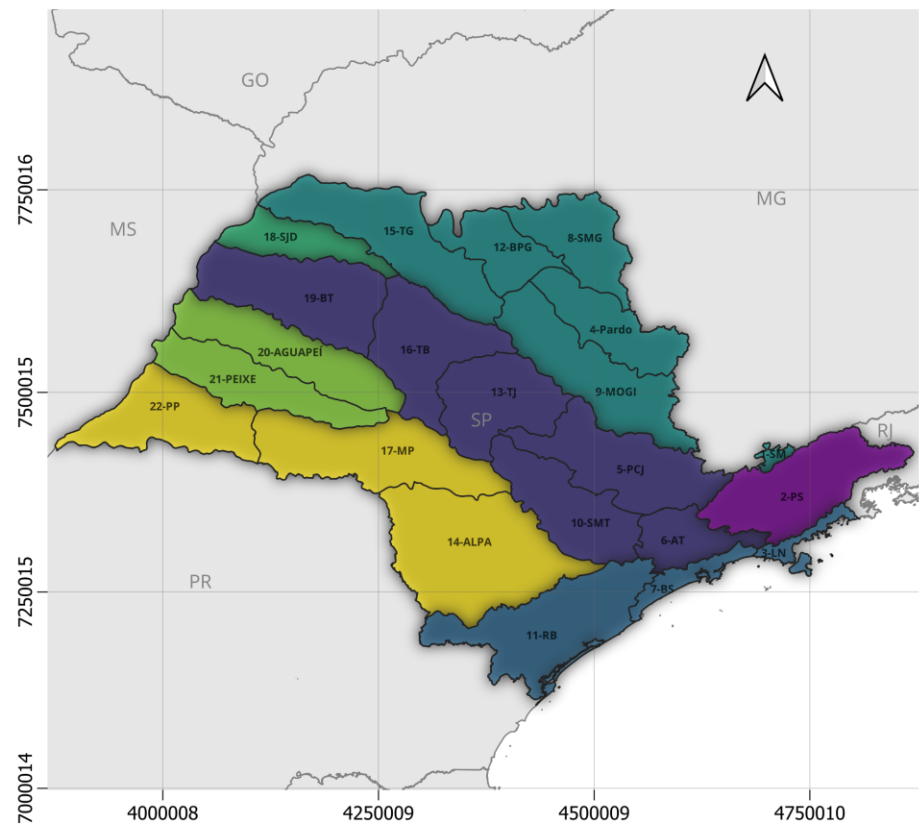


**Balanço das chuvas no Estado de São Paulo**  
**Índice de Precipitação Padronizado (SPI)**  
**Magnitude da Seca (DM)**



**Referência: Julho de 2025**

UNIDADES DE GERENCIAMENTO DE RECURSOS HÍDRICOS  
AGRUPADAS POR REGIÃO HIDROGRÁFICA



**Legenda**

**Regiões Hidrográficas**

- Bacia do Rio Paraíba do Sul
- Bacia do Rio Tietê
- Vertente Litorânea
- Vertente Paulista do Rio Grande
- Vertente Paulista do Rio Grande/São José dos Dourados
- Aguapeí/Peixe
- Vertente Paulista do Rio Paranapanema

**Unidade de Gerenciamento de Recursos Hídricos**

- Limite UGRHI

Contexto espacial

Estado inserido em 3 Regiões

Hidrográficas Brasileiras: Rio Paraná;  
Atlântico Sudeste e Atlântico Sul

- 7 Regiões Hidrográficas Estaduais (vertentes);
- 22 Unidades de Gerenciamento de Recursos Hídricos (UGRHI);
- 9 Regiões Metropolitanas;
- 645 municípios;
- 45,1 milhões de habitantes

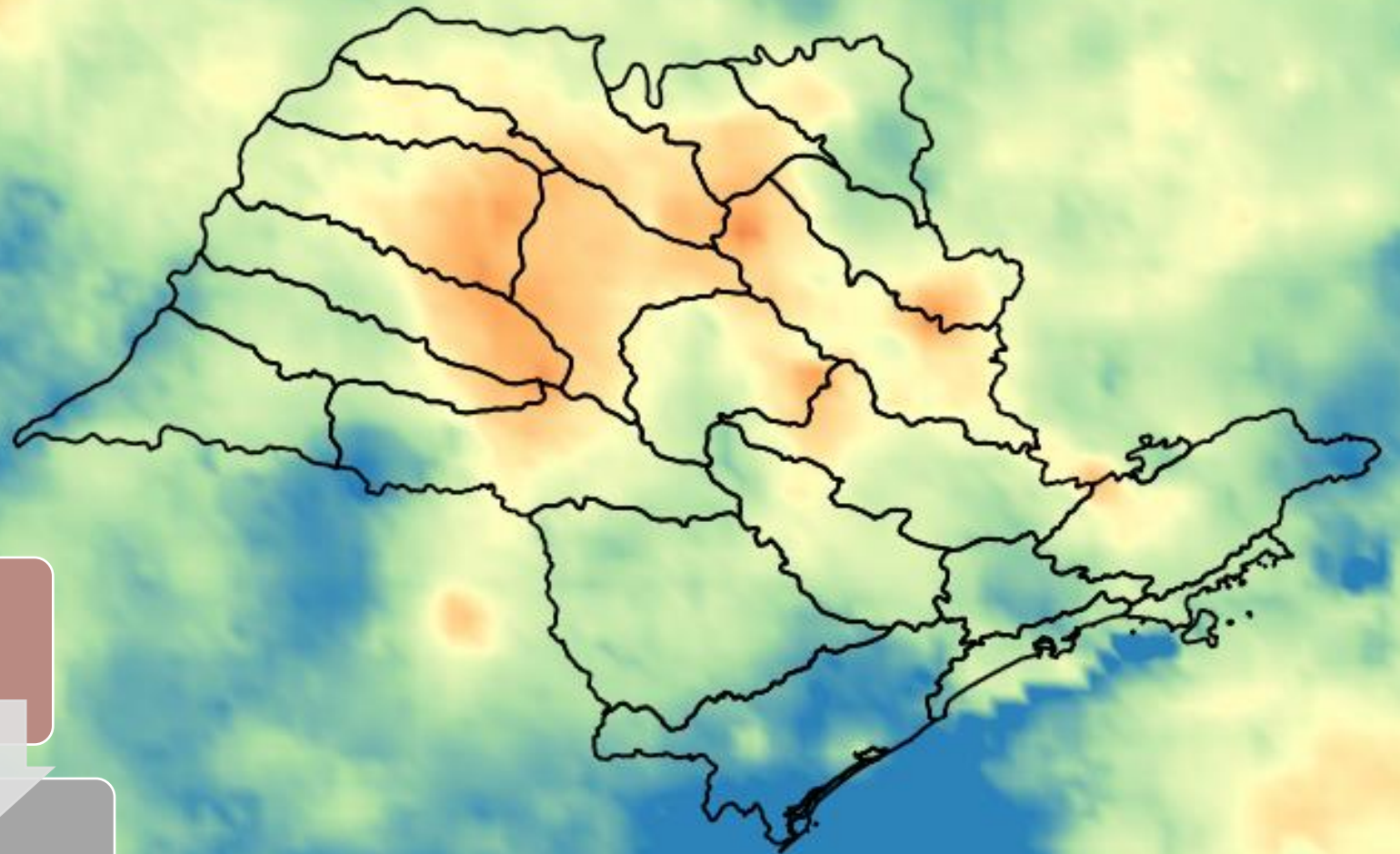
# Metodologia

Coleta dados da chuva diária raster (Merge/INPE): combinação da precipitação observada (pluviômetros) com estimativa de precipitação por satélite.

Processamento com uma biblioteca para dados geoespaciais (GDAL)

Obtenção da chuva diária e mensal na área da UGRHI

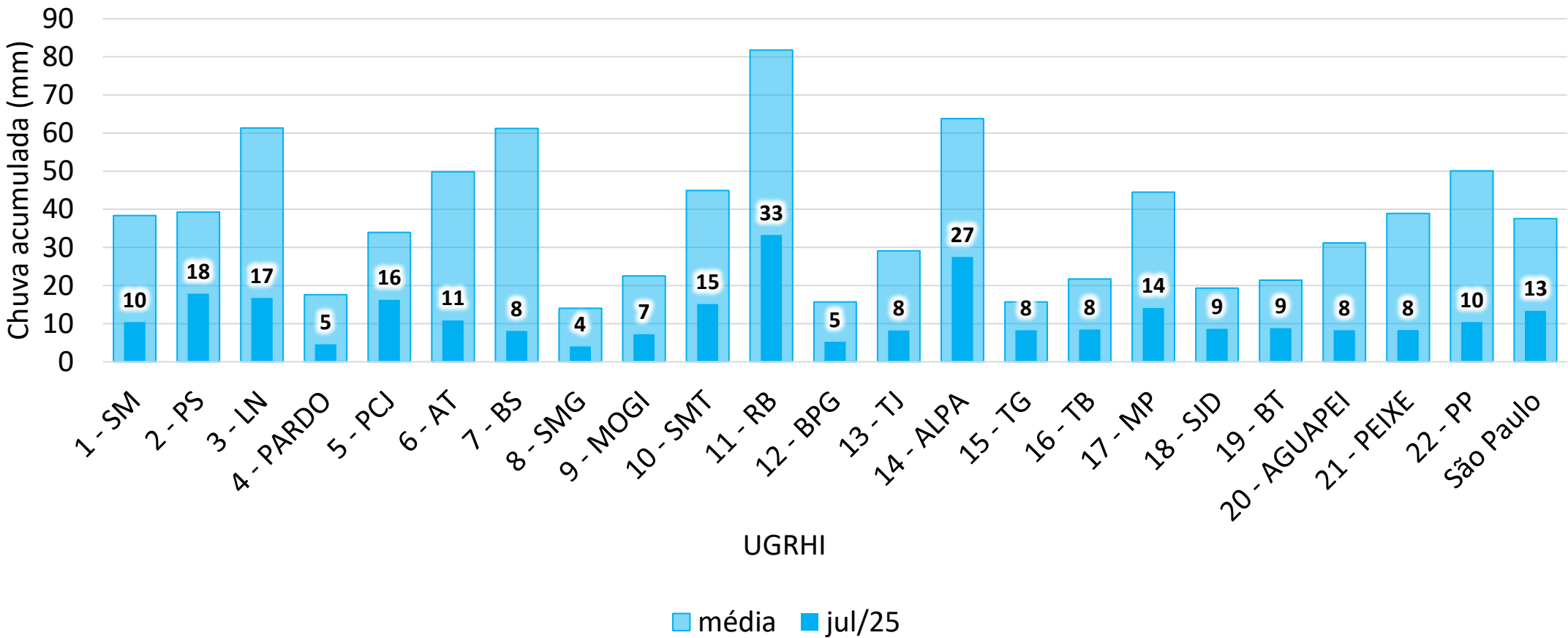
Cálculo de indicadores (SPI e DM)



# Resumo dos acumulados de chuva no estado de São Paulo

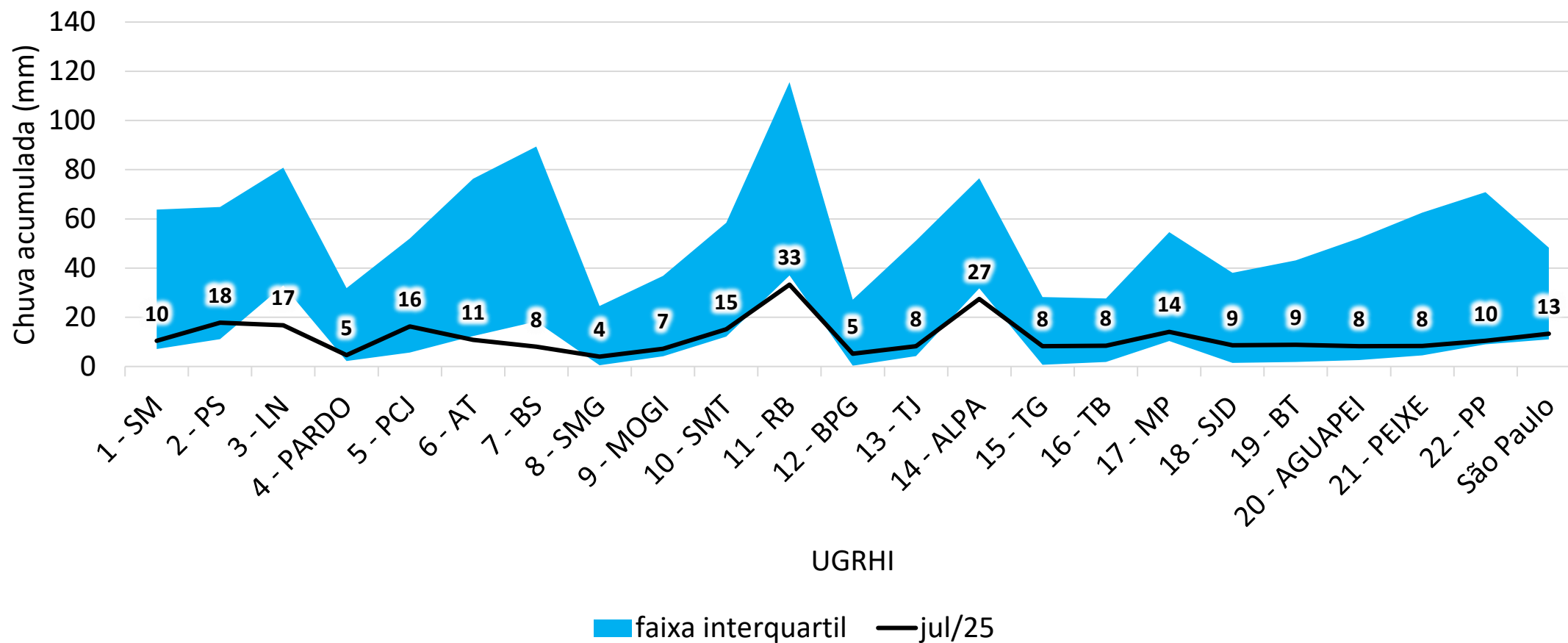


# Chuva por UGRHI em Julho de 2025



# Análise de dispersão – intervalo interquartil

- Precipitação pluviométrica acumulada do mês de análise comparada com o intervalo interquartil, calculado a partir da série histórica de dados do produto MERGE/Inpe;
- Faixa interquartil: valores entre o primeiro quartil (25%) e o terceiro quartil (75%).

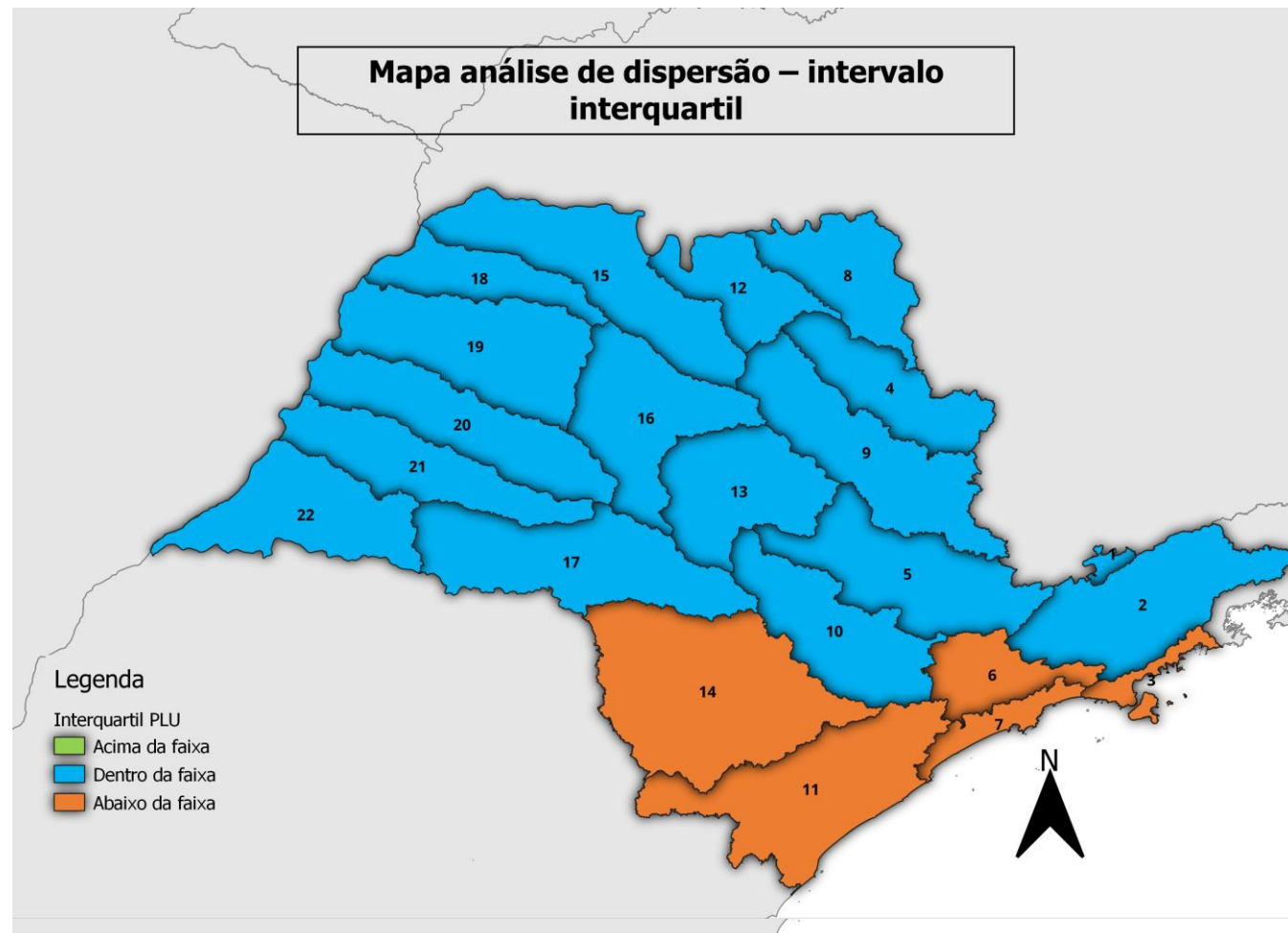


# Análise de dispersão – intervalo interquartil

- Mapa construído a partir da análise de quartis aplicada na série de dados de chuva de cada UGRHI.

## Critérios:

- **Acima da faixa:** valor de chuva acumulada acima do terceiro quartil (75%)
- **Dentro da faixa:** valor de chuva dentro da faixa interquartil, ou seja, entre o primeiro quartil (25%) e o terceiro quartil (75%)
- **Abaixo da faixa:** valor de chuva acumulada abaixo do primeiro quartil (25%)



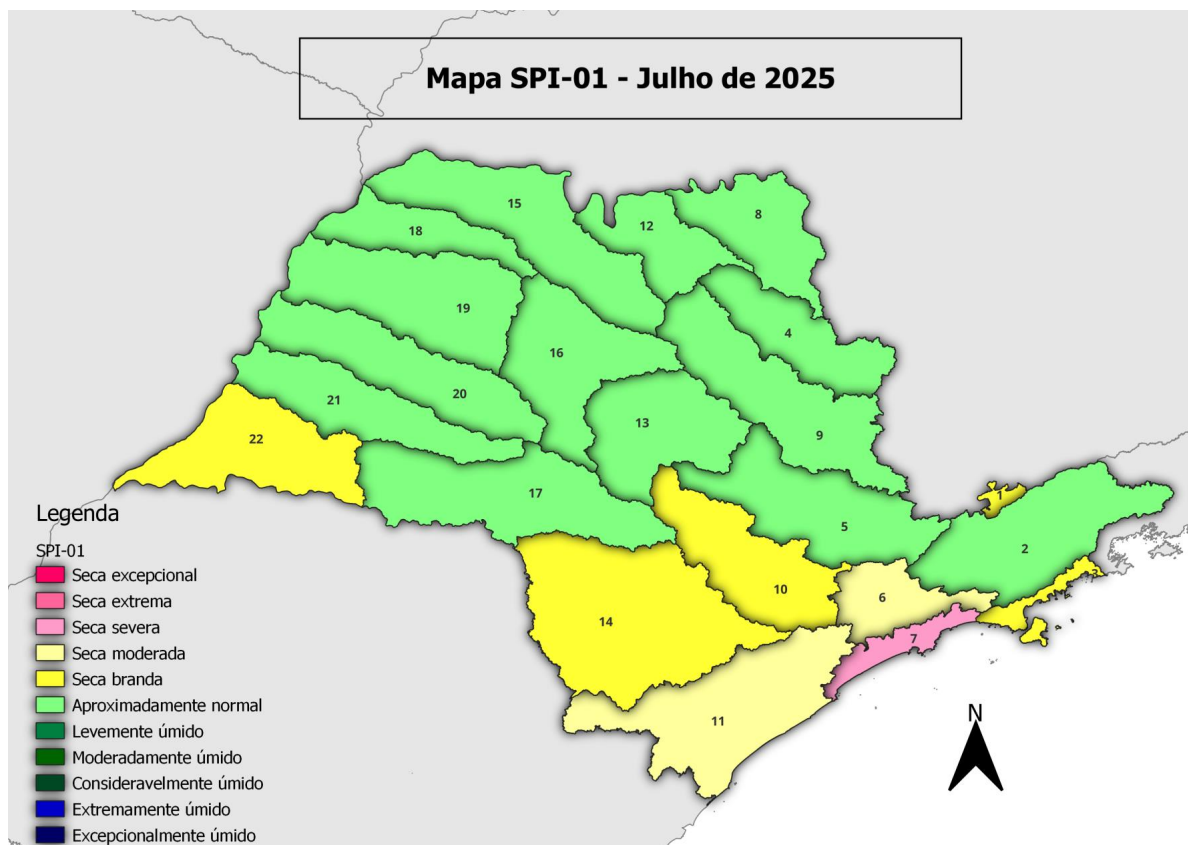
# Resumo do Índice de Precipitação Padronizado no estado de São Paulo



## Índice de Precipitação Padronizado

O Índice Padronizado de Precipitação (Standardized Precipitation Index - SPI) é uma ferramenta consistente de detecção e monitoramento probabilístico/padronizado de déficit ou excesso de precipitação para diferentes escalas temporais, possibilitando a comparação entre regiões com diferentes características climáticas. O índice é negativo para condições de déficit hídrico, nas quais a precipitação é inferior à média histórica (climatológica), e positivo para condições de excesso hídrico, que indicam precipitação superior à média histórica.

Sendo assim, o conhecimento do SPI pode fornecer informações importantes para a tomada de decisões quanto às medidas necessárias ao combate e a mitigação dos efeitos associados às secas e as enchentes.



## Outros indicadores e ano hidrológico



DM (Drought Magnitude): a magnitude da seca é a soma positiva do SPI para todos os meses dentro de um evento de seca, ou seja, meses consecutivos com  $SPI < -0,524$ .



Semestre úmido: Outubro a Março

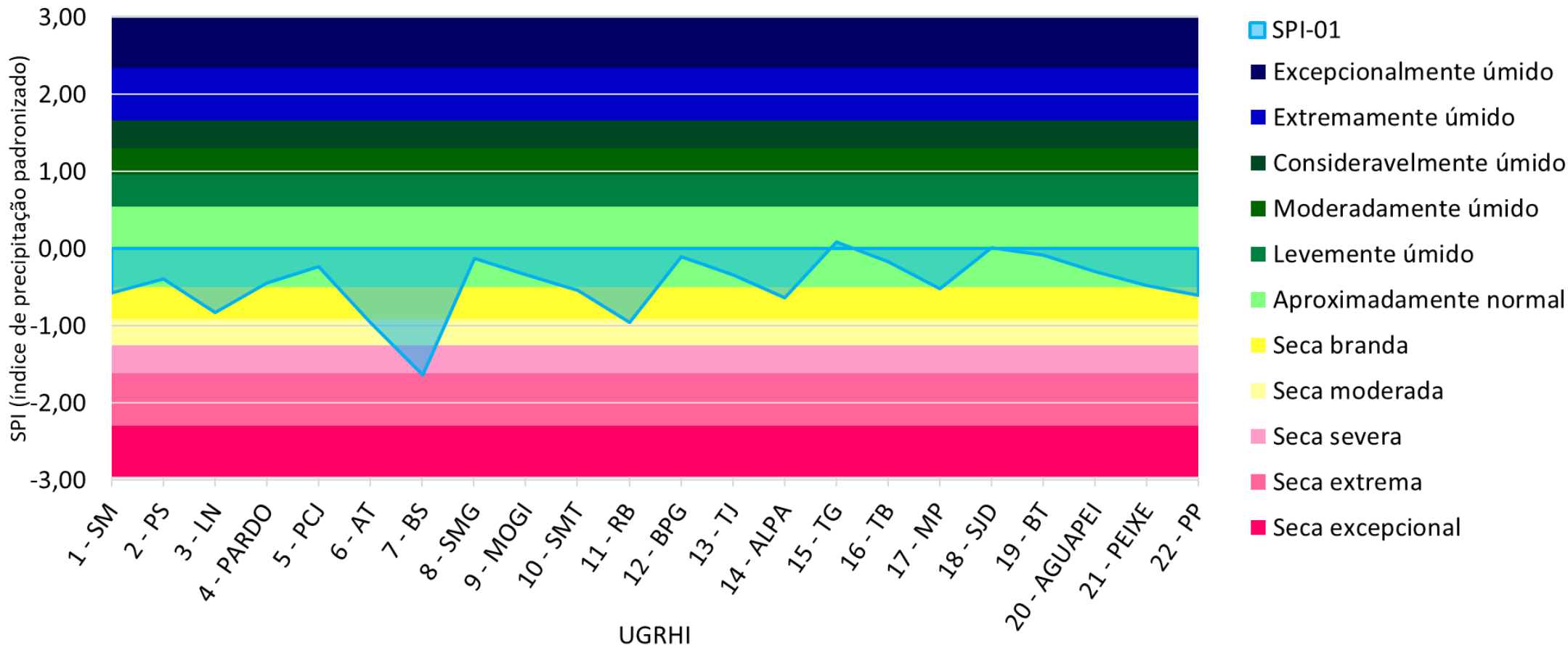


Semestre seco: Abril a Setembro

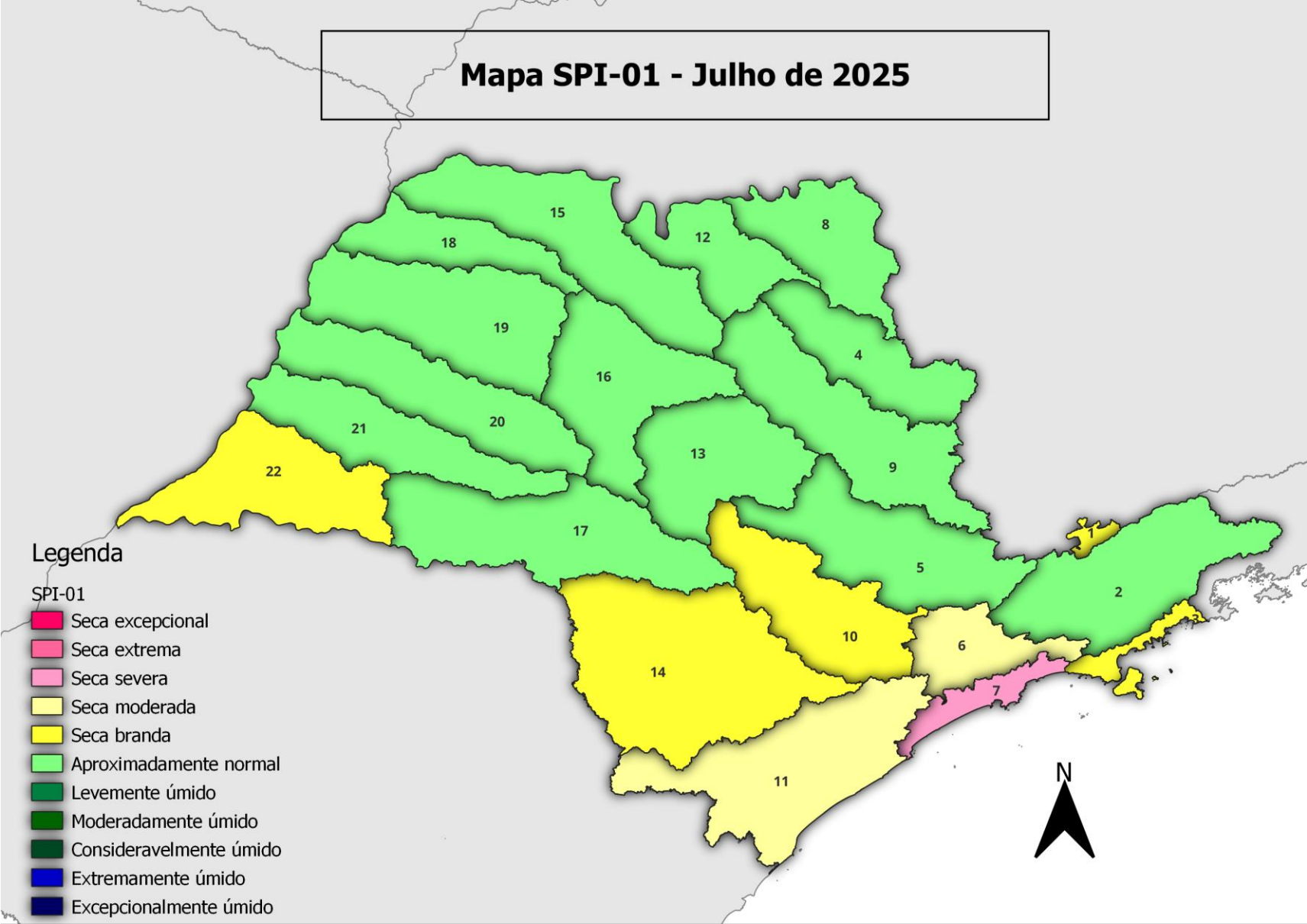
# Classificação SPI

| Valores                    | Condição                | Probabilidade |
|----------------------------|-------------------------|---------------|
| $SPI \leq -2.326$          | Seca excepcional        | 1,0%          |
| $-2.326 < SPI \leq -1.645$ | Seca extrema            | 4,0%          |
| $-1.645 < SPI \leq -1.282$ | Seca severa             | 5,0%          |
| $-1.282 < SPI \leq -0.935$ | Seca moderada           | 7,5%          |
| $-0.935 < SPI \leq -0.524$ | Seca branda             | 12,5%         |
| $-0.524 < SPI < +0.524$    | Aproximadamente normal  | 40,0%         |
| $+0.524 \leq SPI < +0.935$ | Levemente úmido         | 12,5%         |
| $+0.935 \leq SPI < +1.282$ | Moderadamente úmido     | 7,5%          |
| $+1.282 \leq SPI < +1.645$ | Consideravelmente úmido | 5,0%          |
| $+1.645 \leq SPI < +2.326$ | Extremamente úmido      | 4,0%          |
| $SPI \geq +2.326$          | Excepcionalmente úmido  | 1,0%          |

# SPI-01 em Julho de 2025

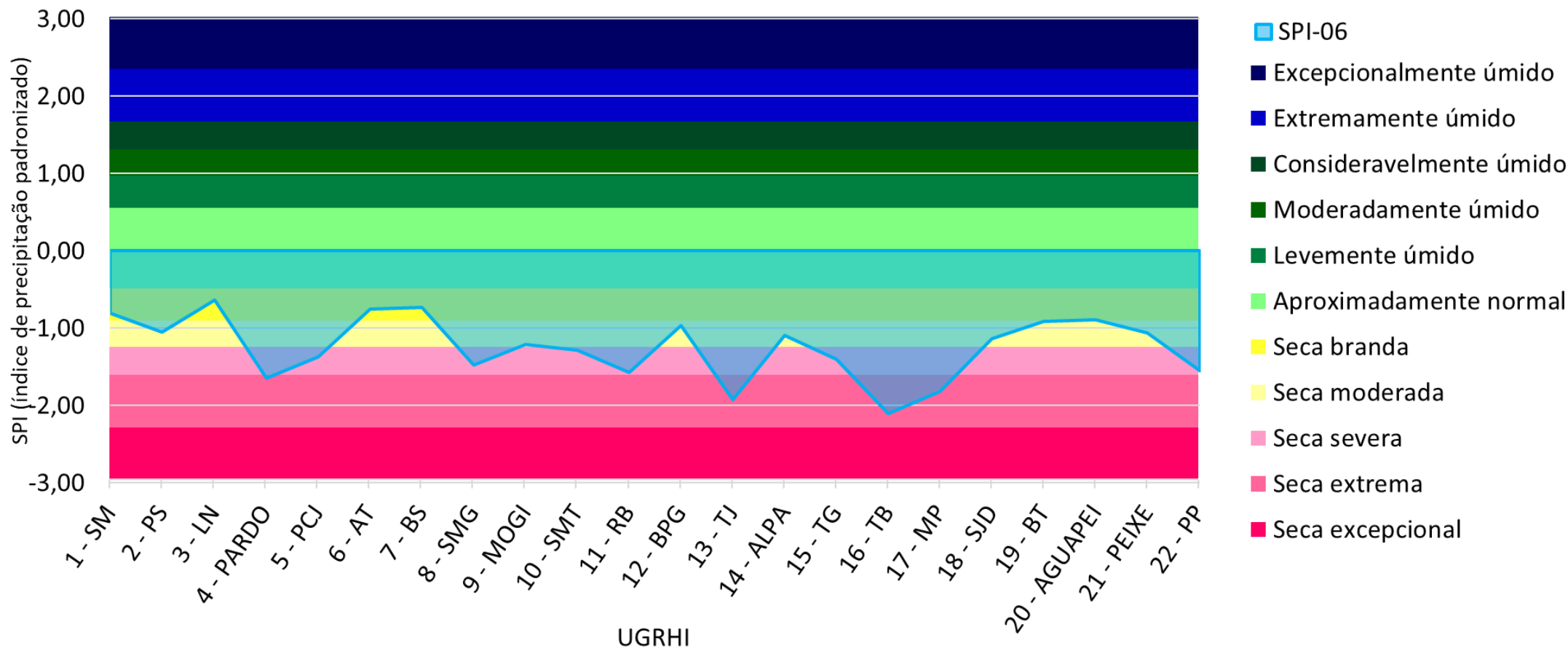


SPI-01 se baseia na análise dos dados de precipitação do mês de Julho de 2025

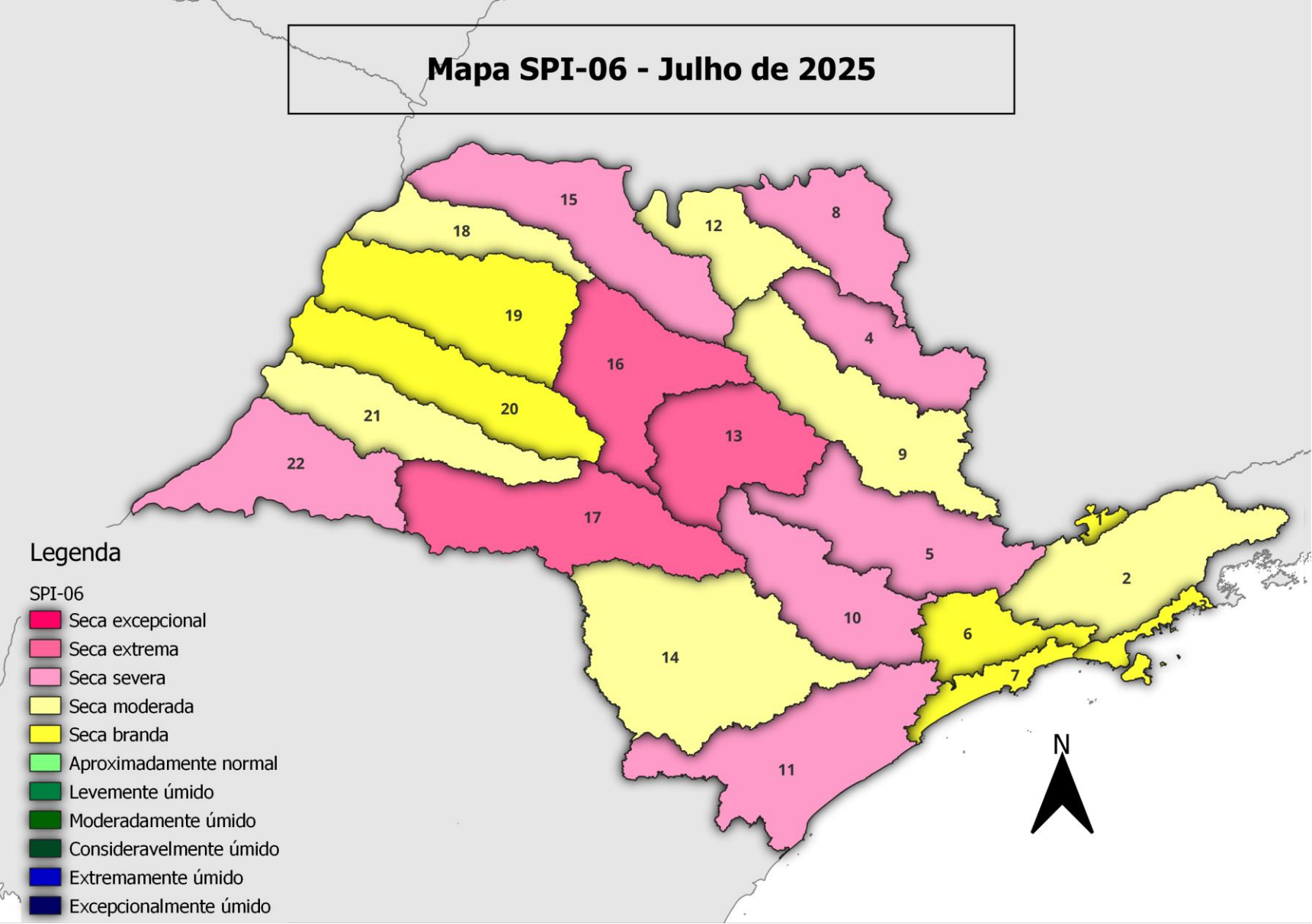




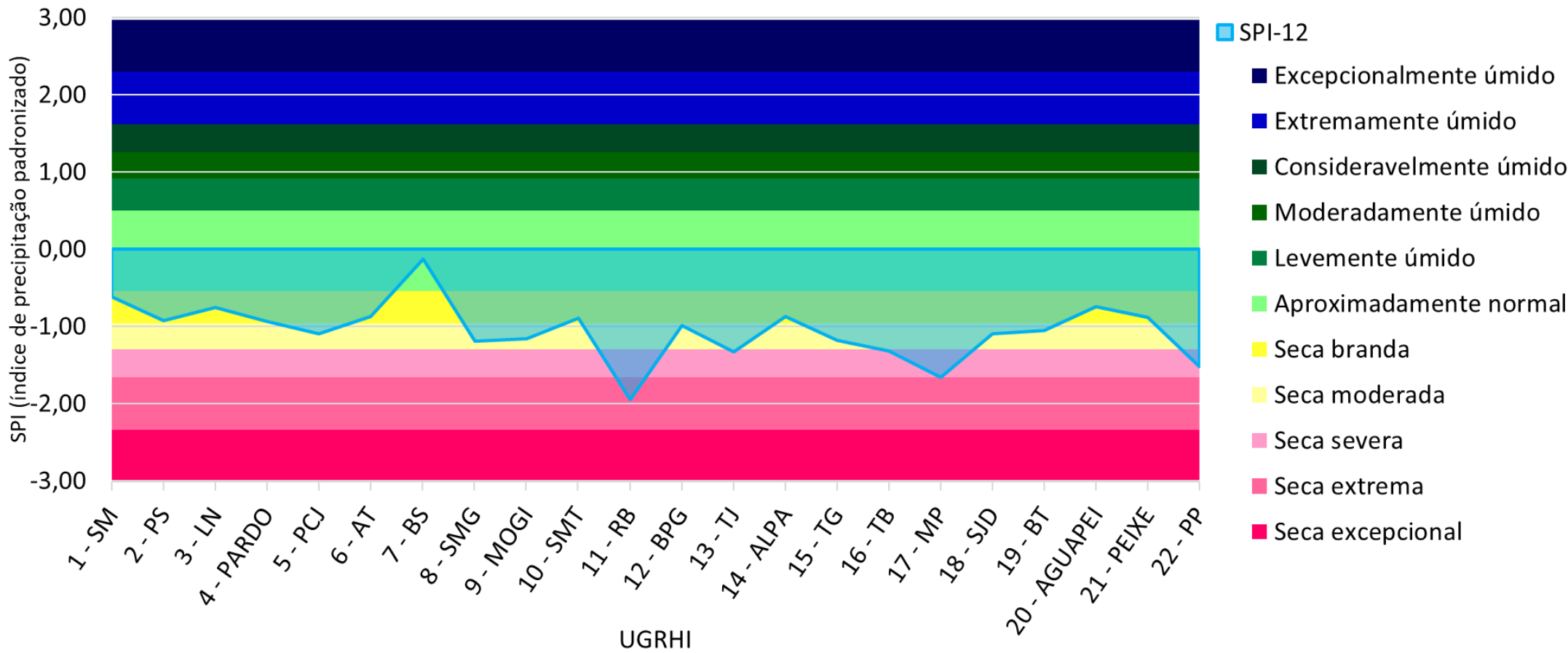
# SPI-06 em Julho de 2025



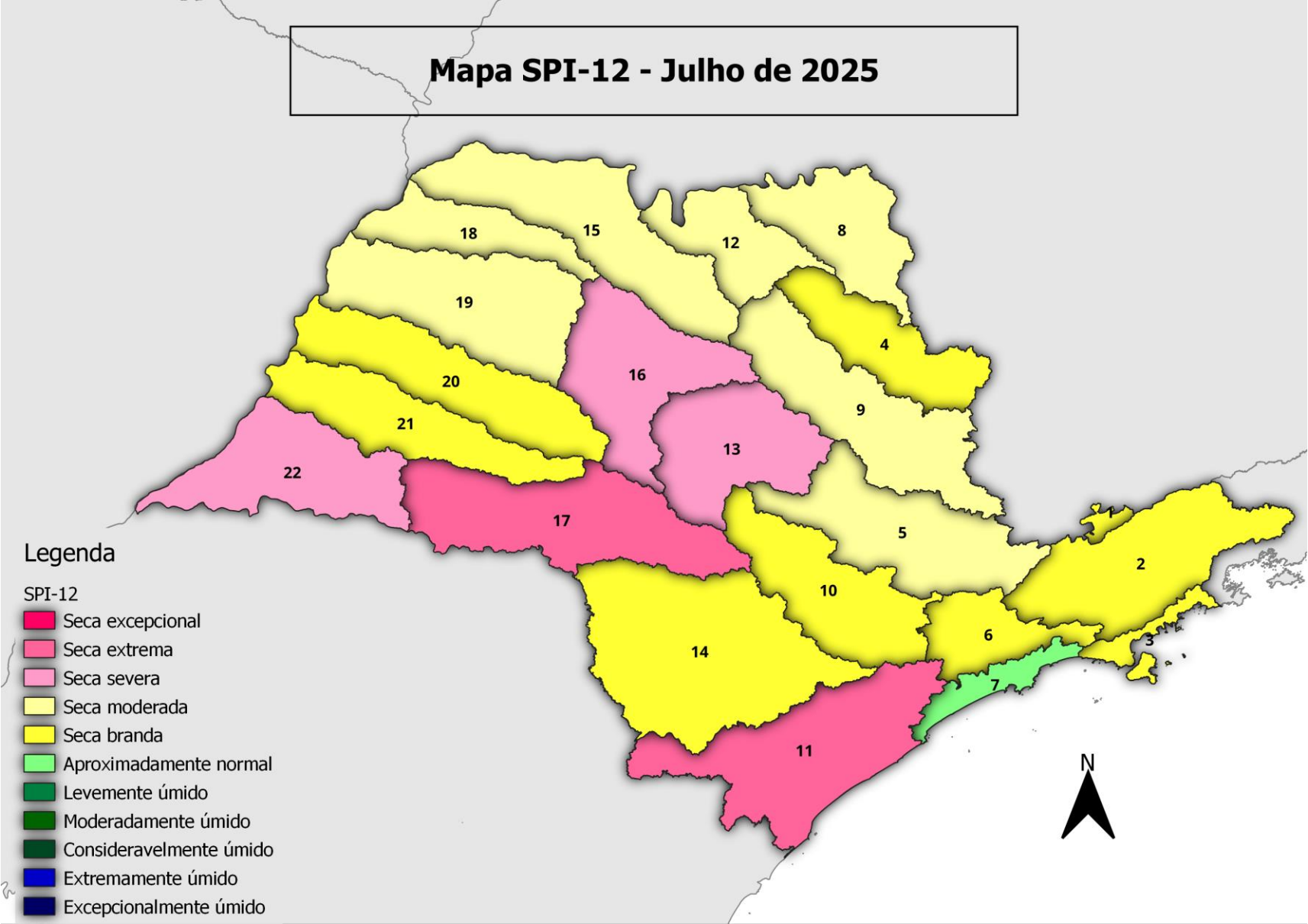
SPI-06 se baseia na análise dos dados de precipitação dos últimos 06 meses.



# SPI-12 em Julho de 2025

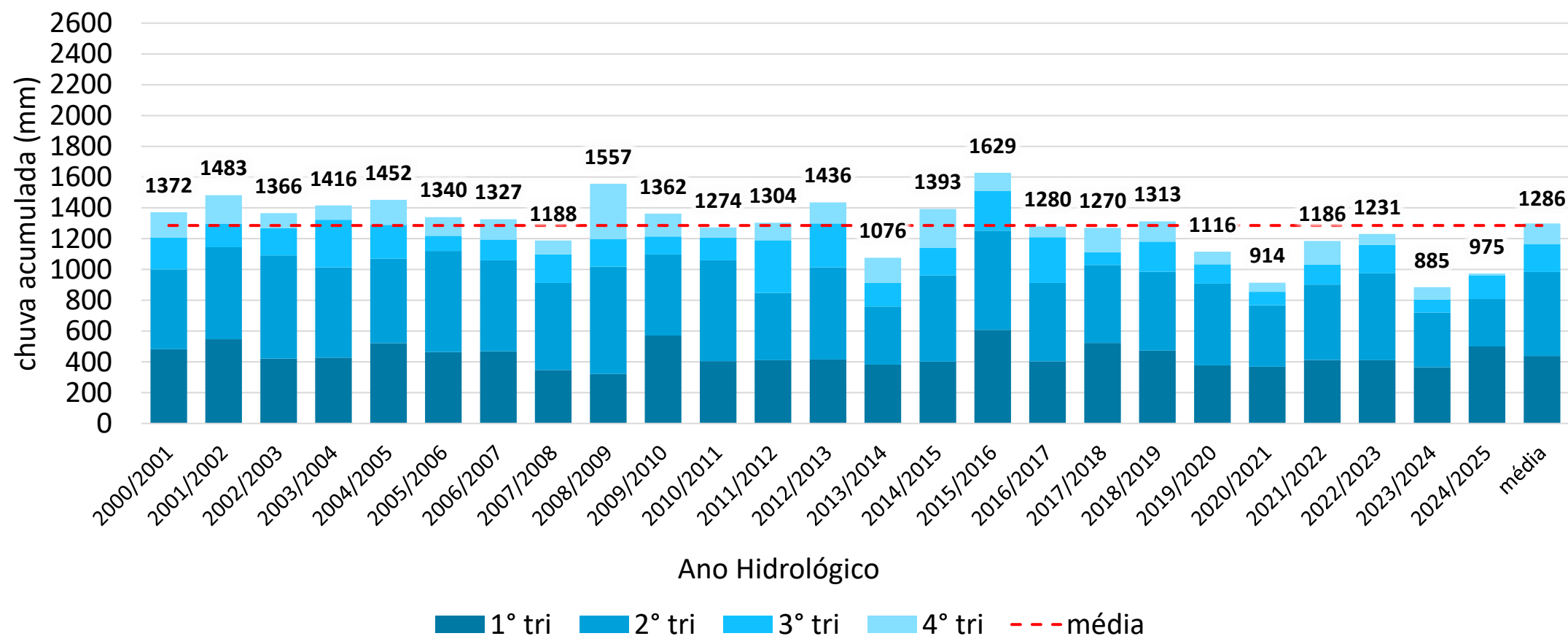


SPI-12 se baseia na análise dos dados de precipitação dos últimos 12 meses (escala anual).



