

# **Distribuição espaço-temporal de variáveis meteorológicas no estado de Rondônia por meio de técnicas de geoestatística e álgebra de mapas**

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Doutoranda em SER/2014

Introdução ao Geoprocessamento  
Dr. Miguel e Dr. Cláudio

Junho/2015.

# Introdução

- O que é a seca?
- Consequências da seca
- Ocorrência de seca na Amazônia

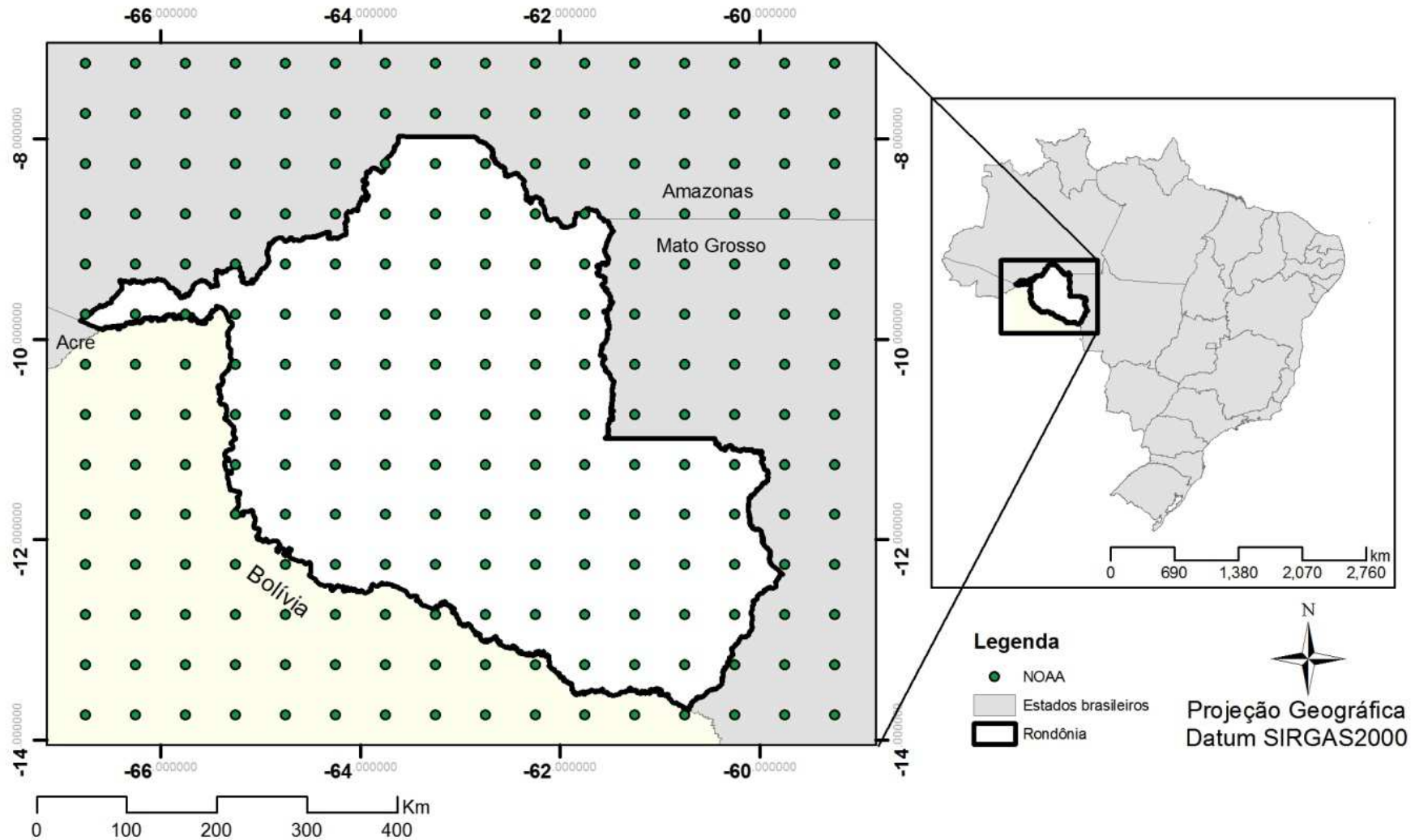
# Objetivo

- Analisar a variabilidade espaço-temporal da precipitação e da seca hidrológica (SH) no estado de Rondônia (de 1983 a 2014);
- Testar a hipótese de que as regiões de baixa precipitação são mais susceptíveis à ocorrência da SH.