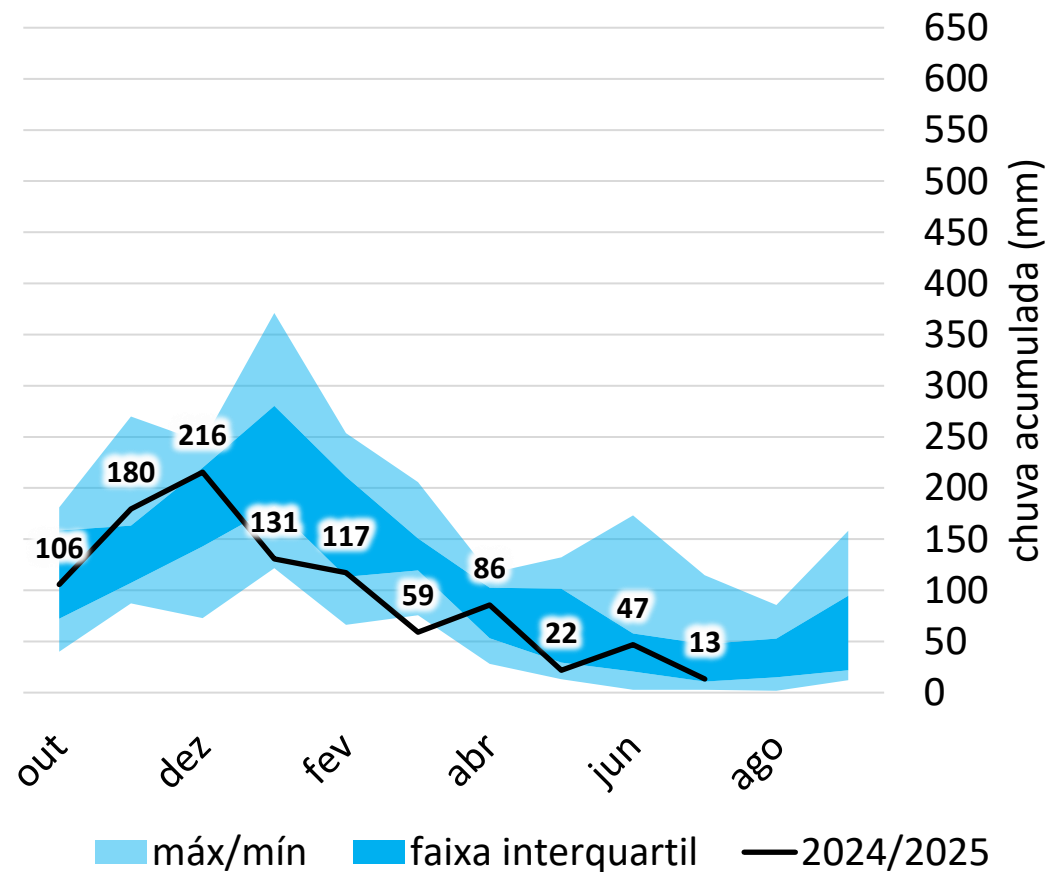
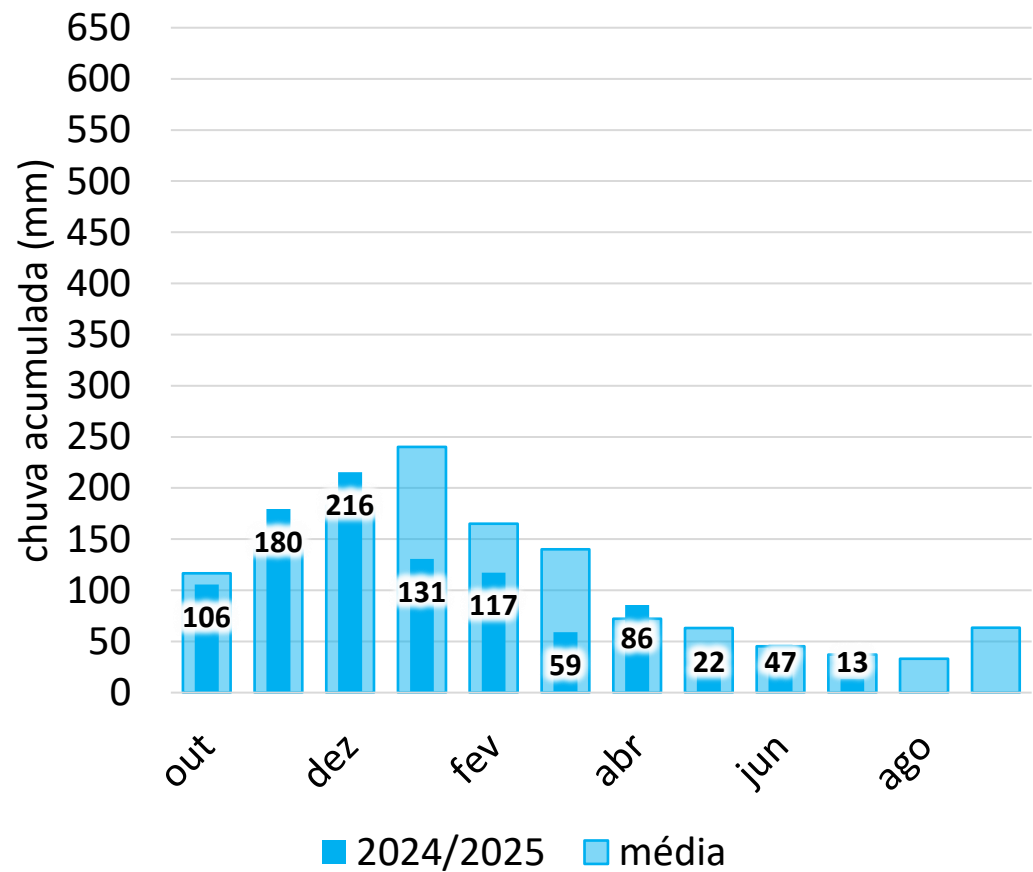
# Resumo dos acumulados de chuva por UGRHI

# Estado de São Paulo

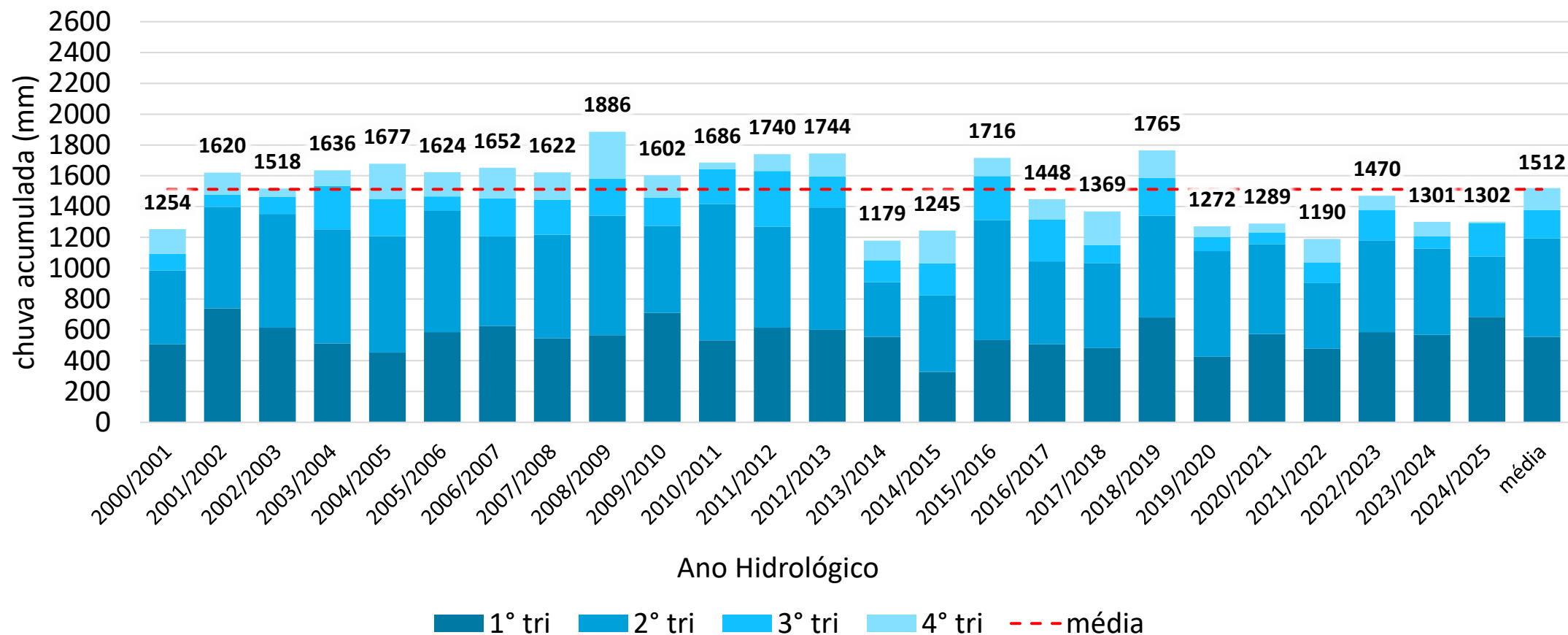




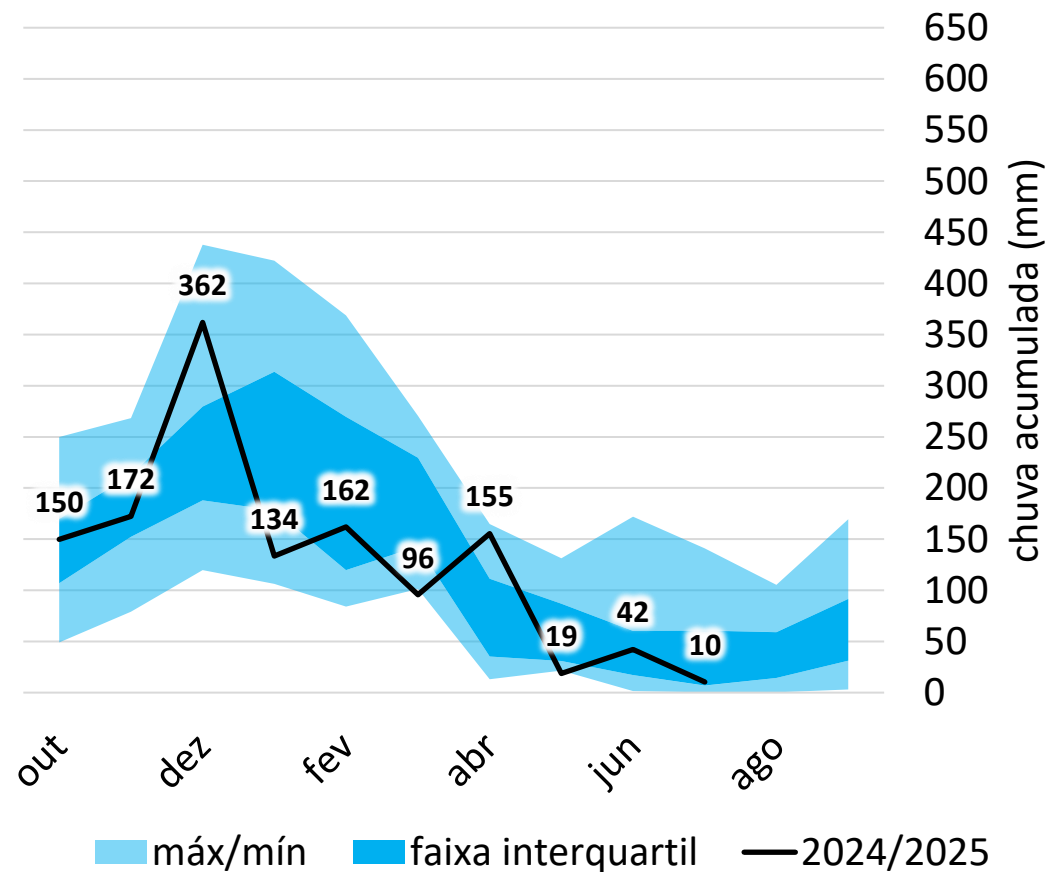
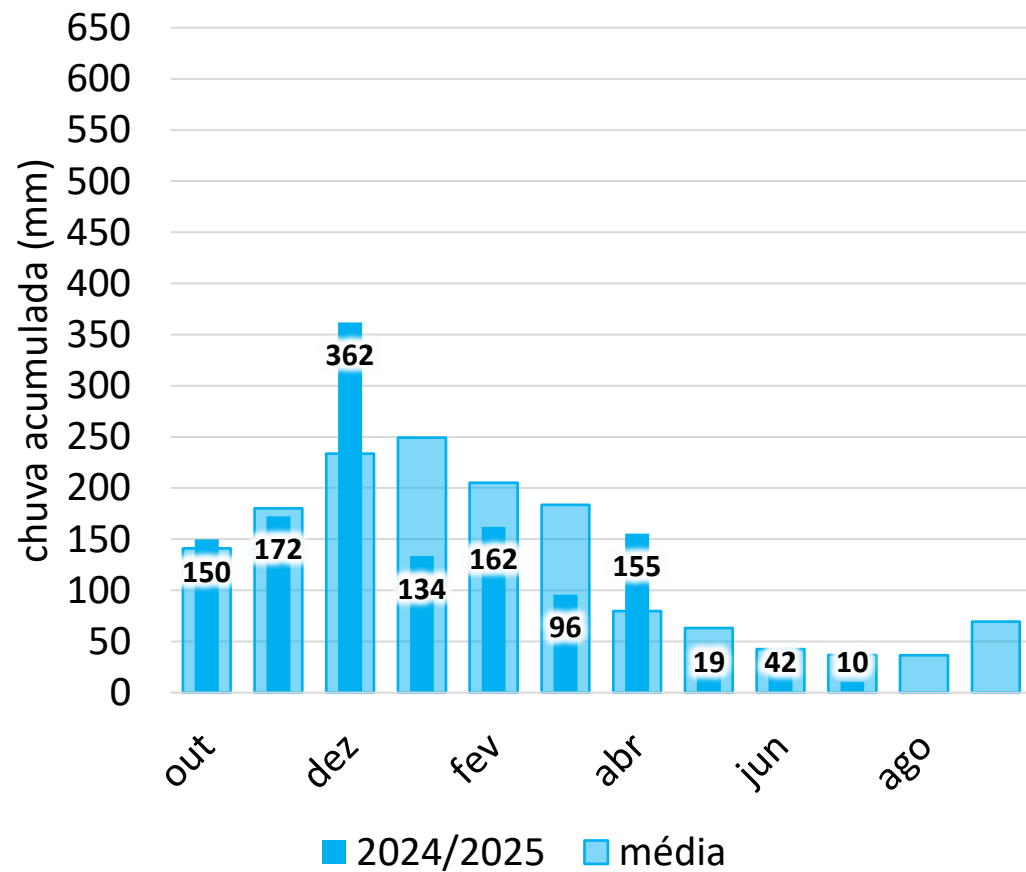
# Estado de São Paulo



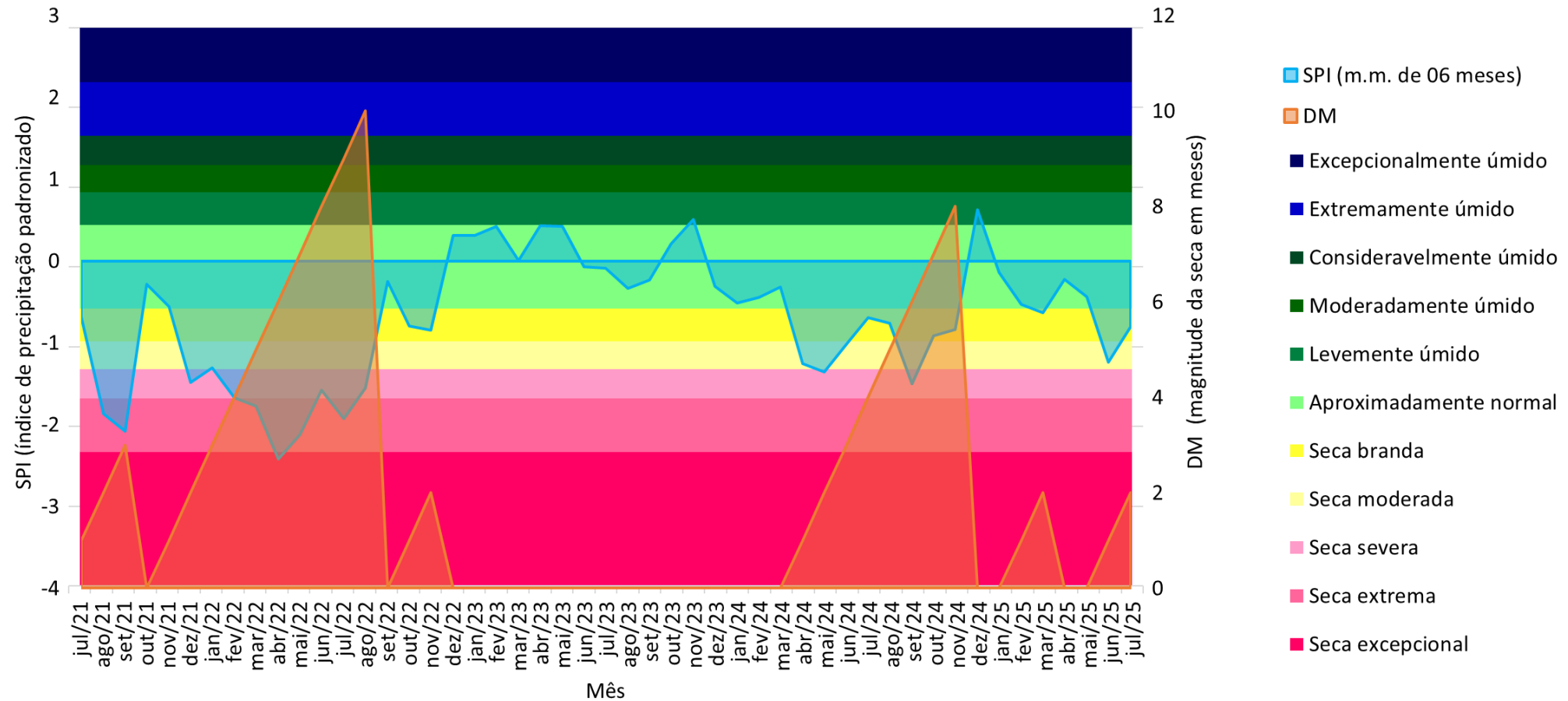
# UGRHI 1 - Mantiqueira



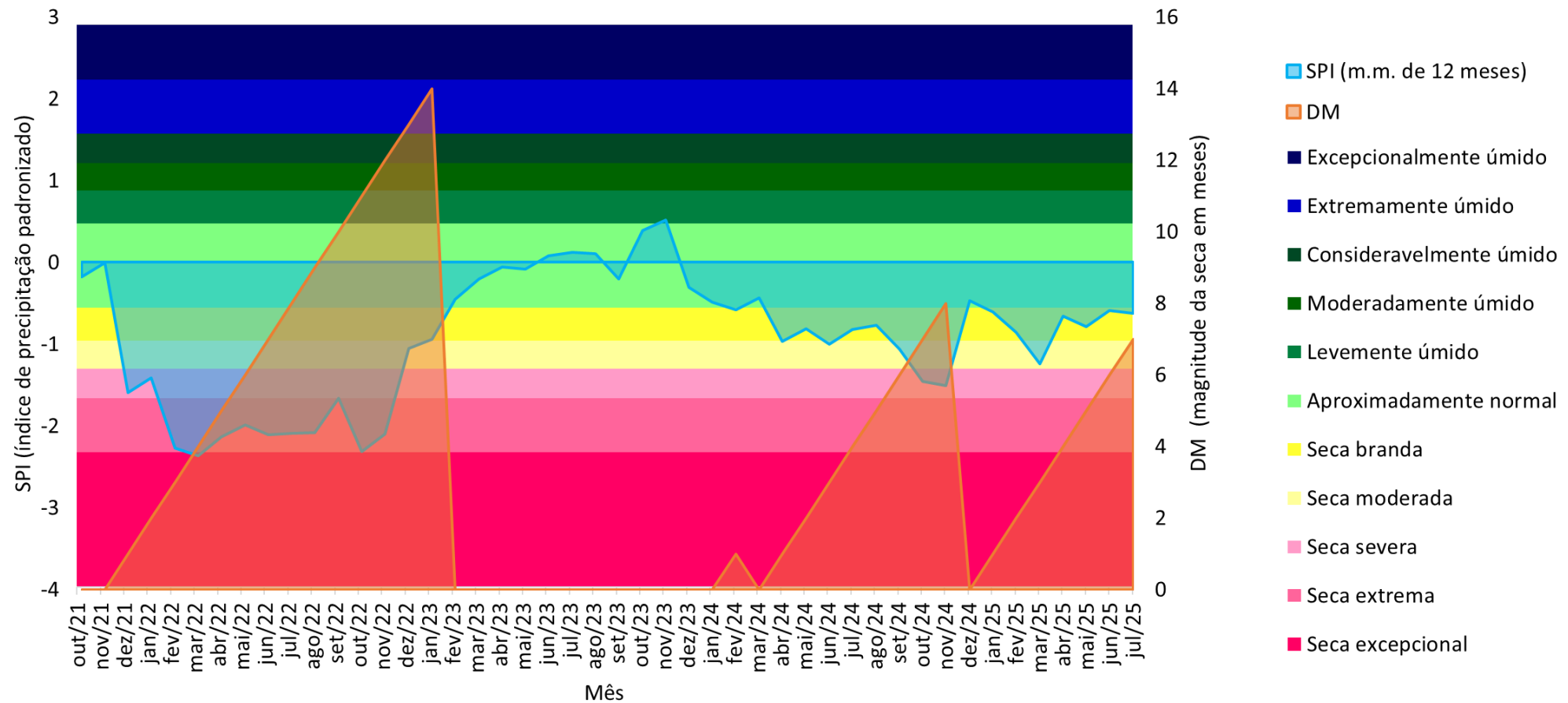
# UGRHI 1 - Mantiqueira



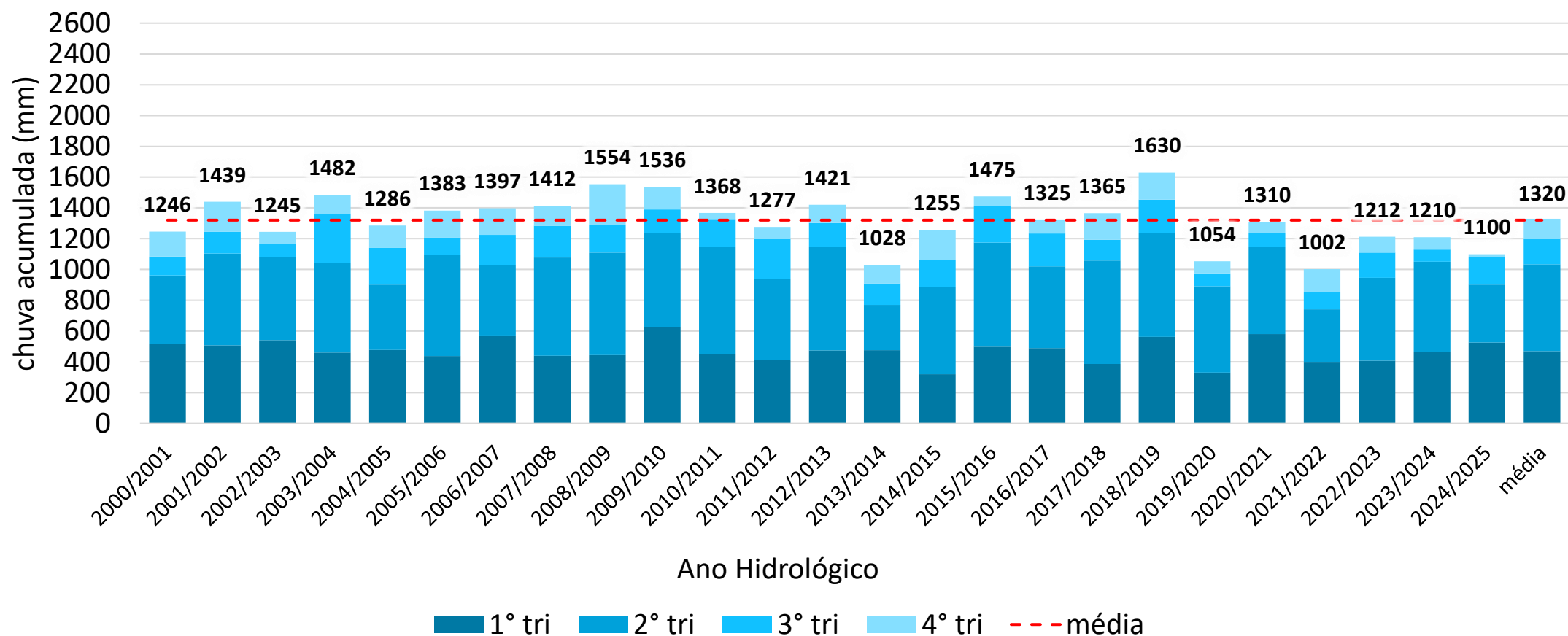
# UGRHI 1 – Mantiqueira | SPI-06



# UGRHI 1 – Mantiqueira | SPI-12

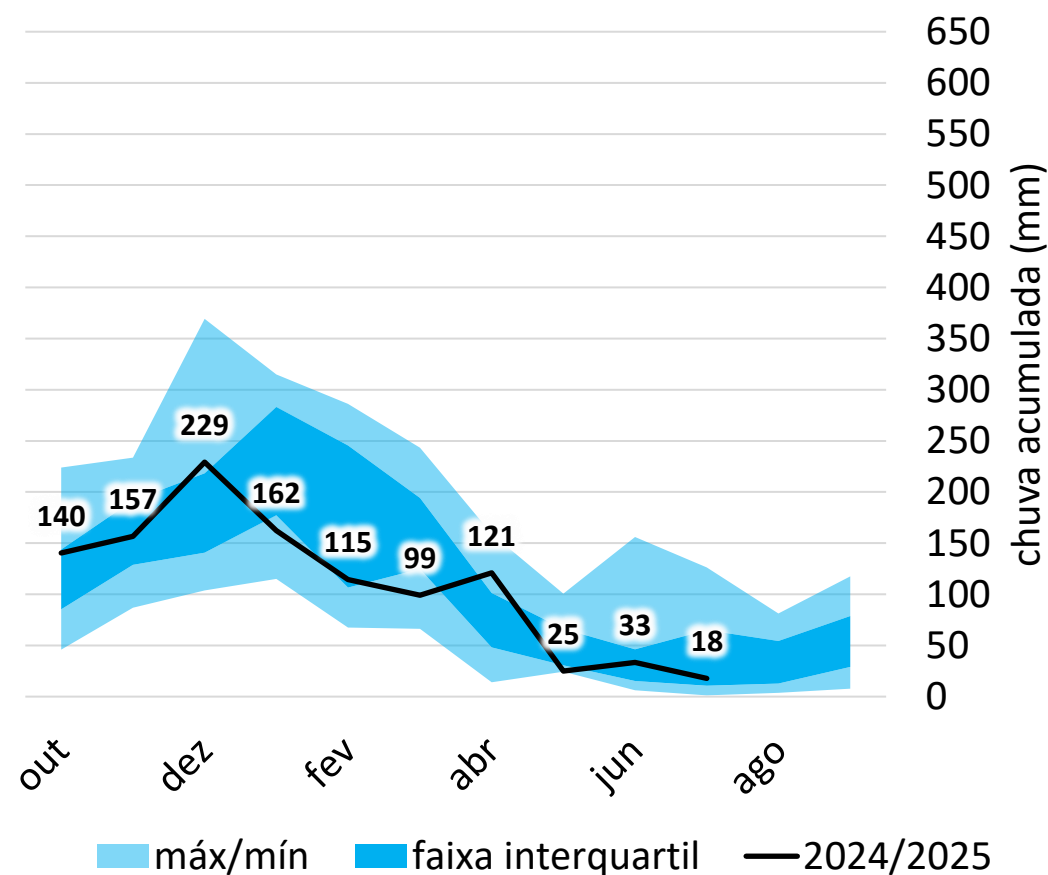
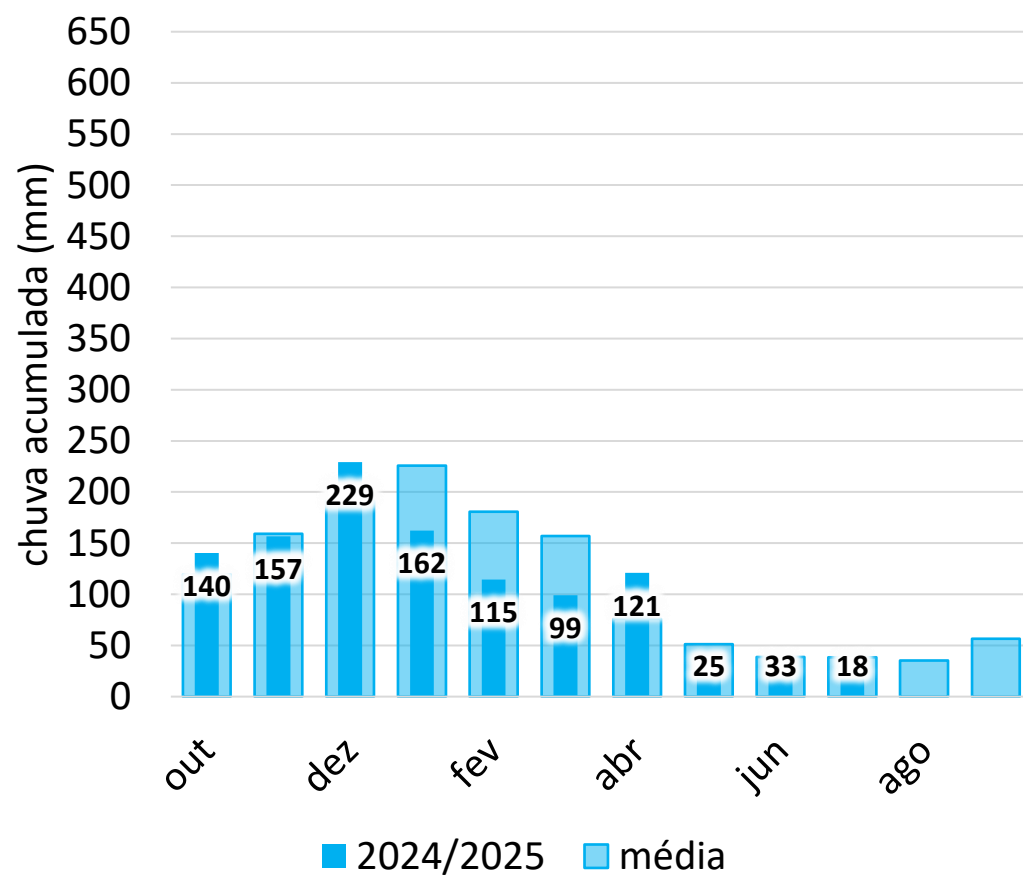


# UGRHI 2 - Paraíba do Sul

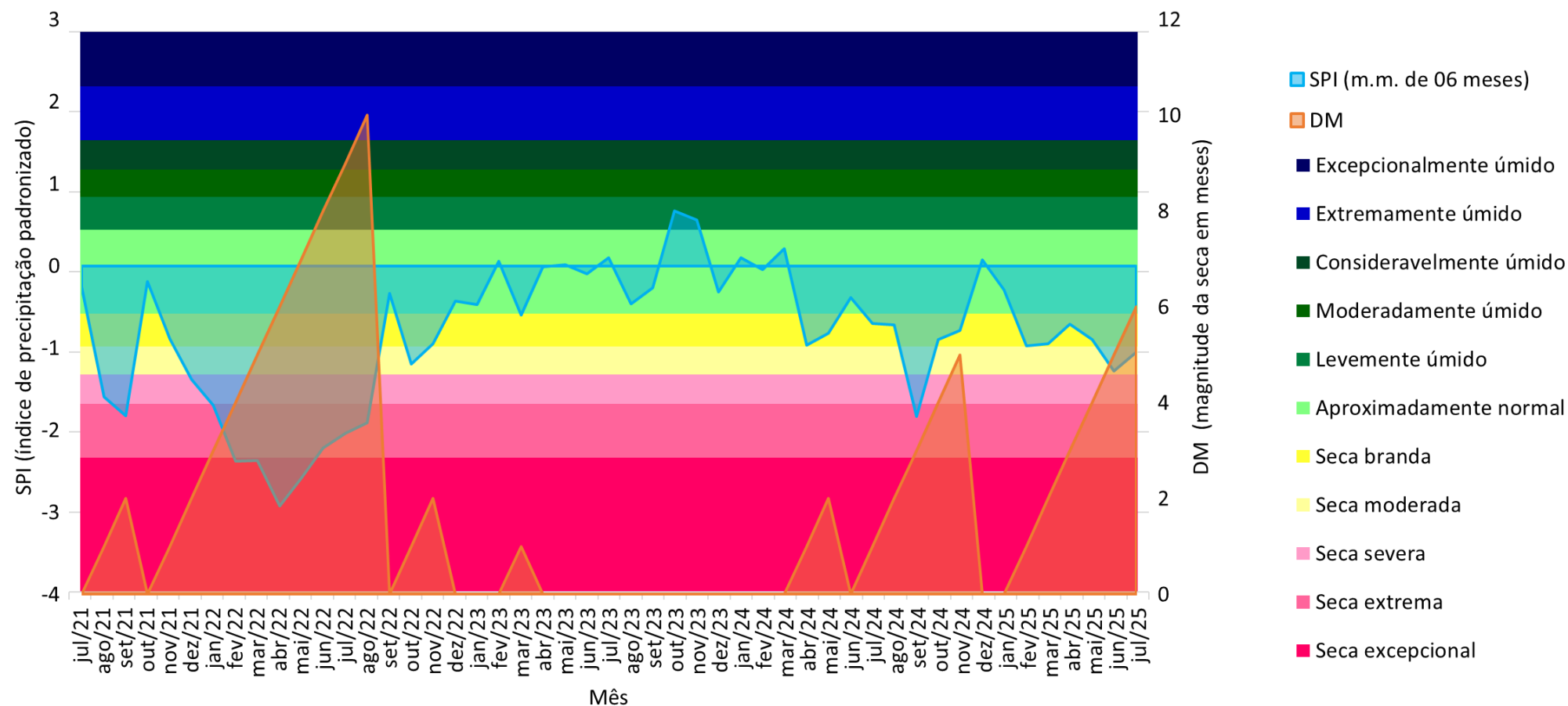




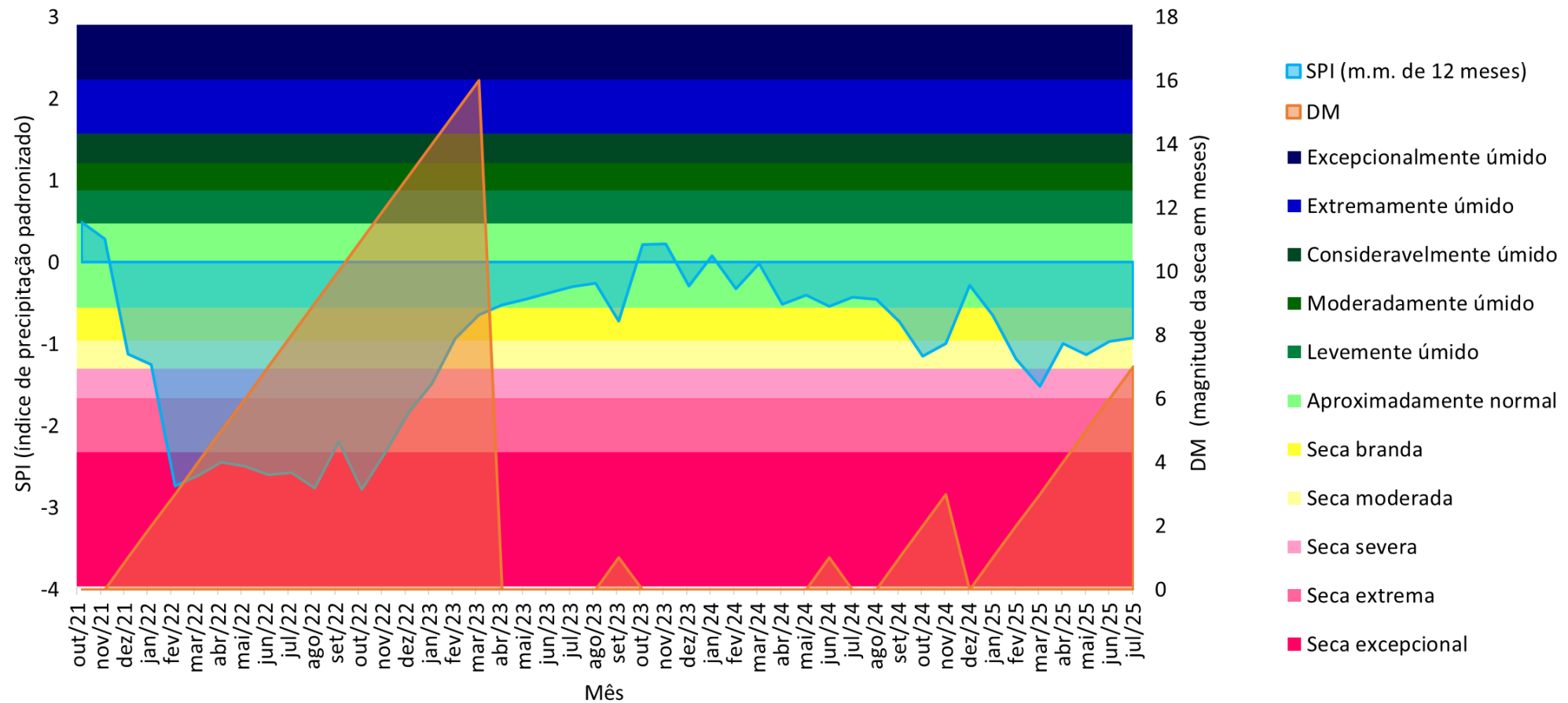
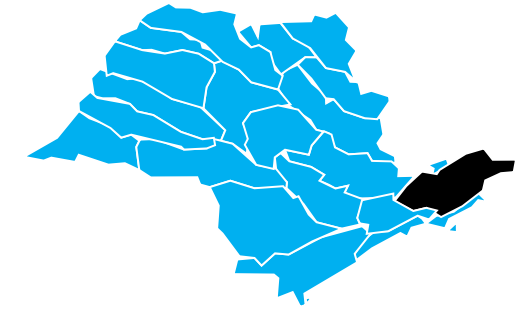
# UGRHI 2 - Paraíba do Sul



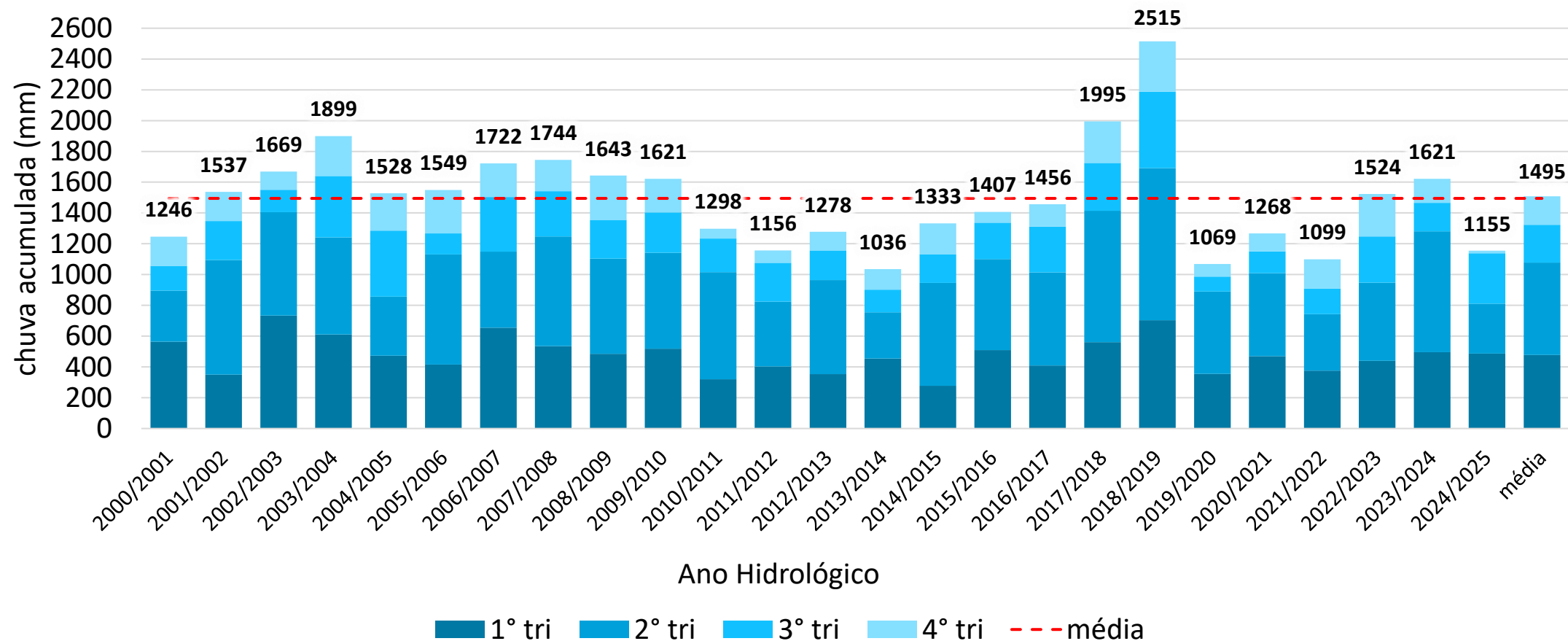
# UGRHI 2 - Paraíba do Sul | SPI-06



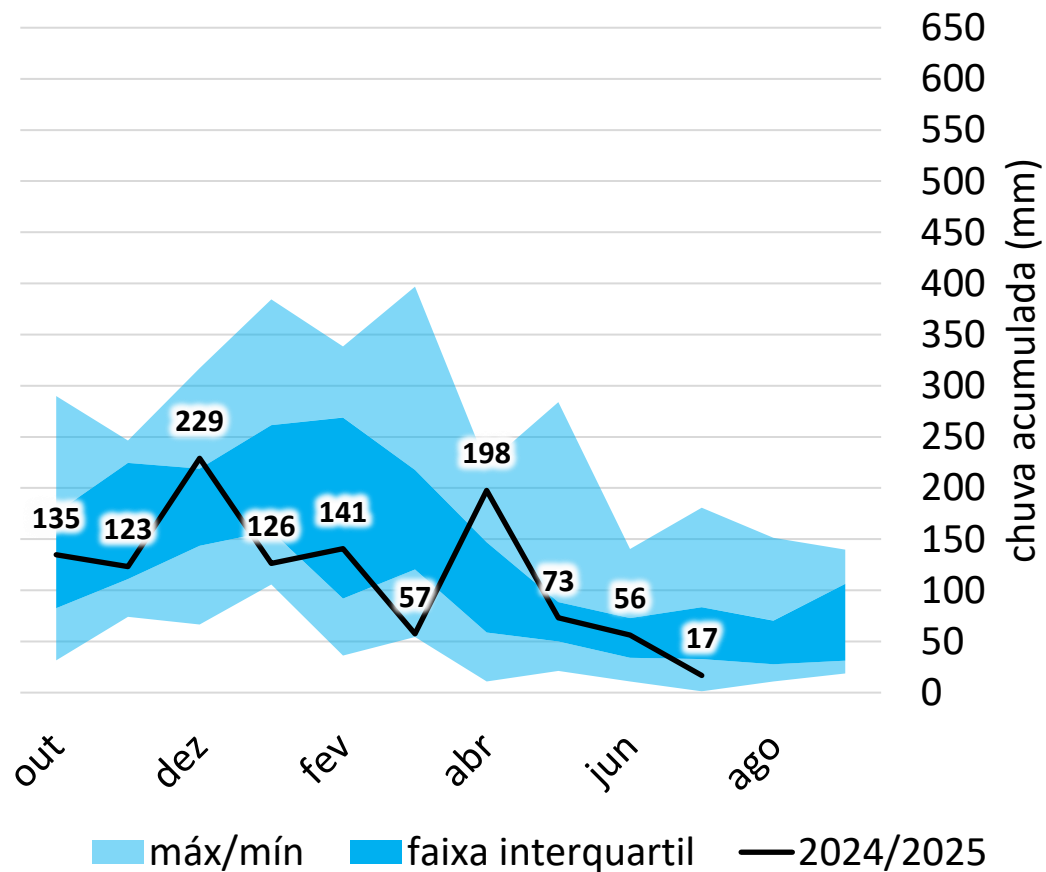
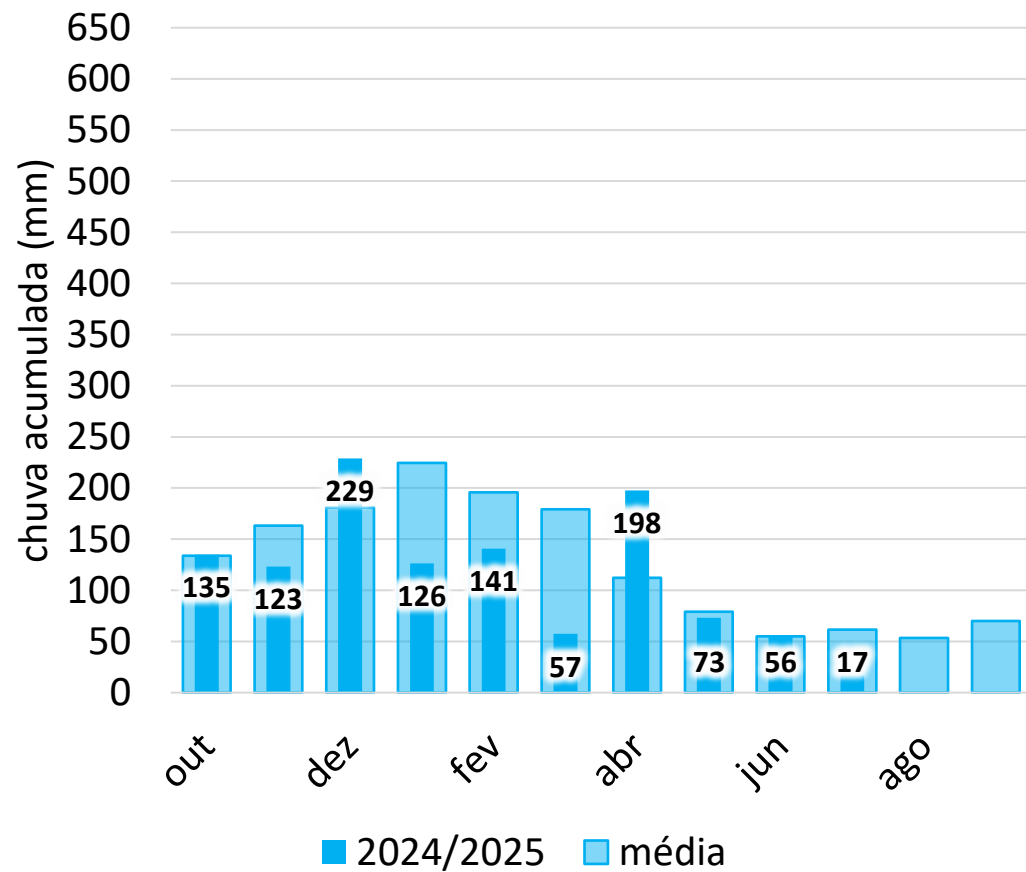
# UGRHI 2 - Paraíba do Sul | SPI-12



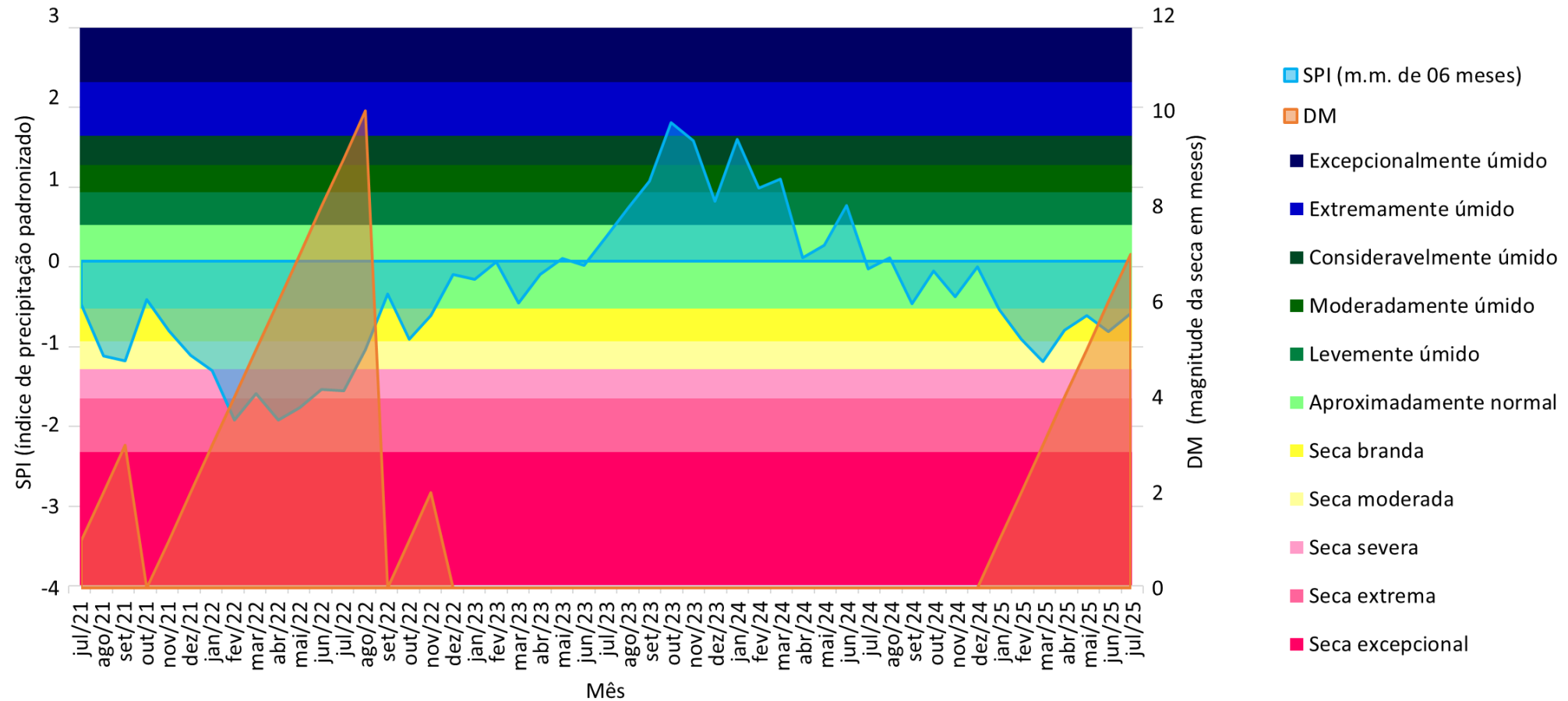
# UGRHI 3 - Litoral Norte



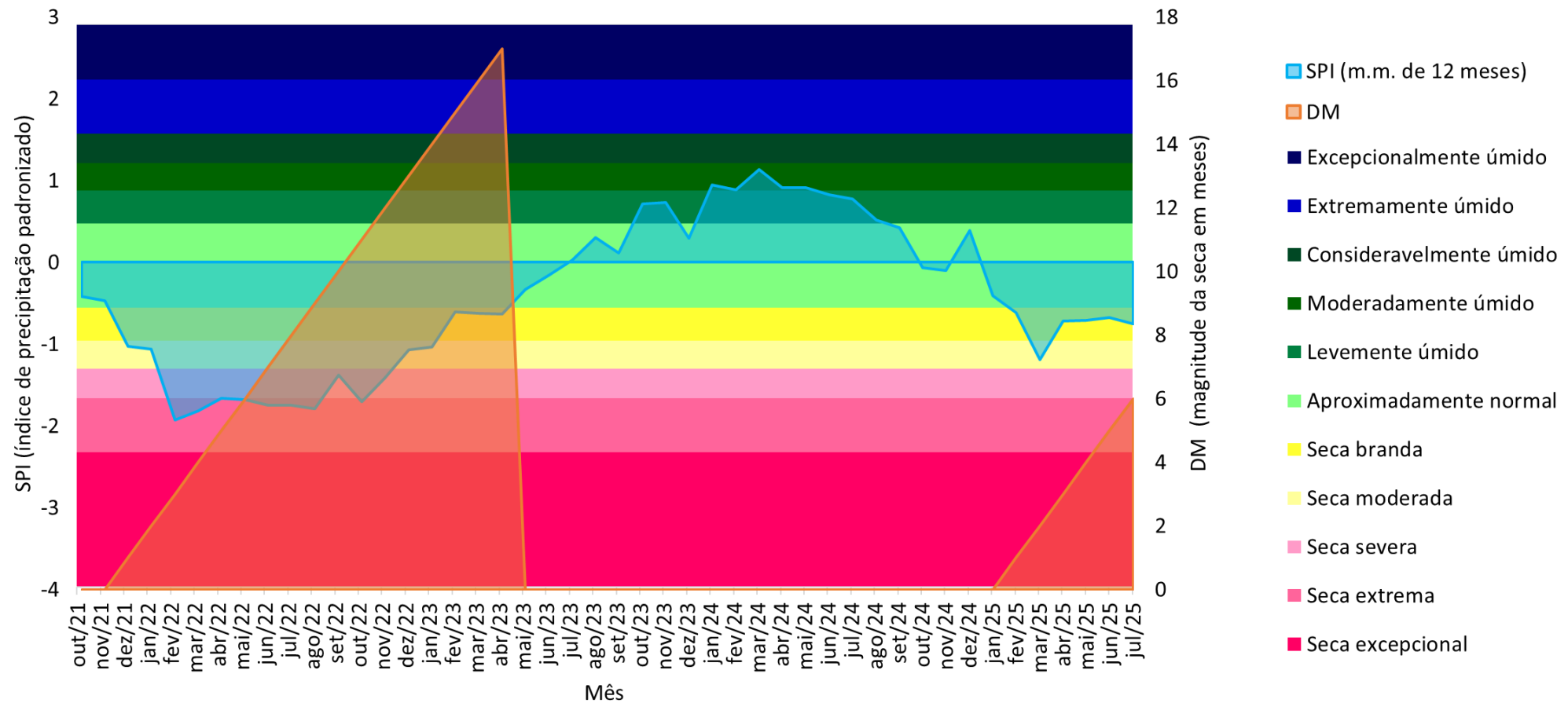
# UGRHI 3 - Litoral Norte



# UGRHI 3 - Litoral Norte | SPI-06

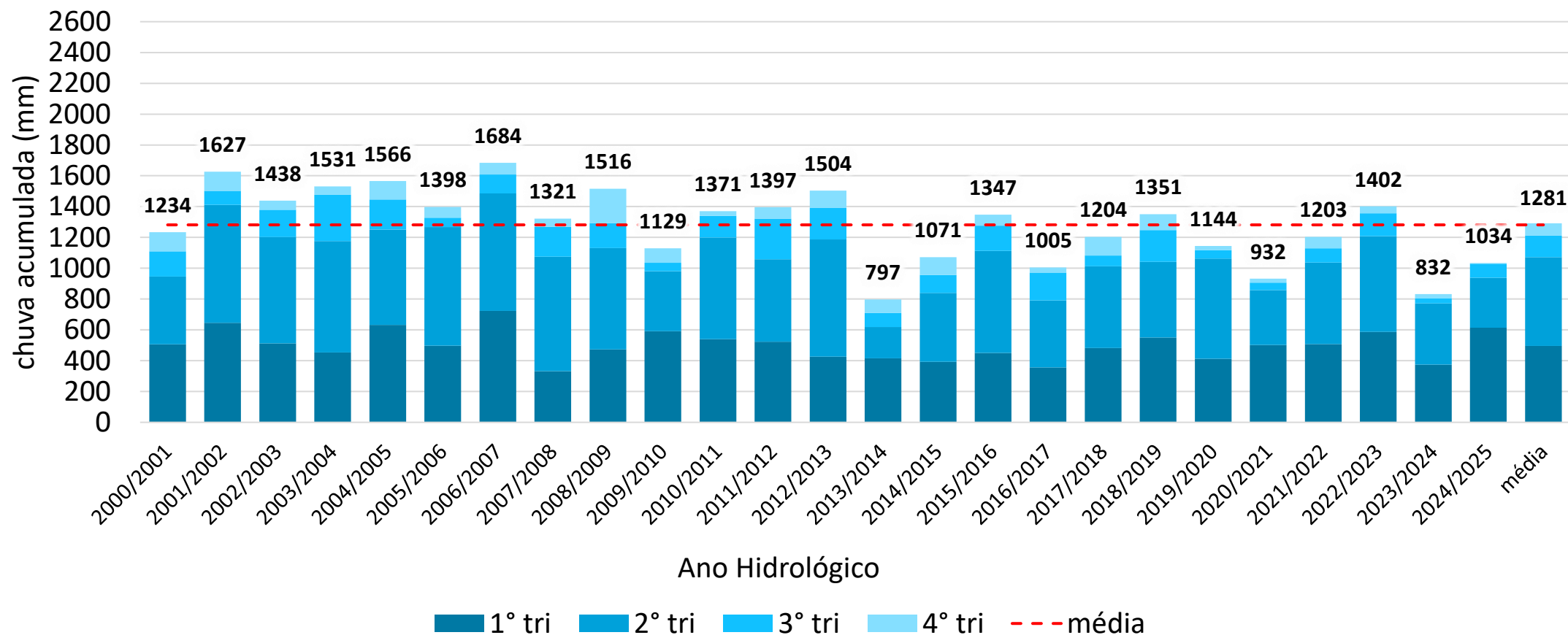


# UGRHI 3 - Litoral Norte | SPI-12

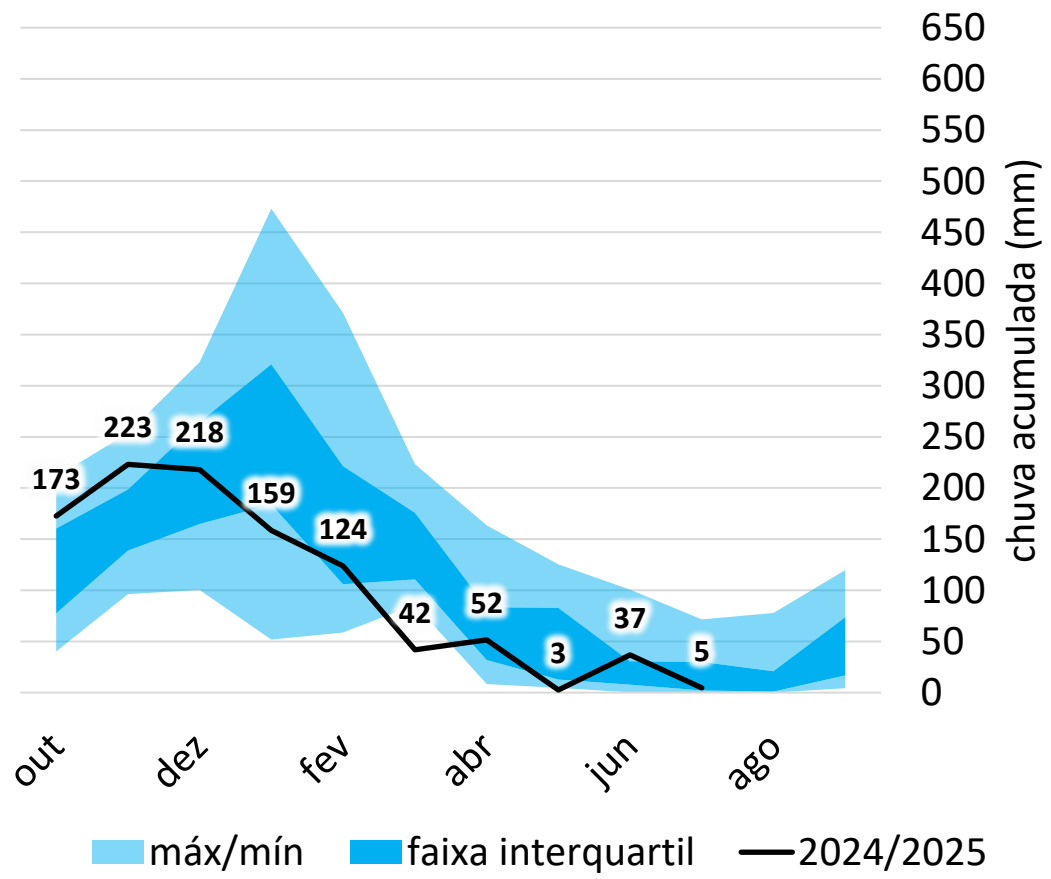
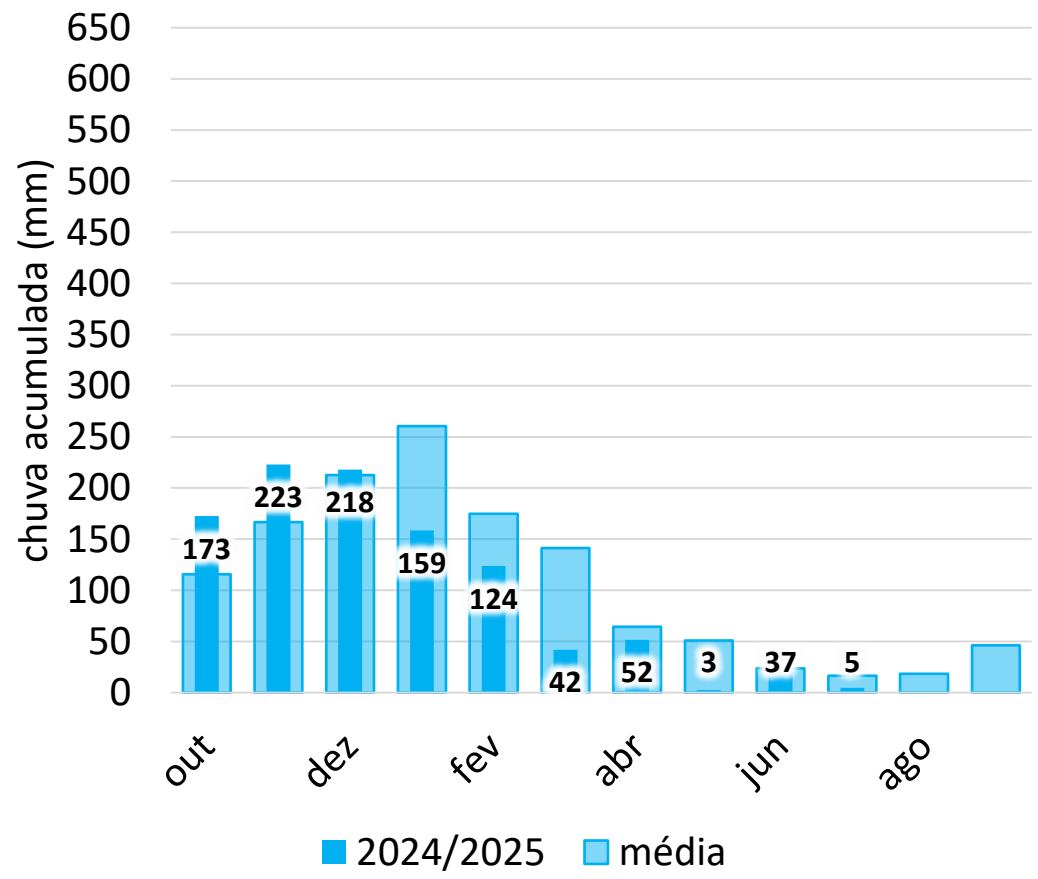




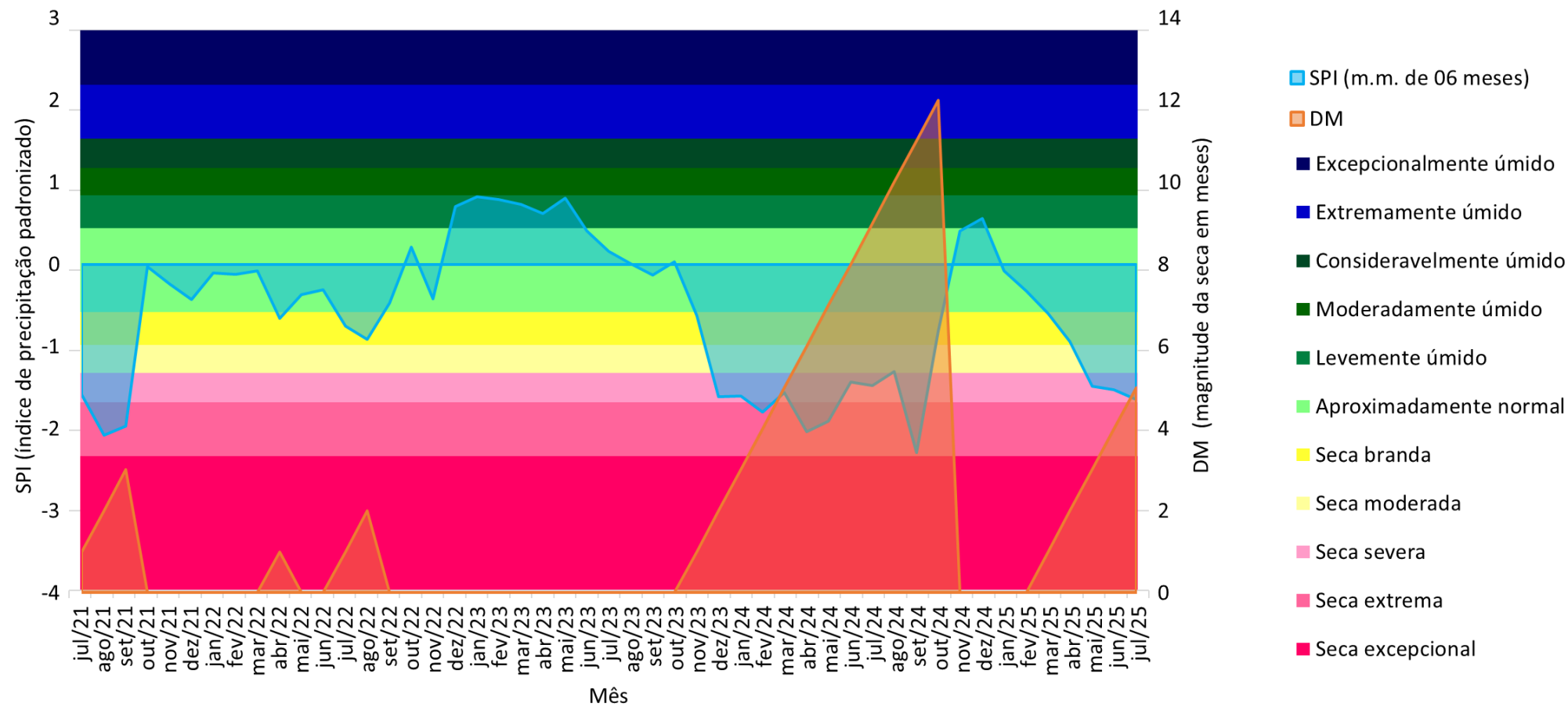
# UGRHI 4 - Pardo



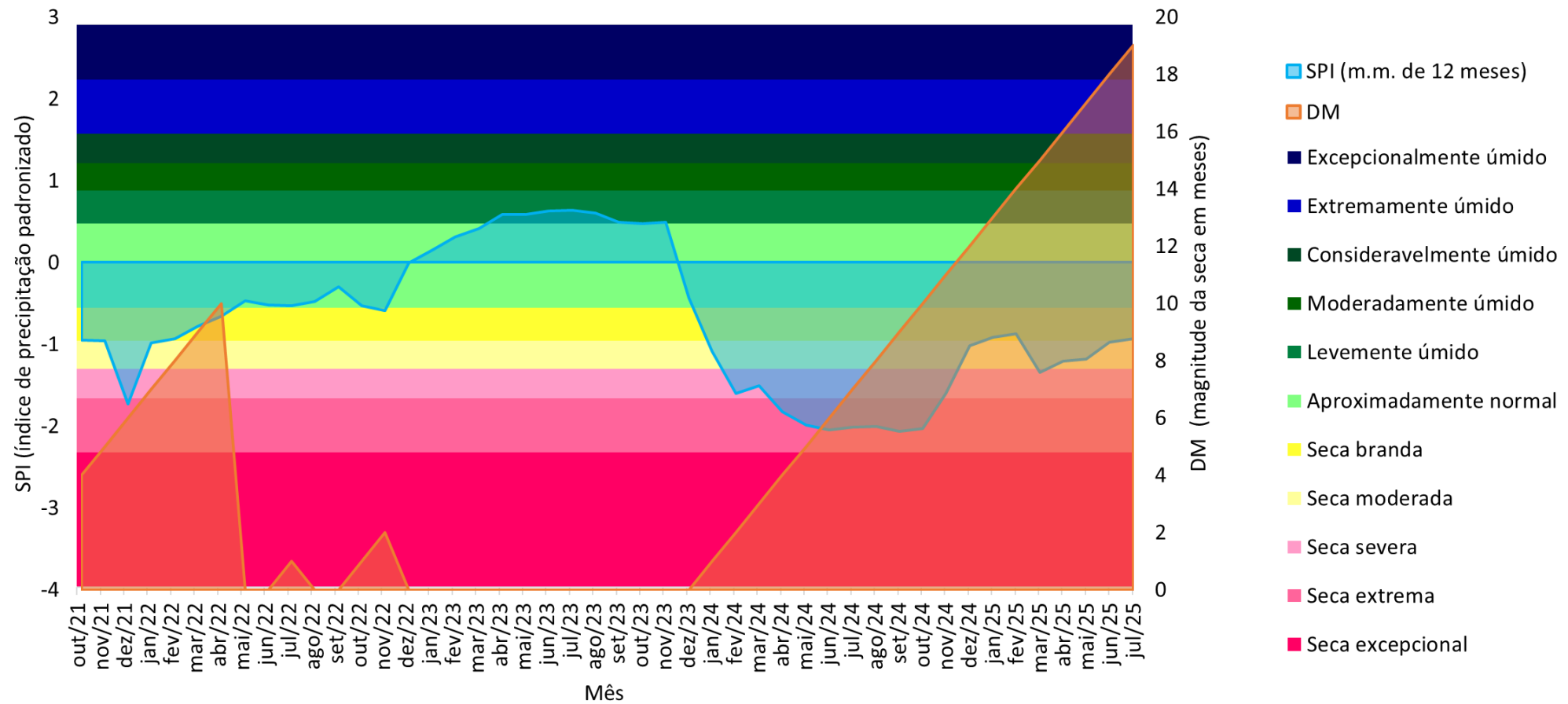
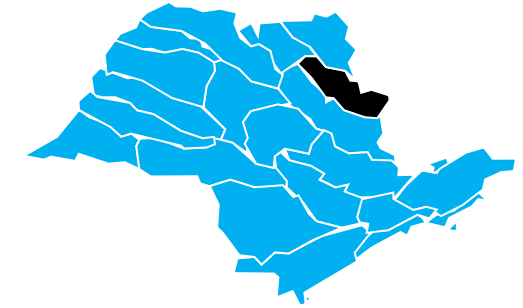
# UGRHI 4 - Pardo



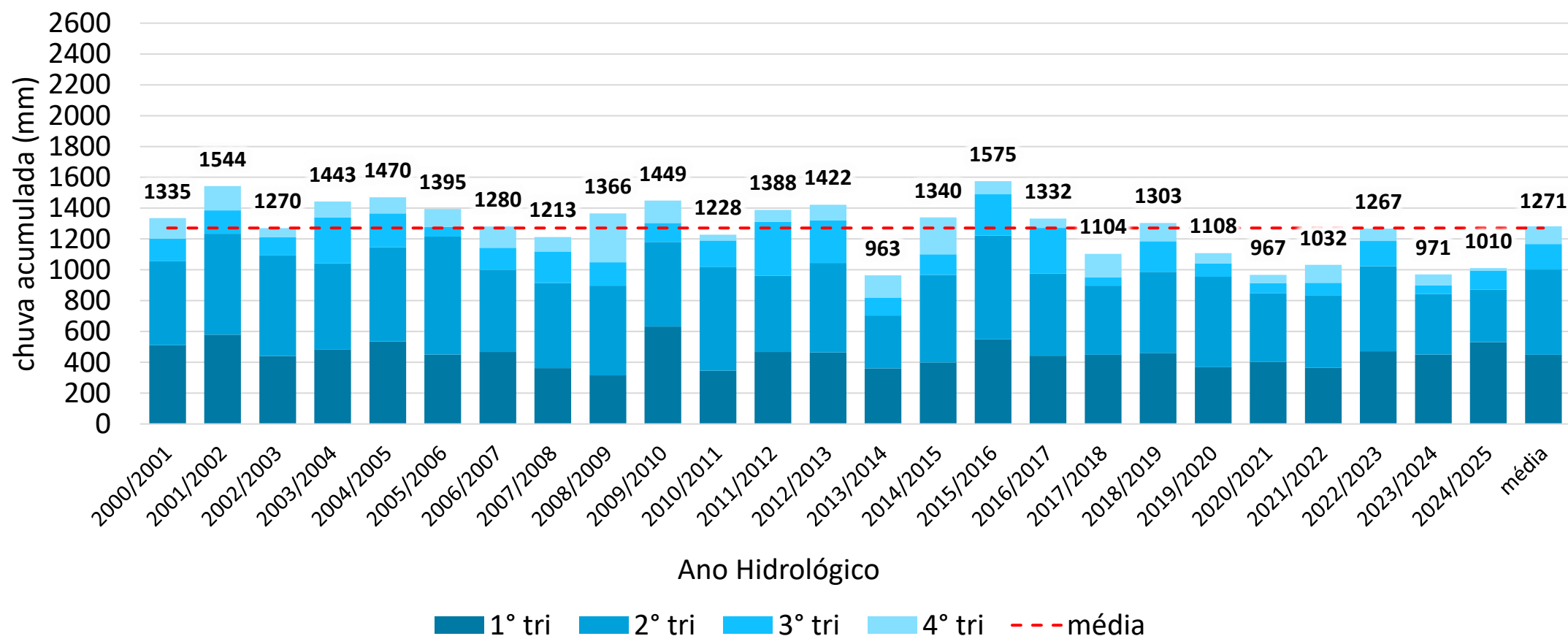
# UGRHI 4 - Pardo | SPI-06



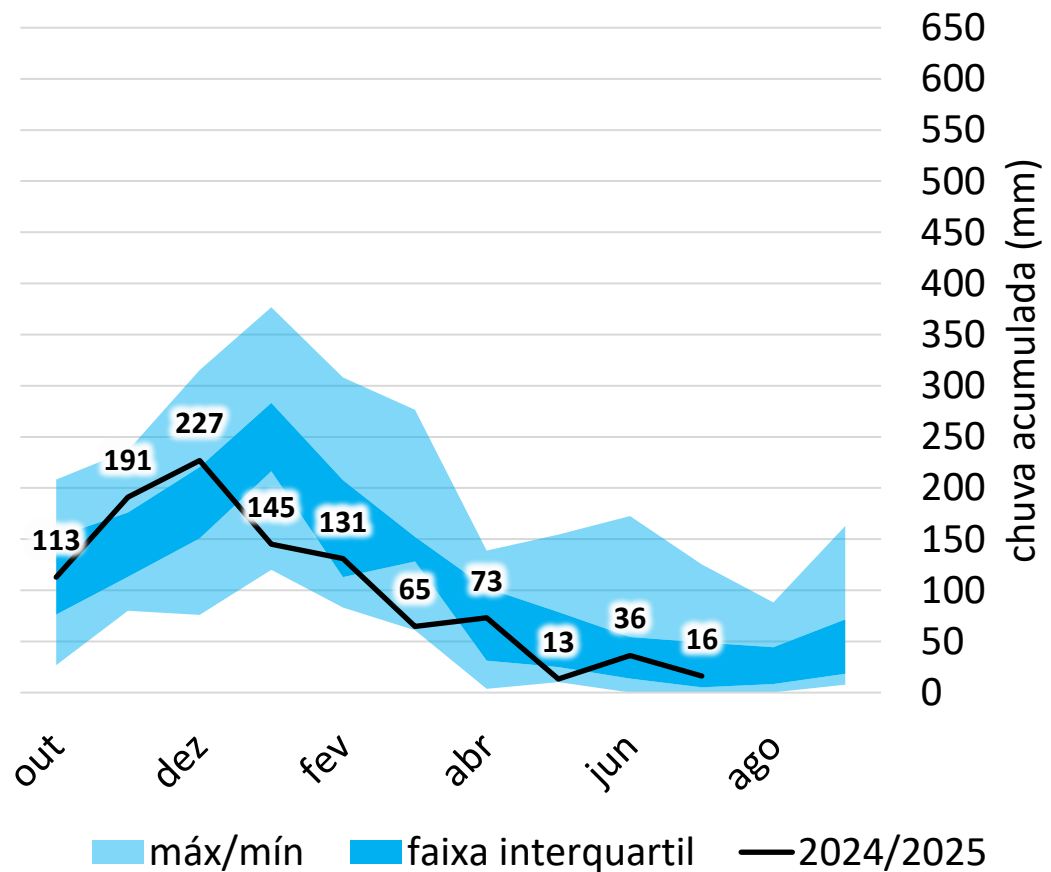
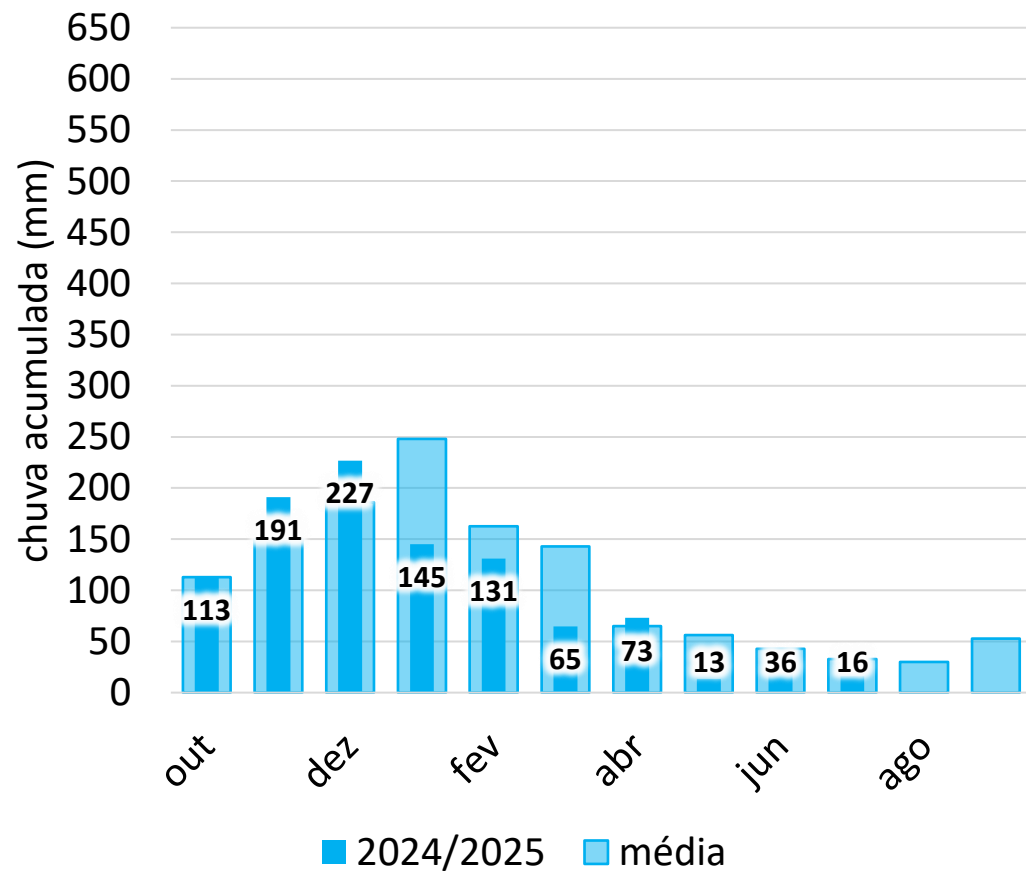
# UGRHI 4 - Pardo | SPI-12



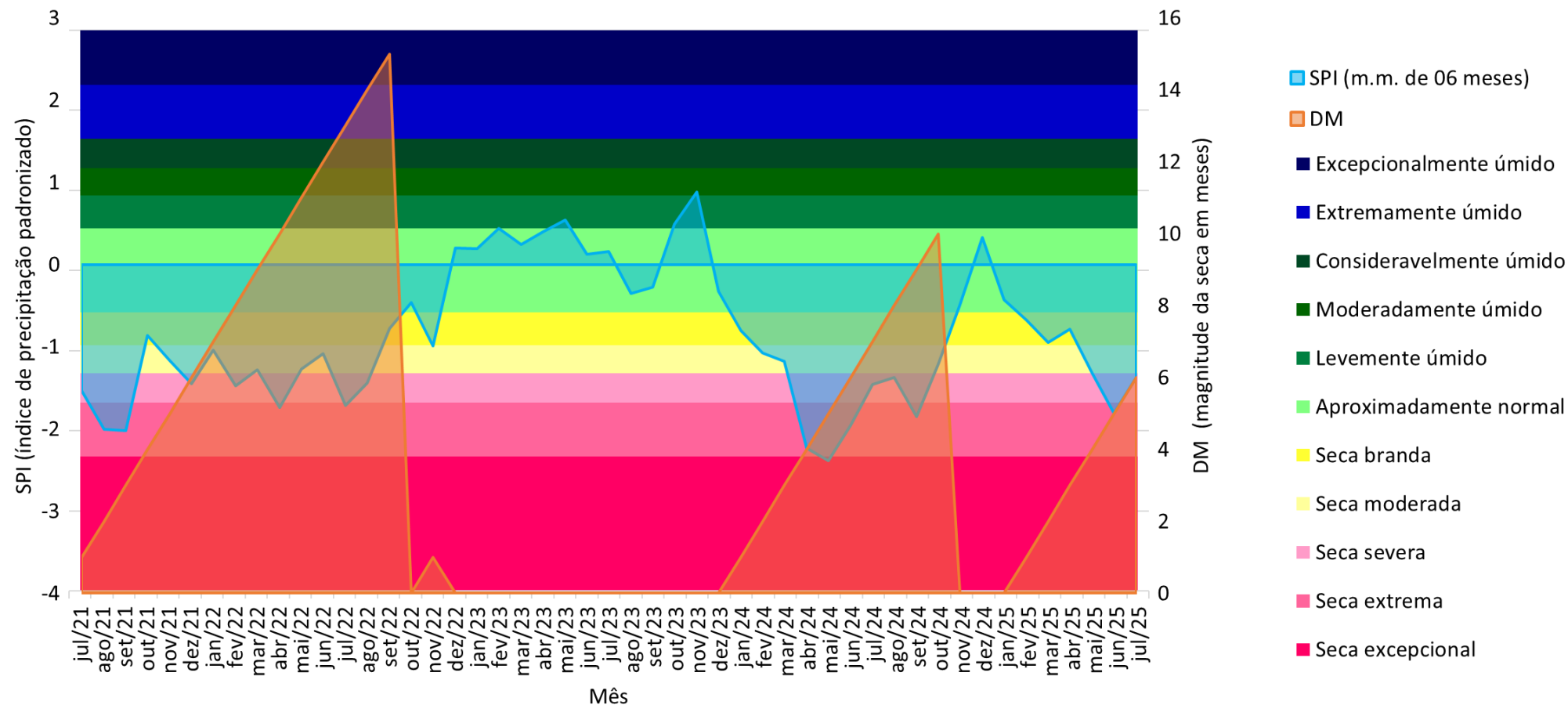
# UGRHI 5 - Piracicaba/Capivari/Jundiaí



# UGRHI 5 - Piracicaba/Capivari/Jundiaí

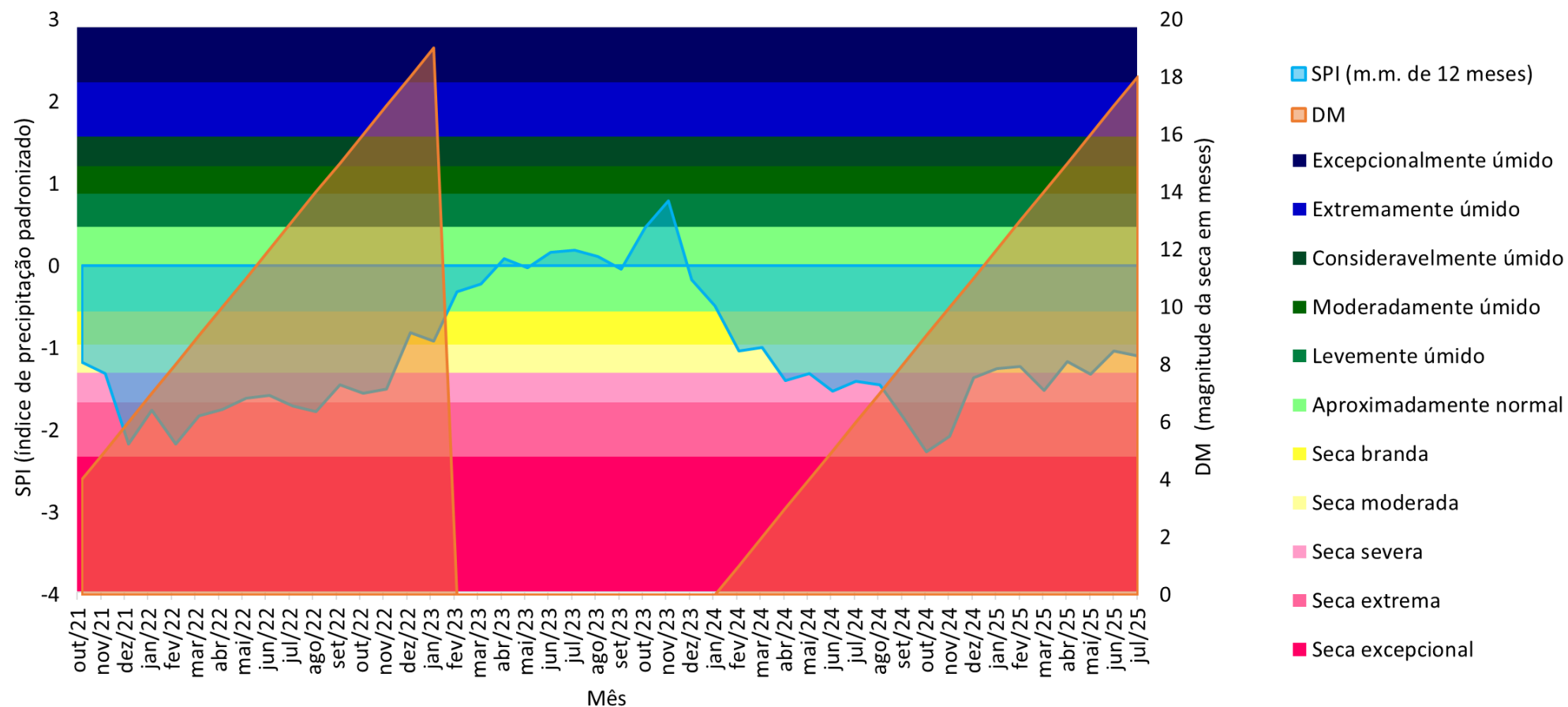


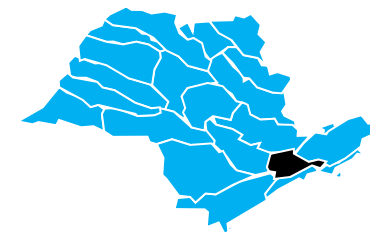
# UGRHI 5 - Piracicaba/Capivari/Jundiaí | SPI-06



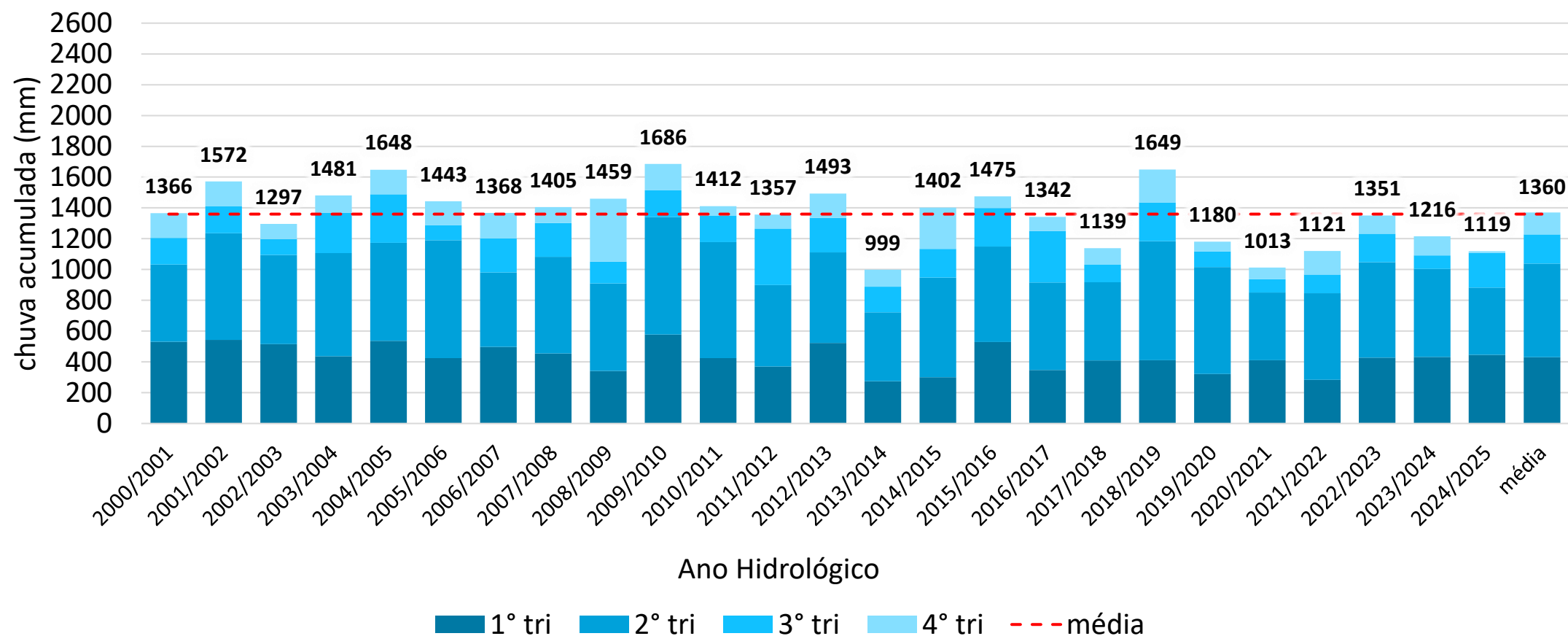


# UGRHI 5 - Piracicaba/Capivari/Jundiaí | SPI-12

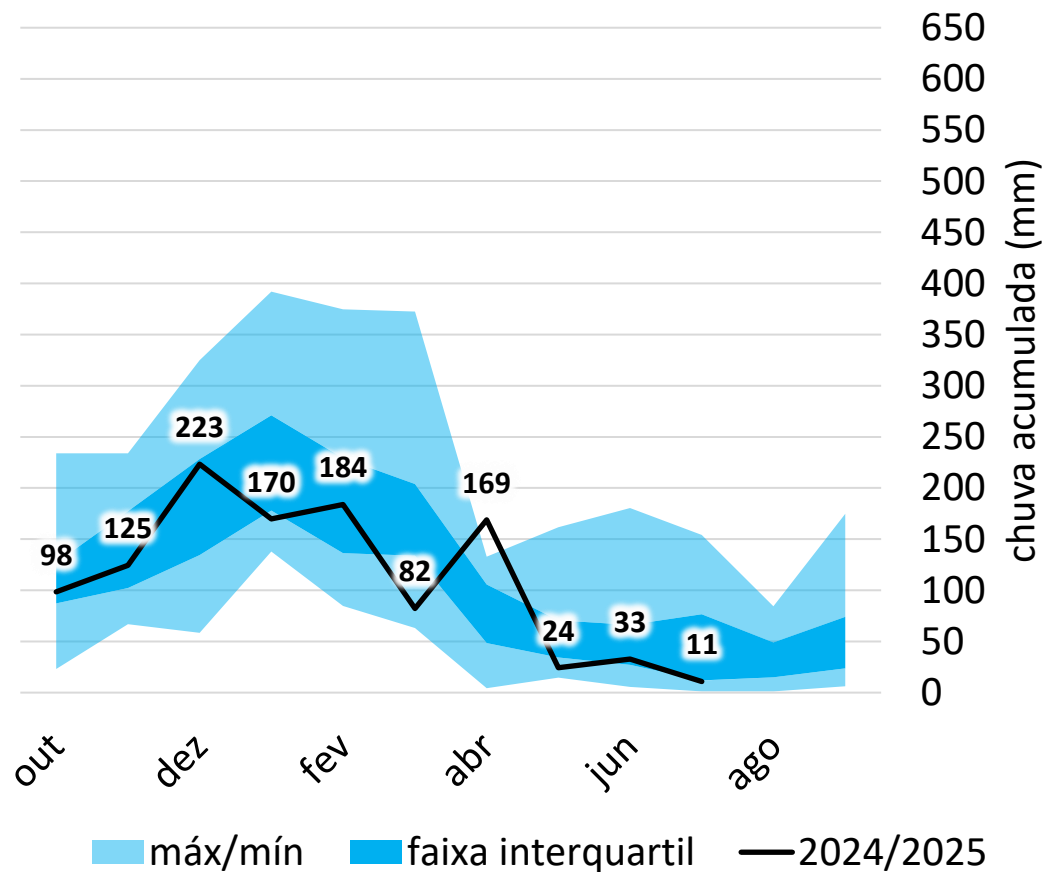
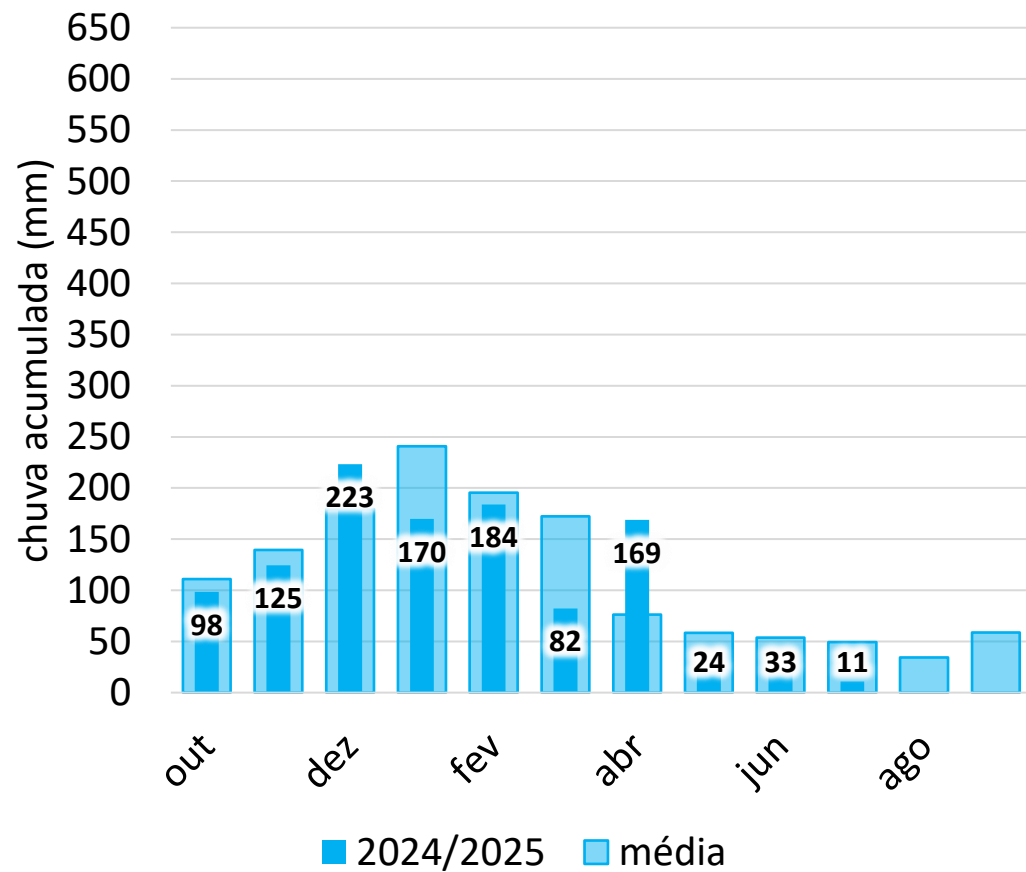
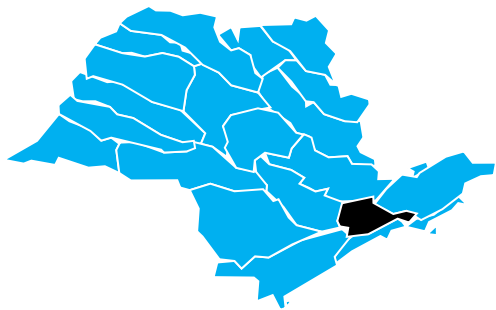




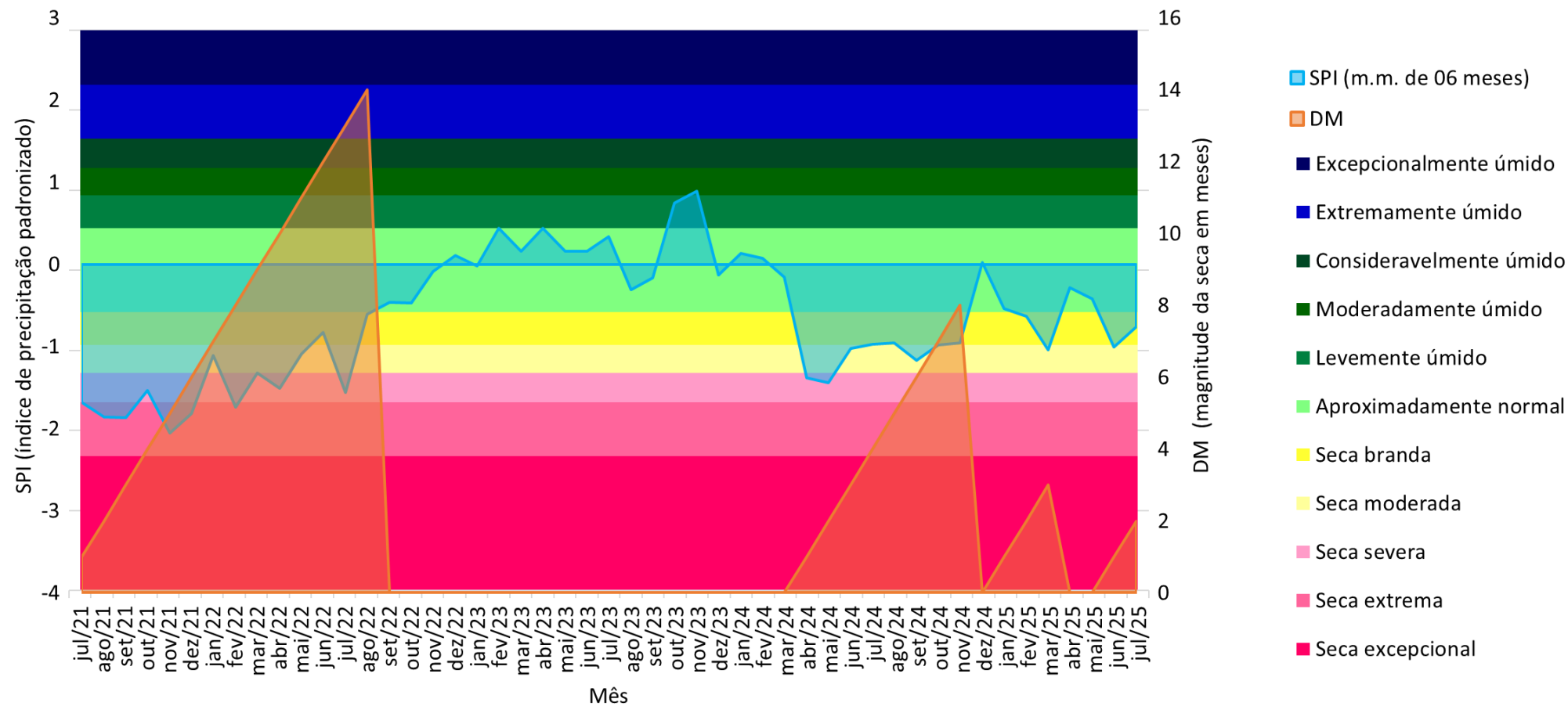
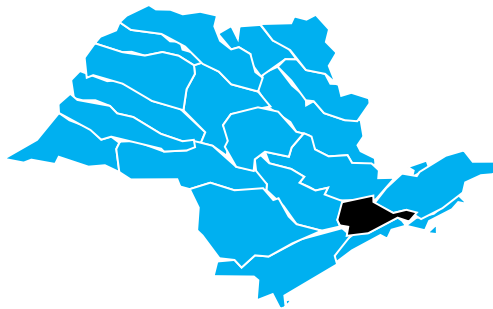
## UGRHI 6 - Alto Tietê



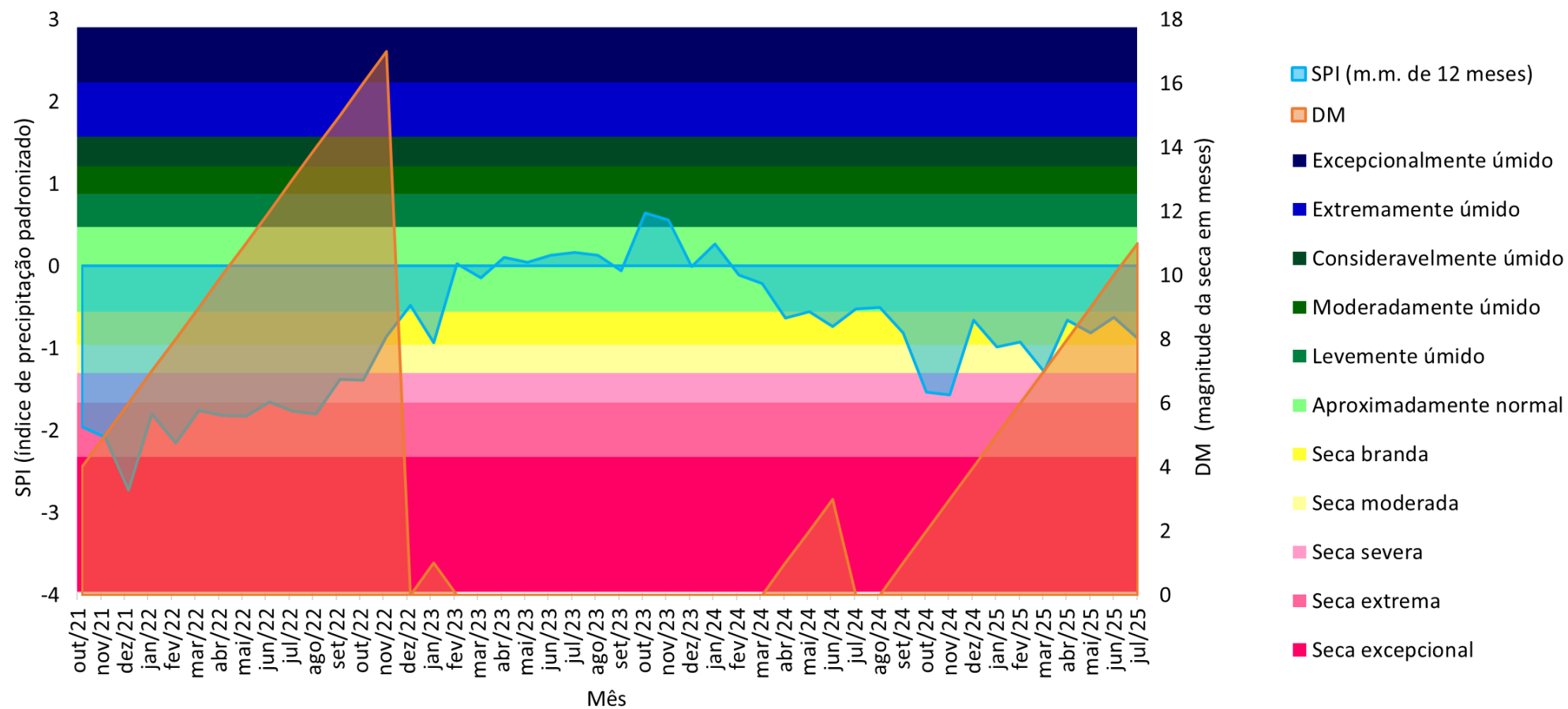
# UGRHI 6 - Alto Tietê



# UGRHI 6 - Alto Tietê | SPI-06

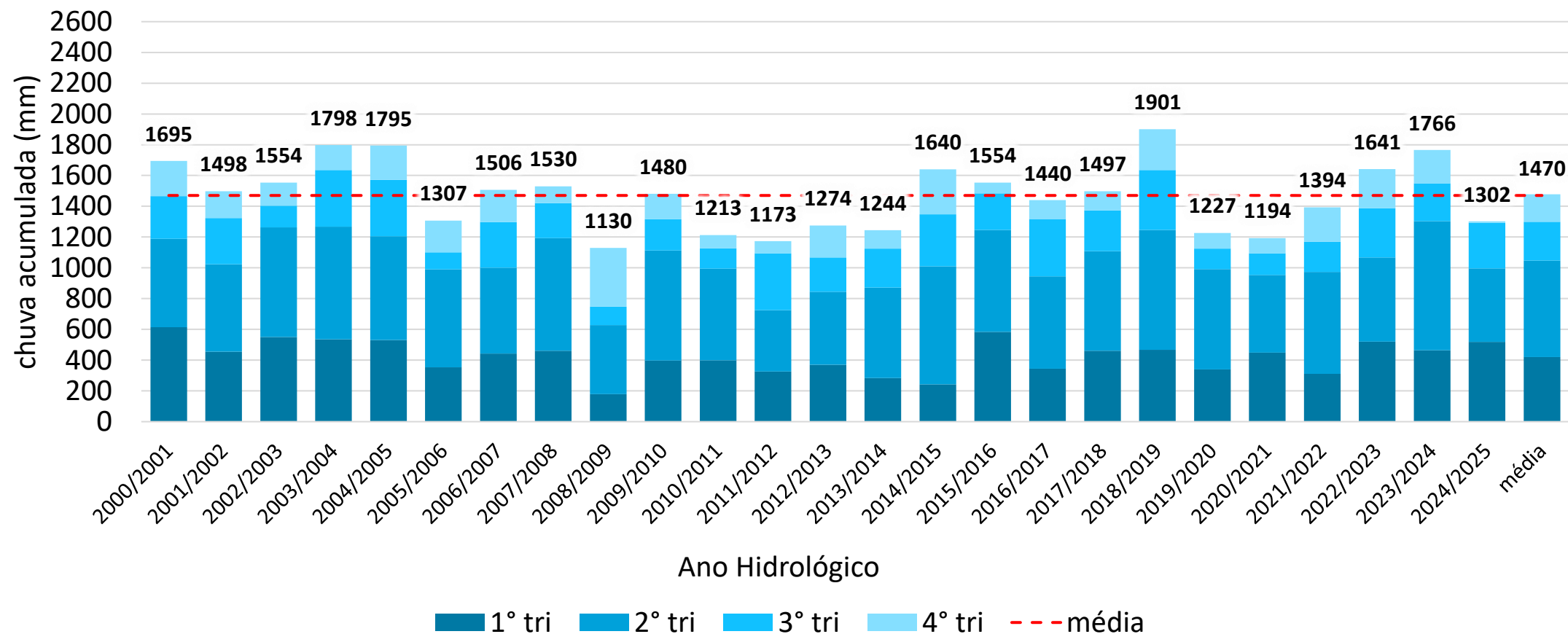


# UGRHI 6 - Alto Tietê | SPI-12

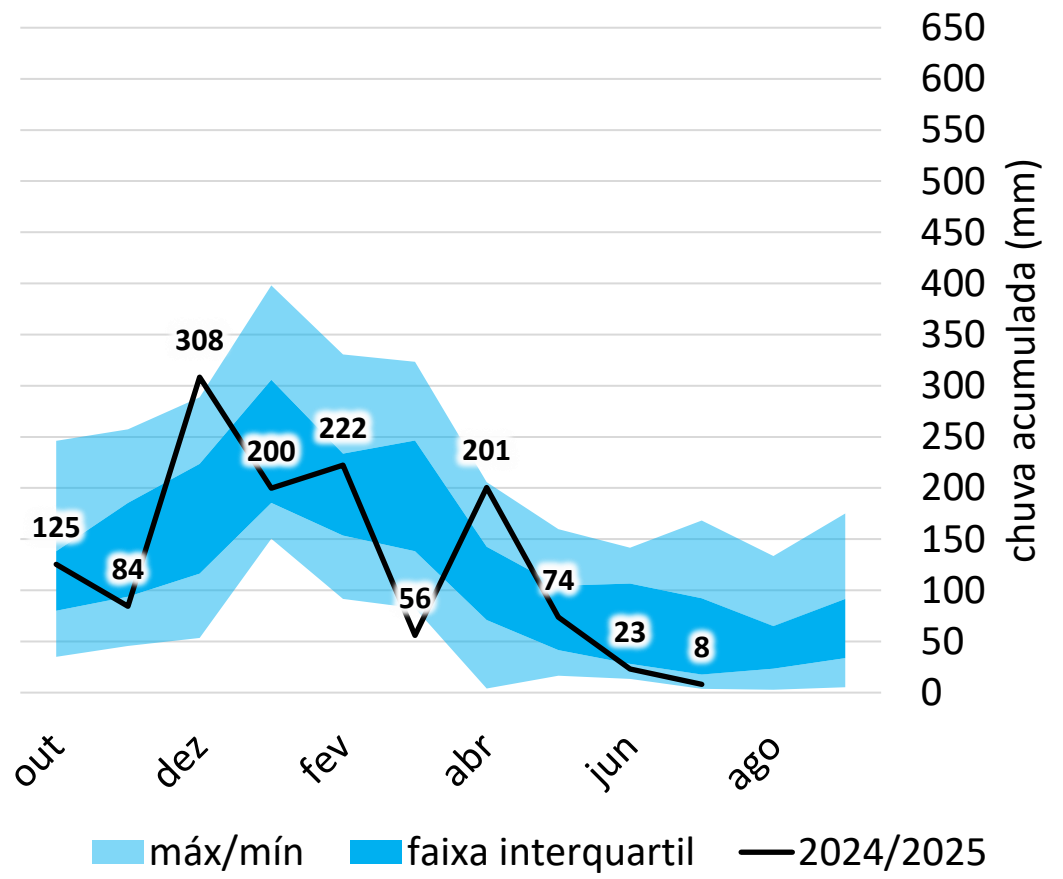
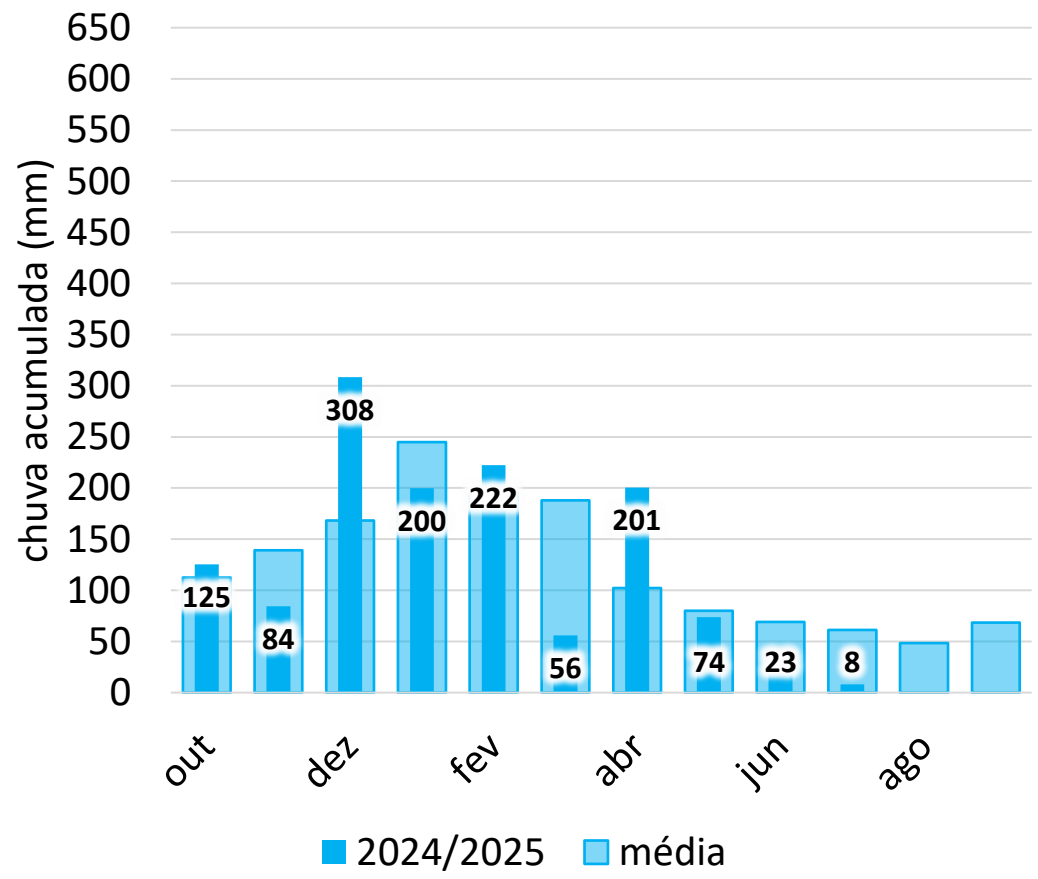