# Metodologia

# Área de Estudo e Estações



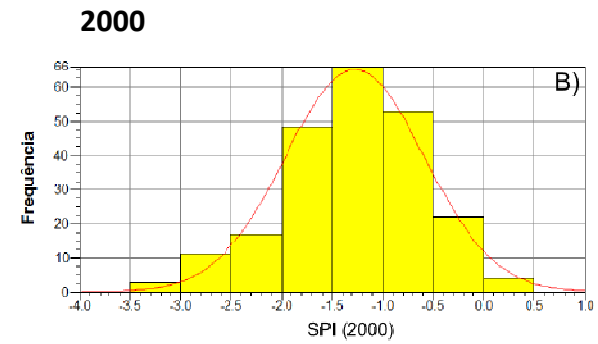
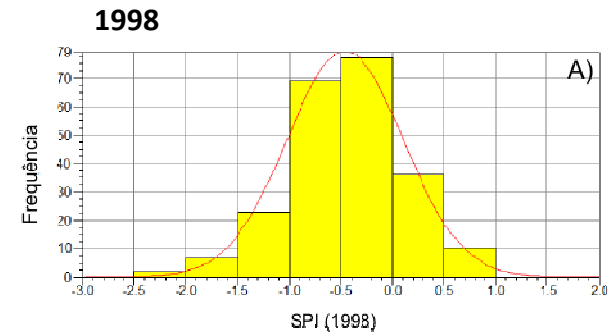
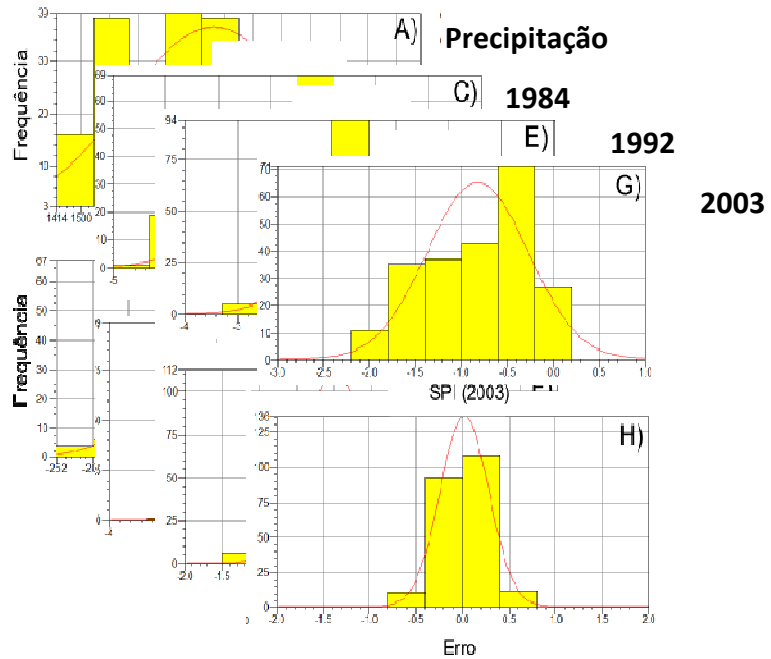
# GEOMT-G