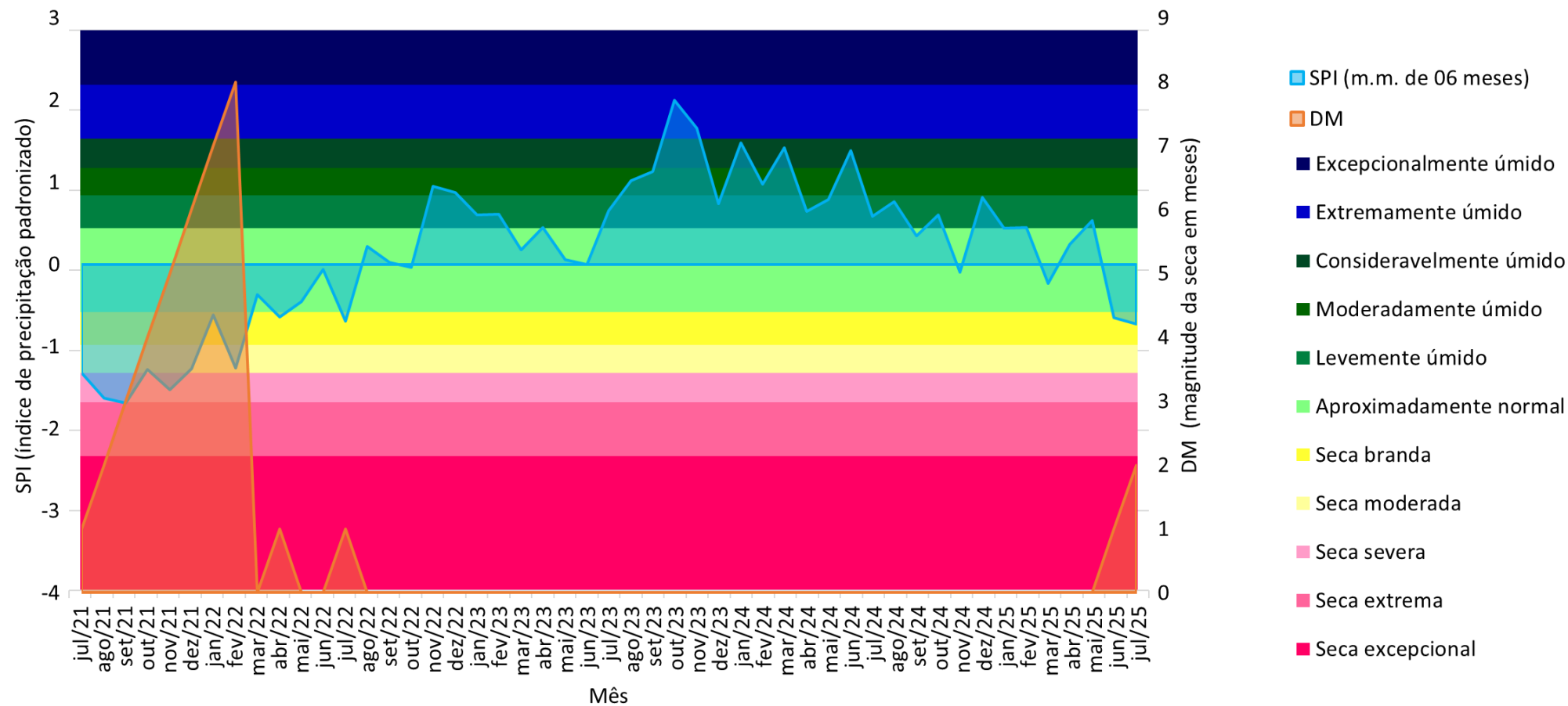
## UGRHI 7 - Baixada Santista



# UGRHI 7 - Baixada Santista

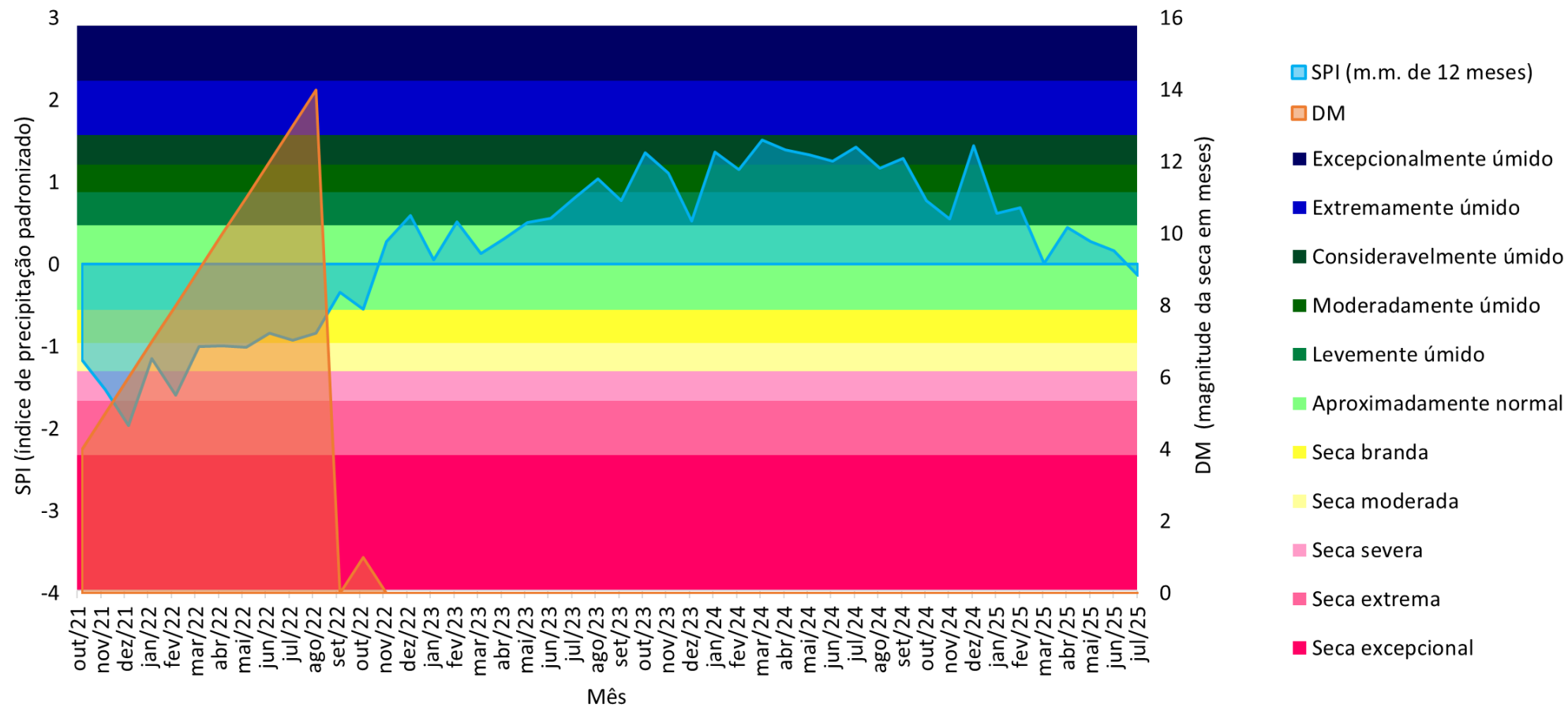


# UGRHI 7 - Baixada Santista | SPI-06



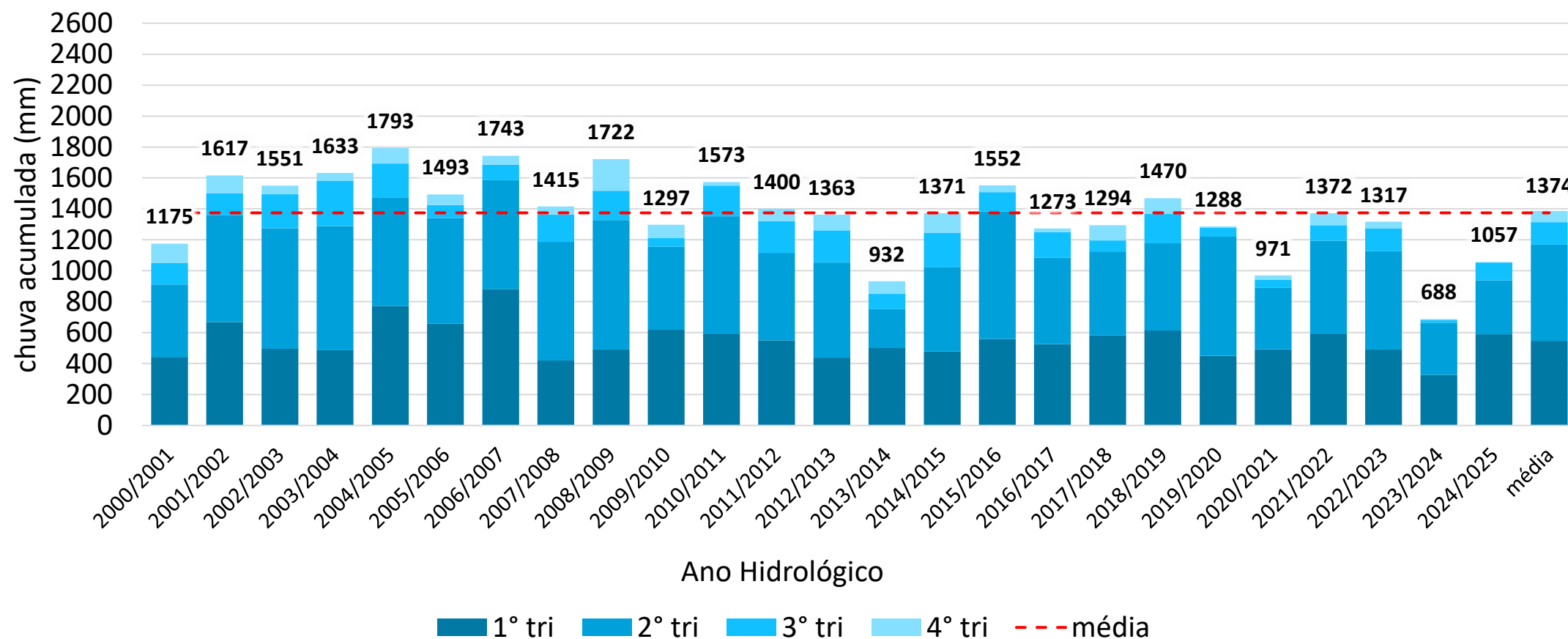


# UGRHI 7 - Baixada Santista | SPI-12

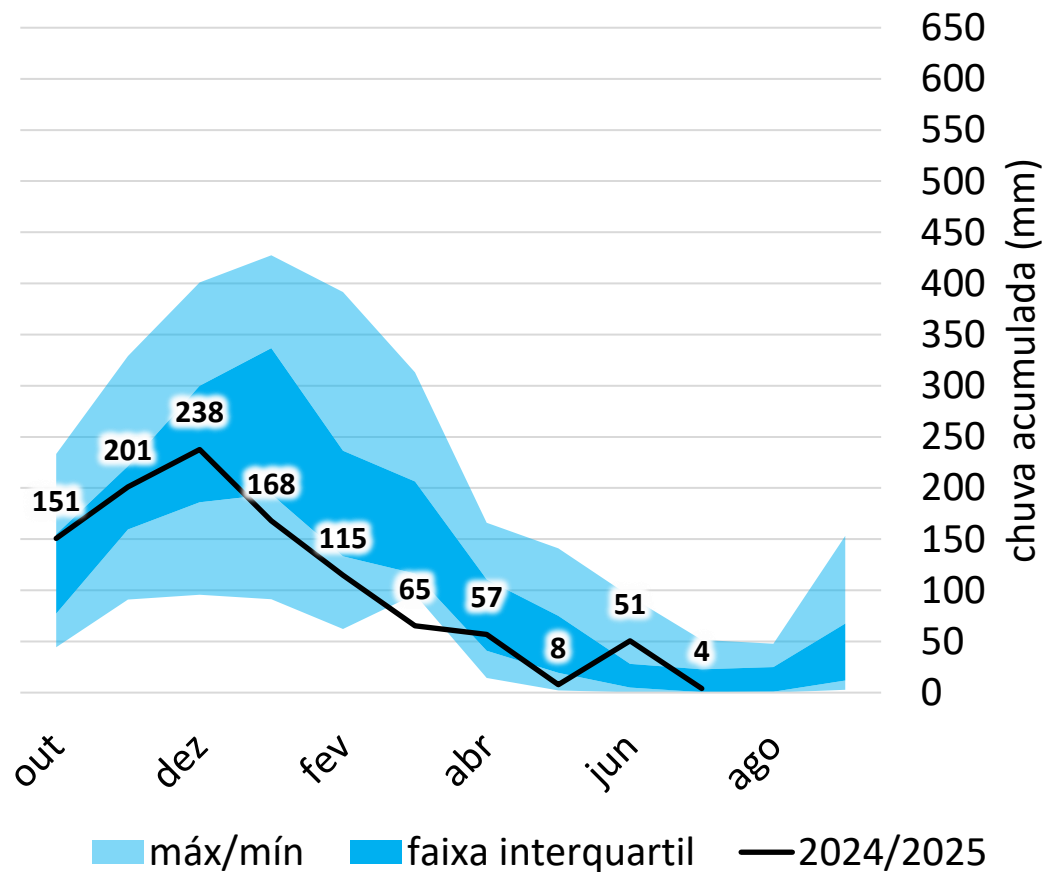
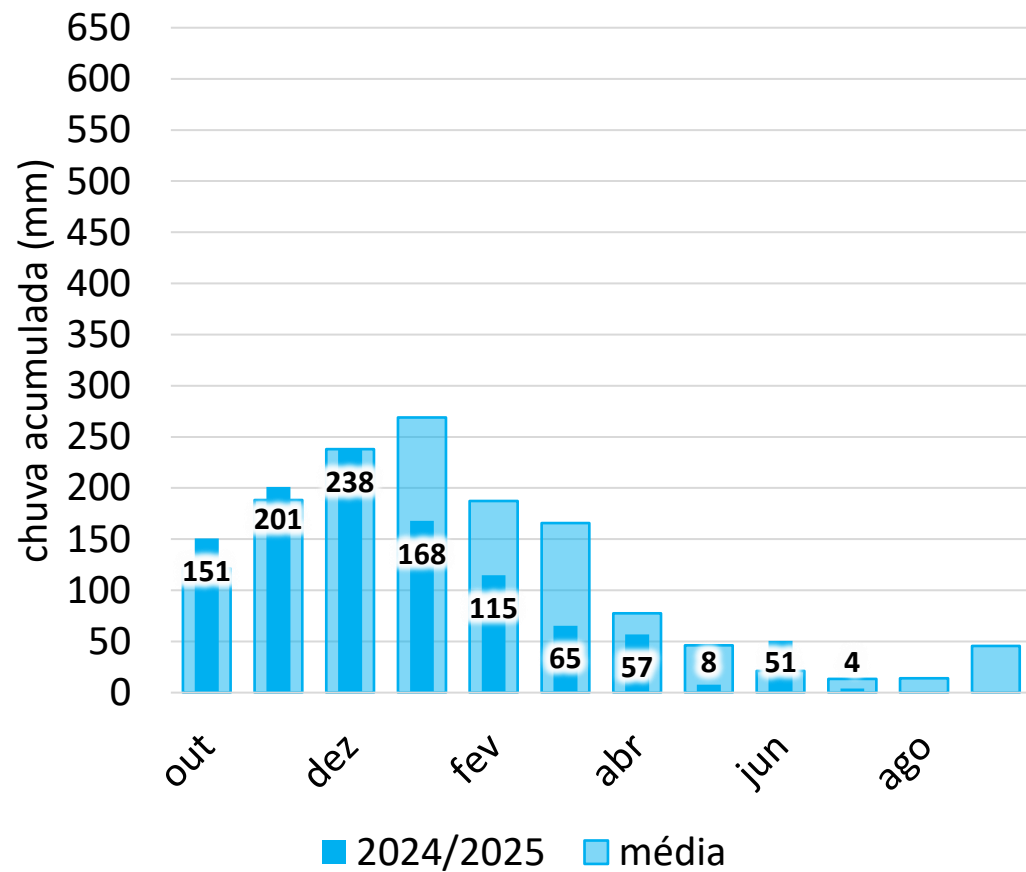




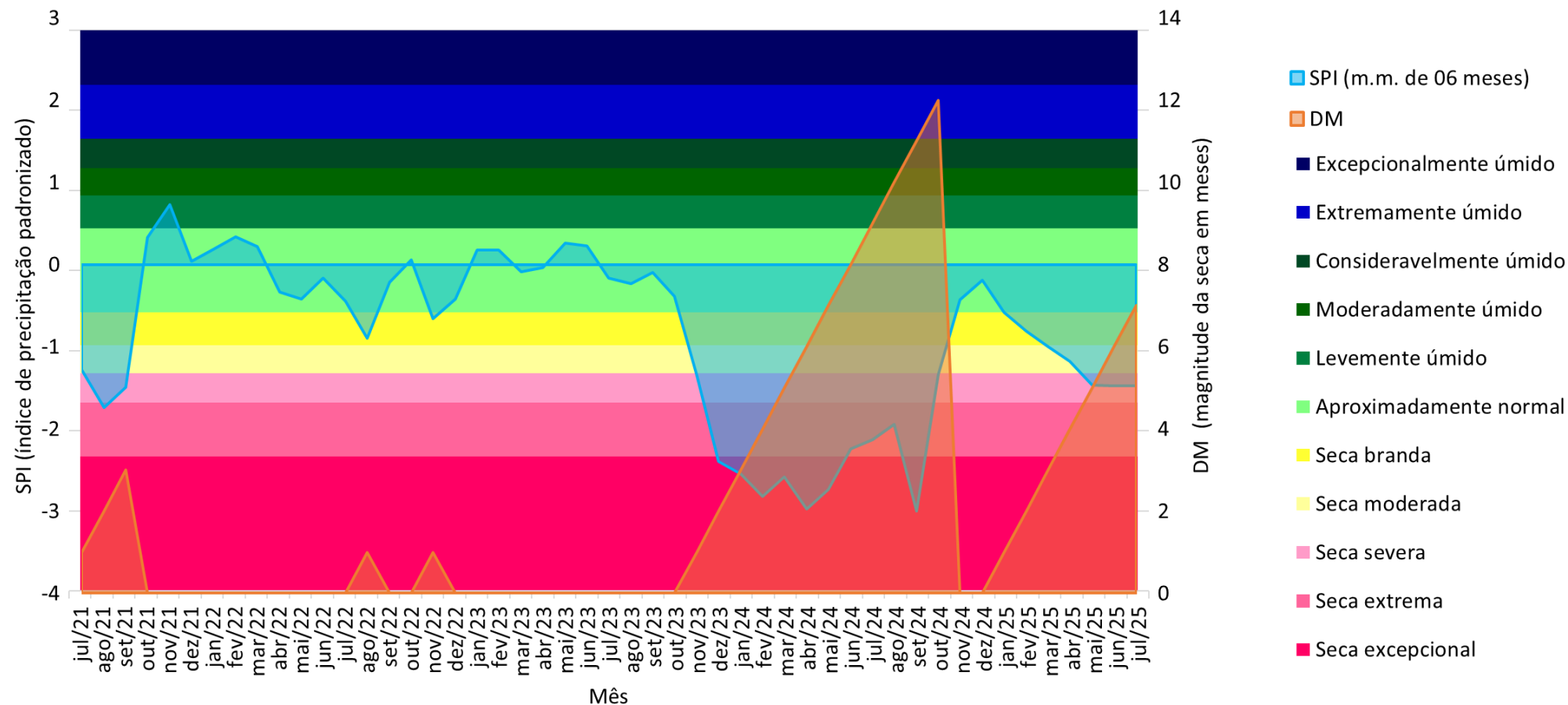
## UGRHI 8 - Sapucaí/Grande



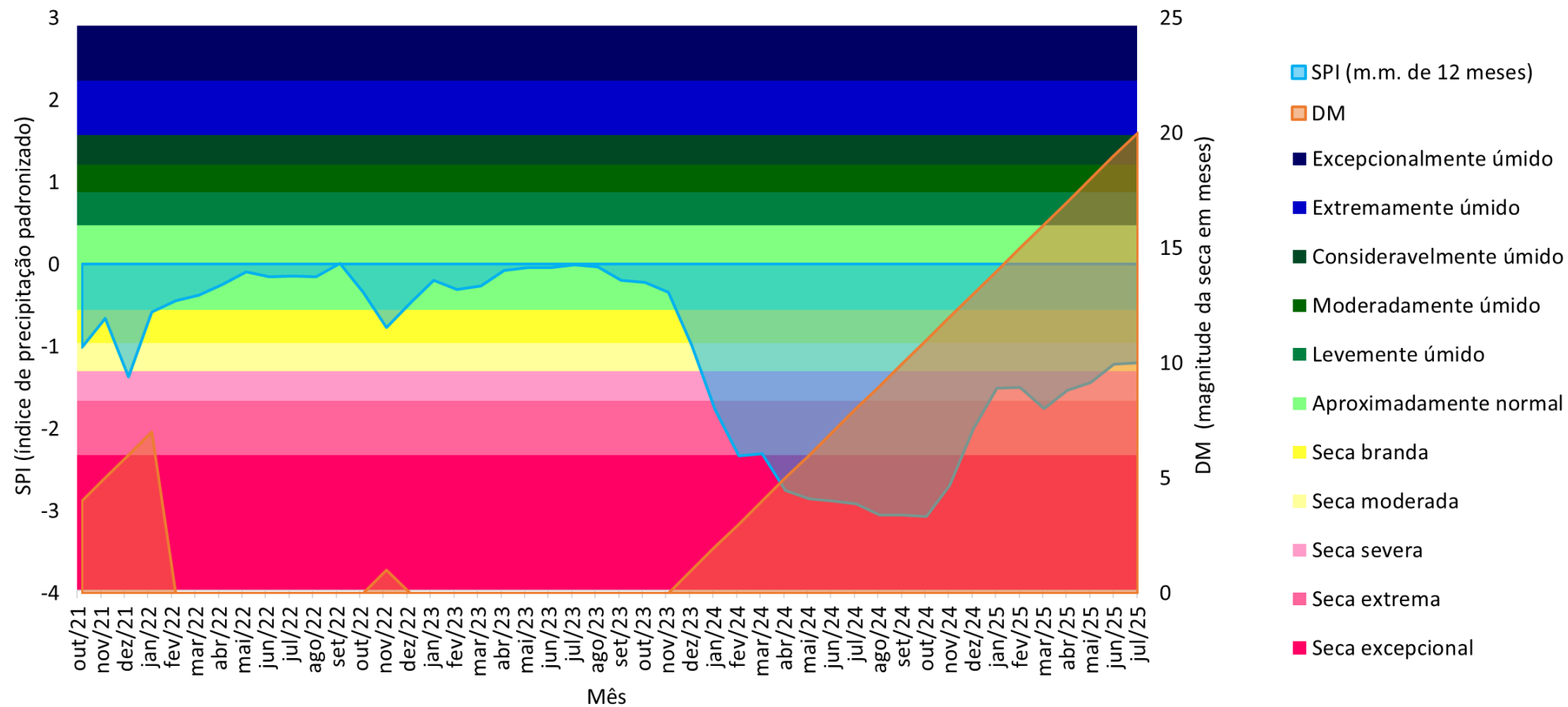
# UGRHI 8 - Sapucaí/Grande



# UGRHI 8 - Sapucaí/Grande | SPI-06

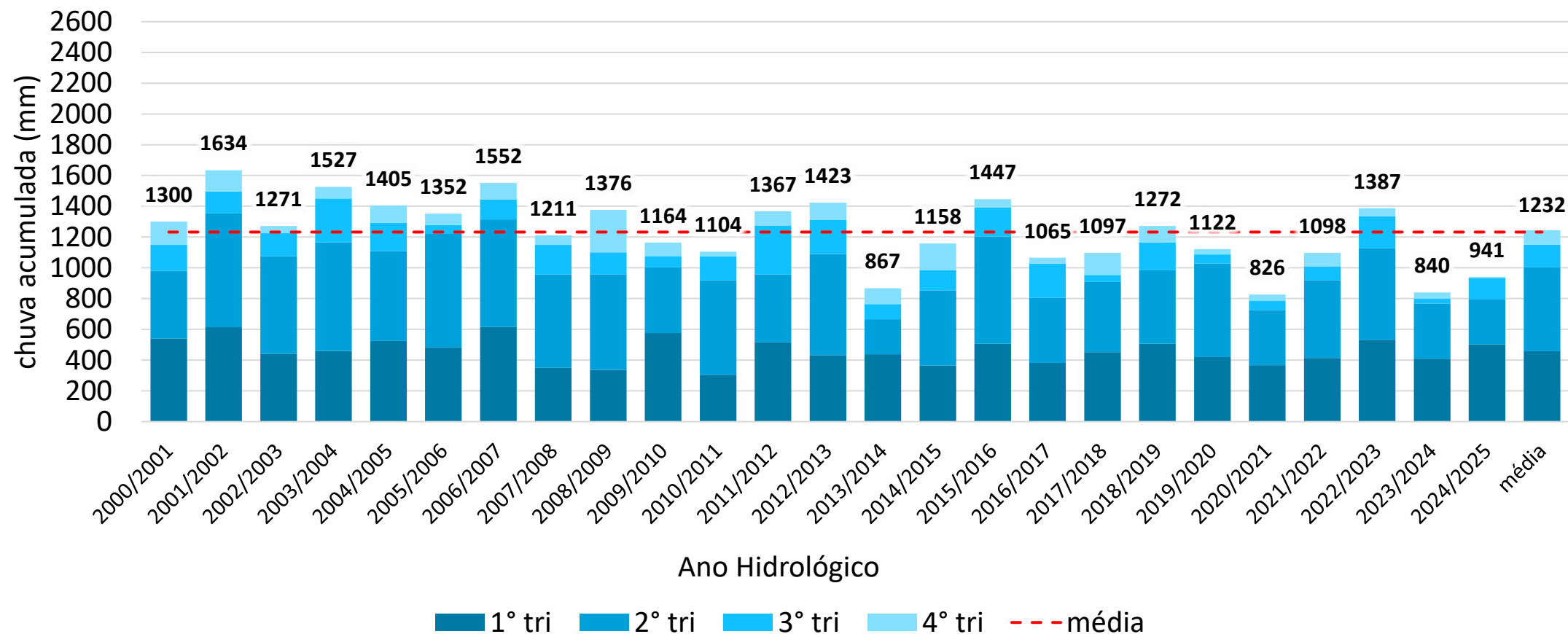


# UGRHI 8 - Sapucaí/Grande | SPI-12

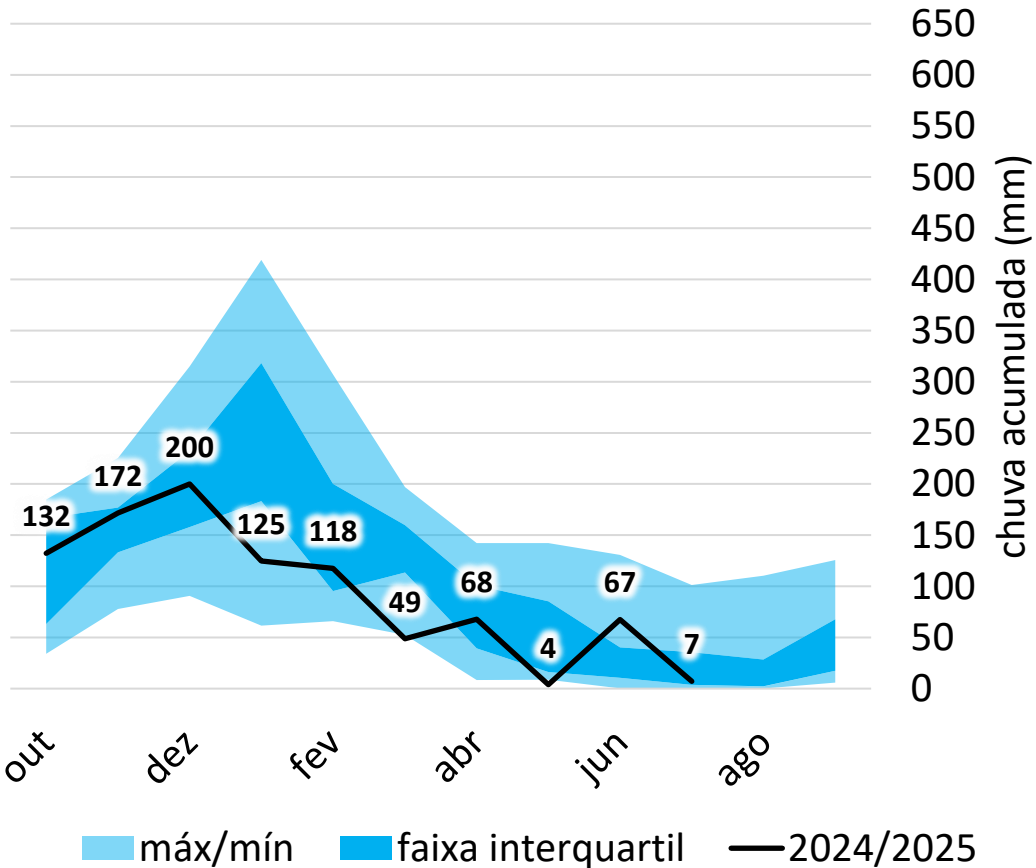
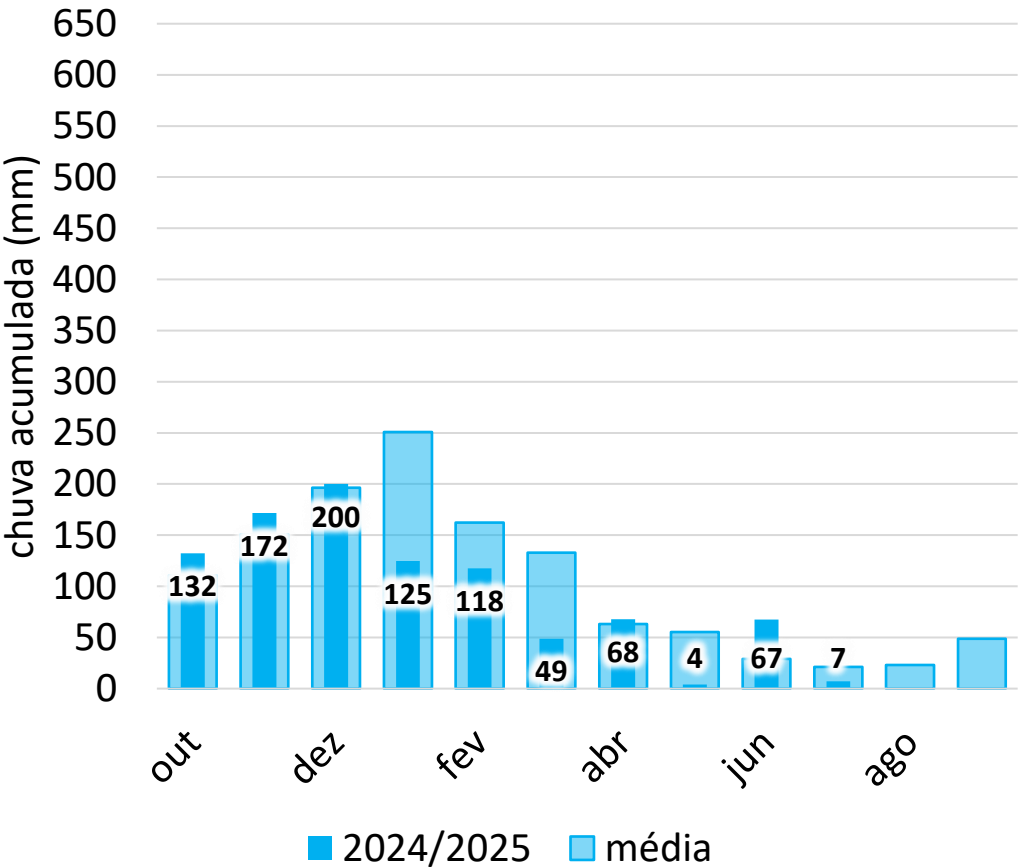




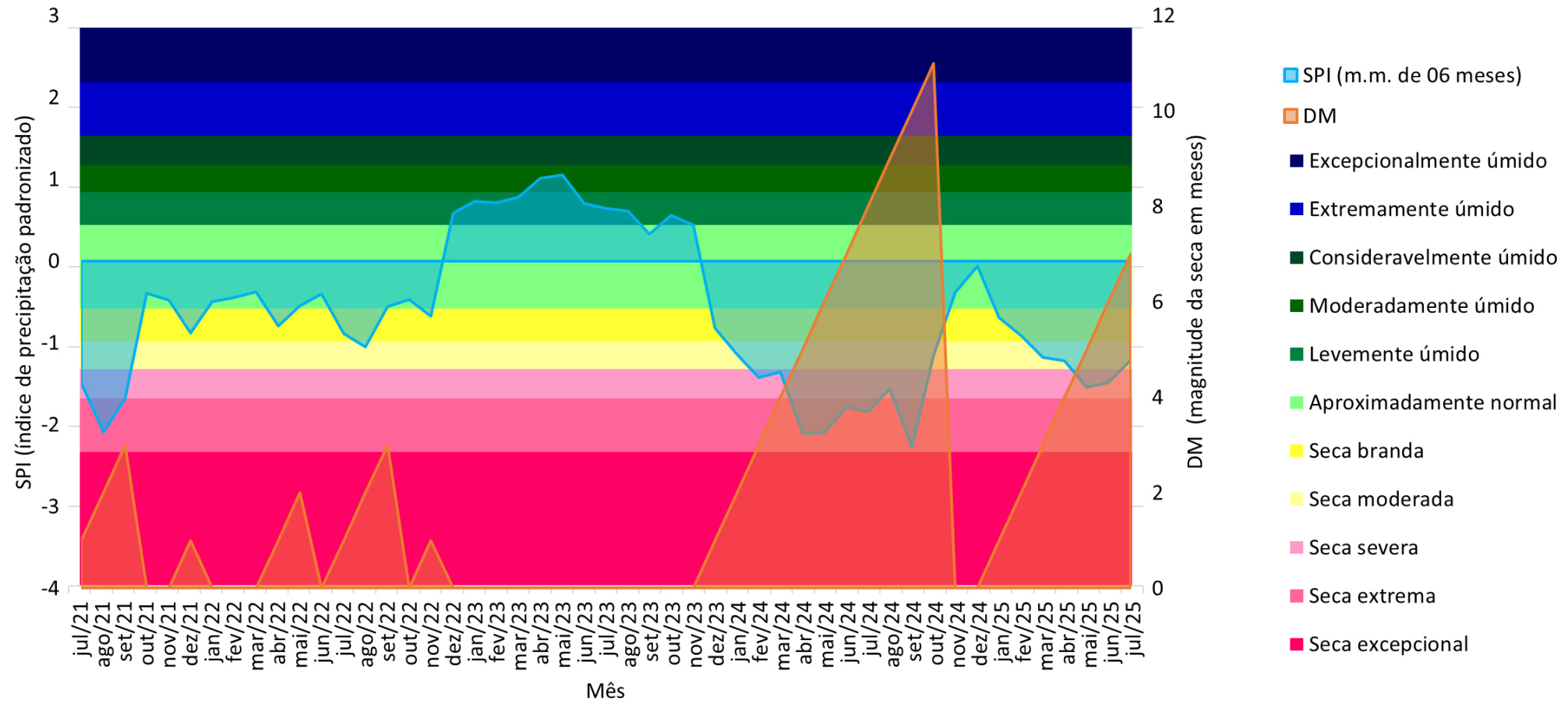
## UGRHI 9 - Mogi-Guaçu



# UGRHI 9 - Mogi-Guaçu

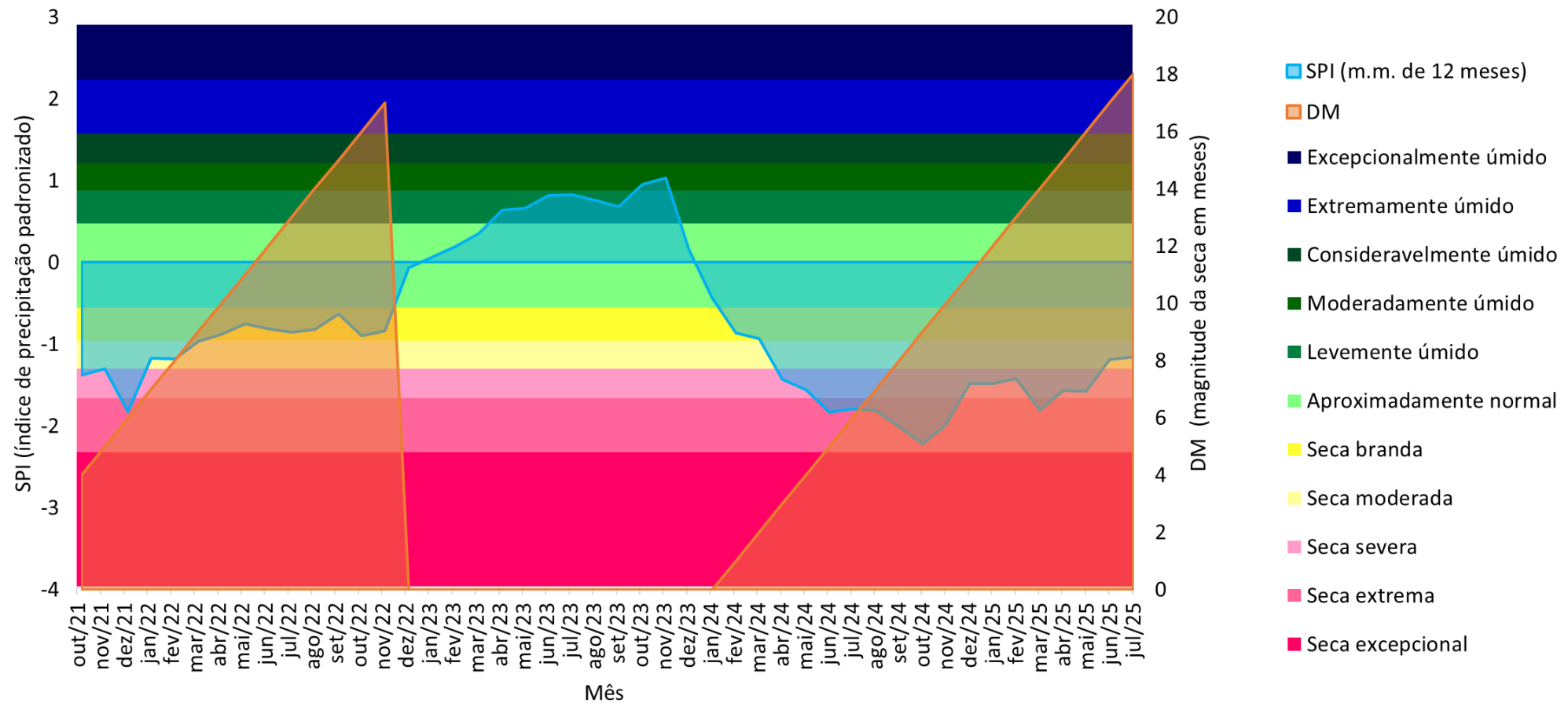


# UGRHI 9 - Mogi-Guaçu | SPI-06



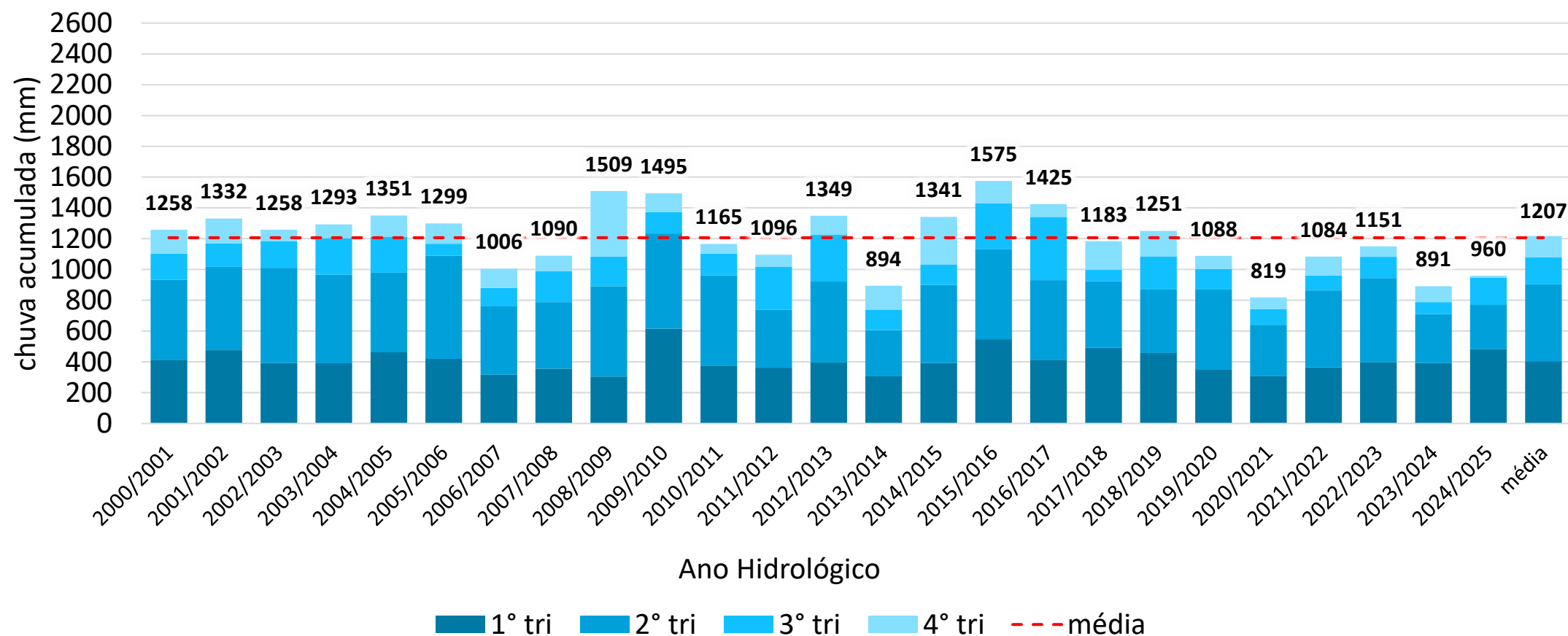


# UGRHI 9 - Mogi-Guaçu | SPI-12

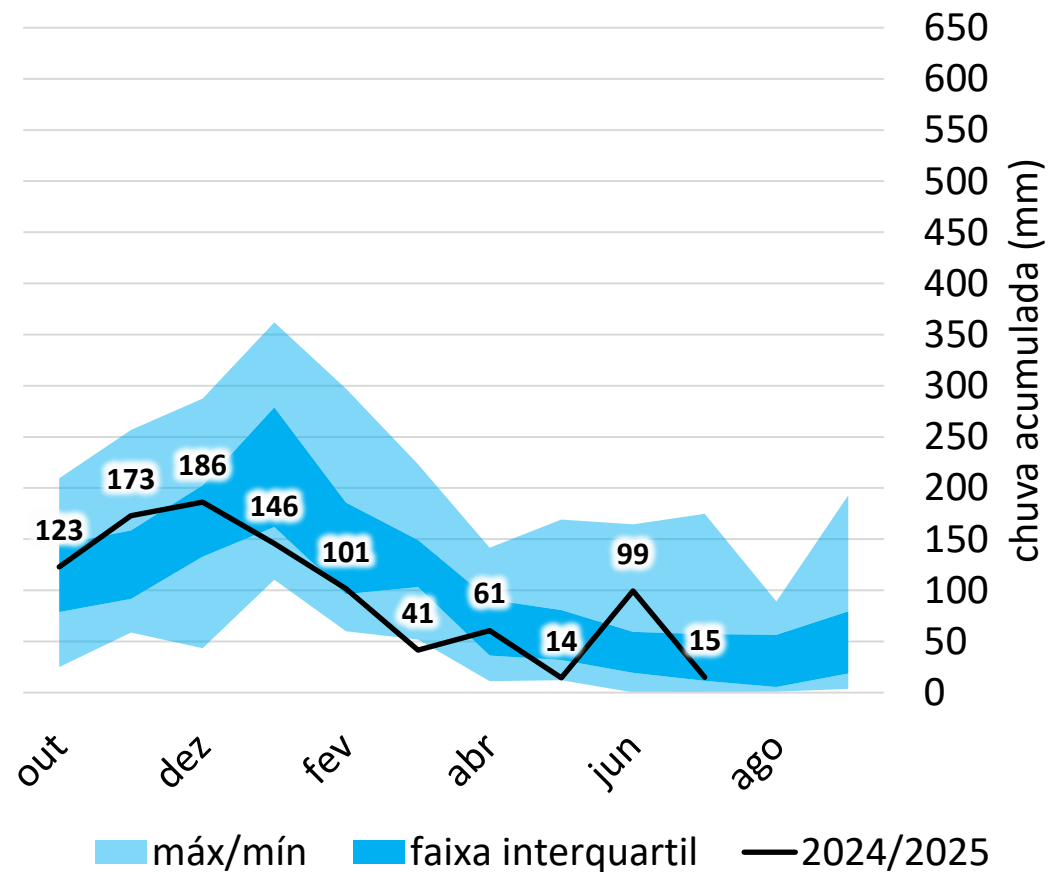
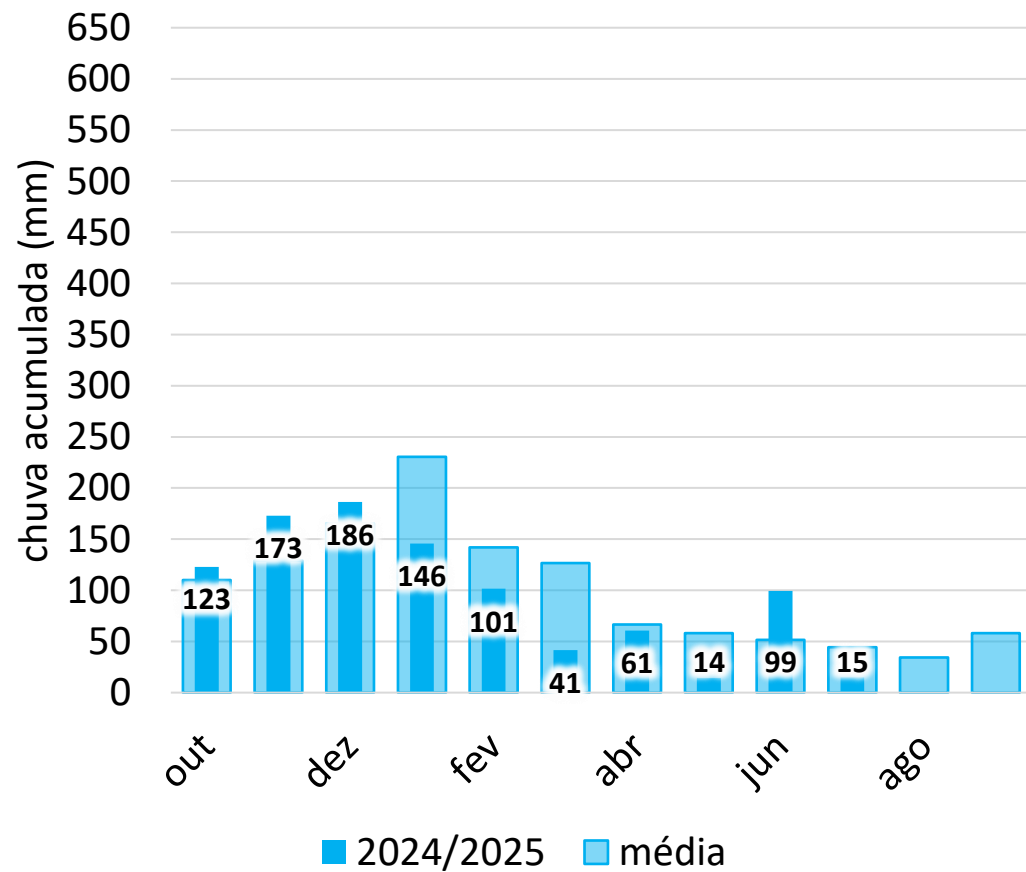




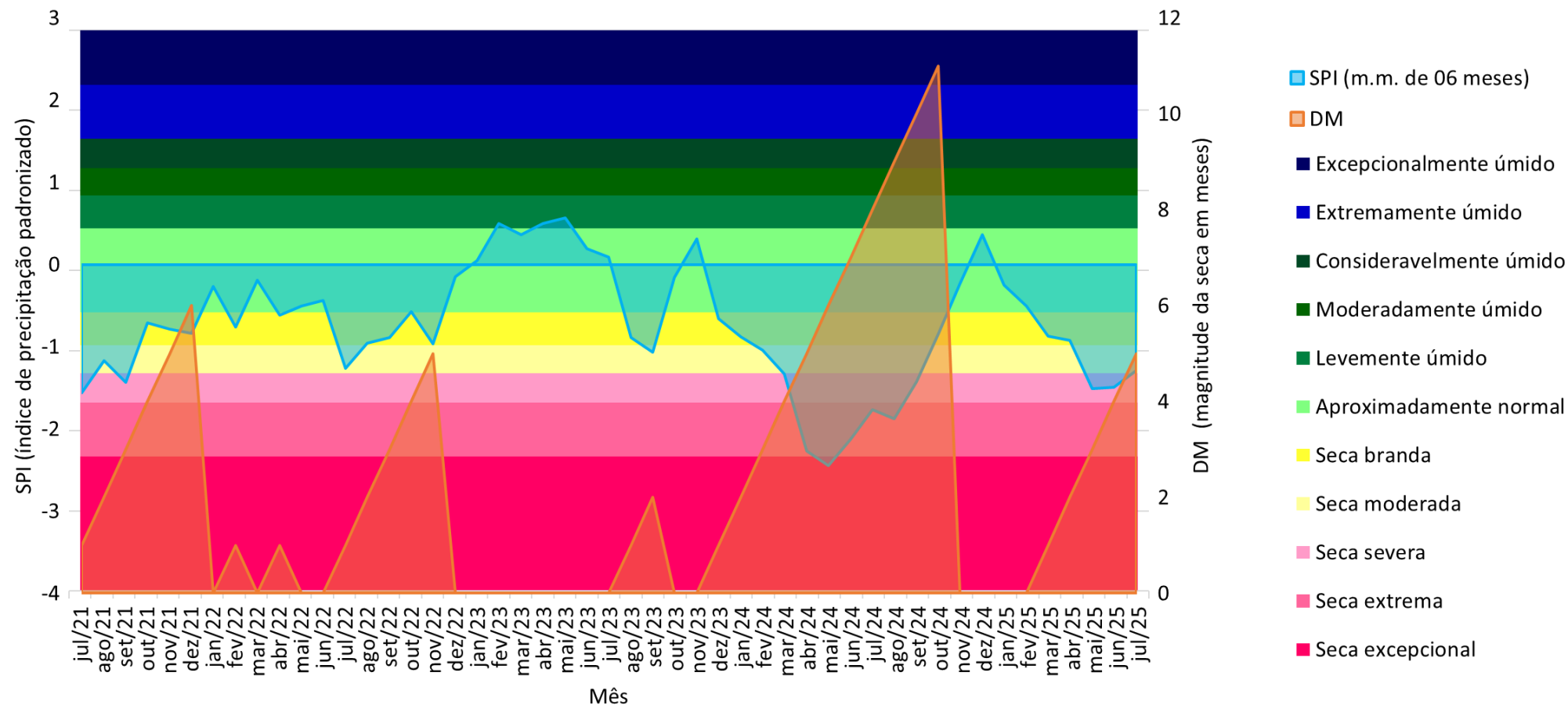
# UGRHI 10 - Tietê/Sorocaba



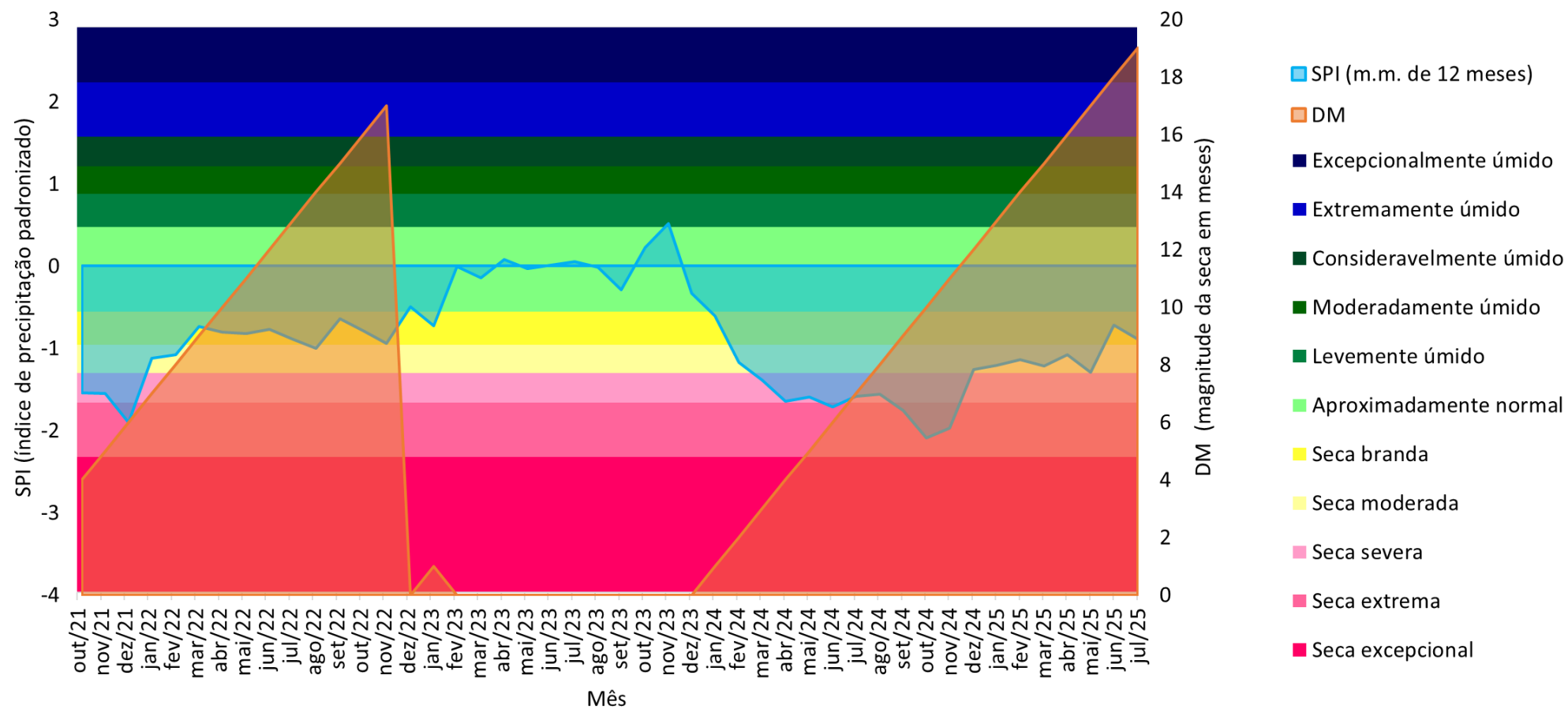
# UGRHI 10 - Tietê/Sorocaba



# UGRHI 10 - Tietê/Sorocaba | SPI-06

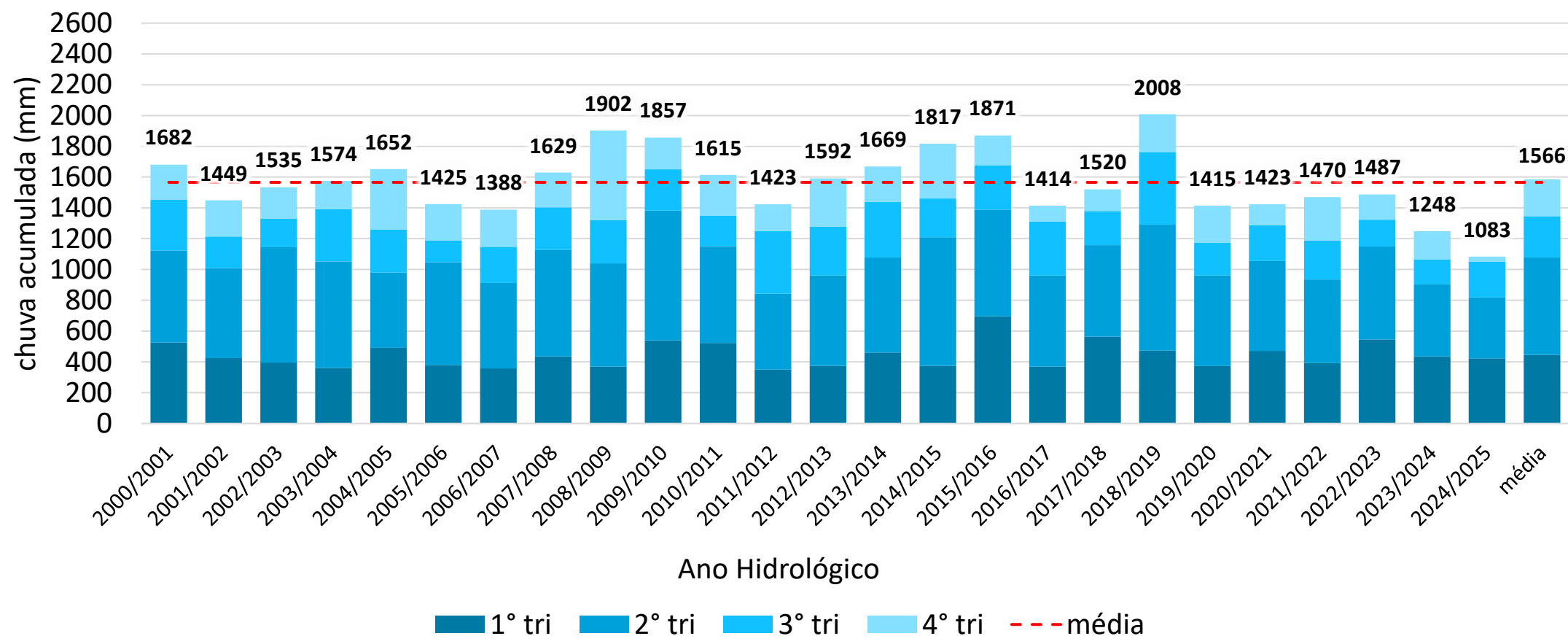


# UGRHI 10 - Tietê/Sorocaba | SPI-12

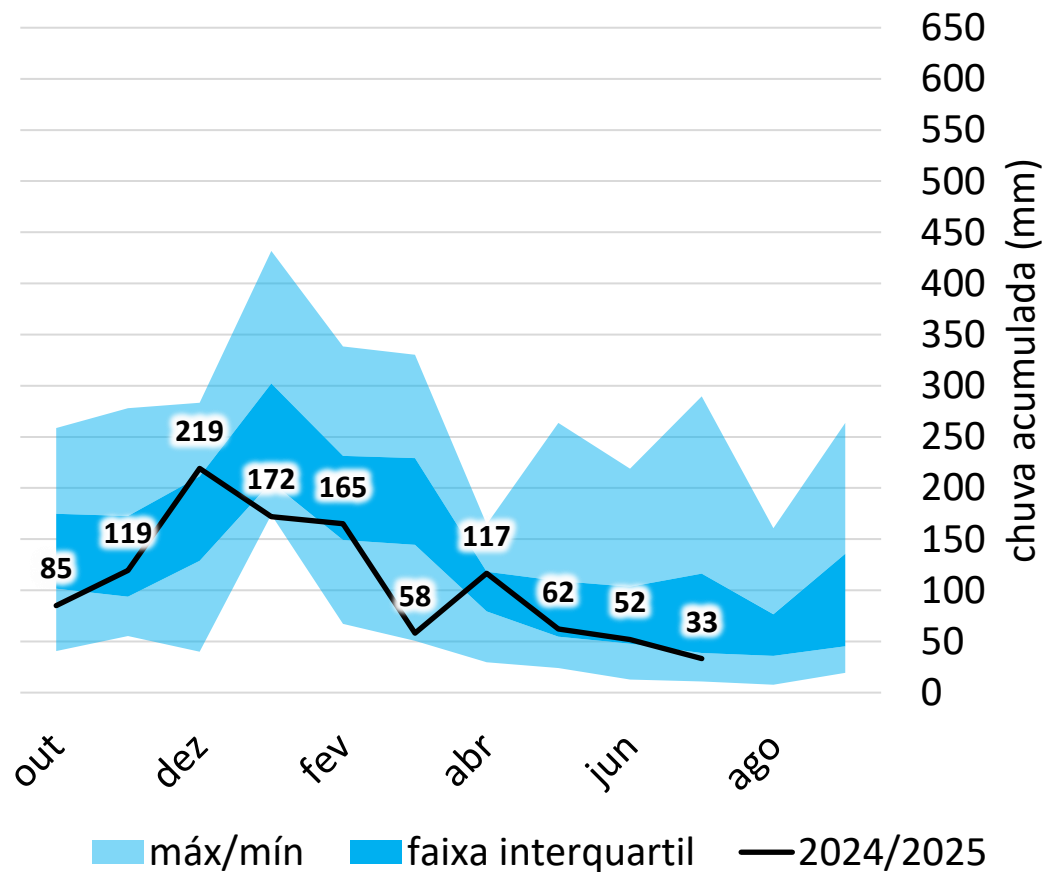
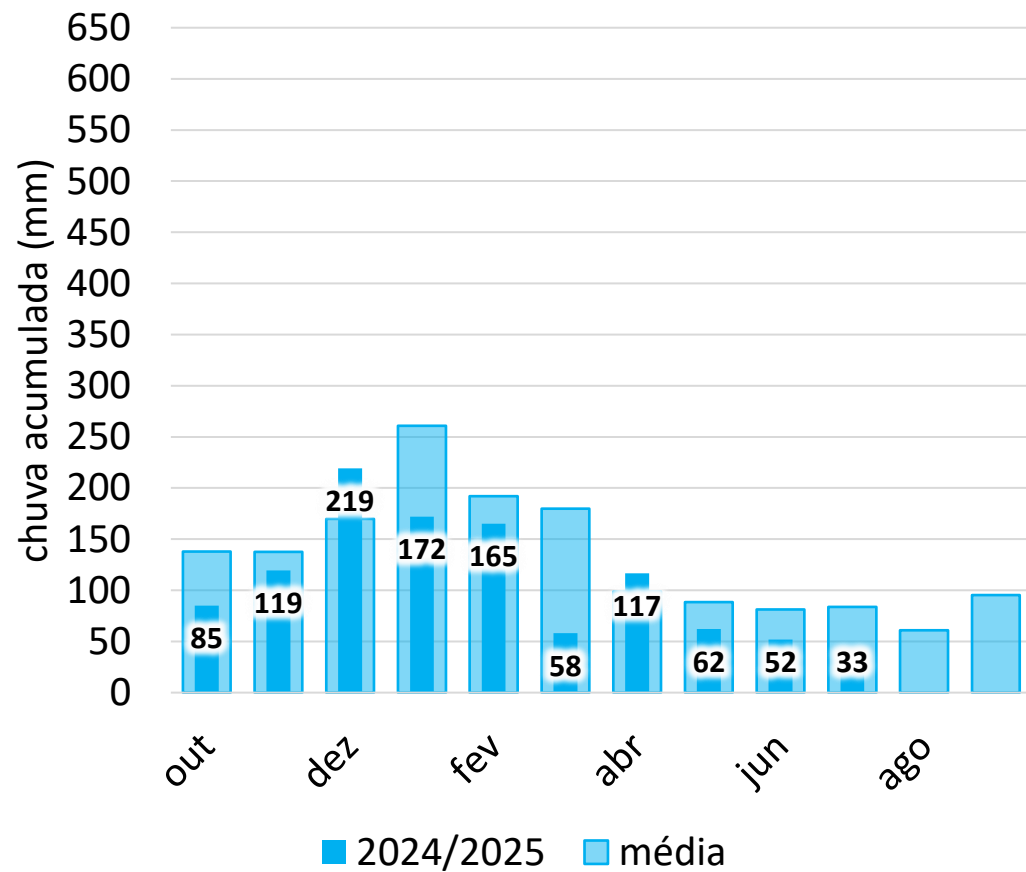




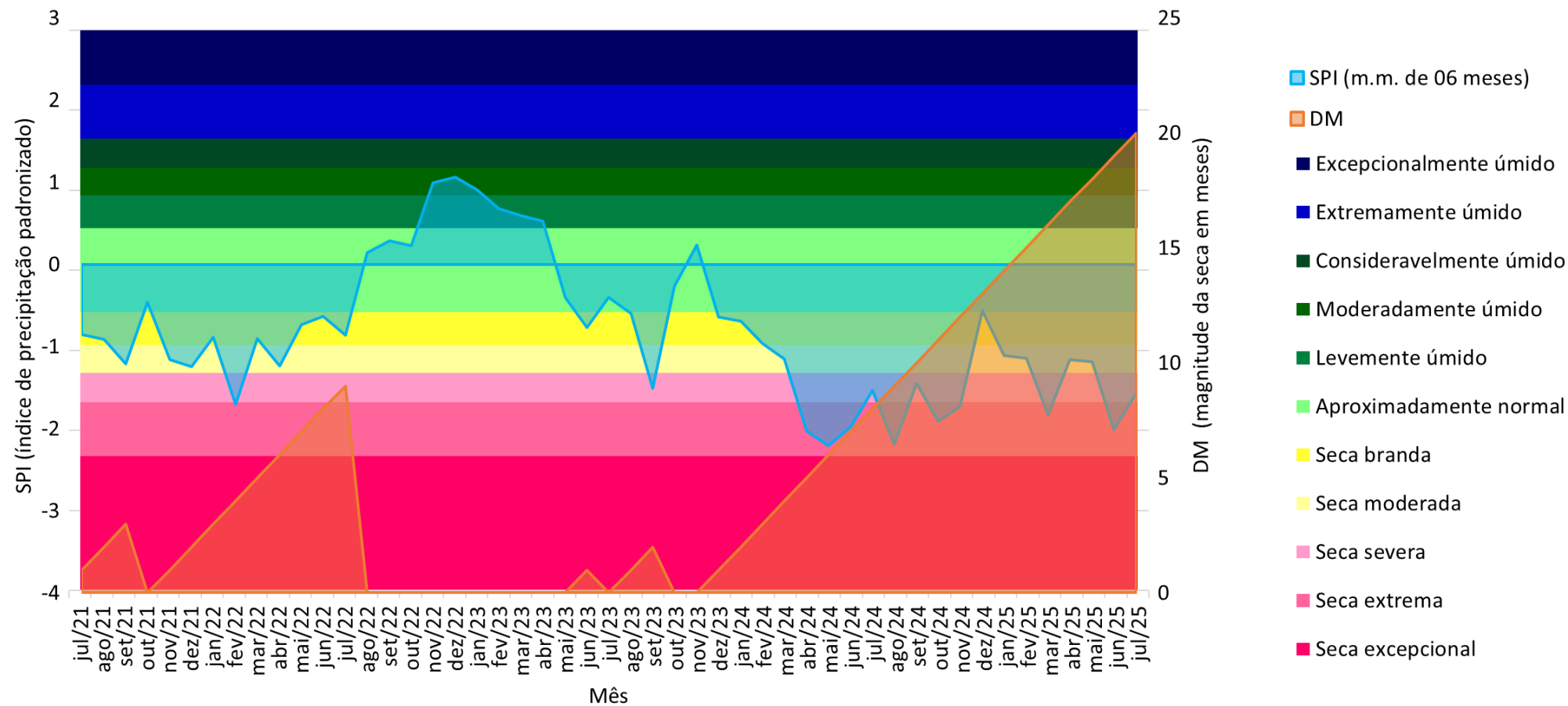
# UGRHI 11 - Ribeira de Iguape/Litoral Sul



# UGRHI 11 - Ribeira de Iguape/Litoral Sul

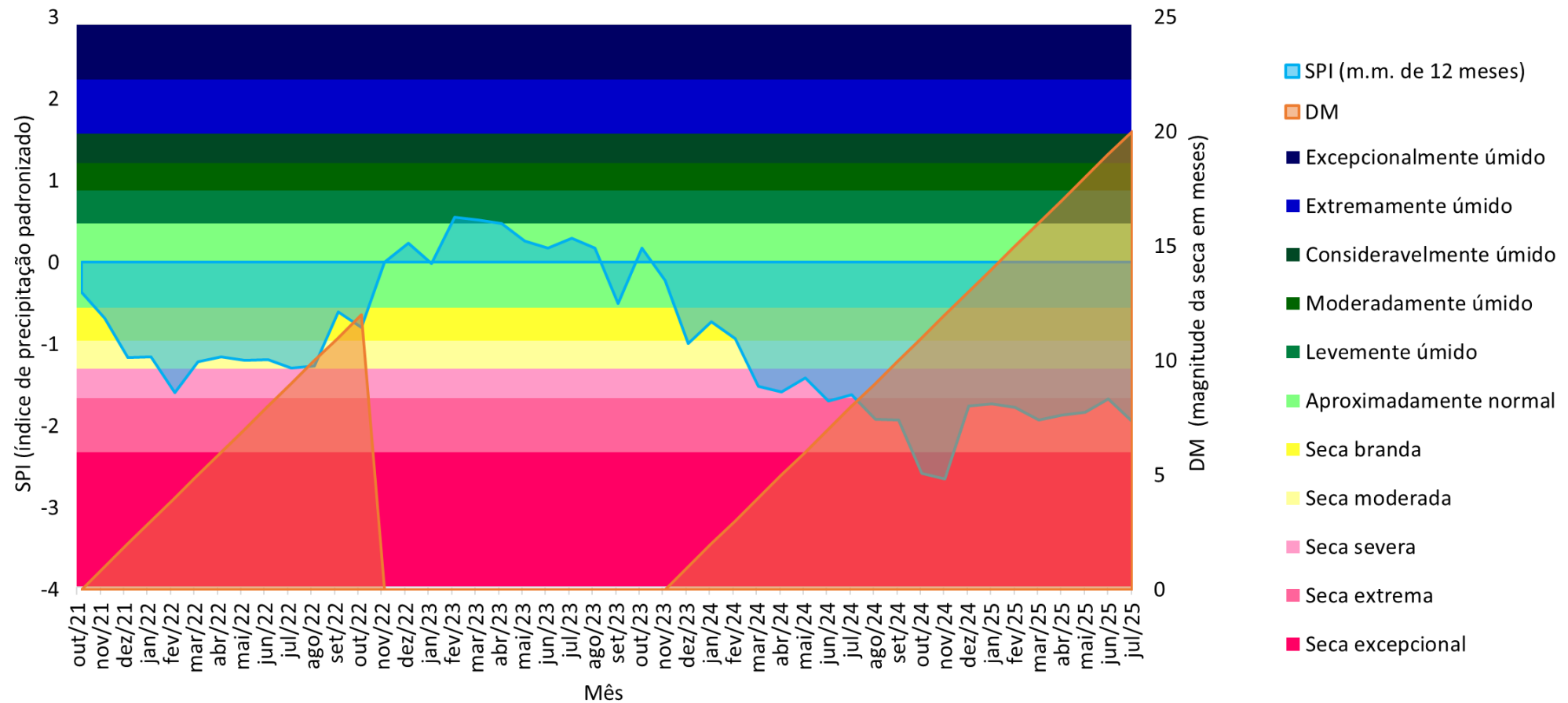


# UGRHI 11 Ribeira de Iguape/Litoral Sul | SPI-06



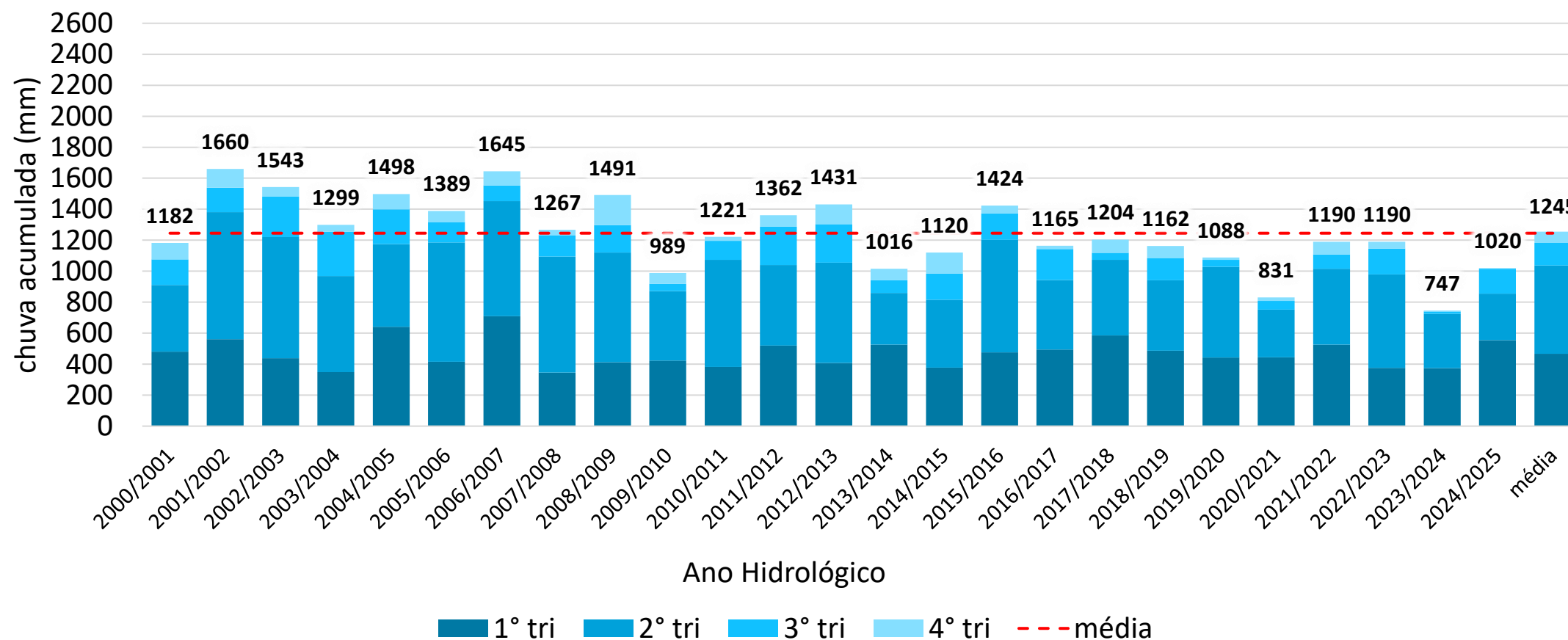


# UGRHI 11 Ribeira de Iguape/Litoral Sul | SPI-12

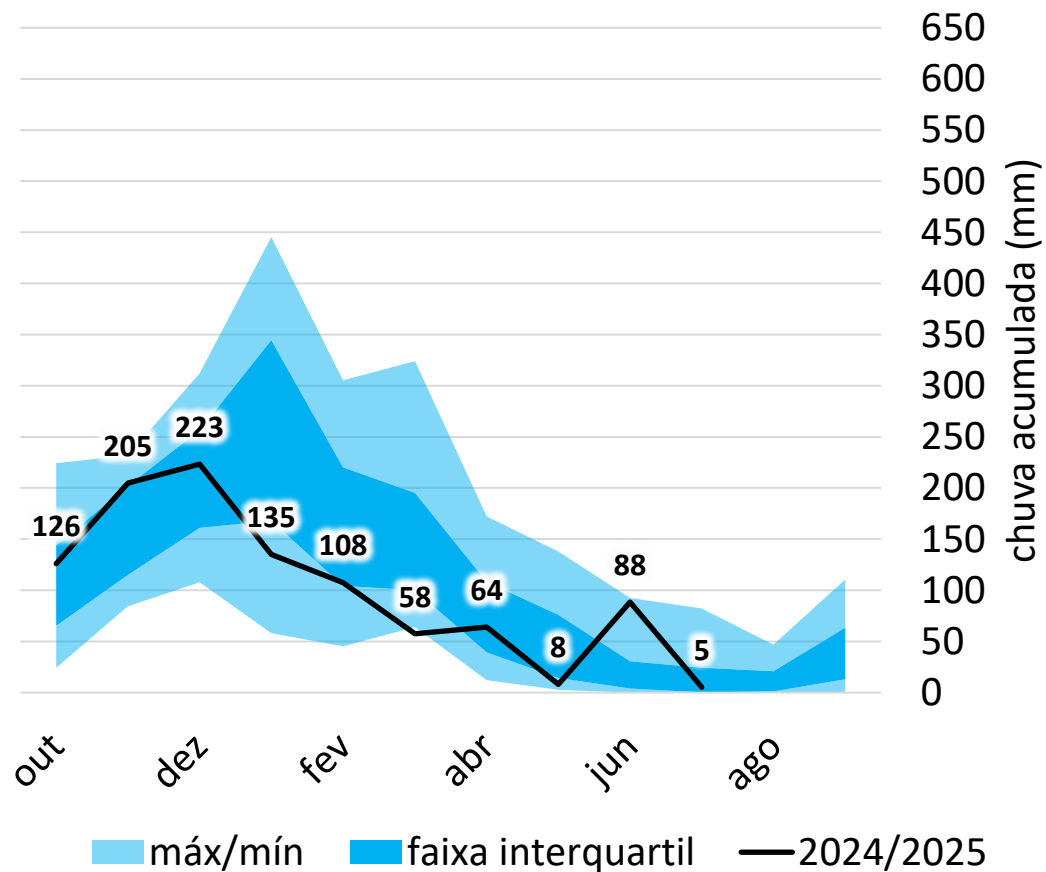
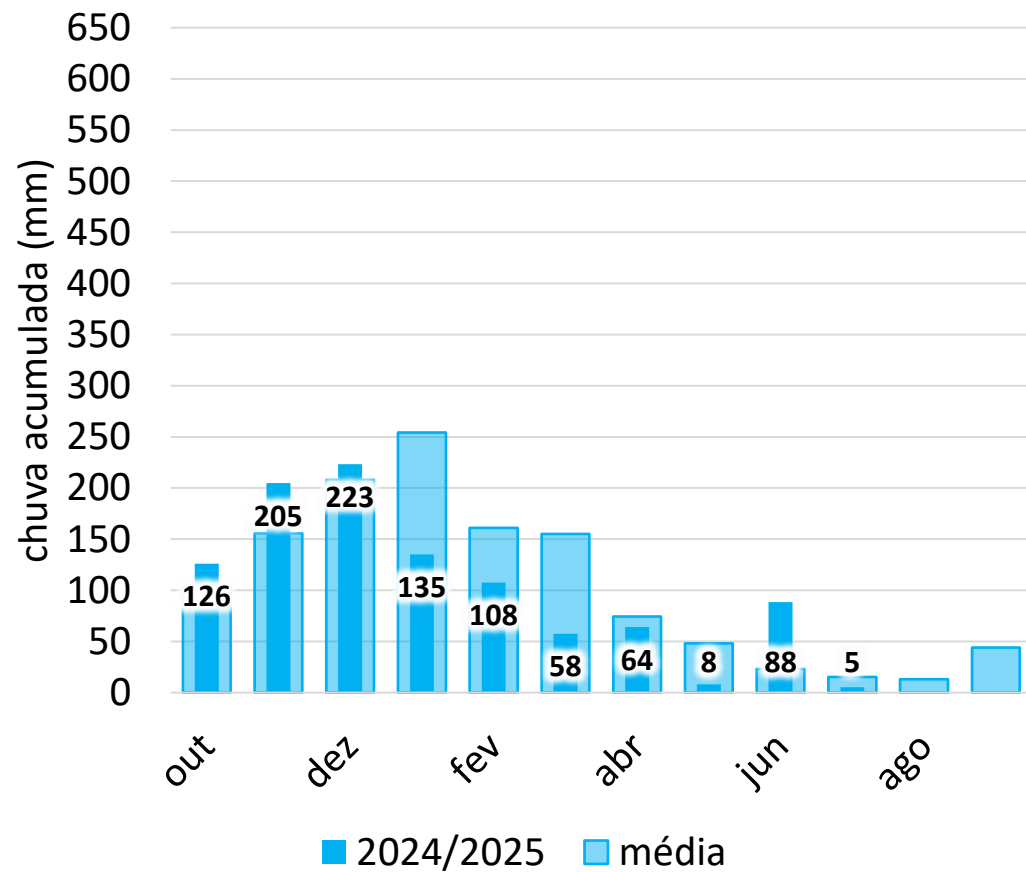
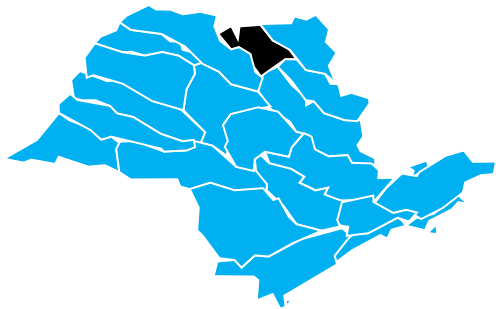




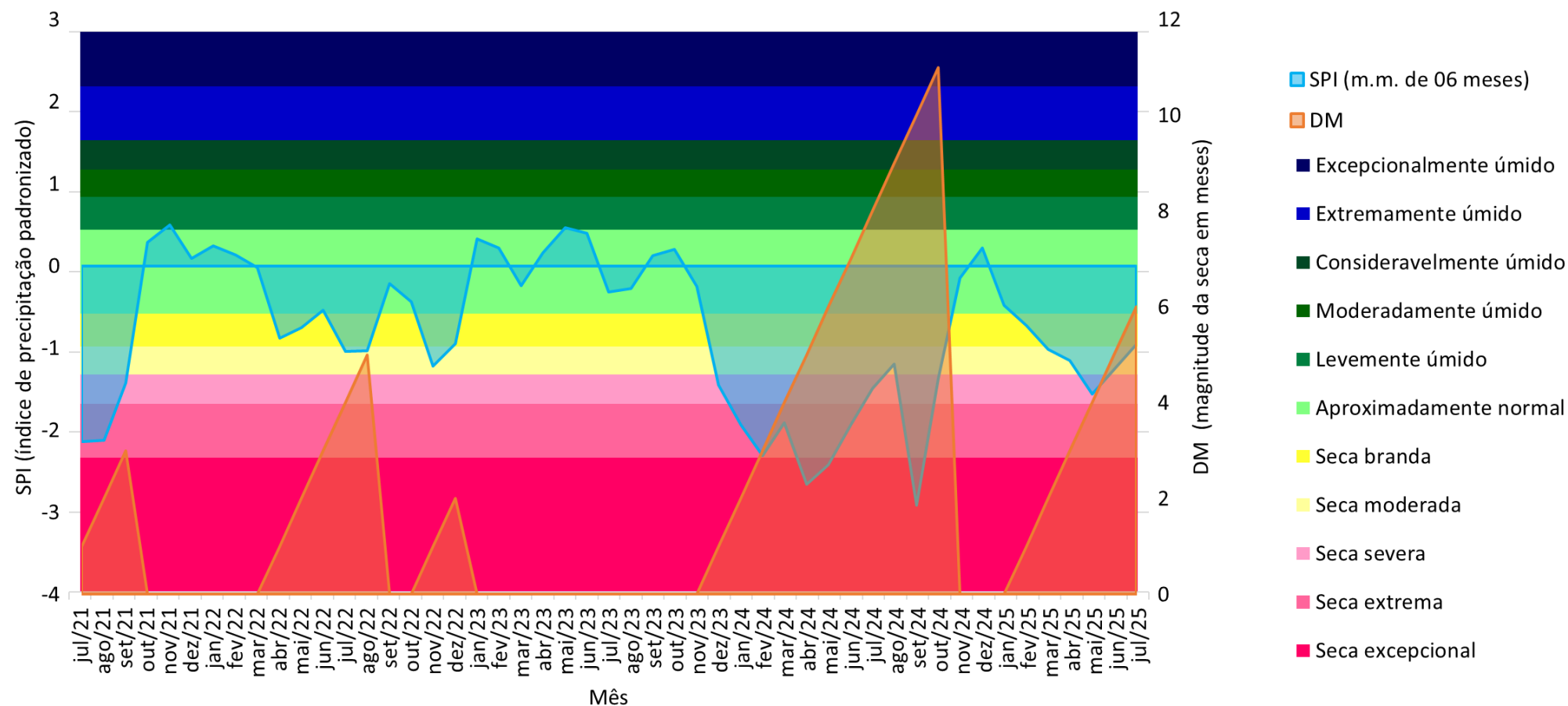
## UGRHI 12 - Baixo Pardo/Grande



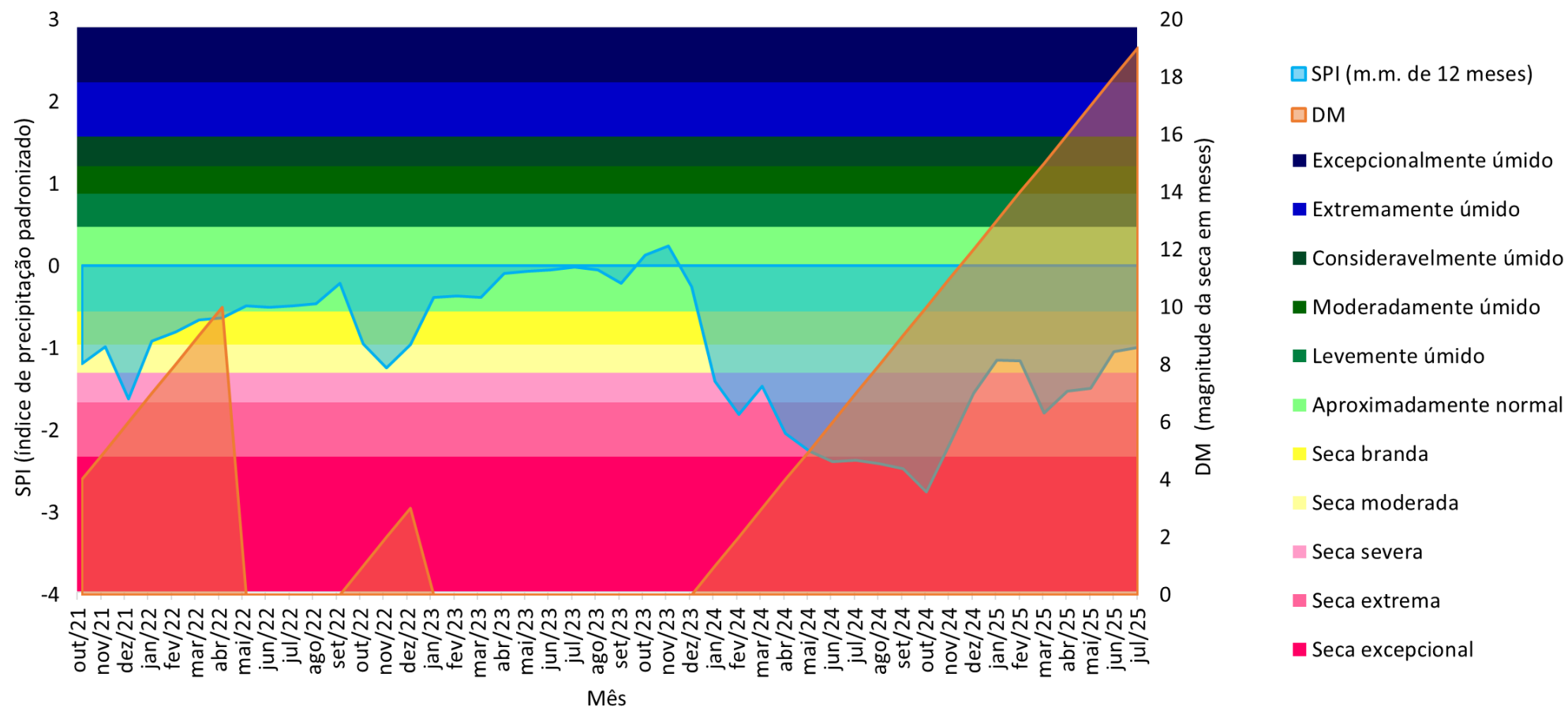
# UGRHI 12 - Baixo Pardo/Grande



# UGRHI 12 - Baixo Pardo/Grande | SPI-06

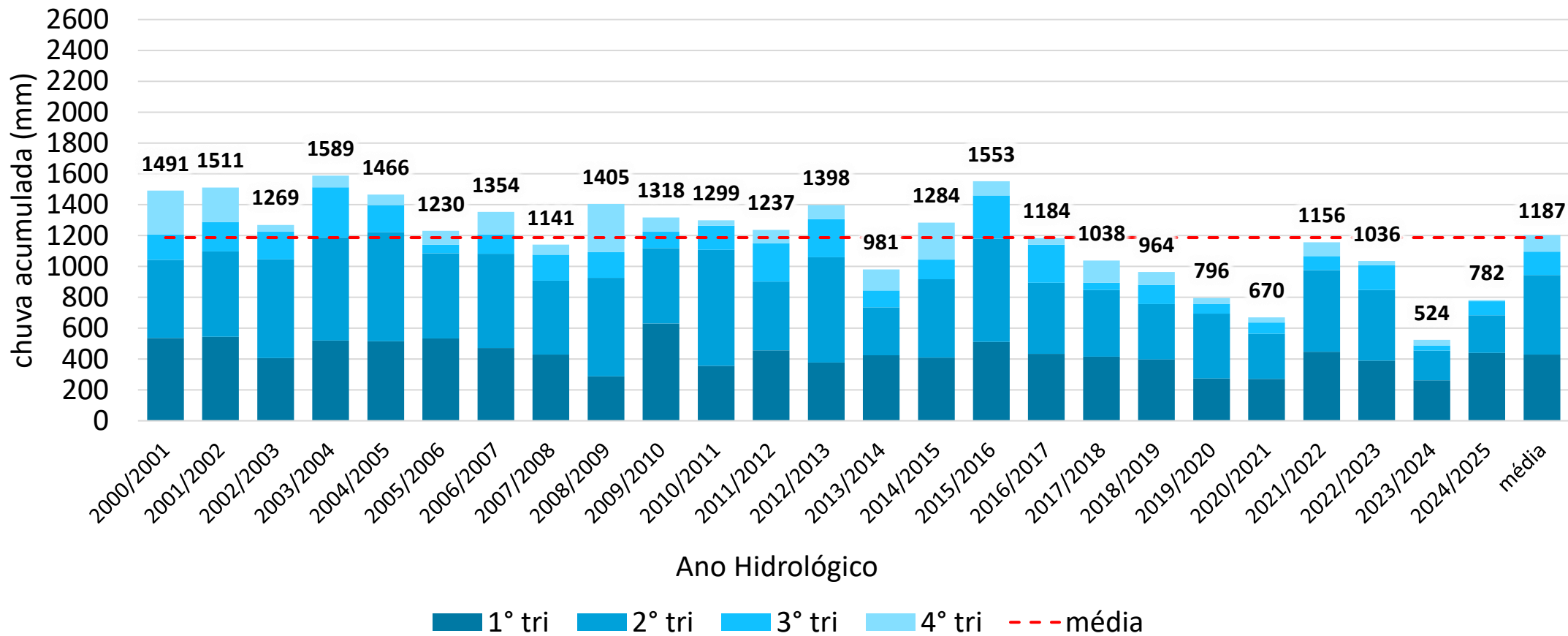


# UGRHI 12 - Baixo Pardo/Grande | SPI-12

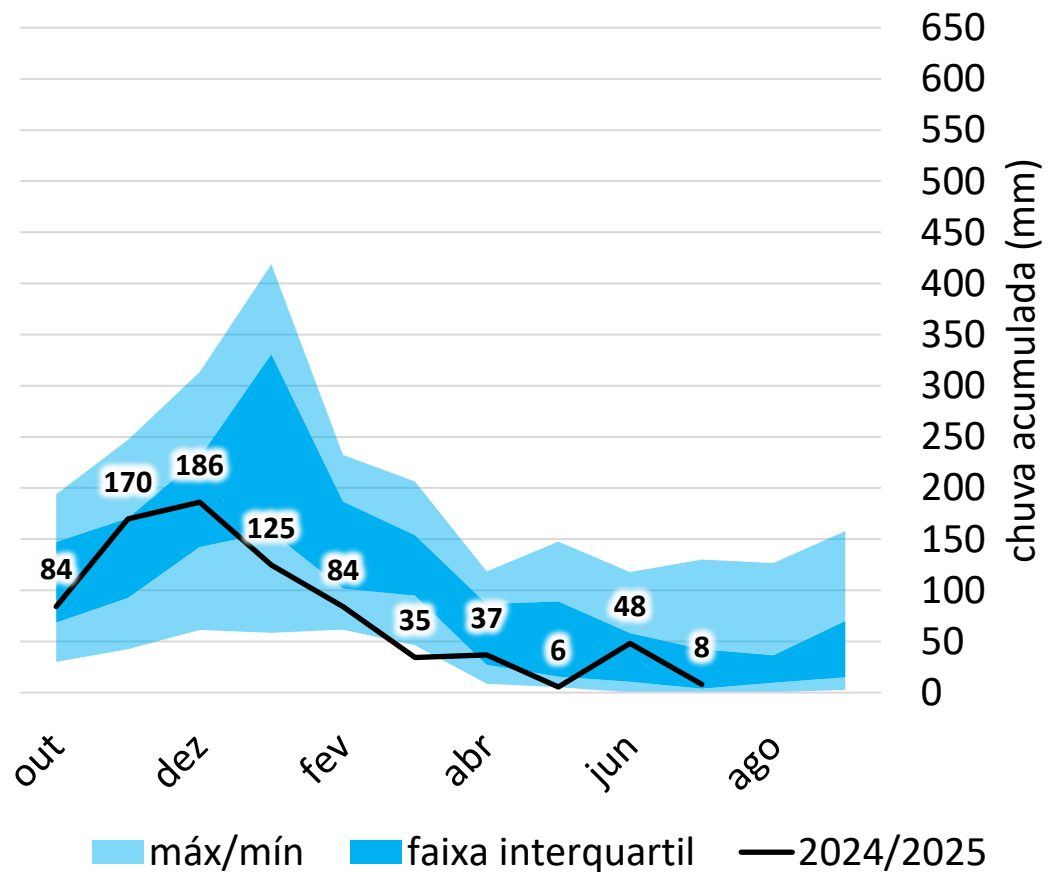
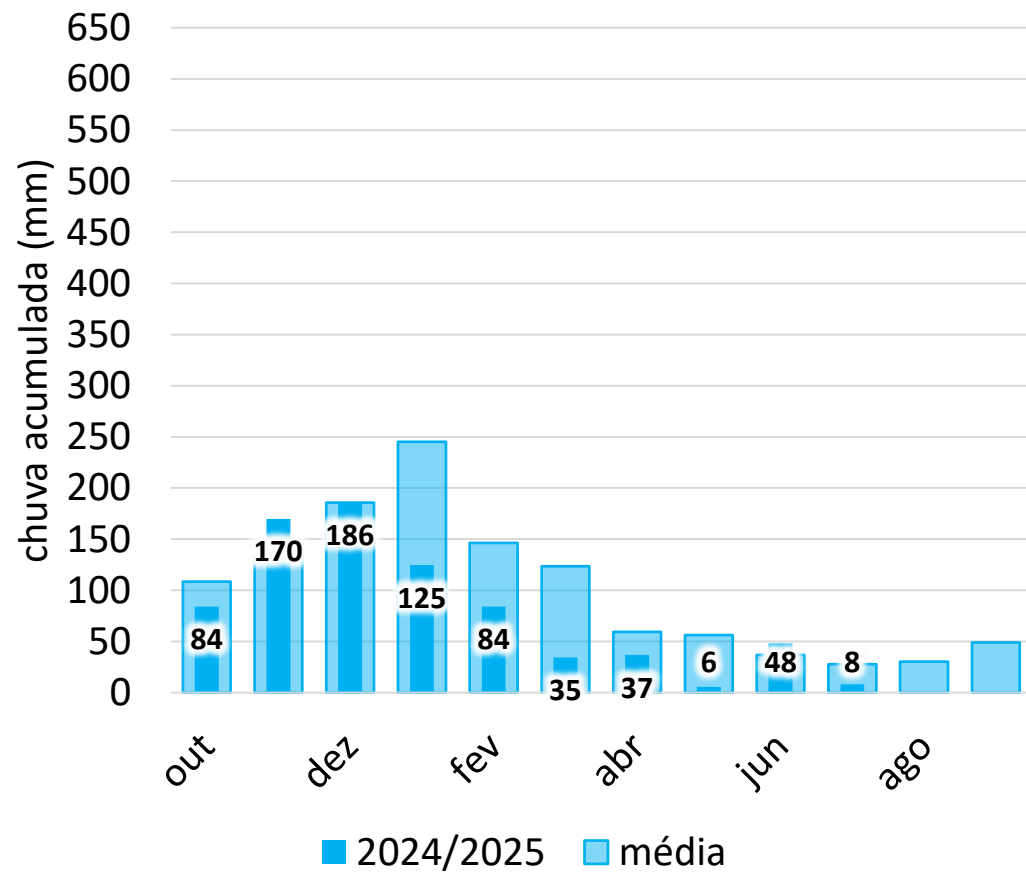