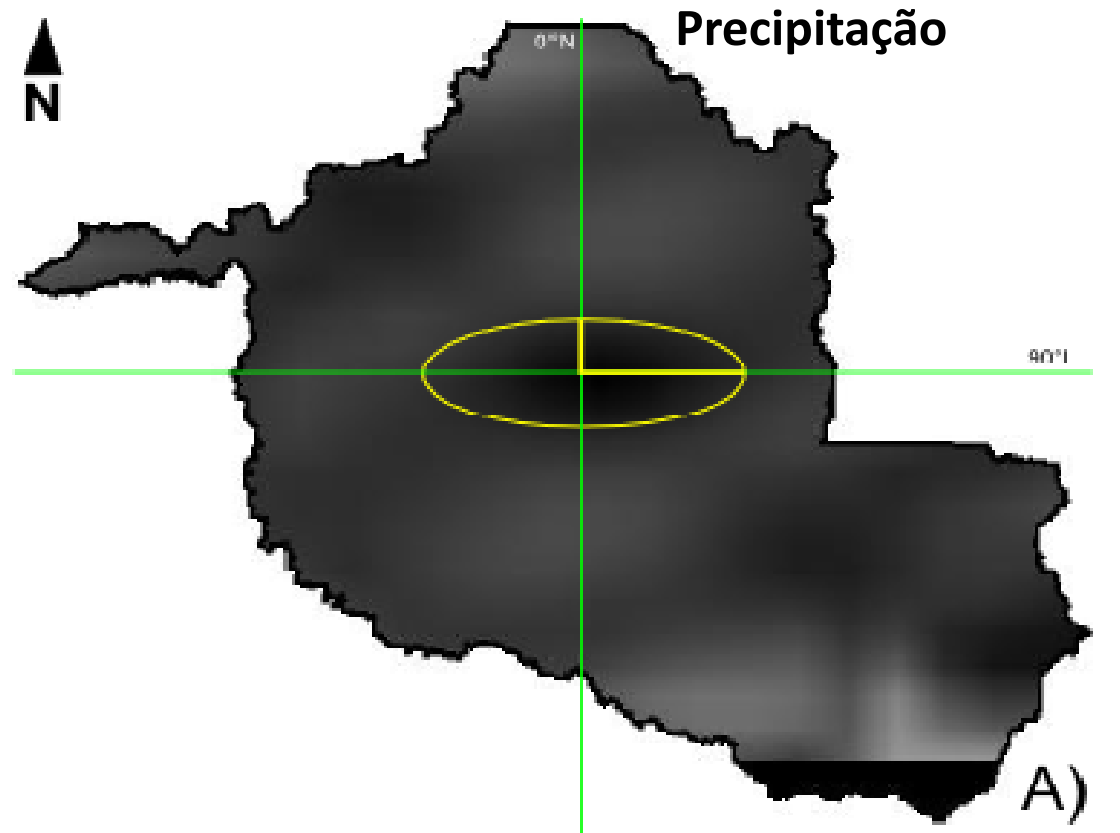
# Resultados

# Análise exploratória



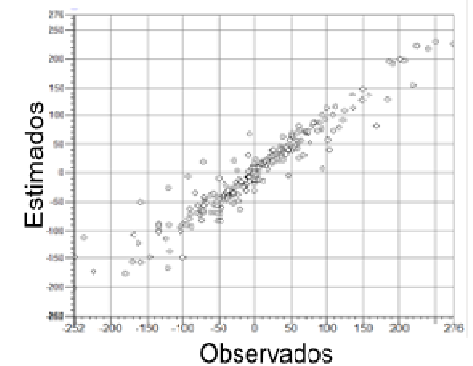
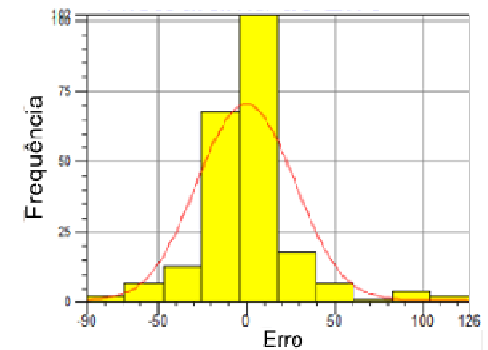
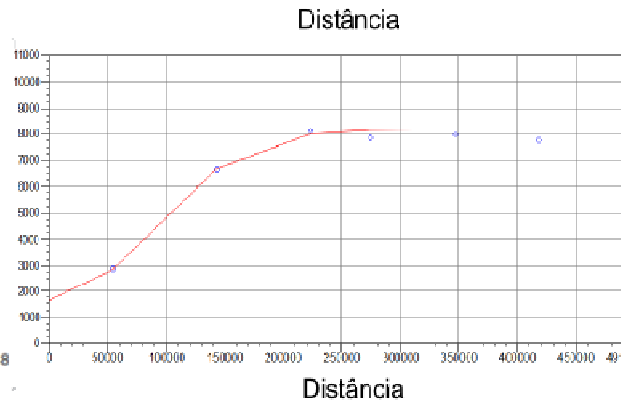
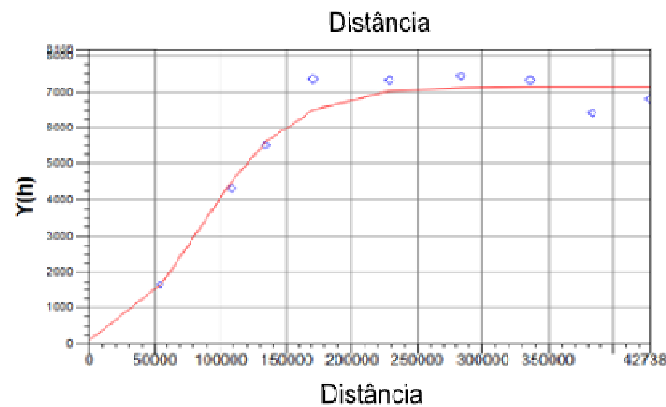
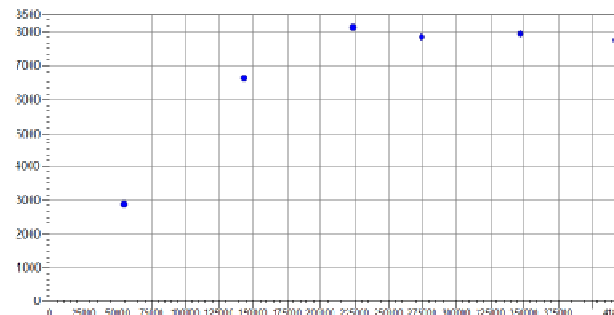
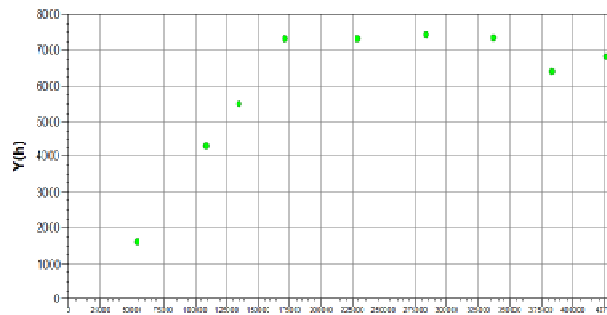