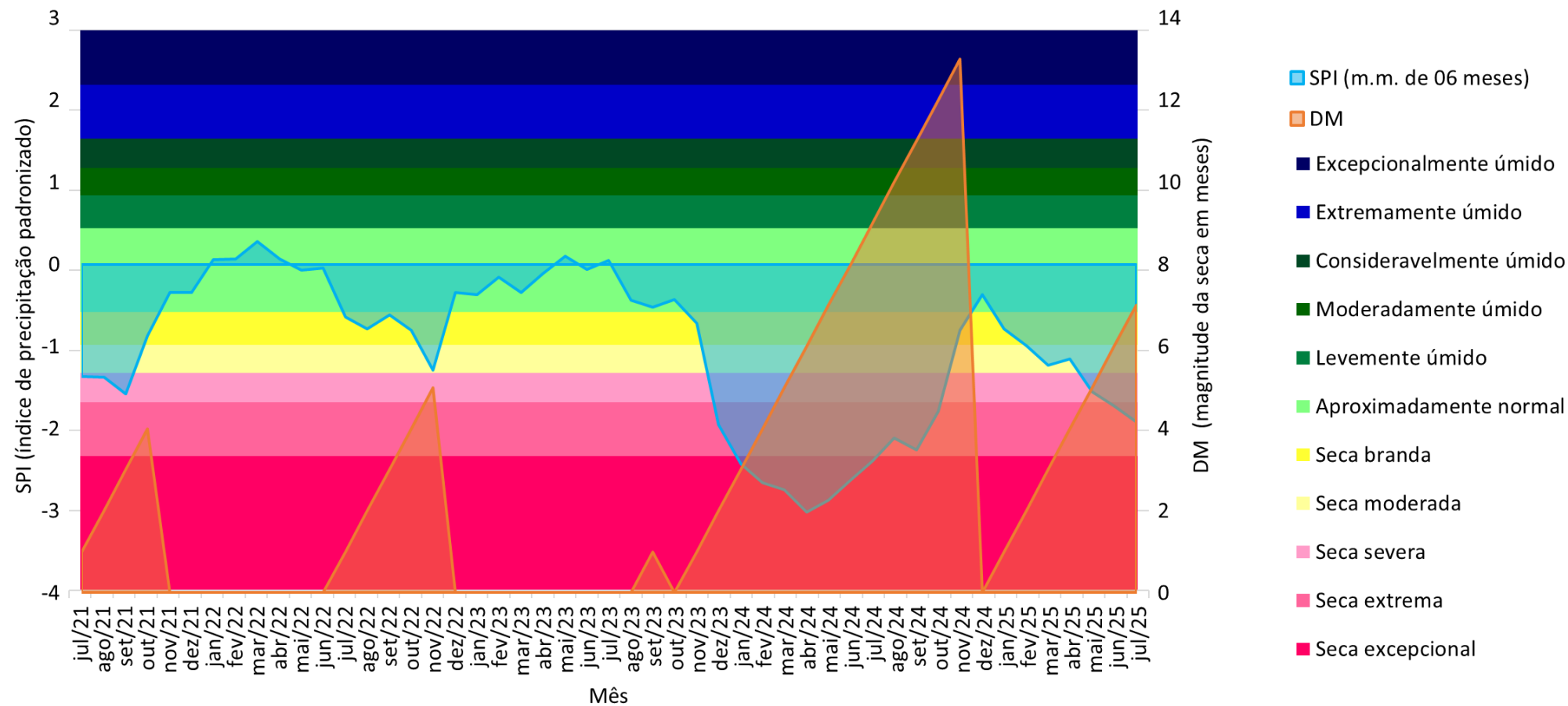
# UGRHI 13 - Tietê/Jacararé



# UGRHI 13 - Tietê/Jacararé

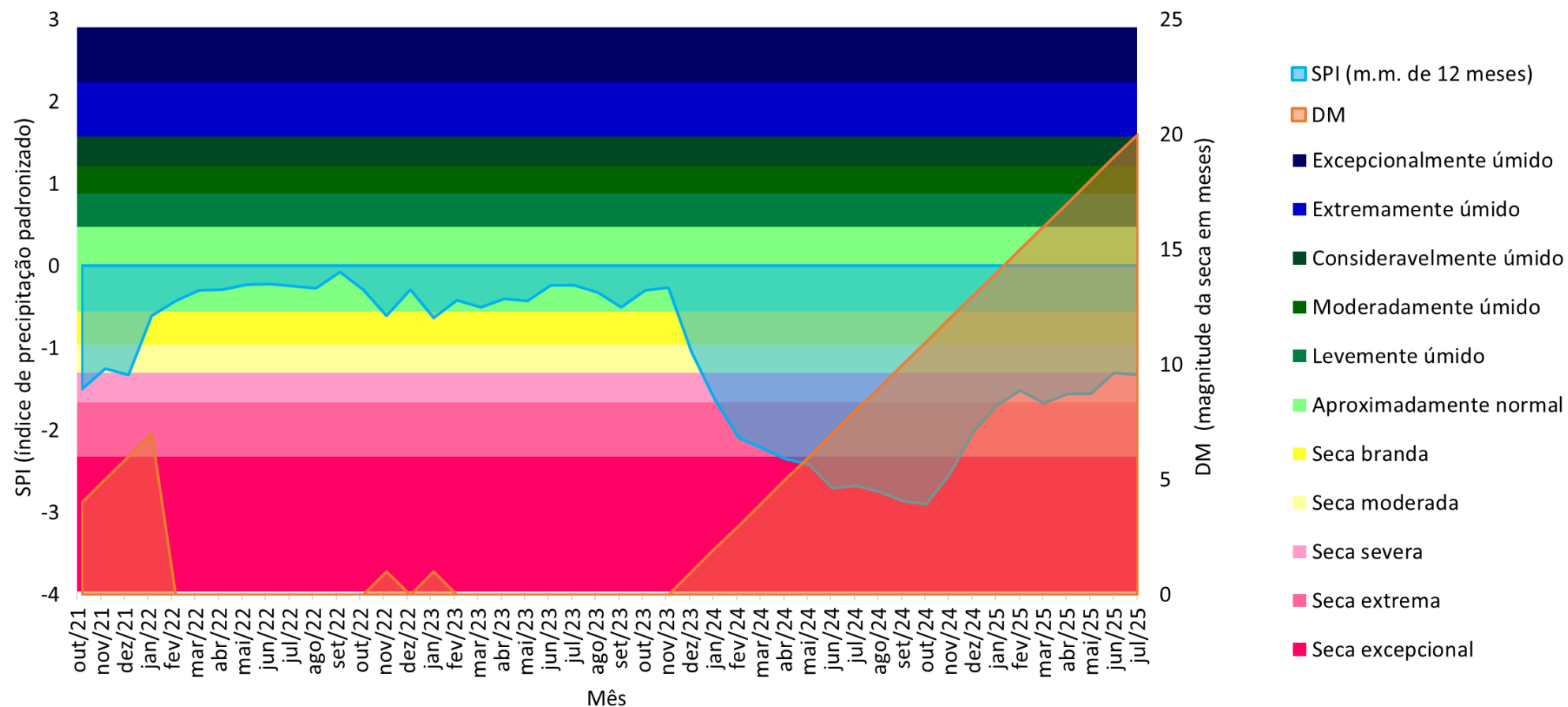


# UGRHI 13 - Tietê/Jacararé | SPI-06



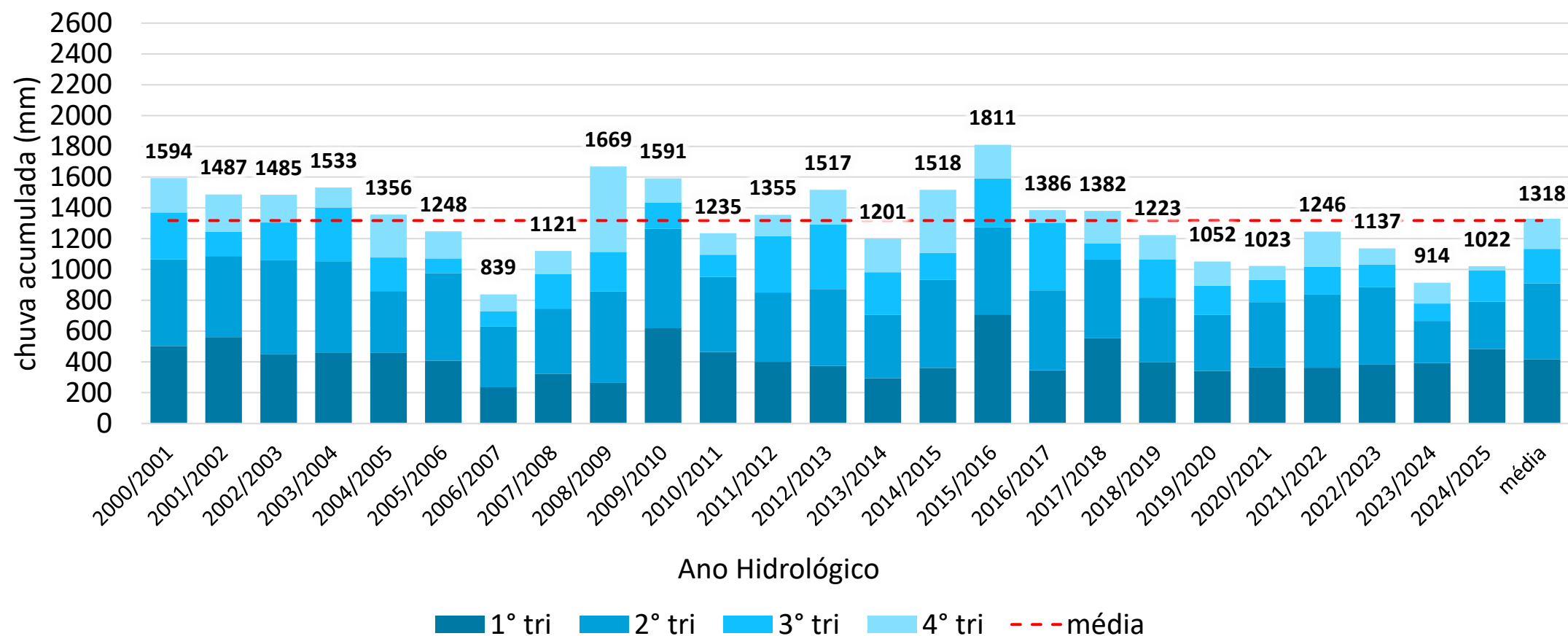


# UGRHI 13 - Tietê/Jacararé | SPI-12

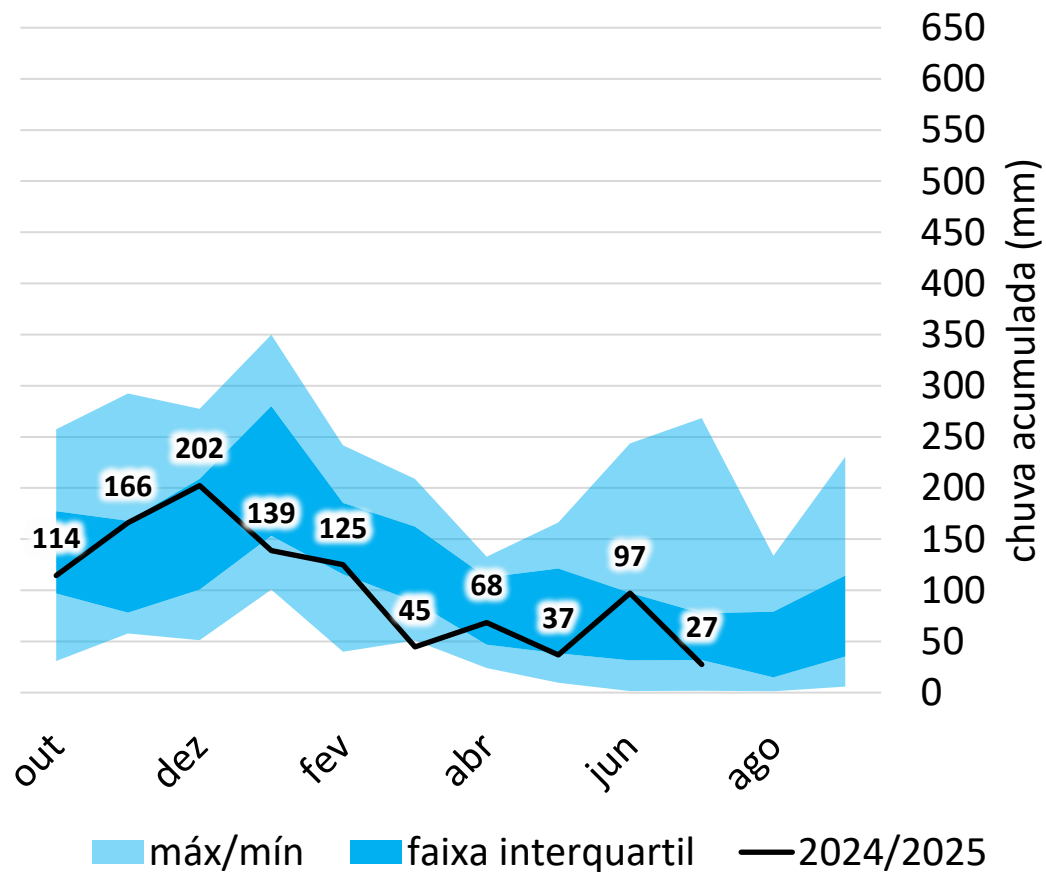
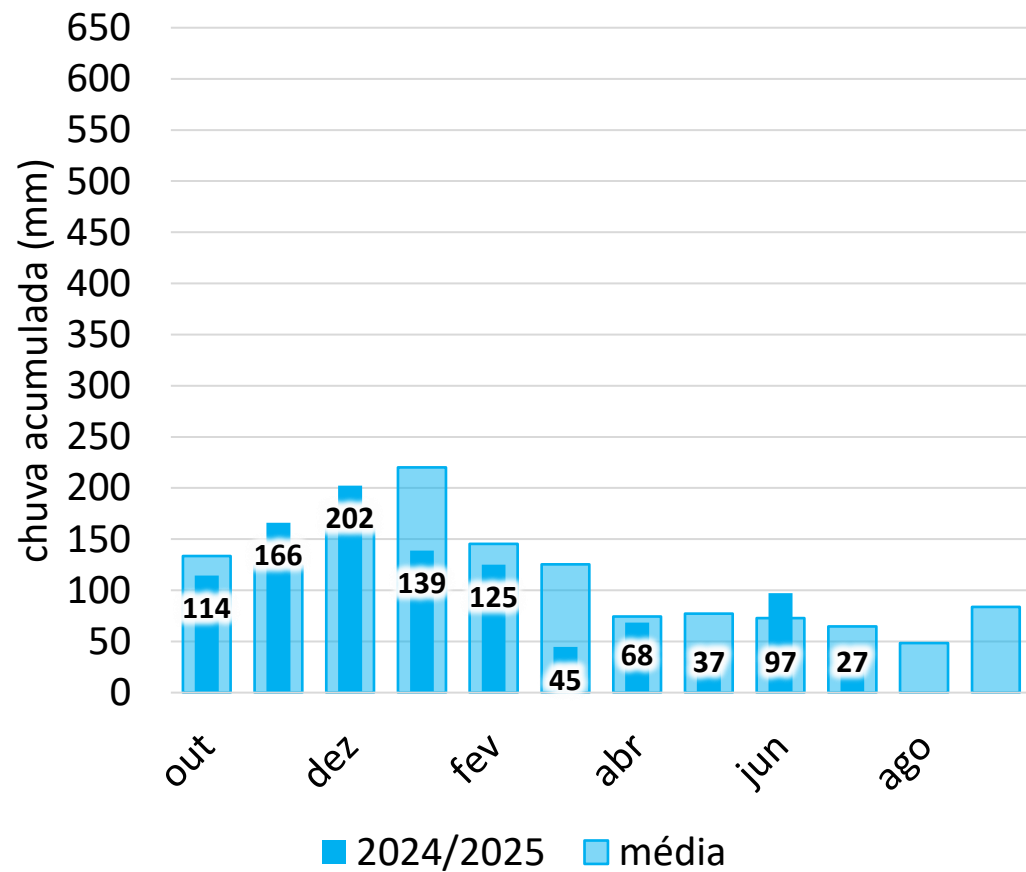




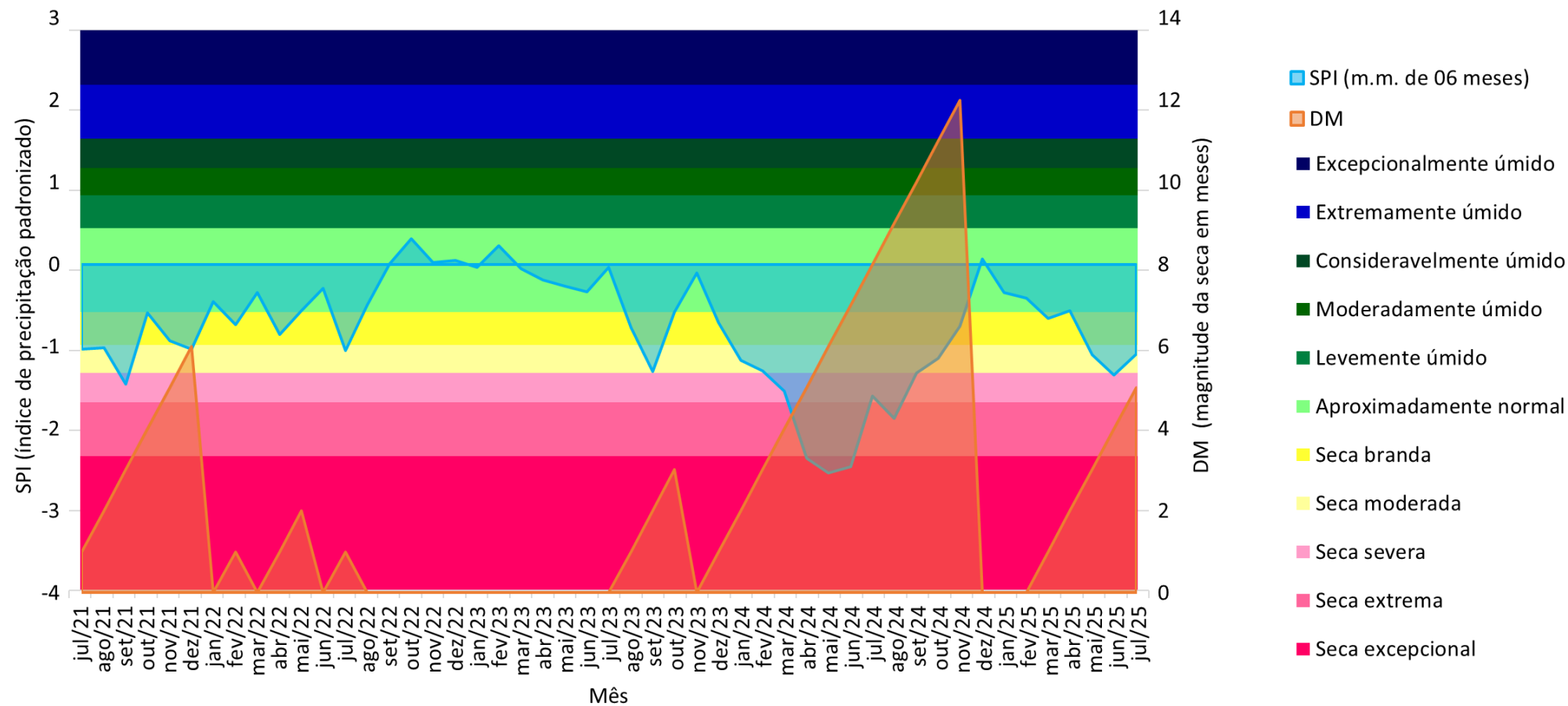
# UGRHI 14 - Alto Paranapanema



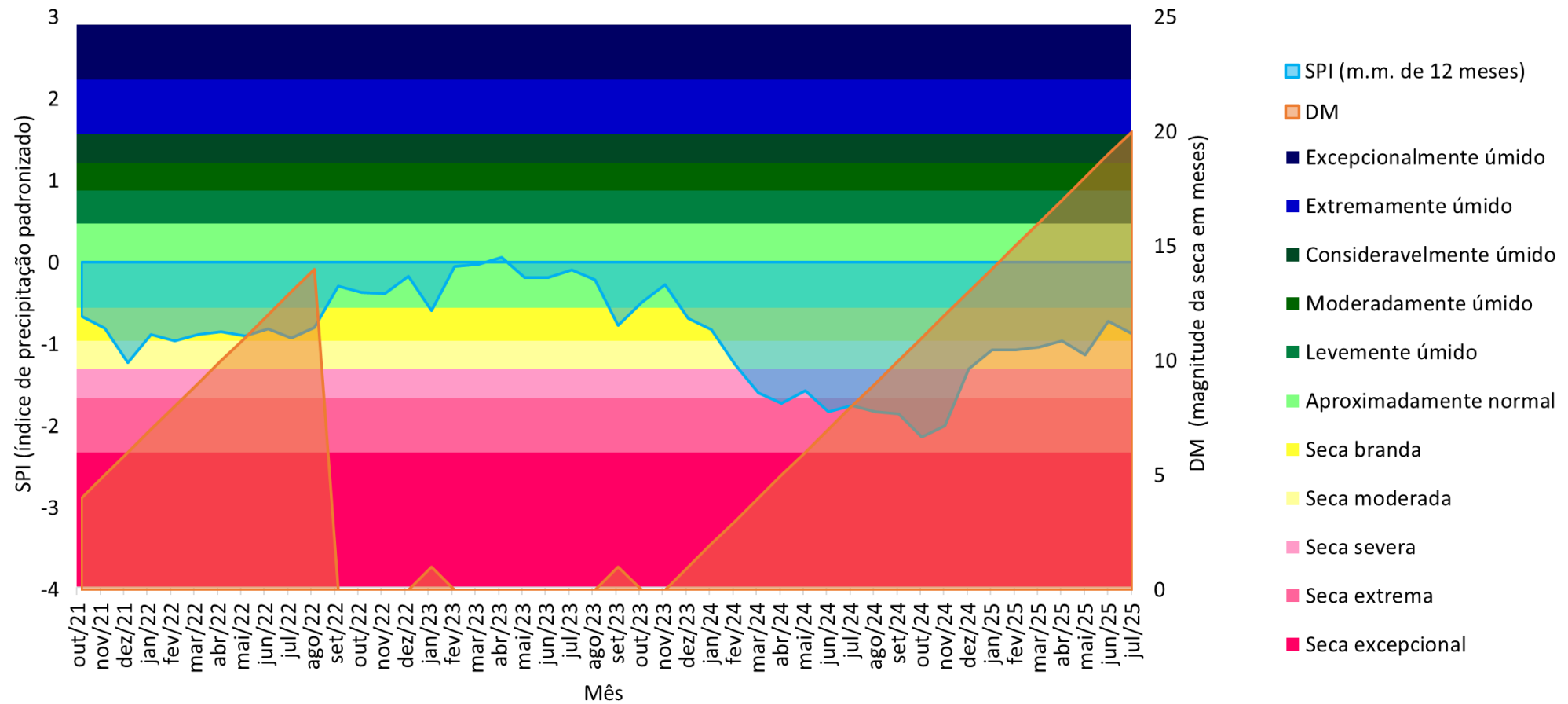
# UGRHI 14 - Alto Paranapanema



# UGRHI 14 - Alto Paranapanema | SPI-06

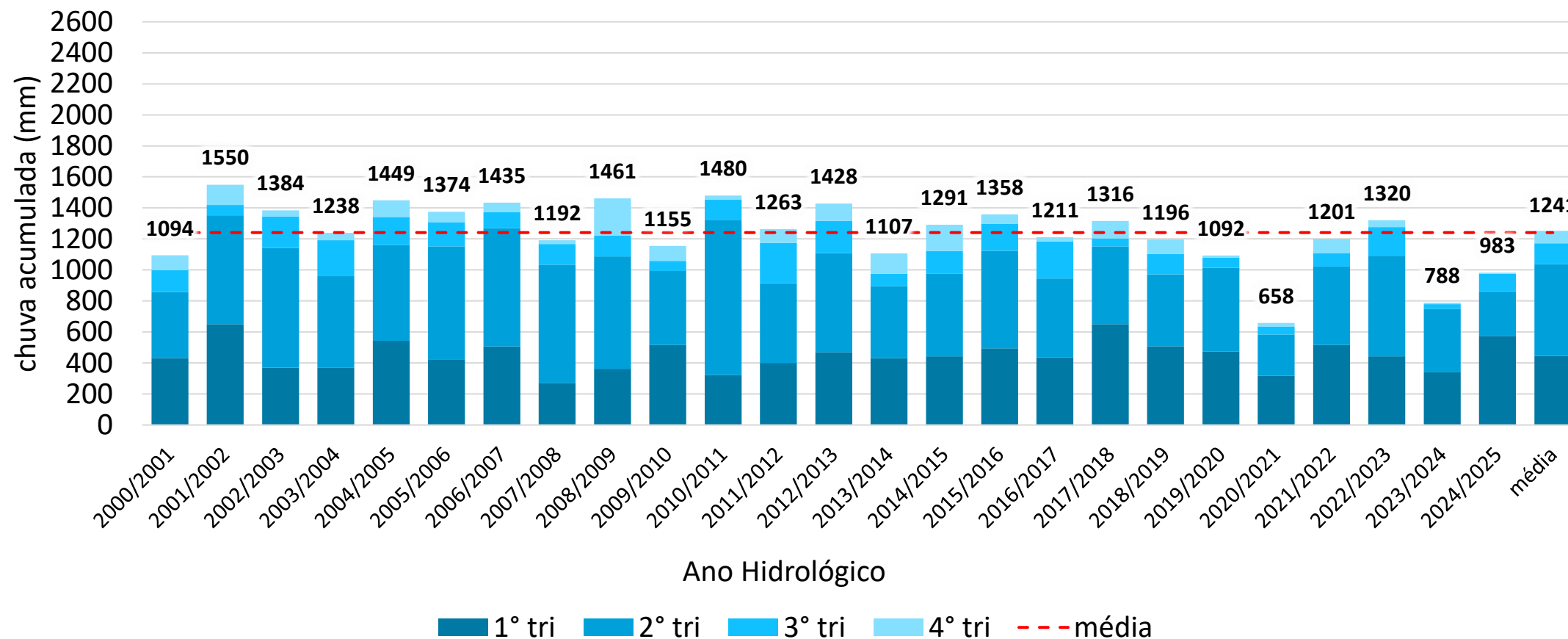


# UGRHI 14 - Alto Paranapanema | SPI-12

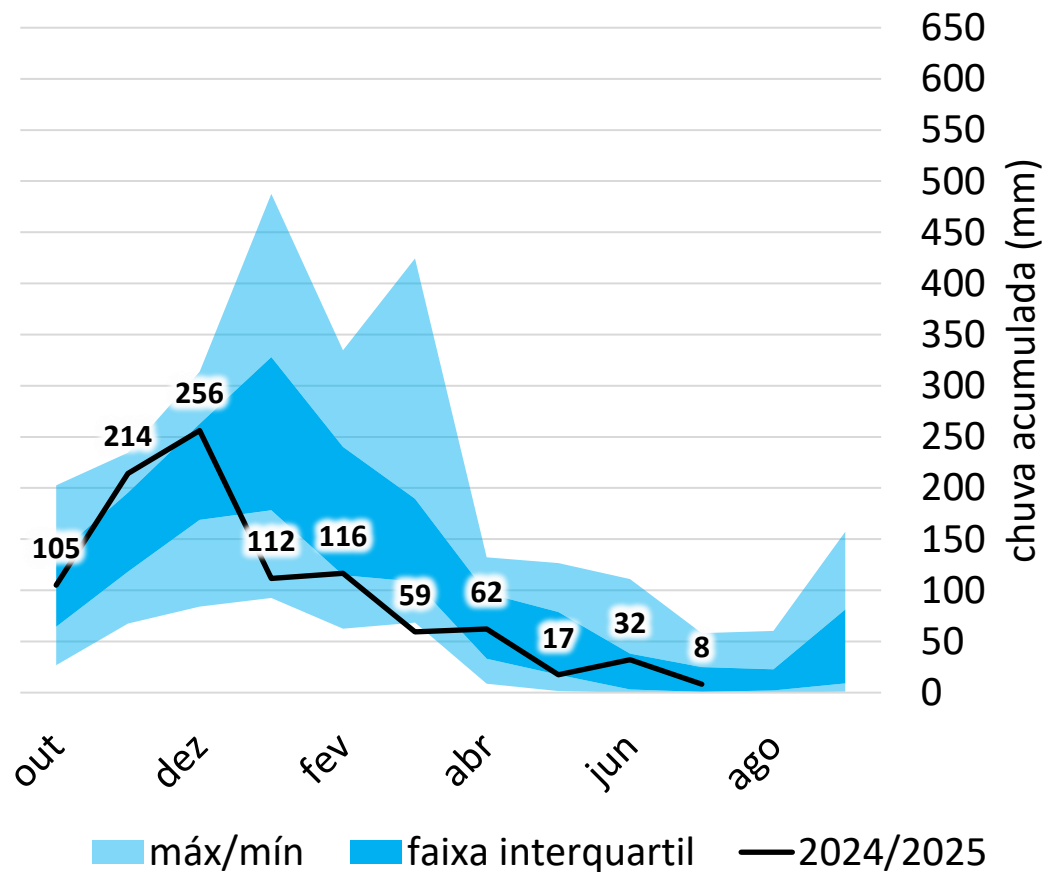
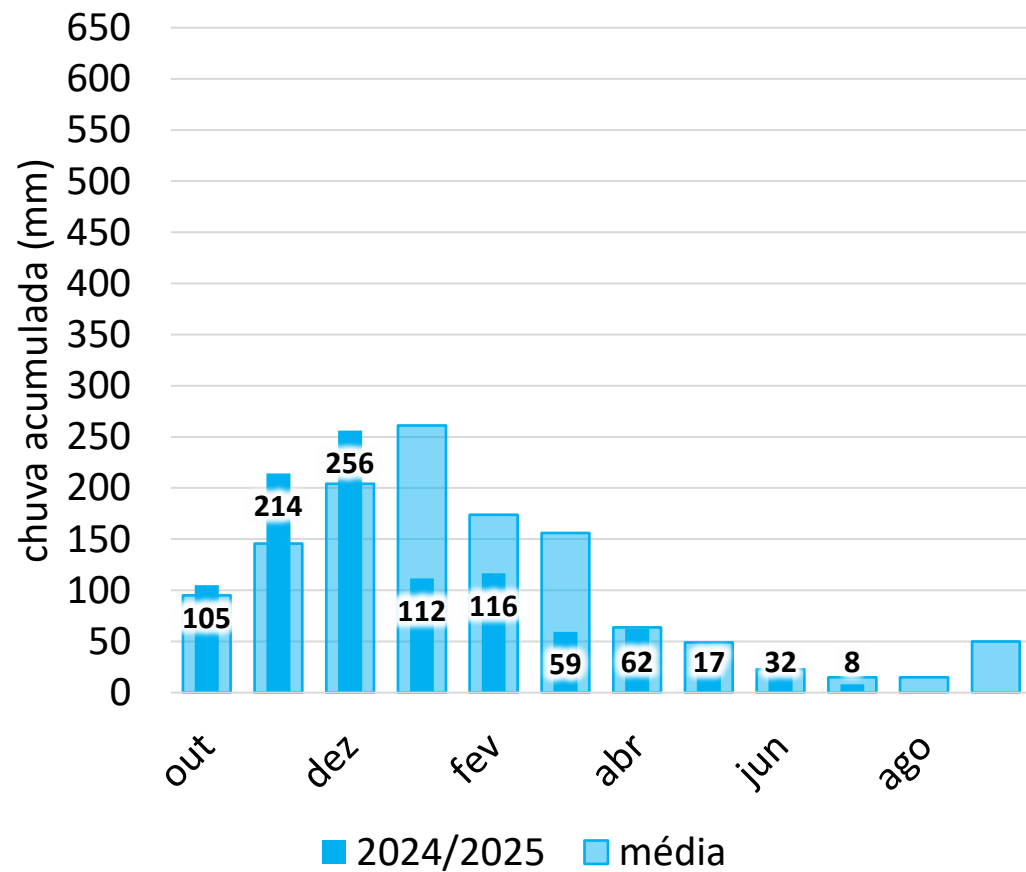
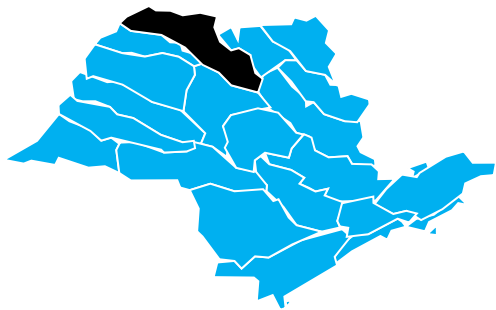




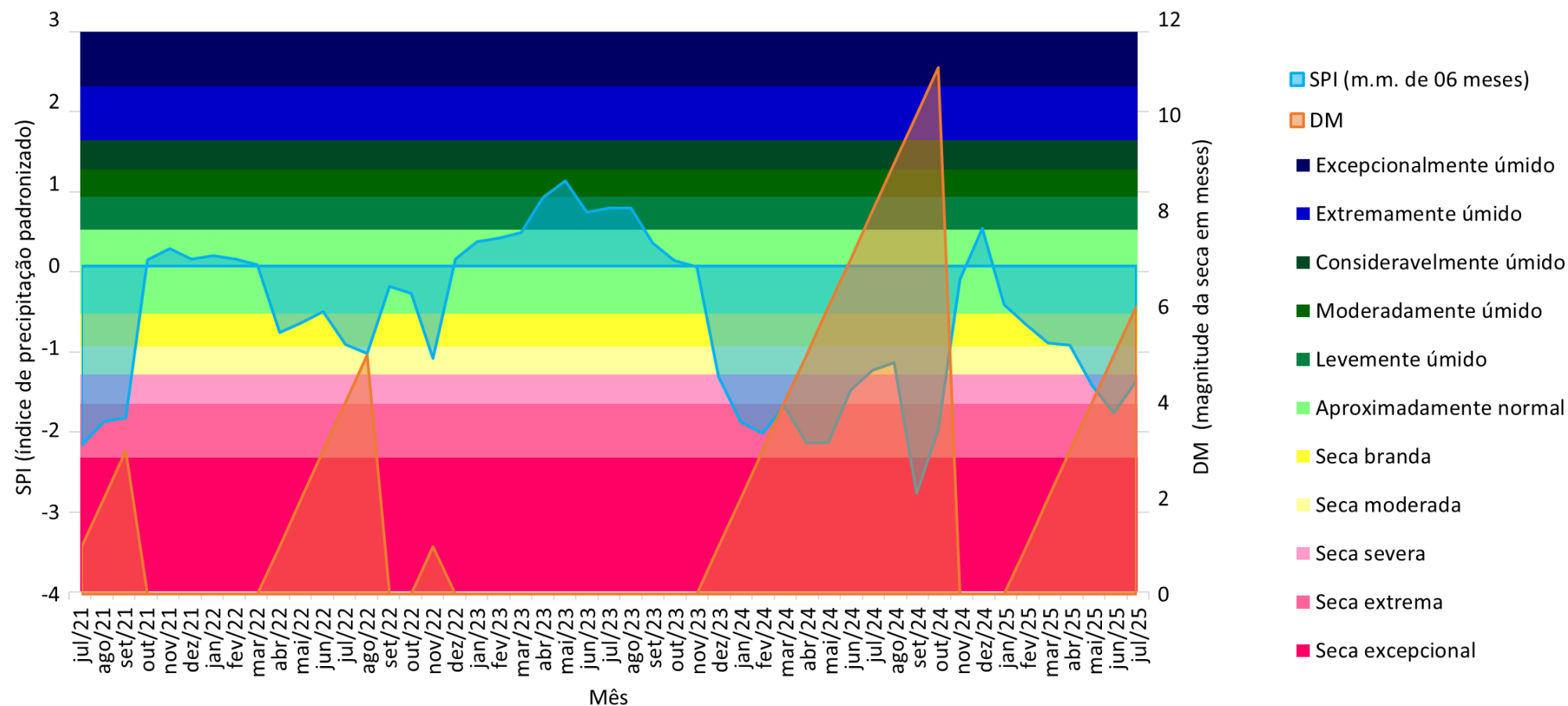
## UGRHI 15 - Turvo/Grande



# UGRHI 15 - Turvo/Grande

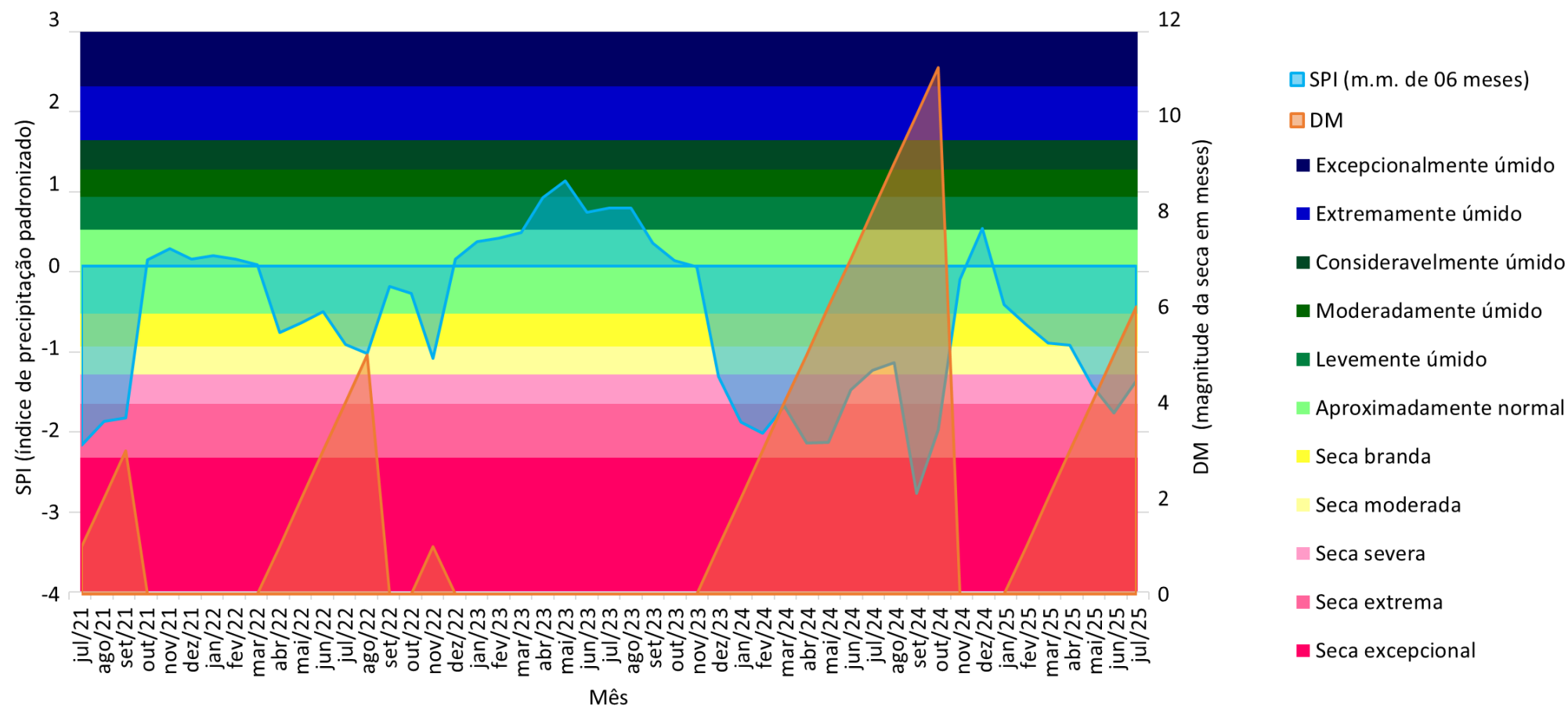


# UGRHI 15 - Turvo/Grande | SPI-06



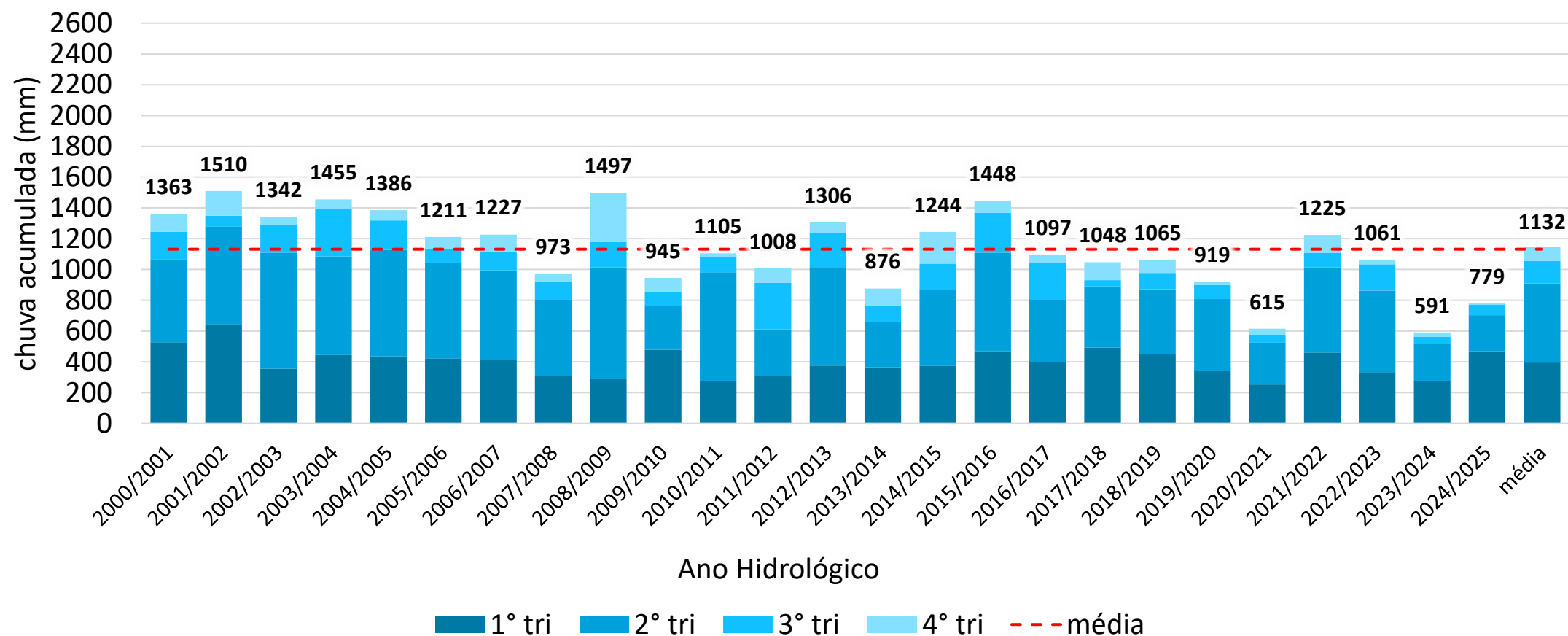


# UGRHI 15 - Turvo/Grande | SPI-12

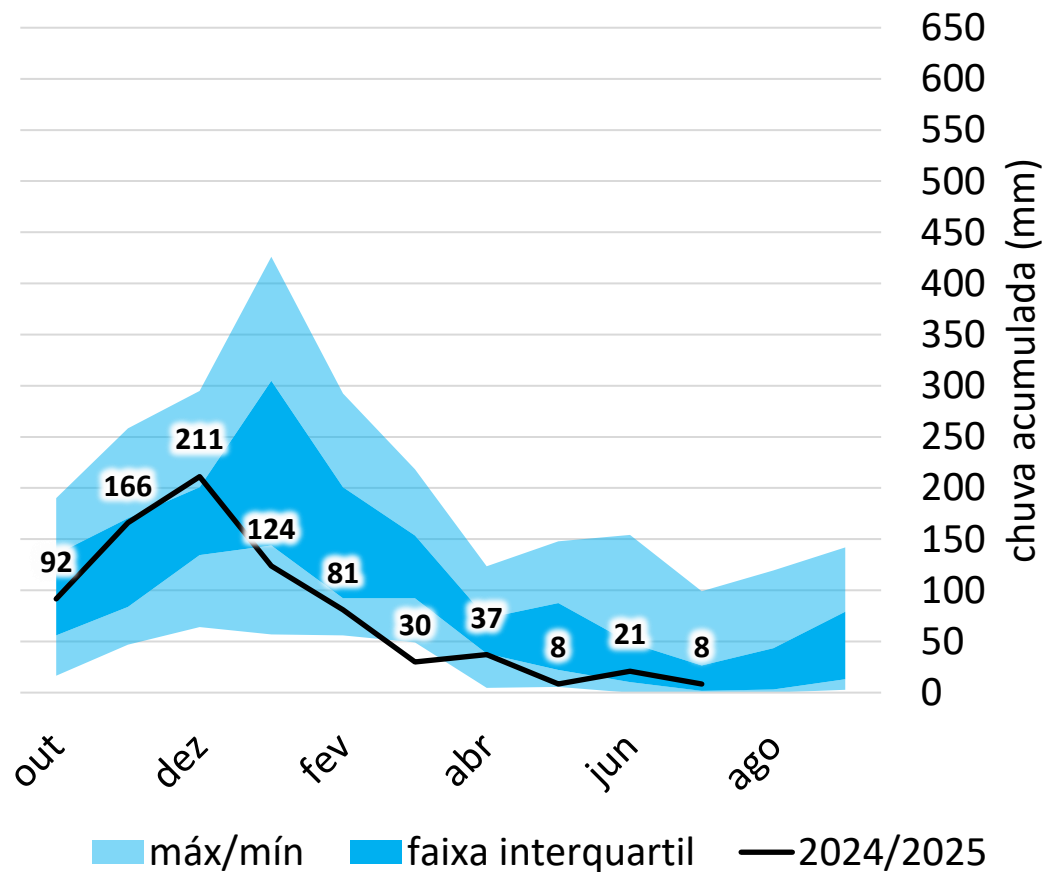
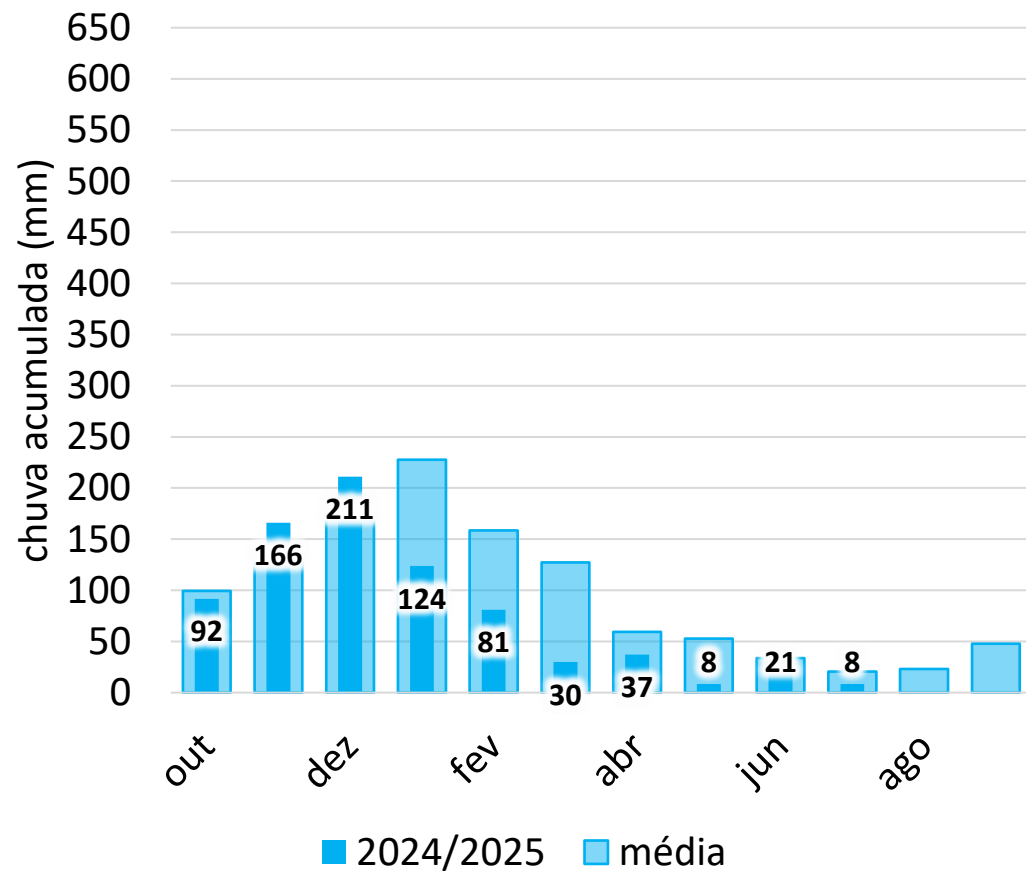




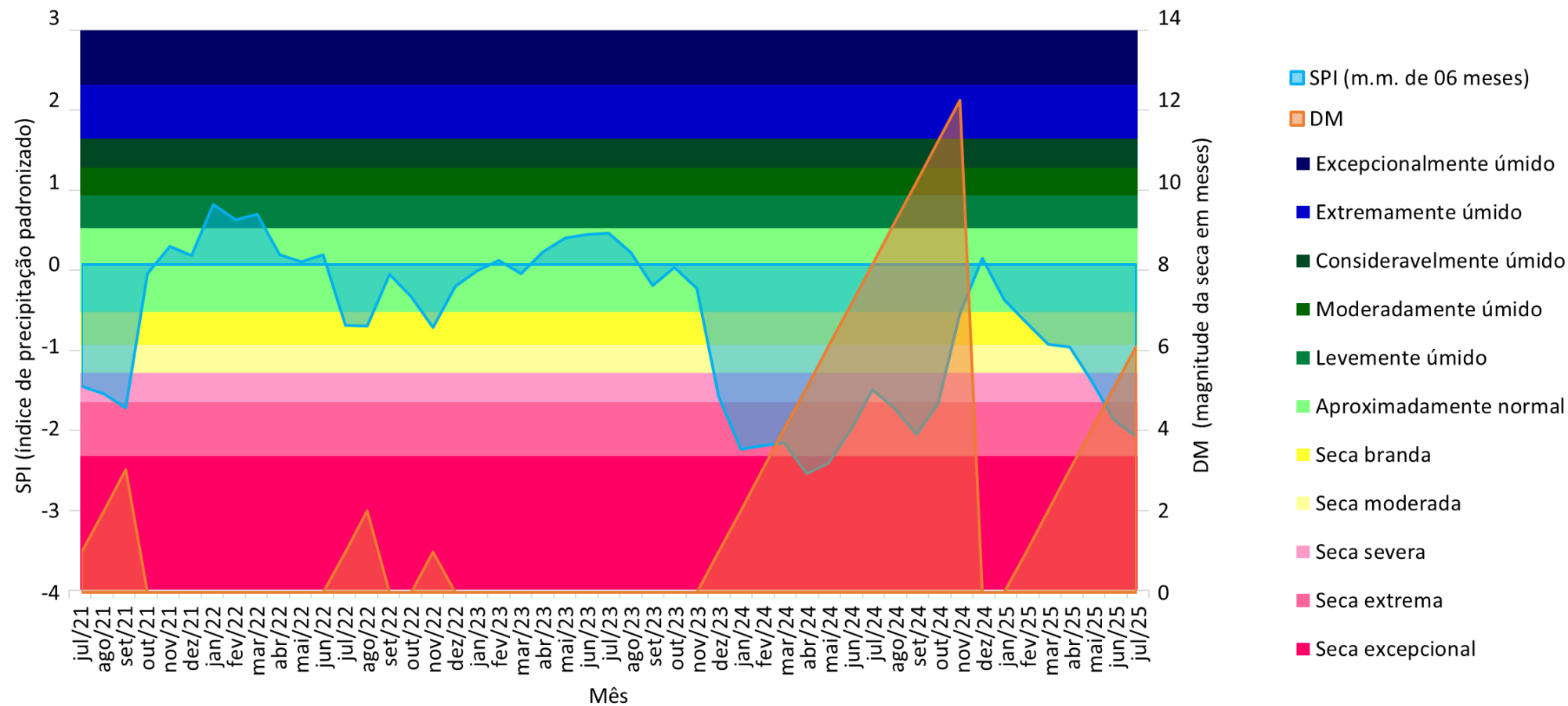
## UGRHI 16 - Tietê/Batalha



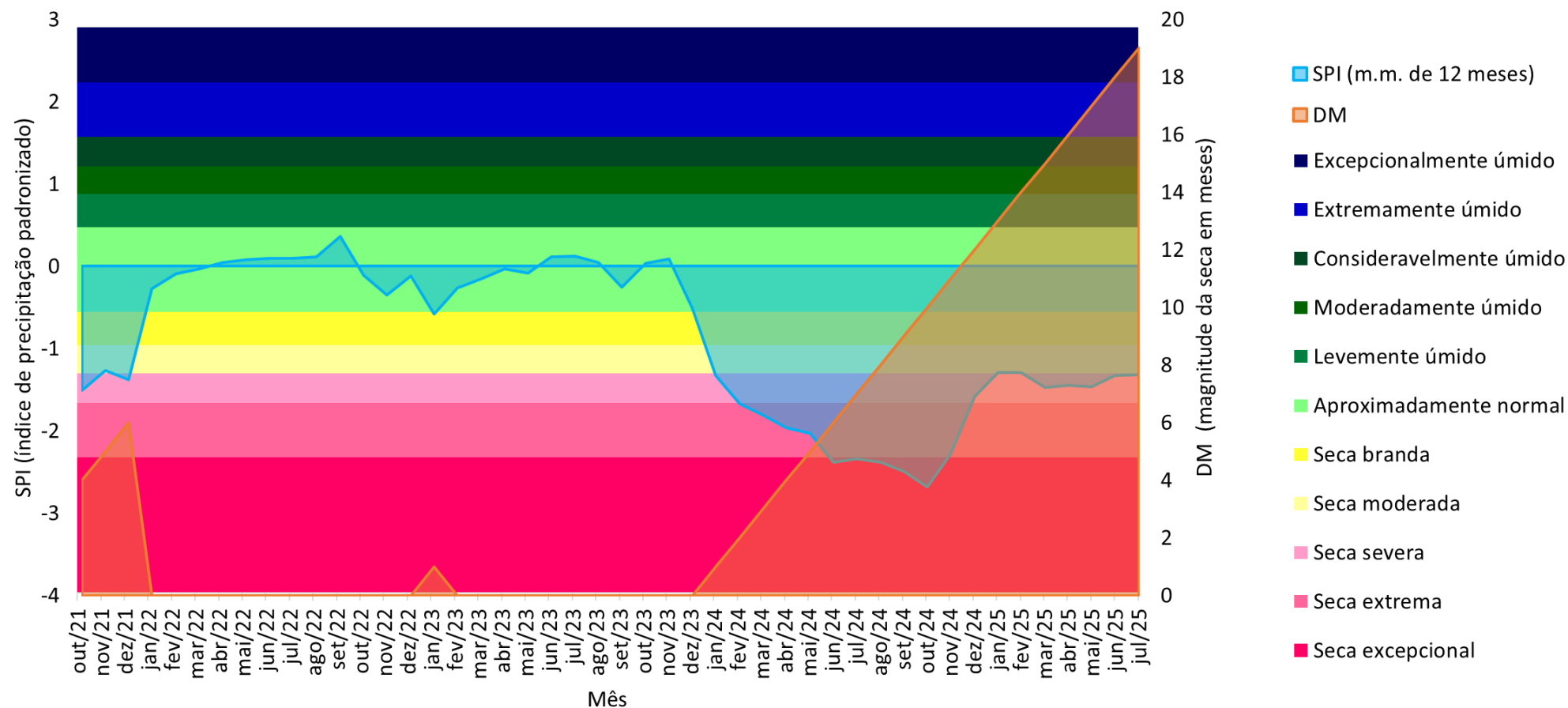
# UGRHI 16 - Tietê/Batalha



# UGRHI 16 - Tietê/Batalha | SPI-06

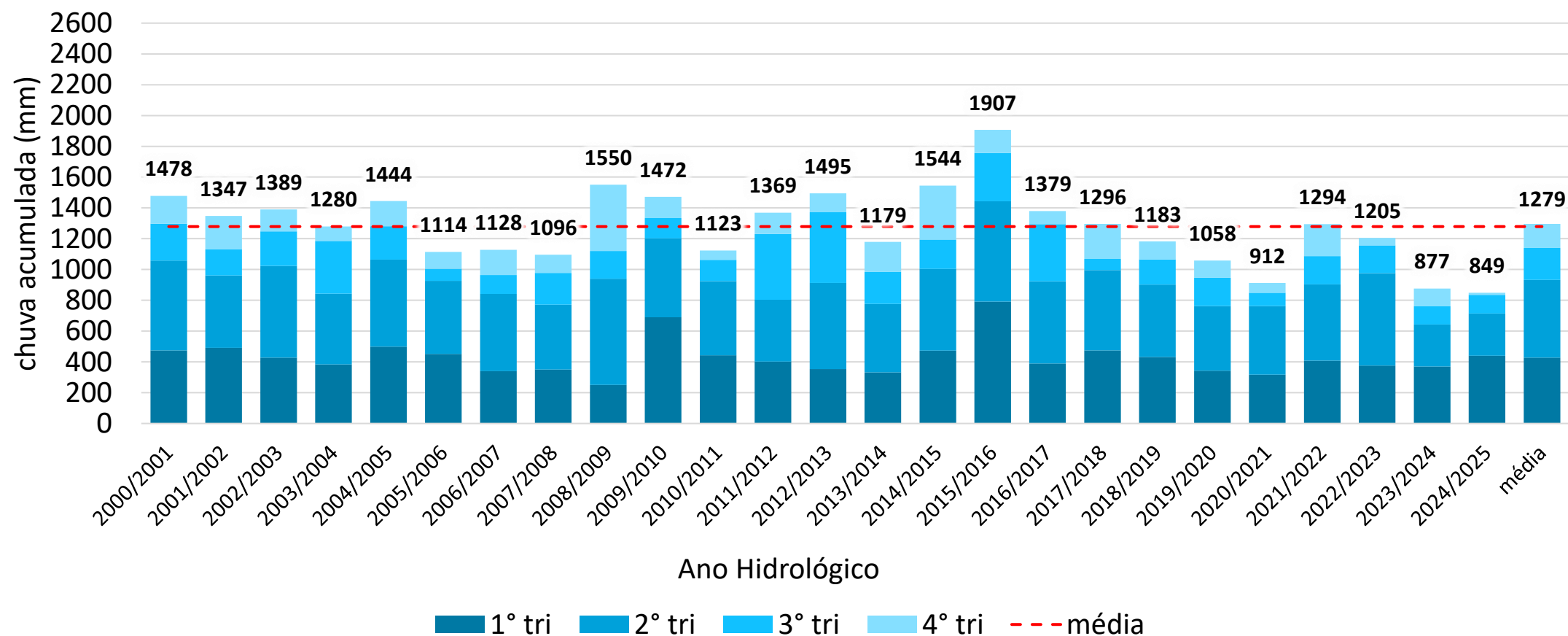


# UGRHI 16 - Tietê/Batalha | SPI-12

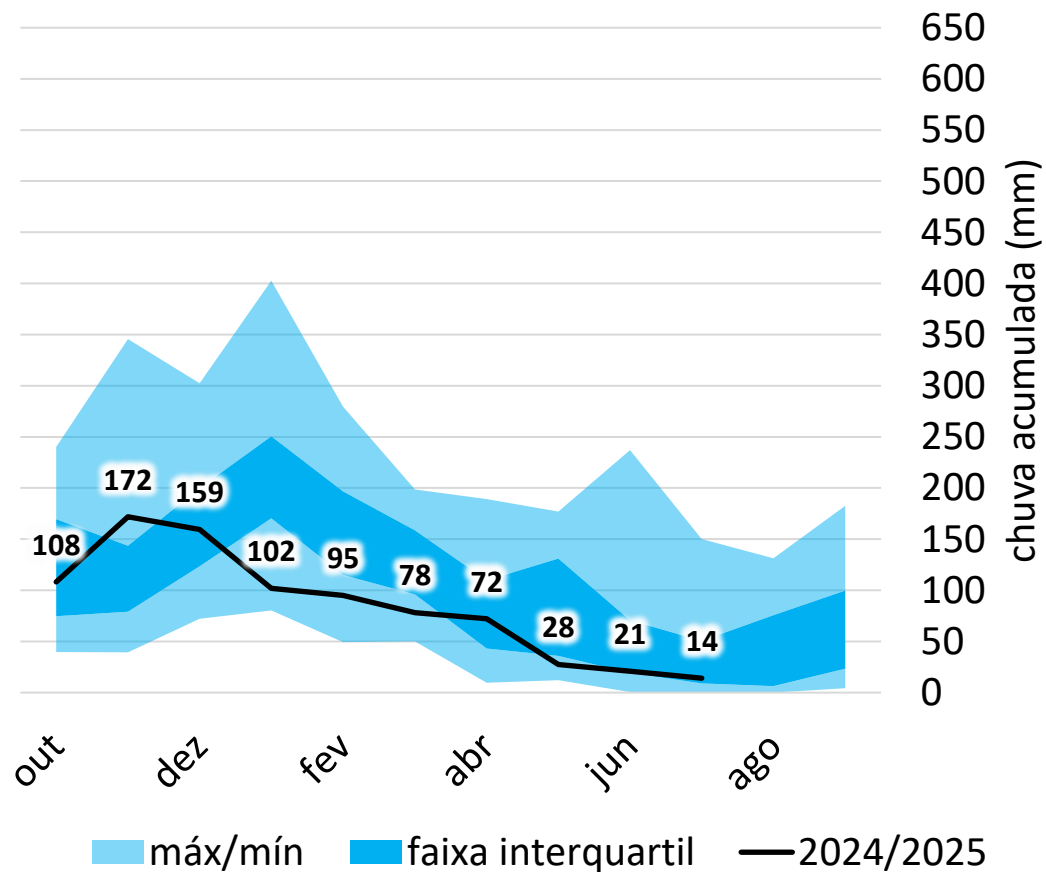
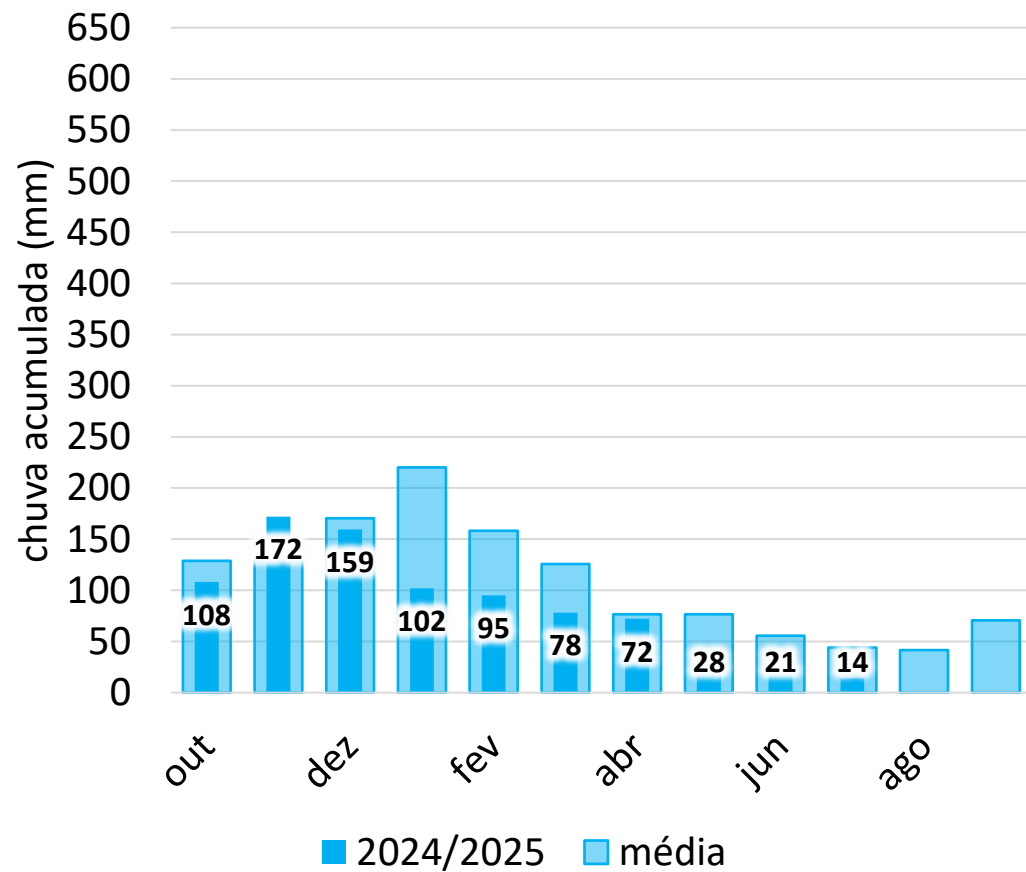




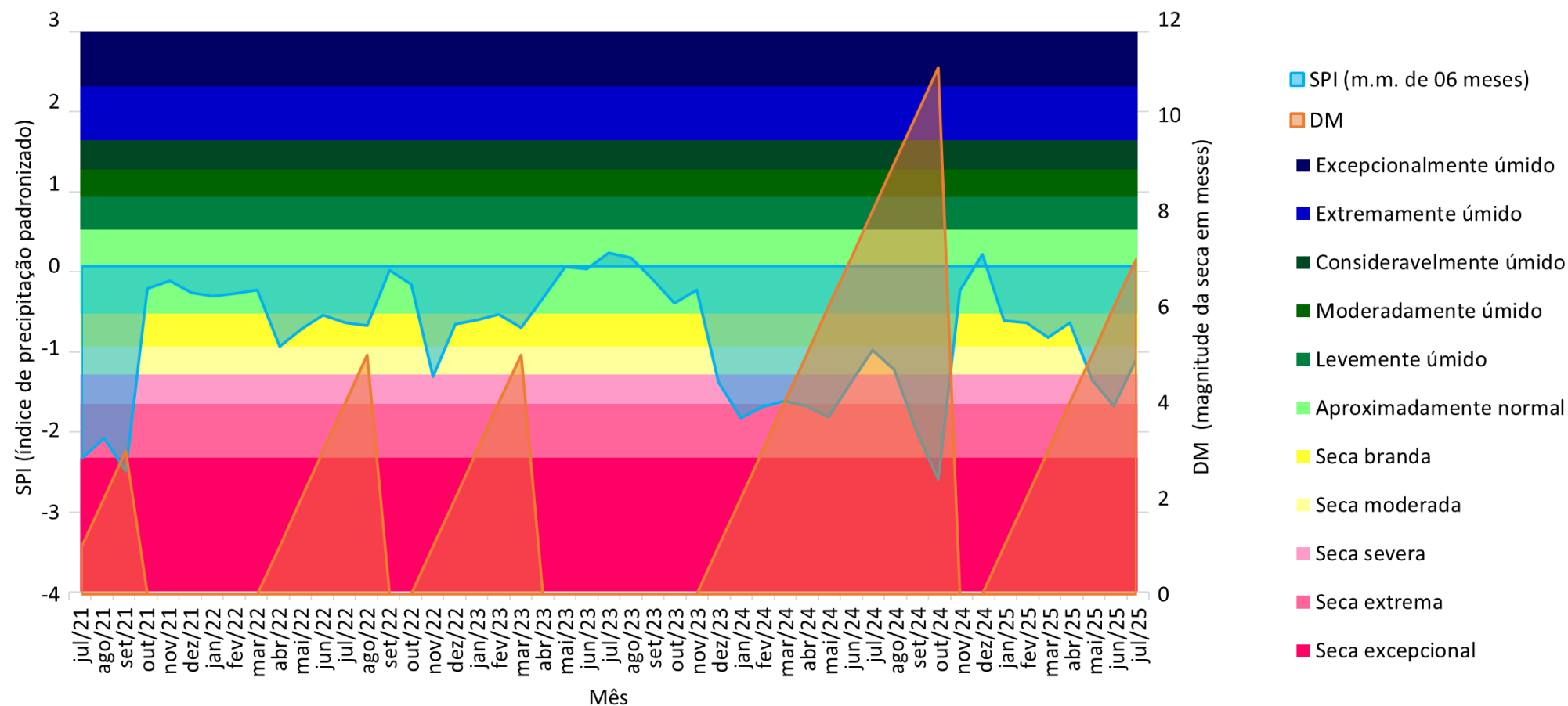
## UGRHI 17 - Médio Paranapanema



# UGRHI 17 - Médio Paranapanema

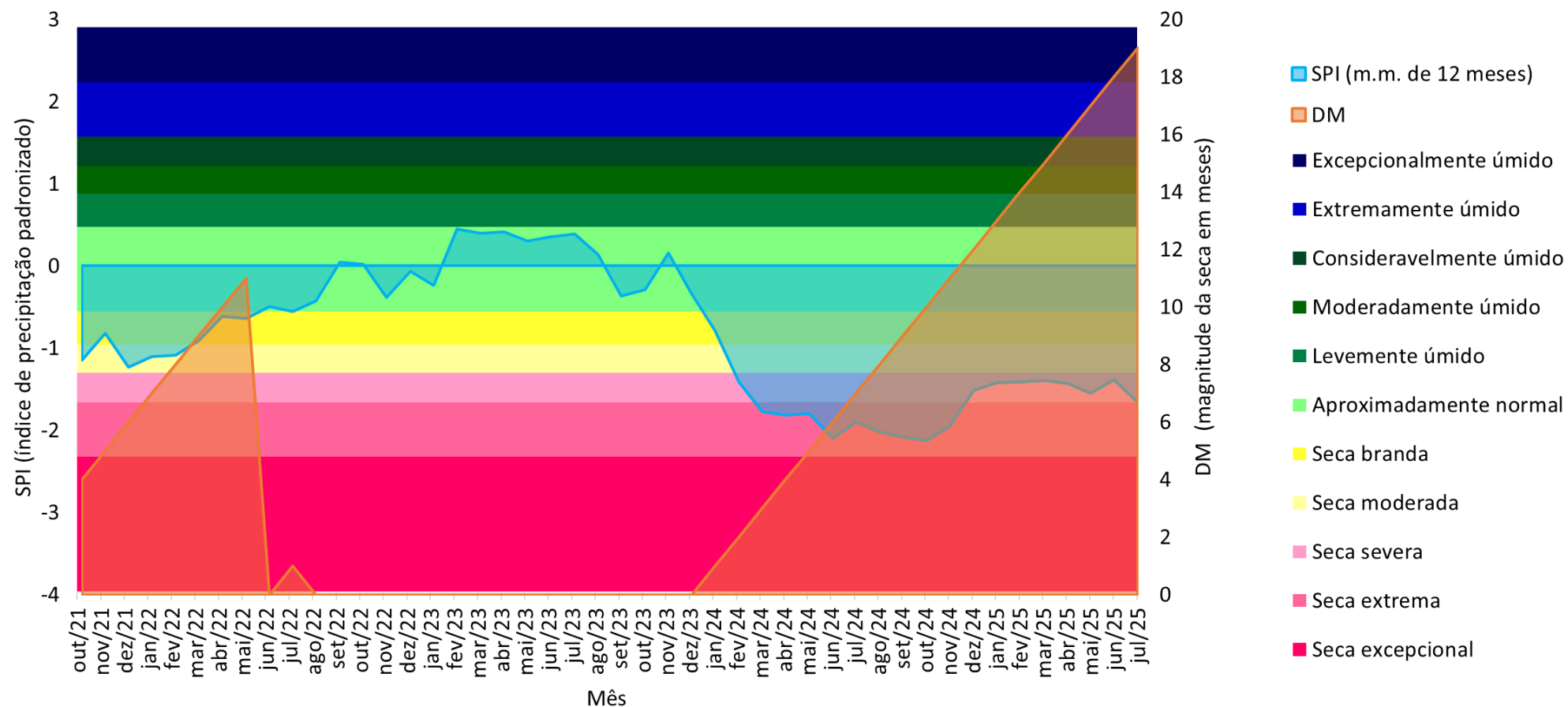


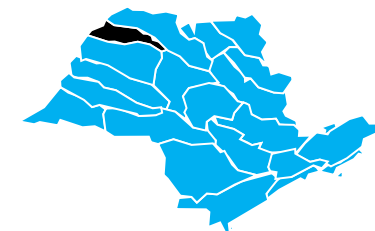
# UGRHI 17 - Médio Paranapanema | SPI-06



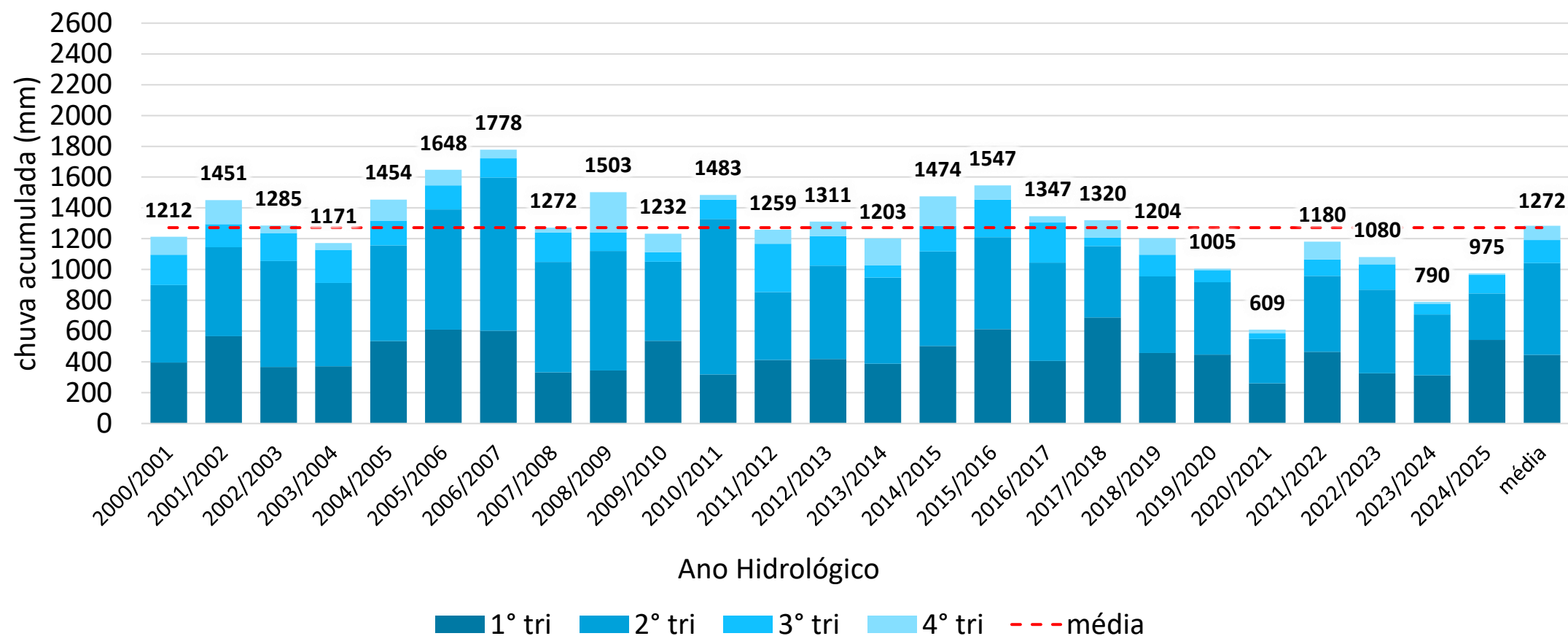


# UGRHI 17 - Médio Paranapanema | SPI-12

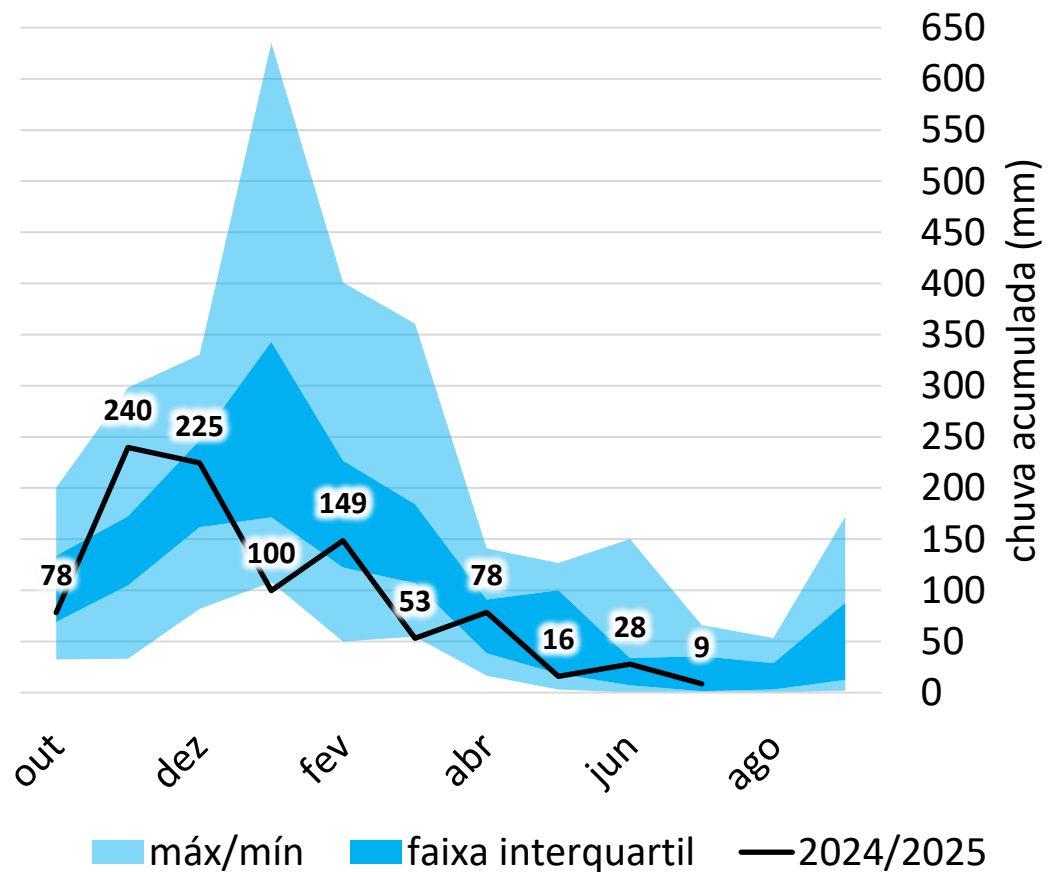
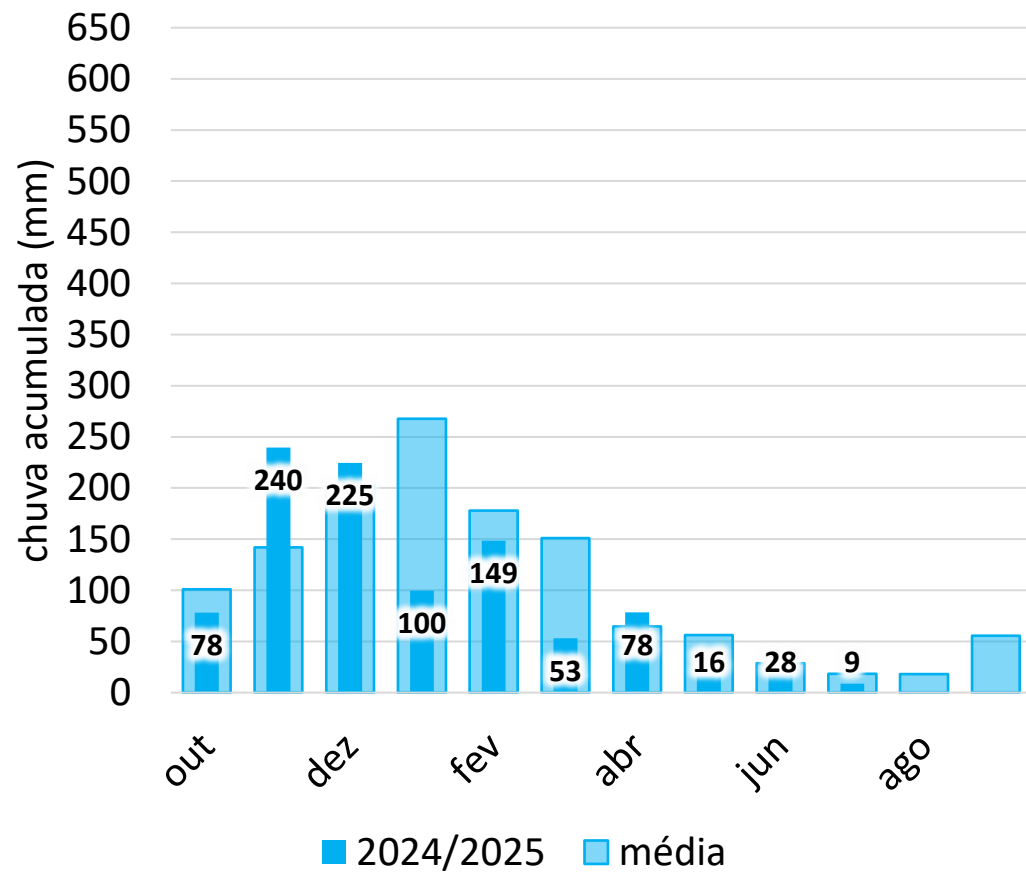
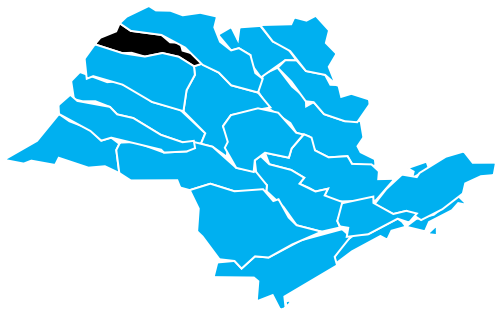




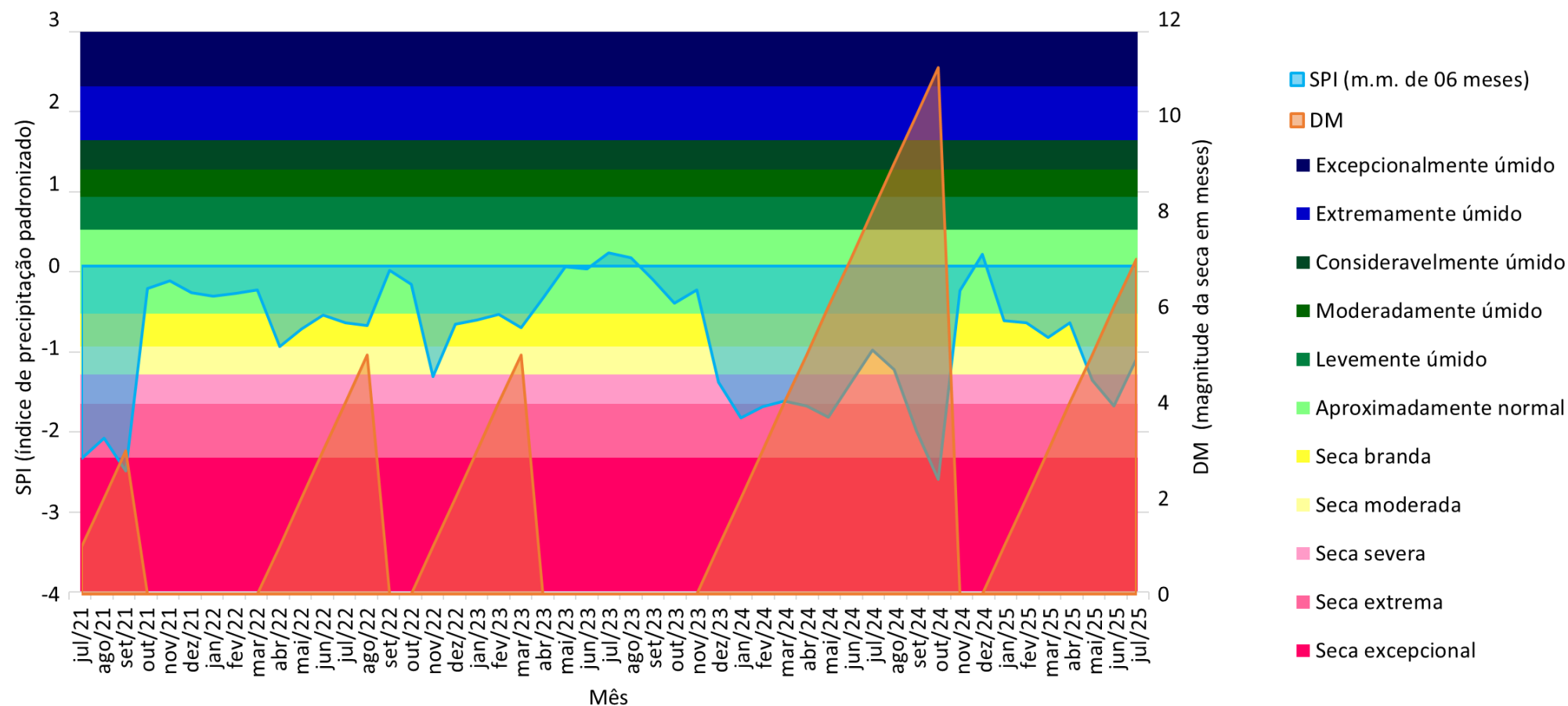
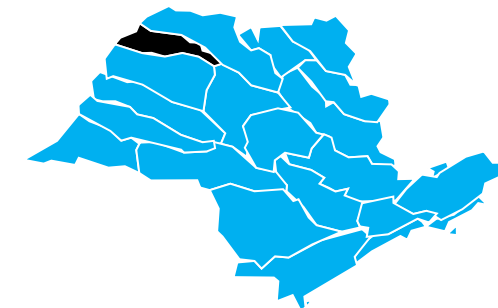
# UGRHI 18 - São José dos Dourados



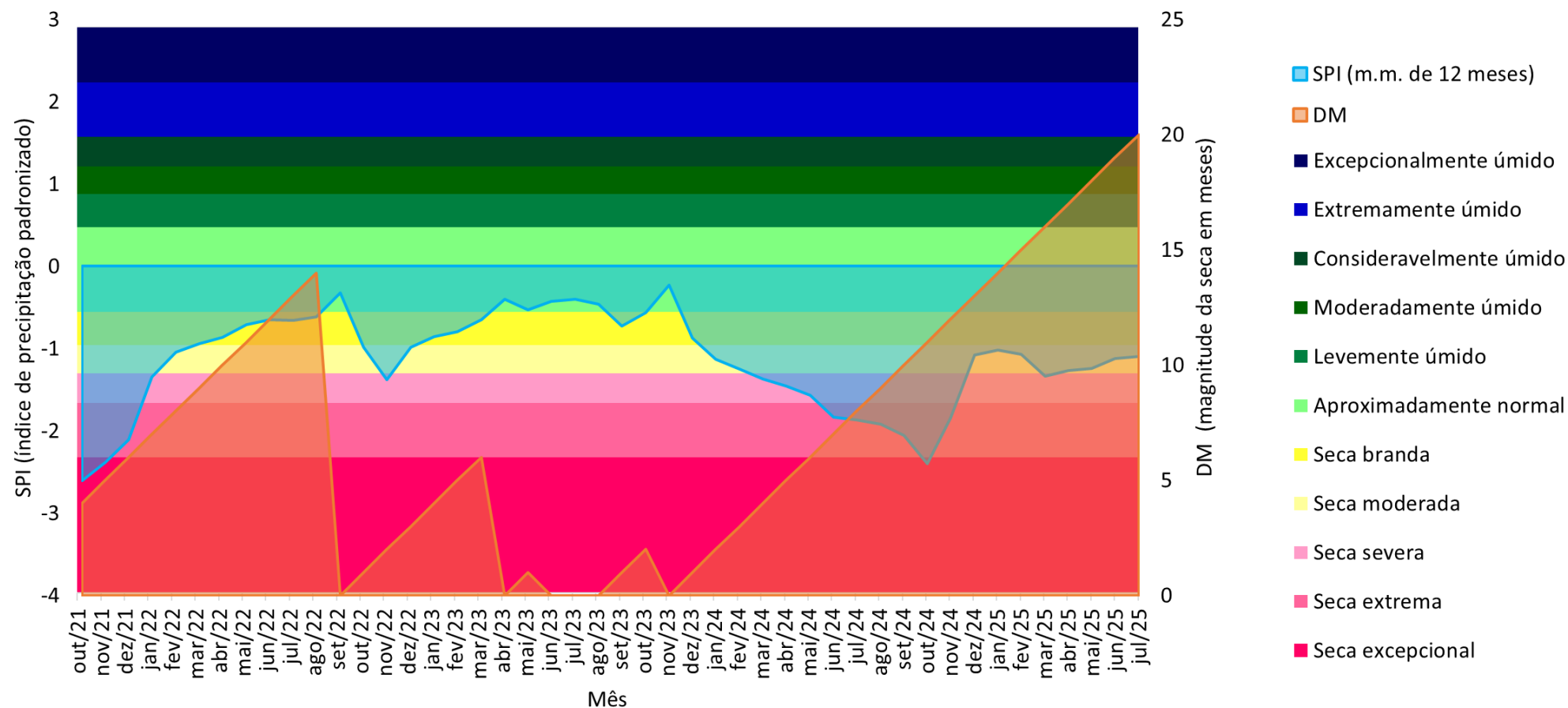
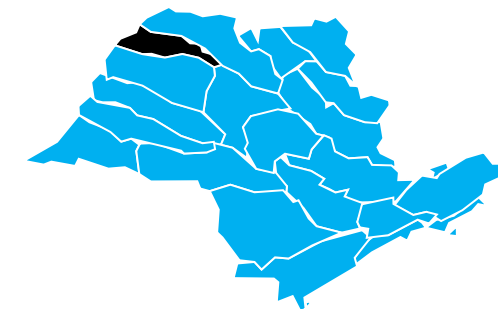
# UGRHI 18 - São José dos Dourados



# UGRHI 18 - São José dos Dourados | SPI-06

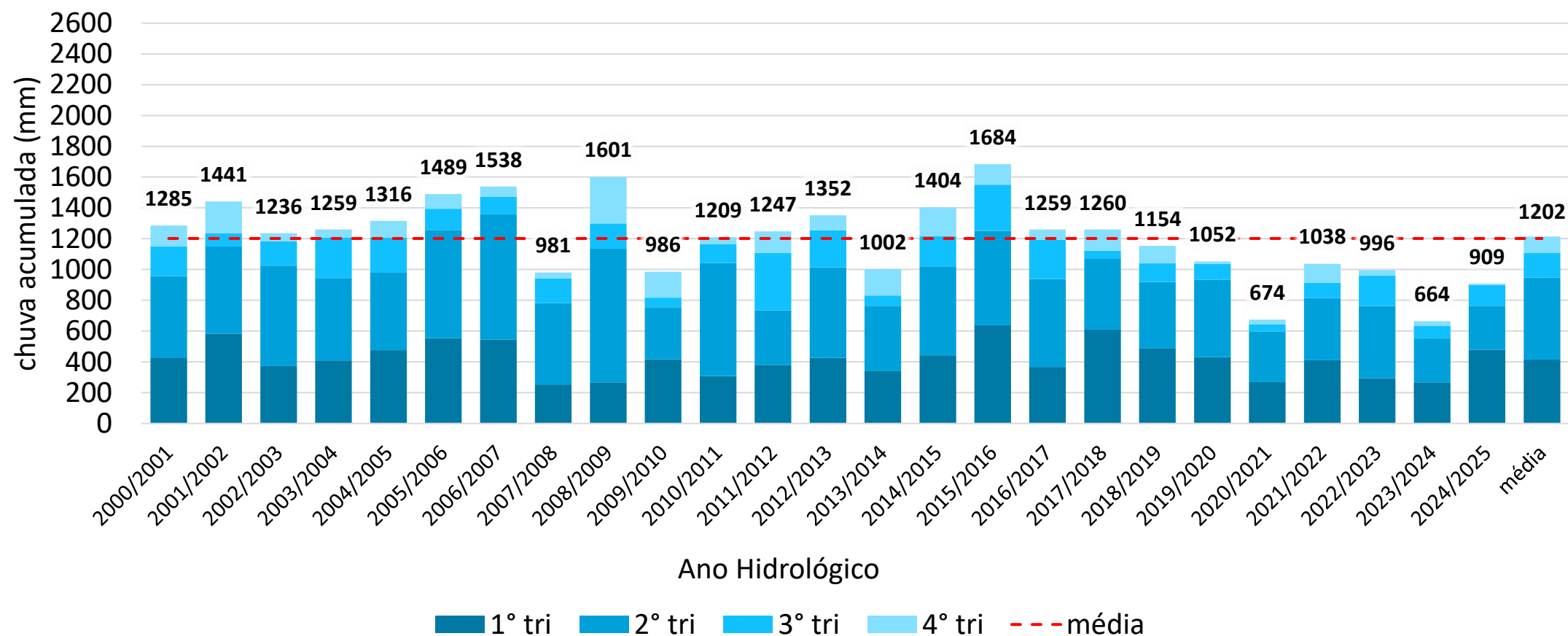


# UGRHI 18 - São José dos Dourados | SPI-12

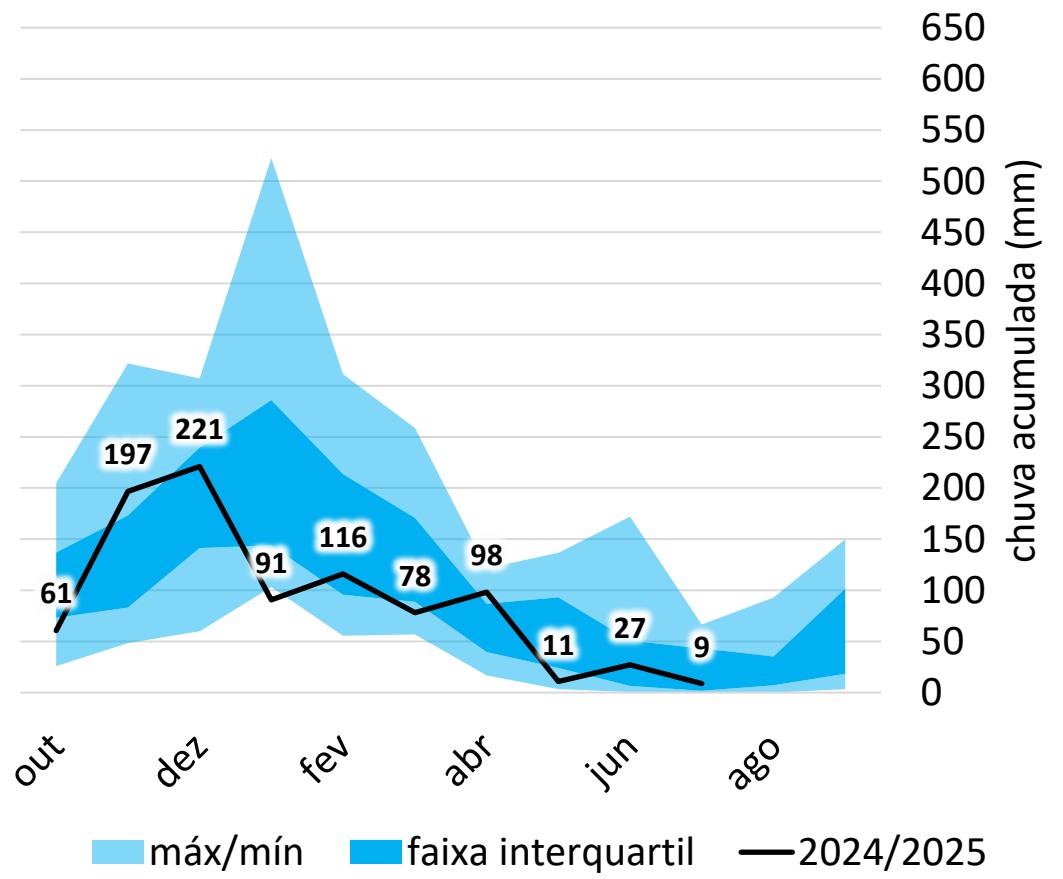
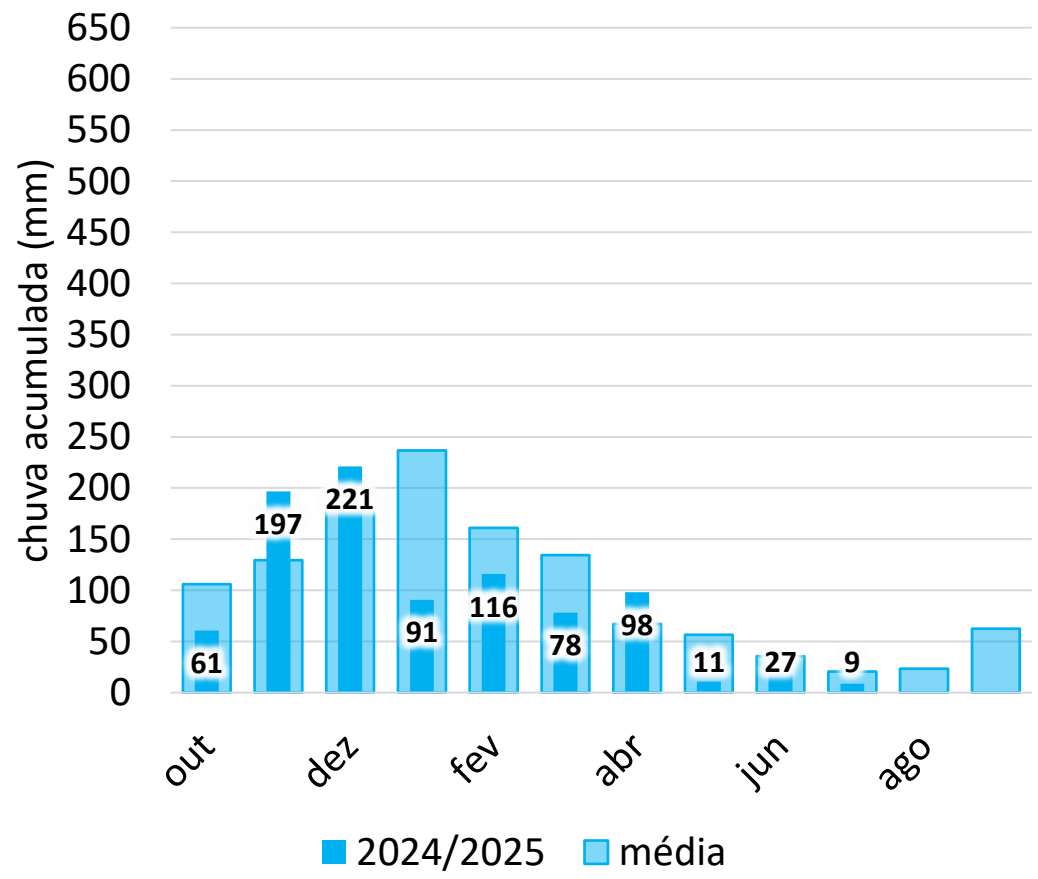
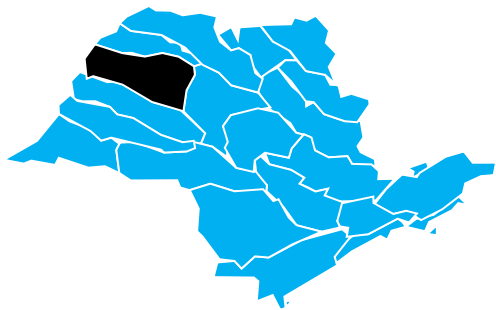




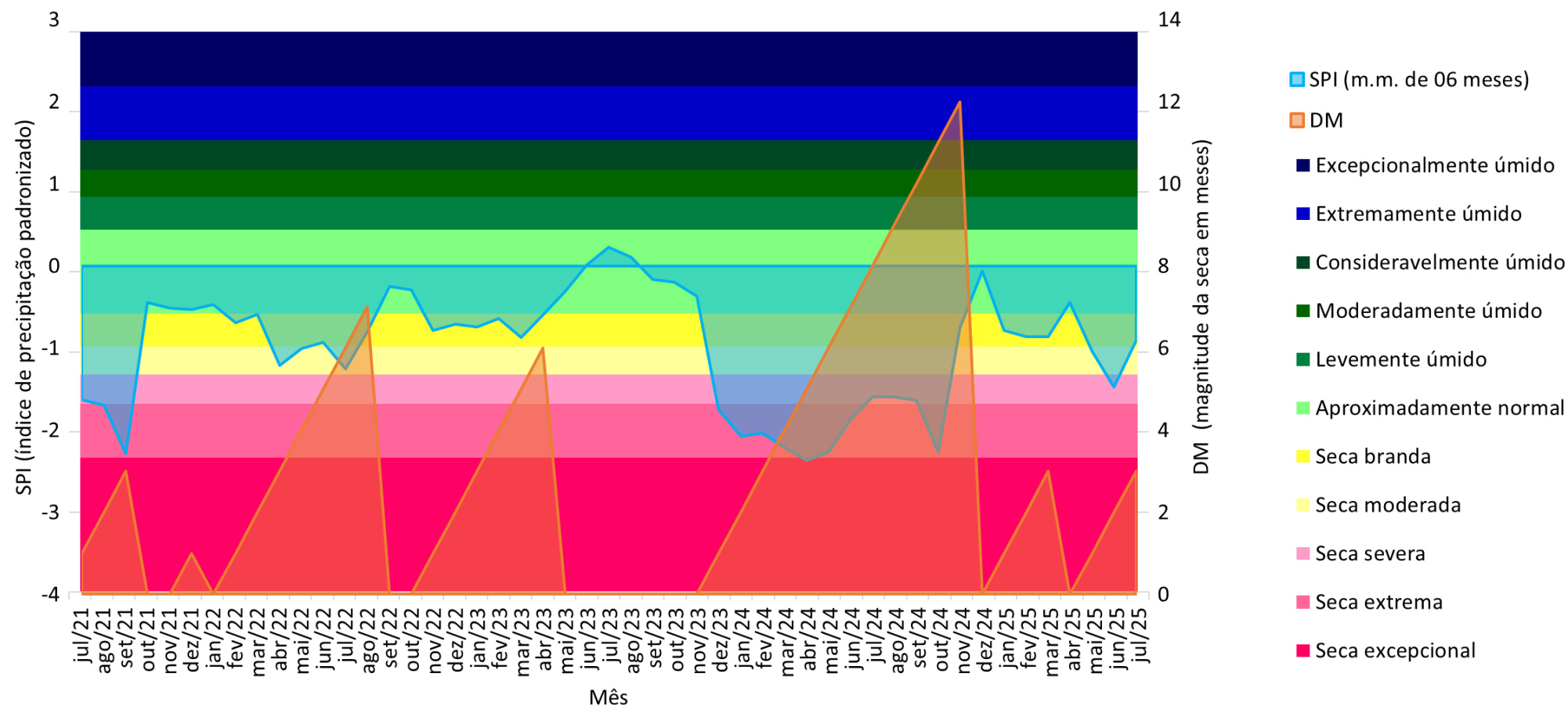
## UGRHI 19 - Baixo Tietê



# UGRHI 19 - Baixo Tietê

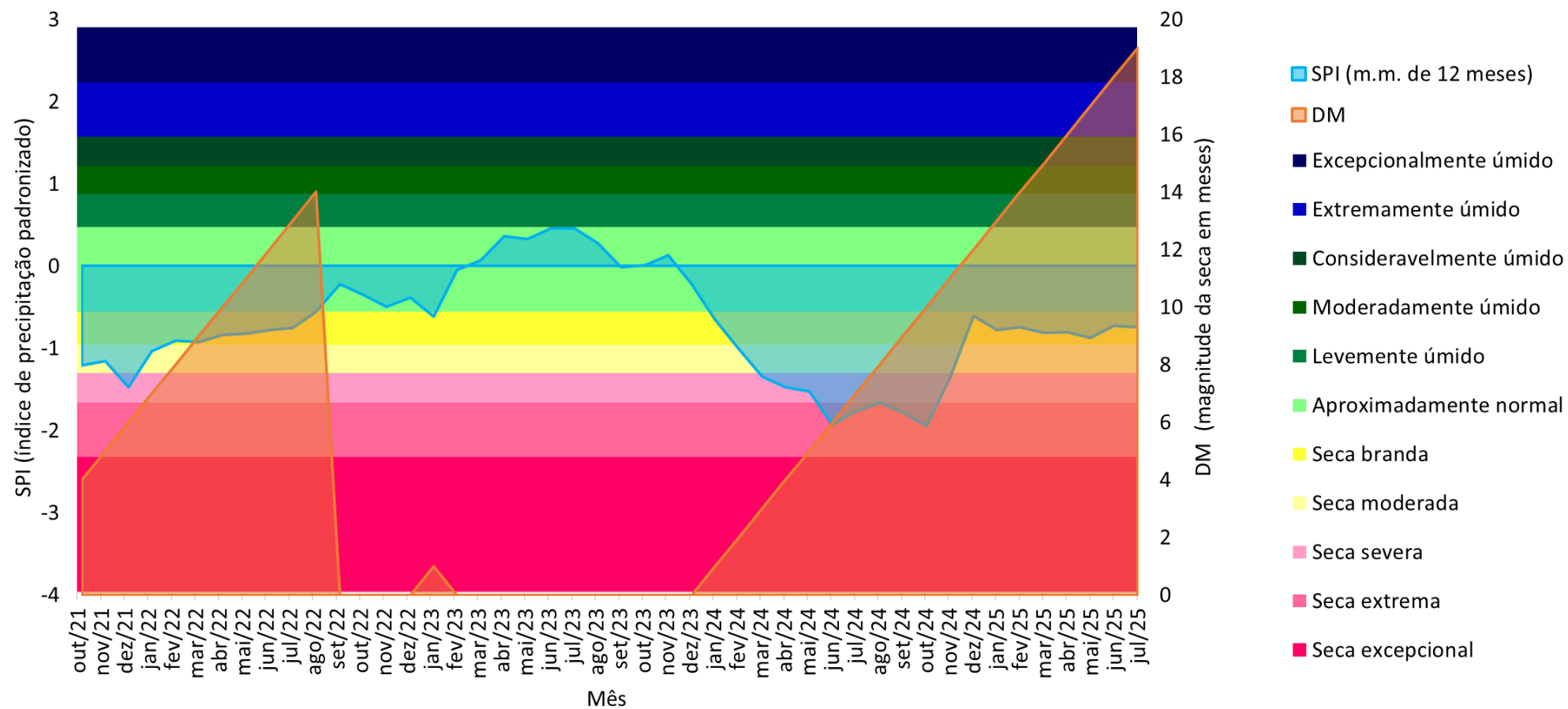


# UGRHI 19 - Baixo Tietê | SPI-06



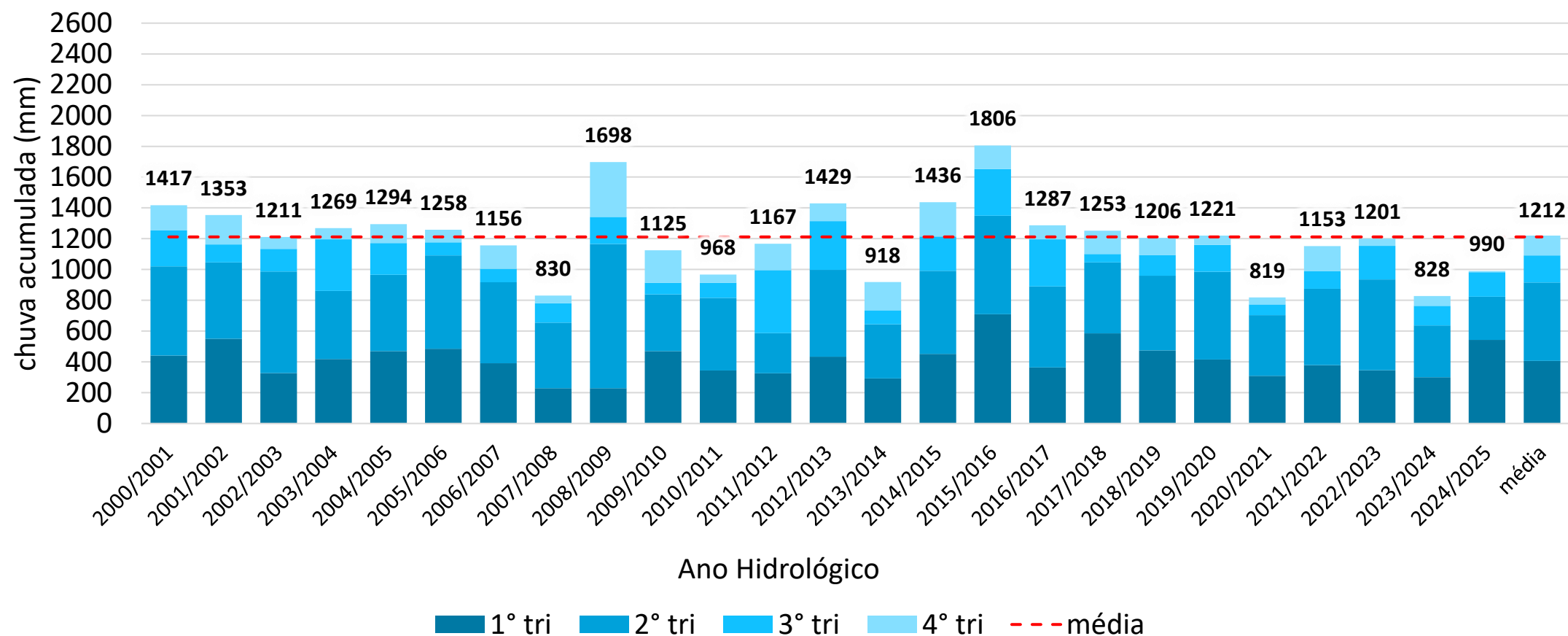


# UGRHI 19 - Baixo Tietê | SPI-12

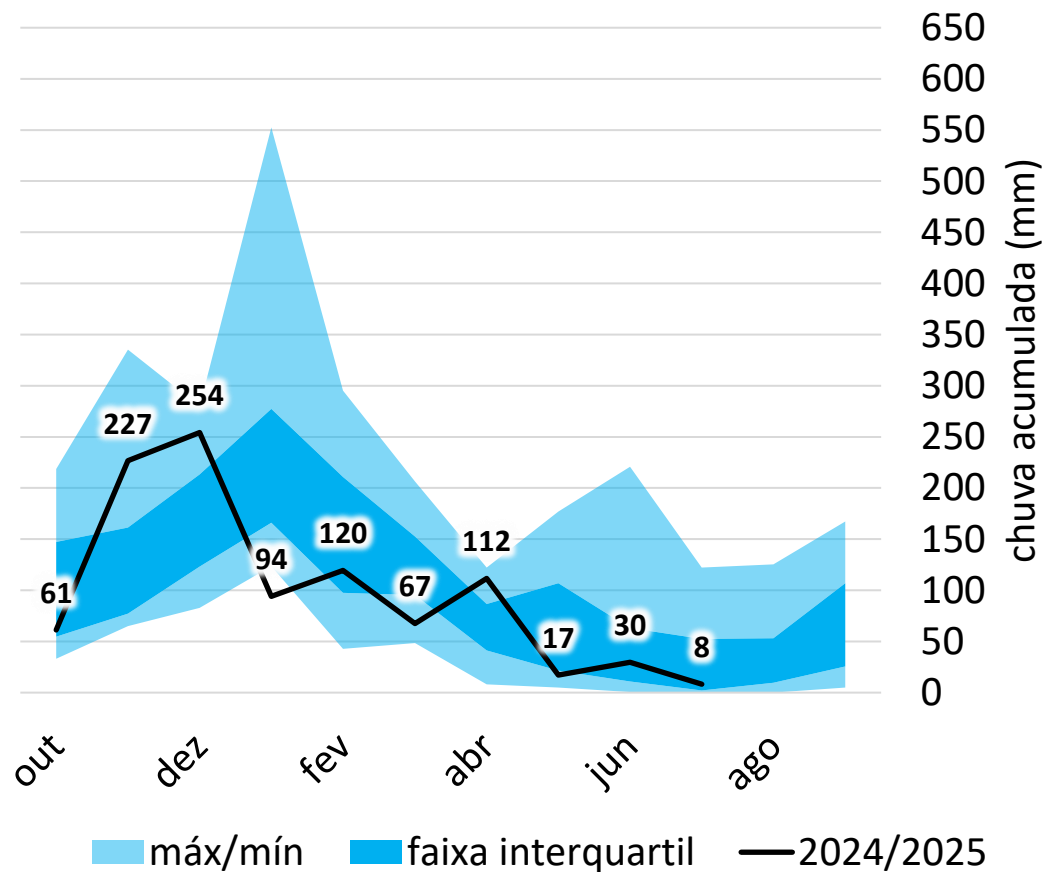
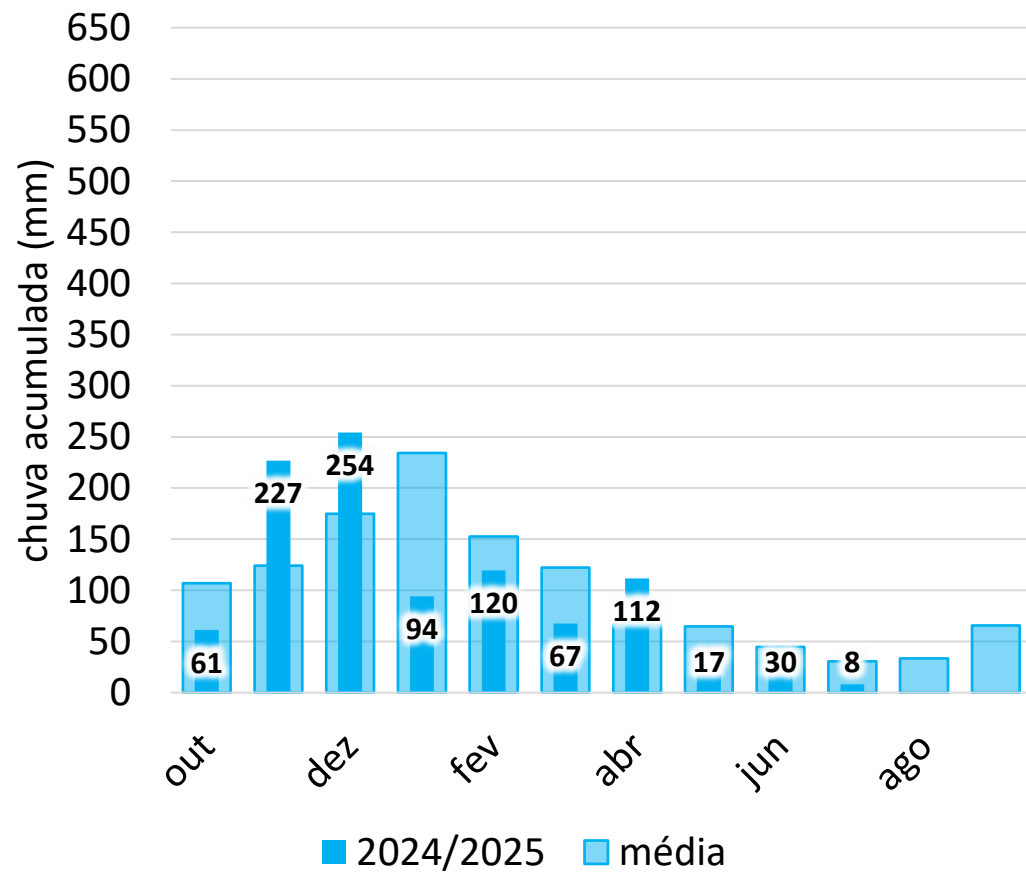




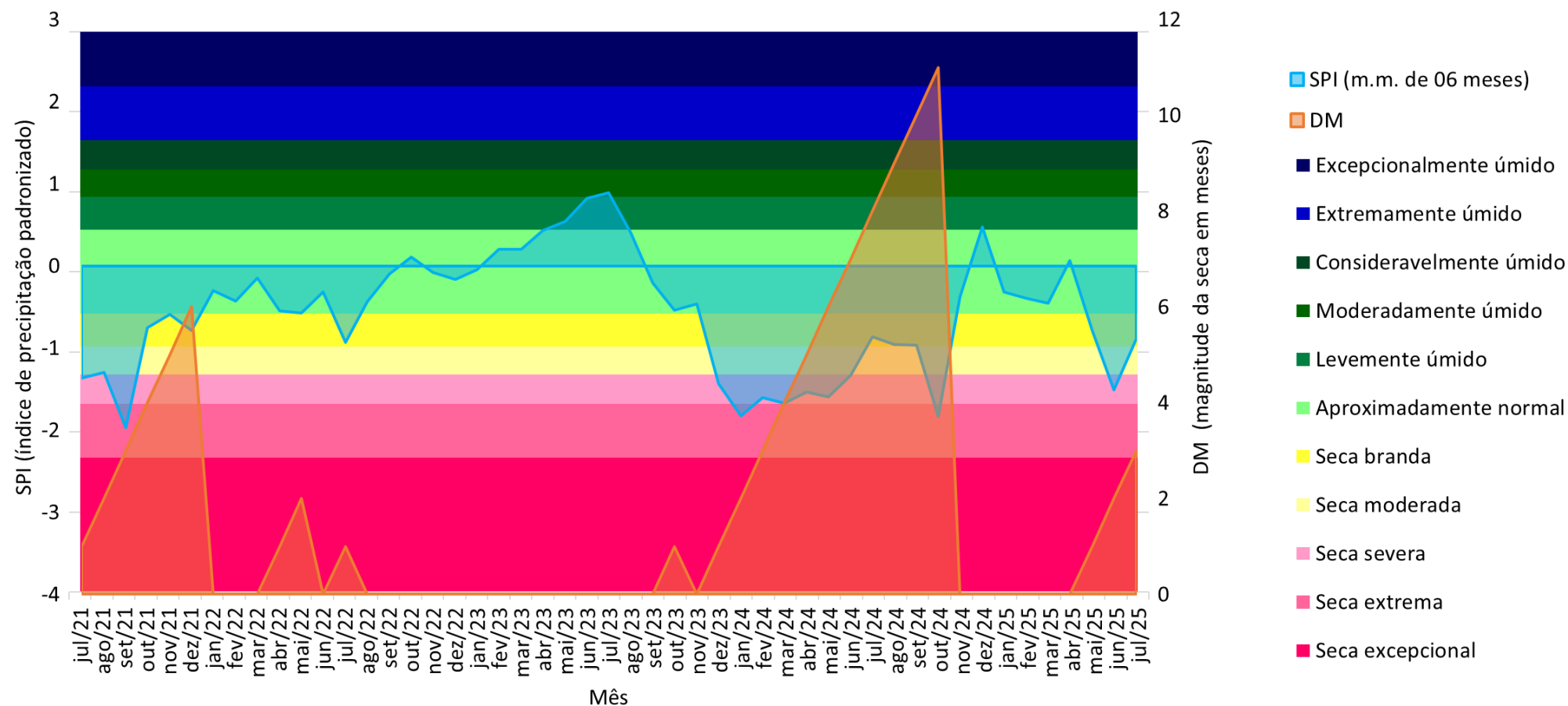
# UGRHI 20 - Aguapeí



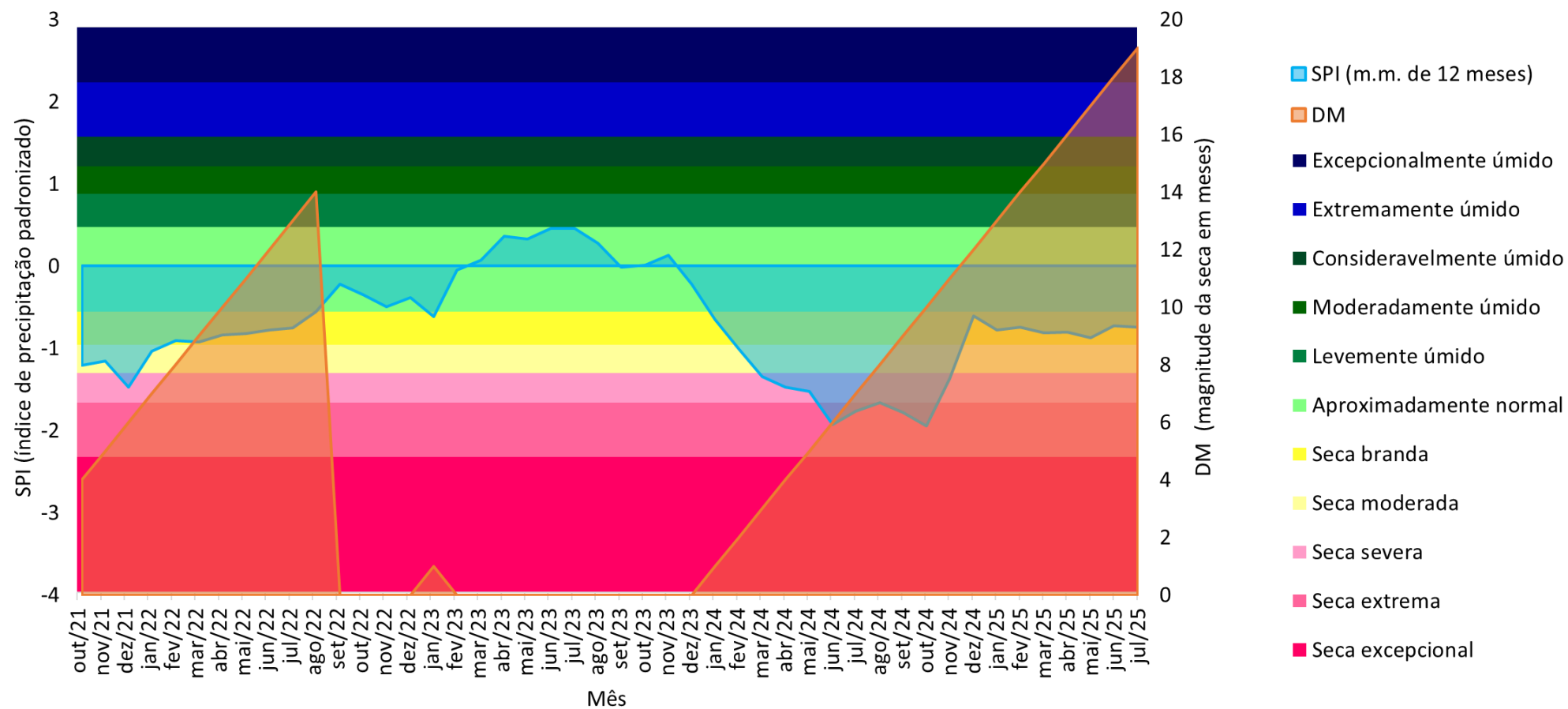
# UGRHI 20 - Aguapeí



# UGRHI 20 - Aguapeí | SPI-06

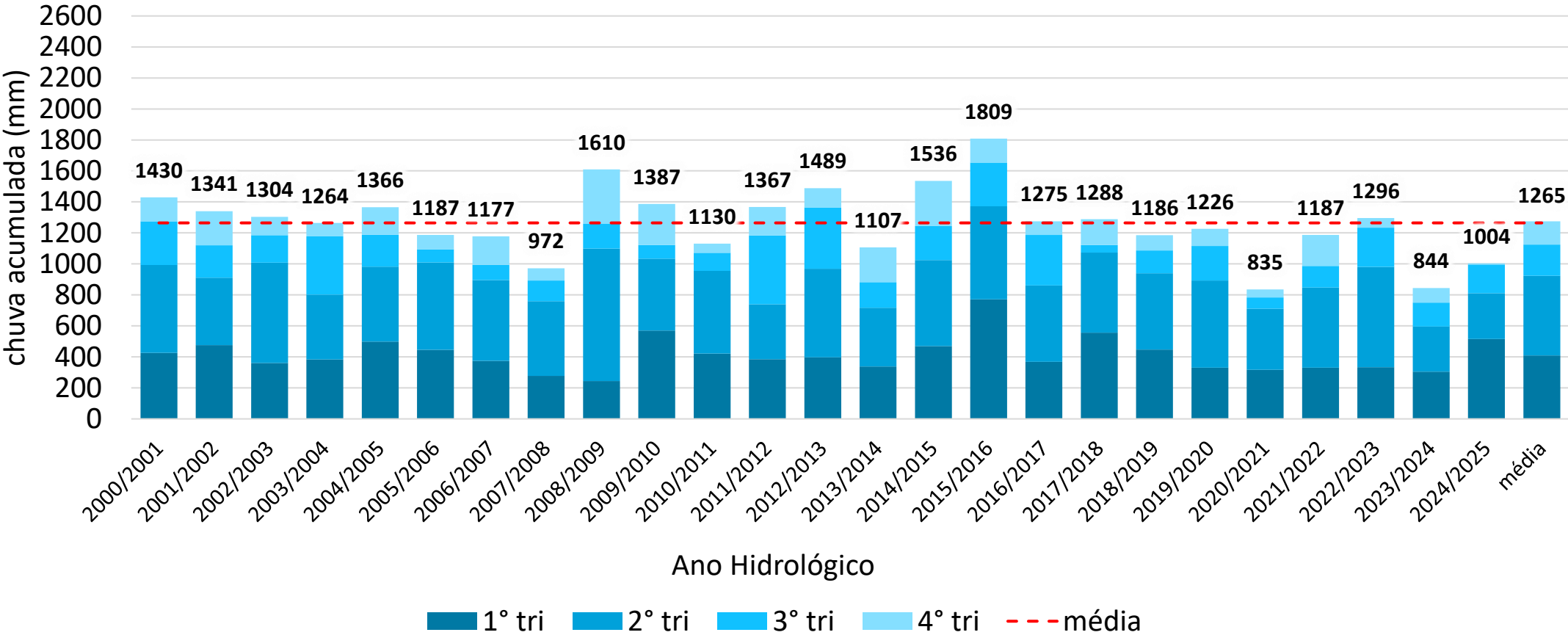


# UGRHI 20 - Aguapeí | SPI-12

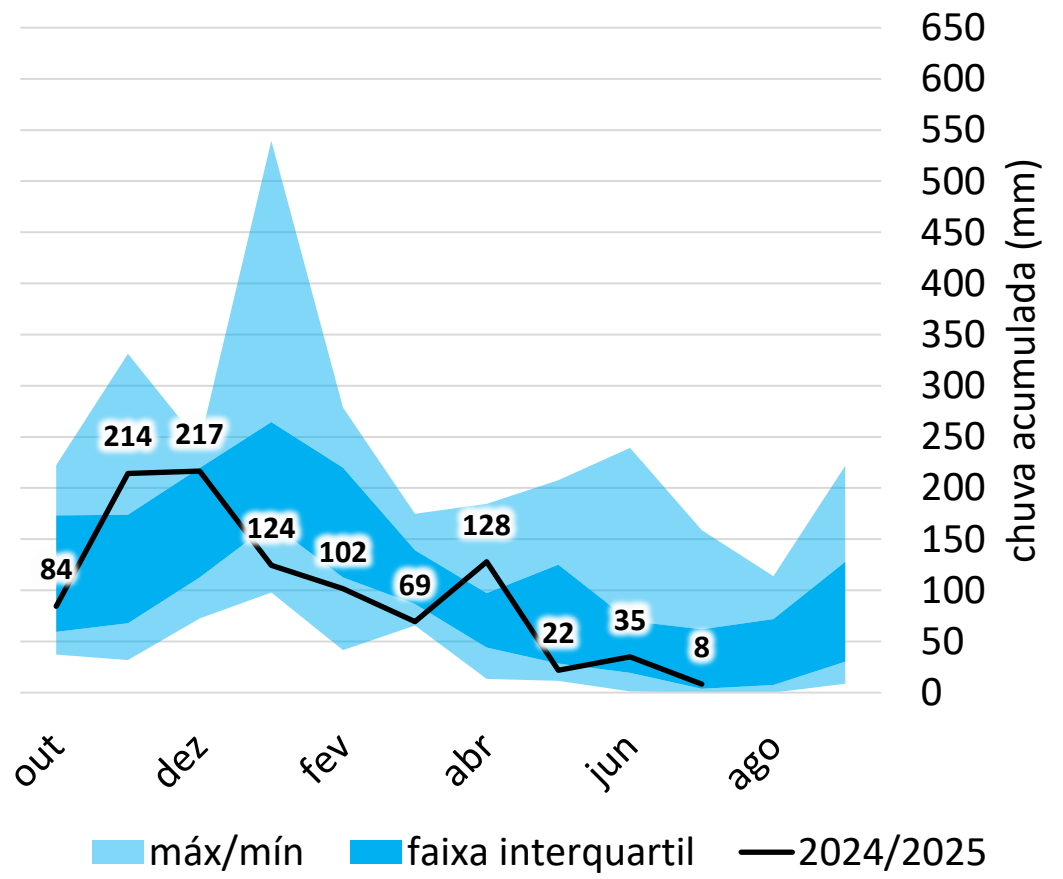
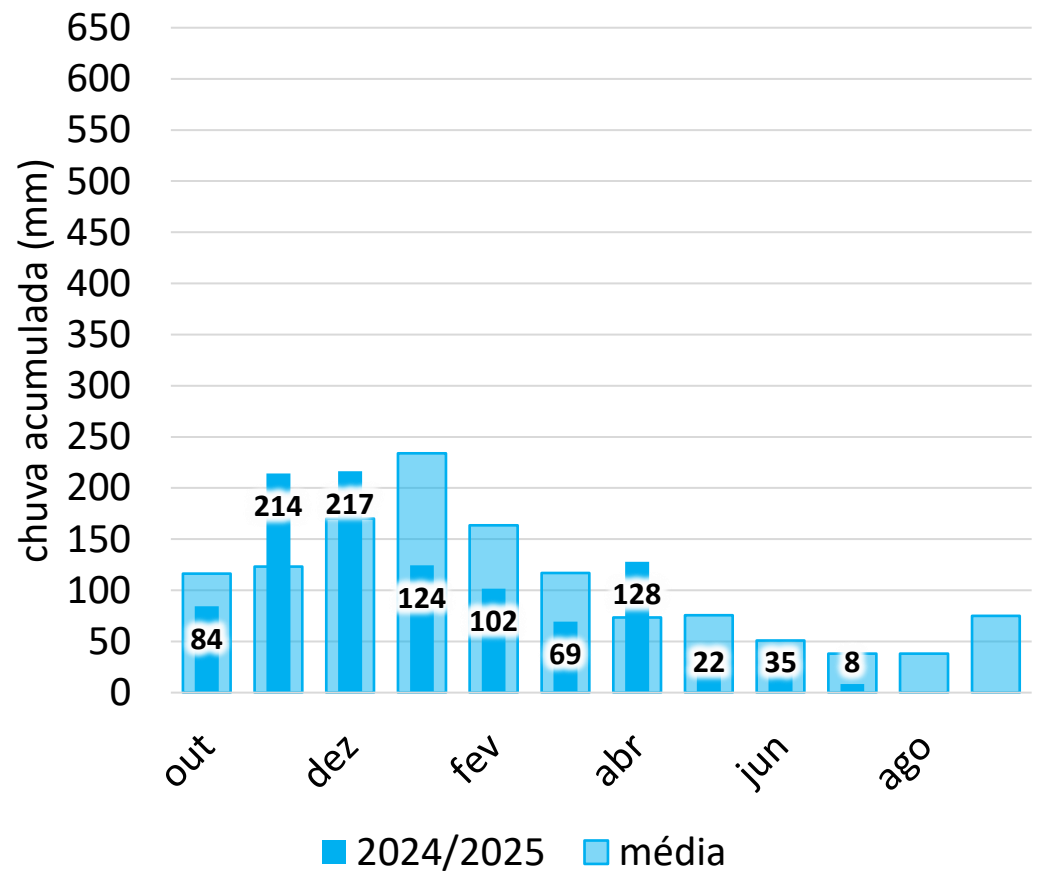




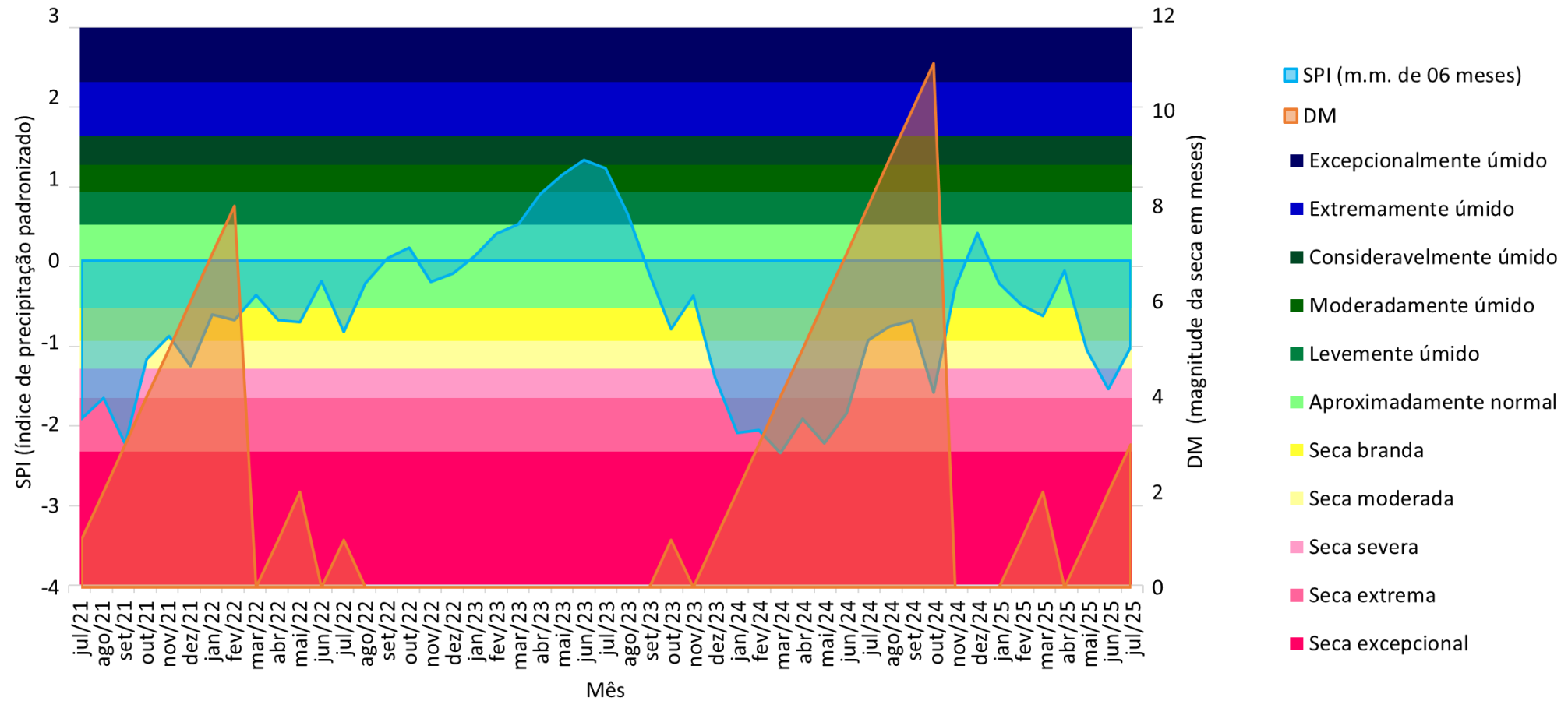
# UGRHI 21 - Peixe



# UGRHI 21 - Peixe

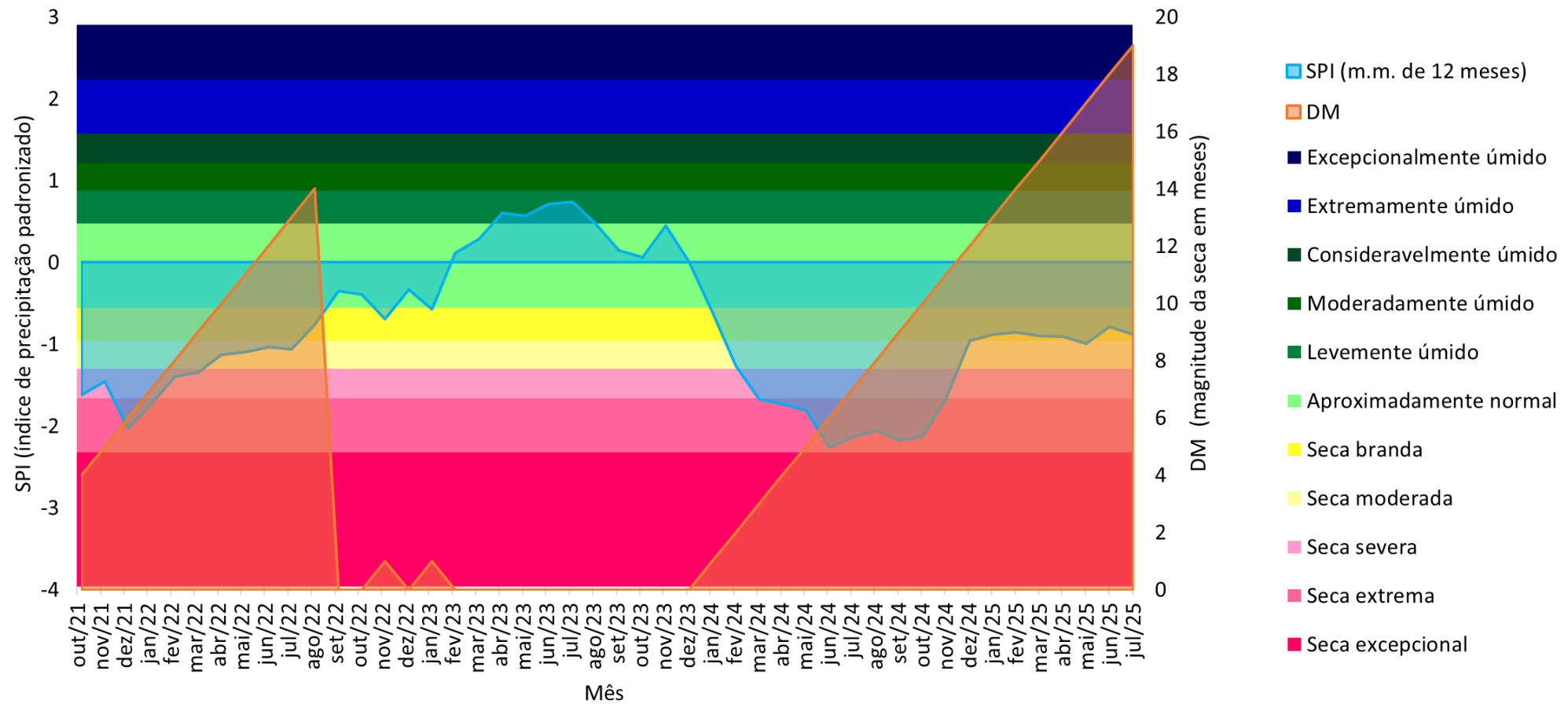


# UGRHI 21 – Peixe | SPI-06



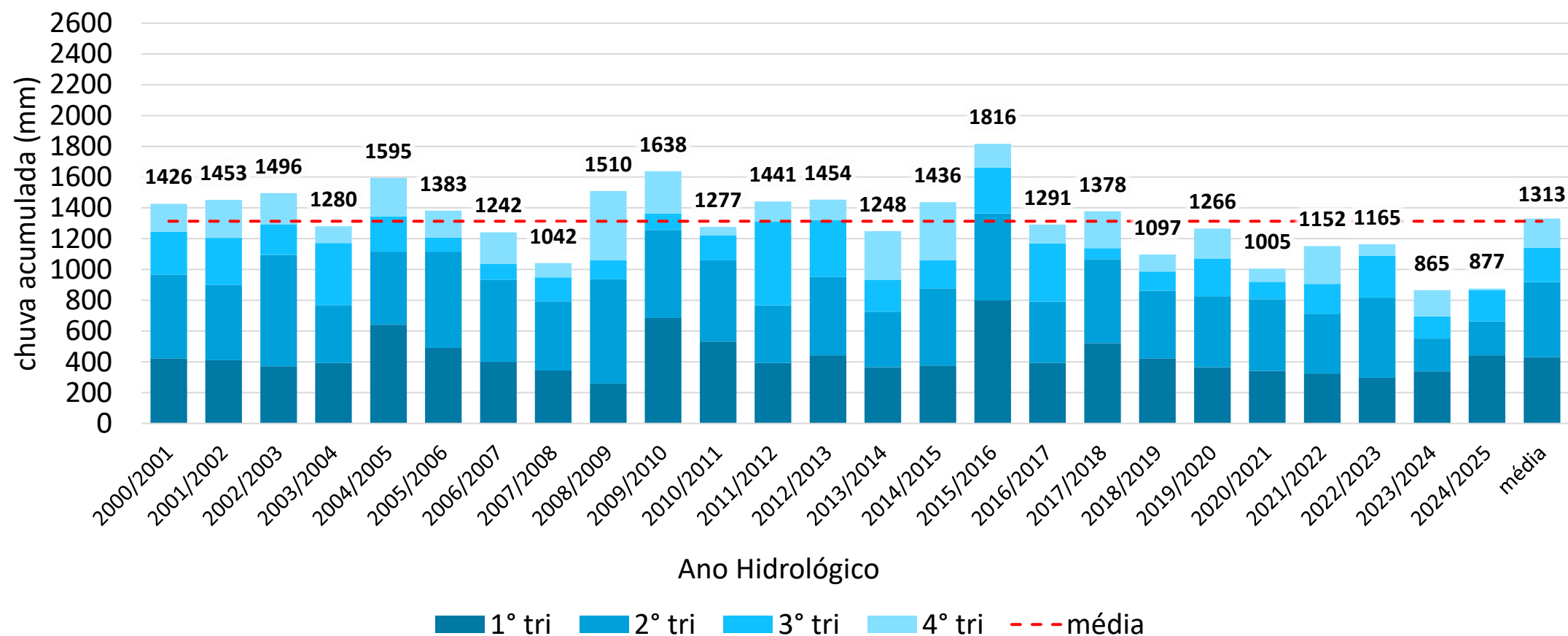


# UGRHI 21 – Peixe | SPI-12

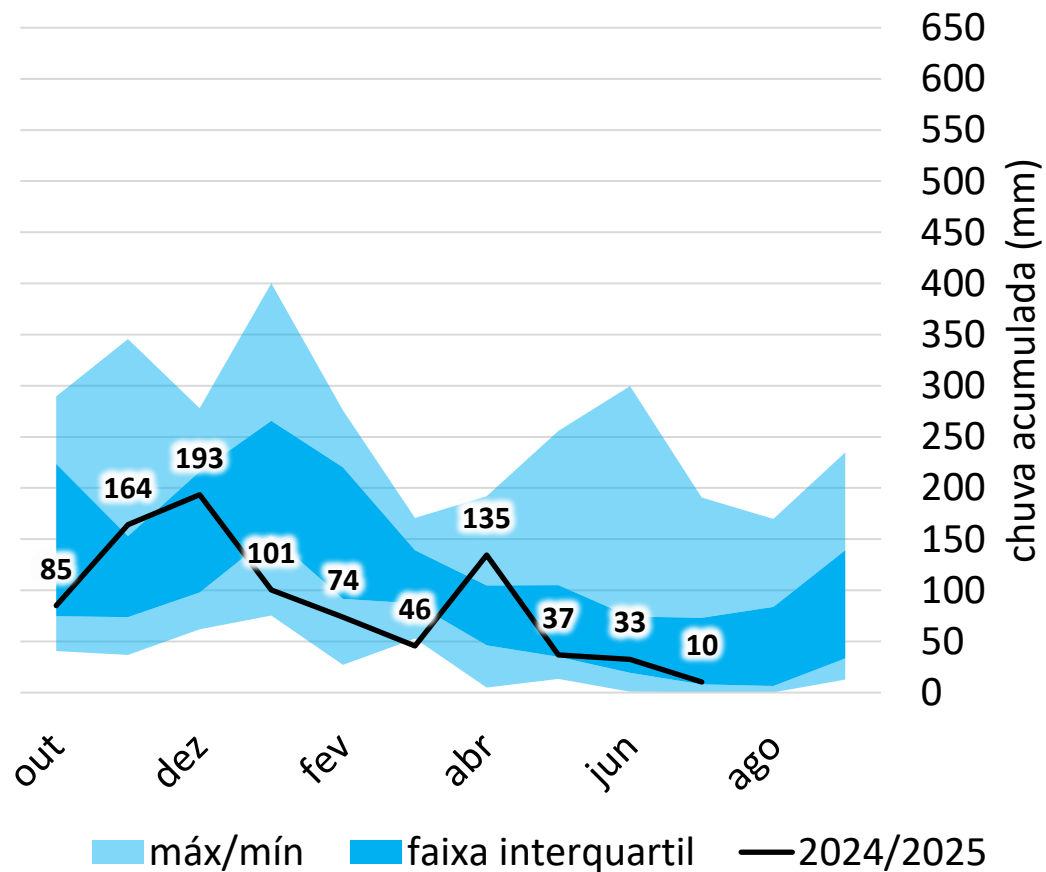
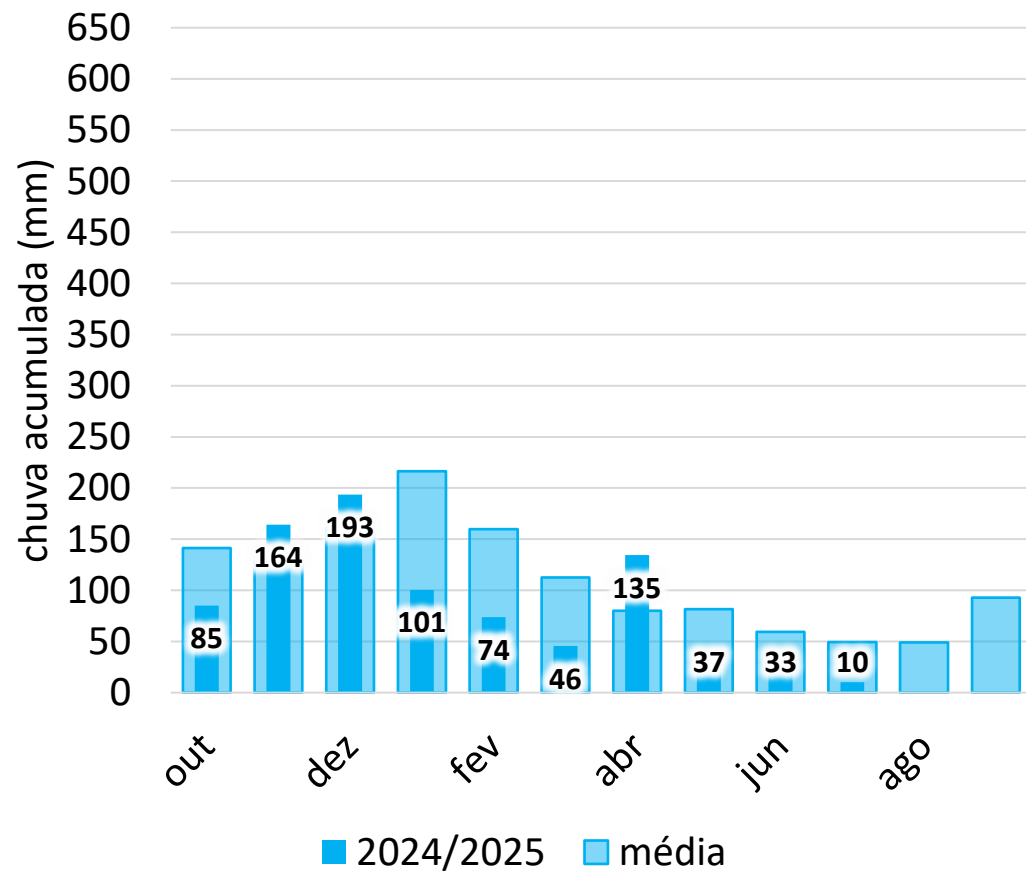
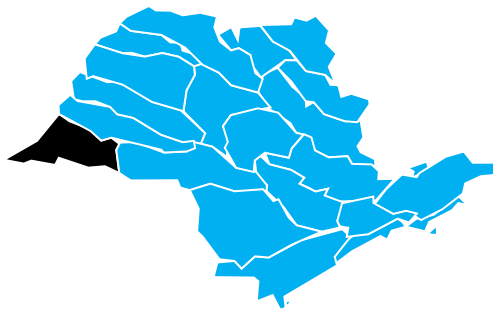




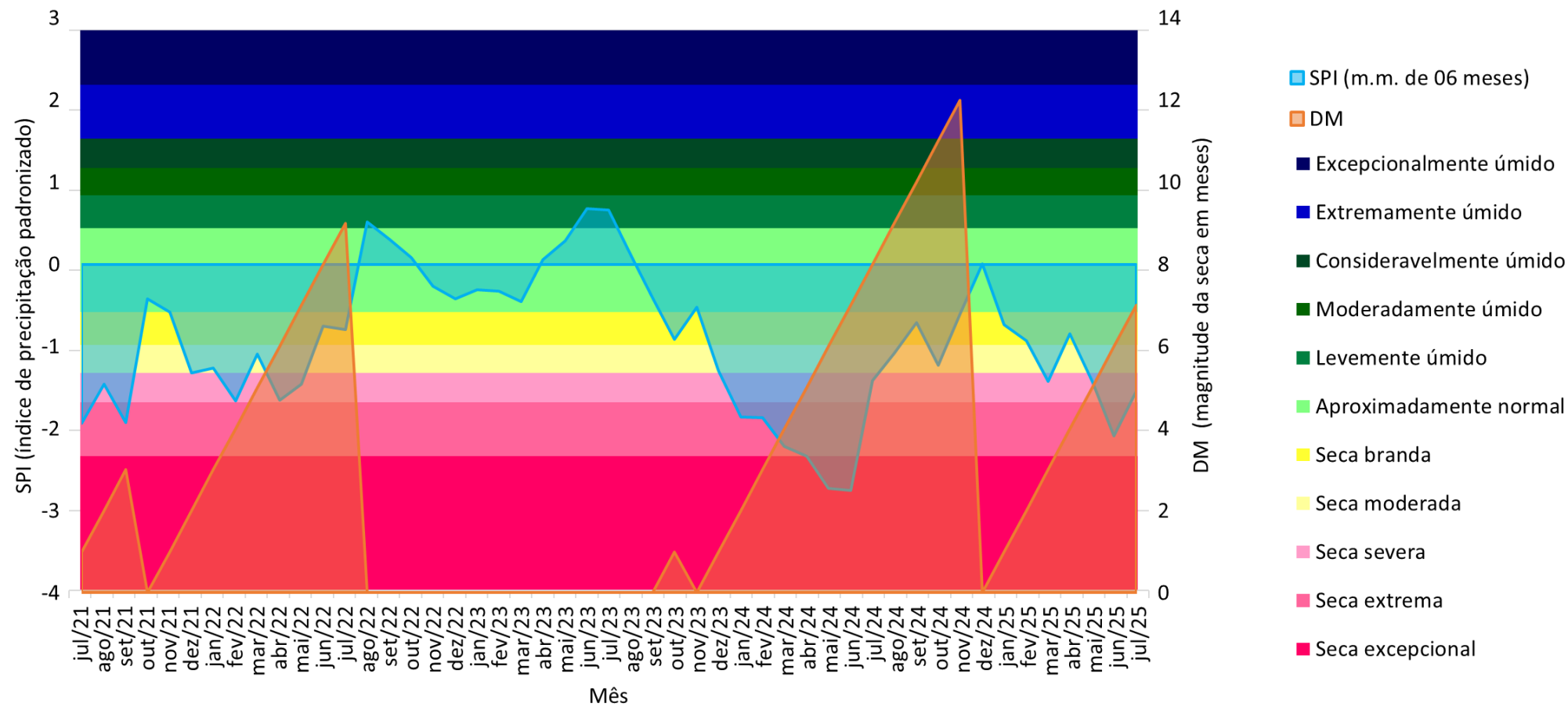
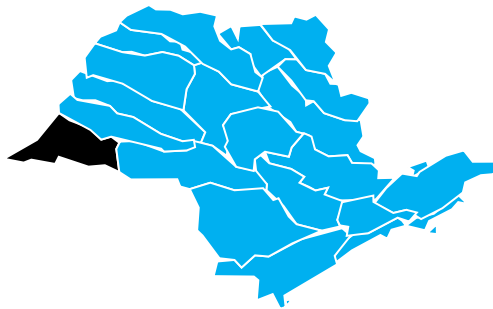
## UGRHI 22 - Pontal do Paranapanema



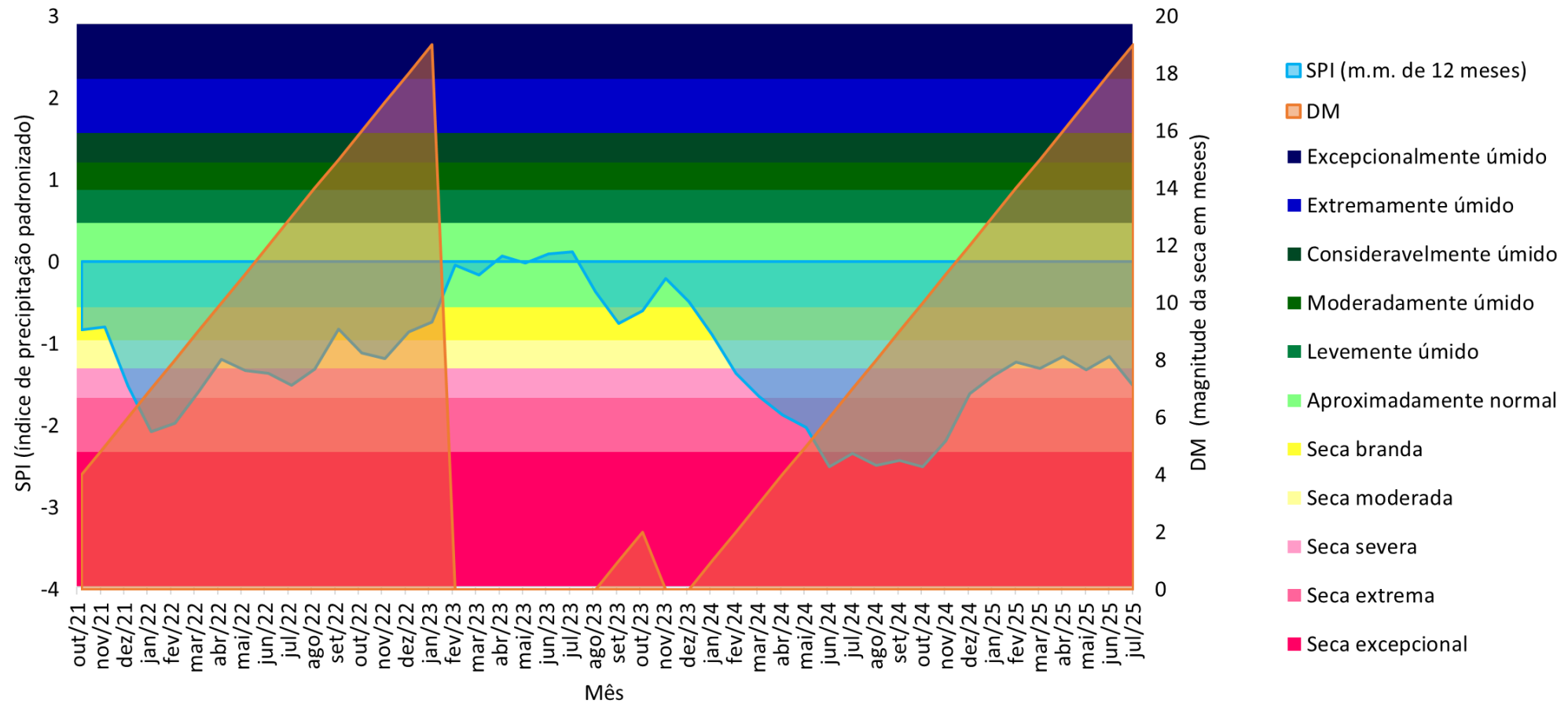
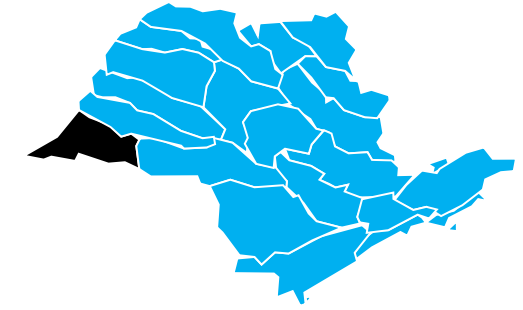
# UGRHI 22 - Pontal do Paranapanema



# UGRHI 22 - Pontal do Paranapanema | SPI-06



# UGRHI 22 - Pontal do Paranapanema | SPI-12





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