# Análise estrutural (Precipitação)

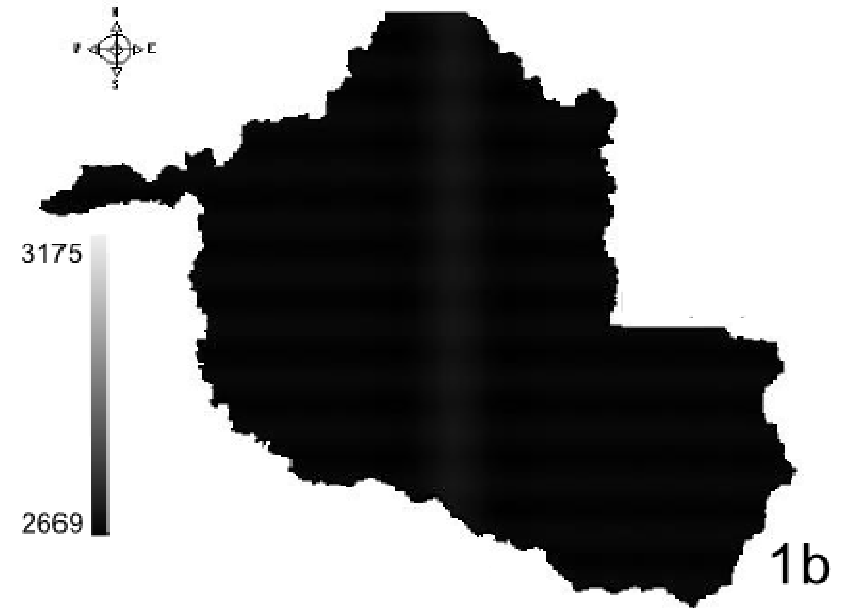
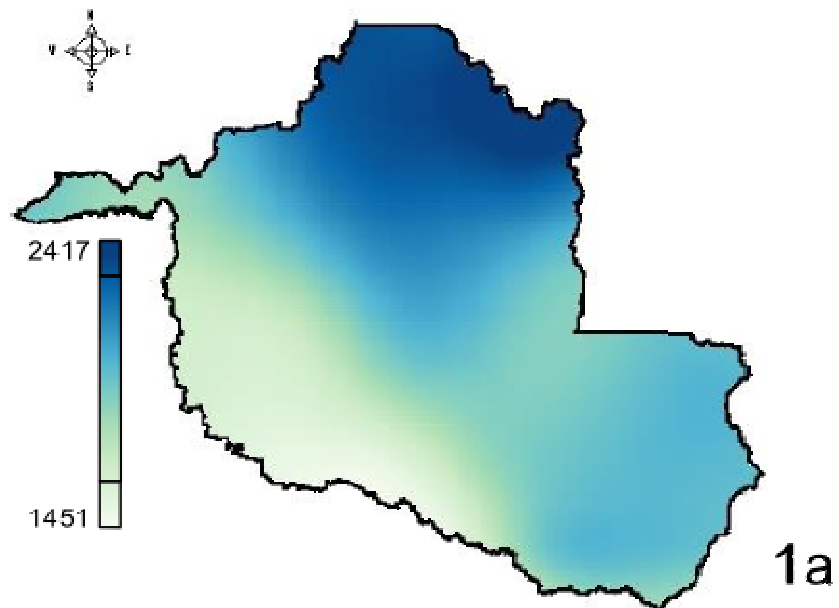


# Análise estrutural (Precipitação)

## Precipitação

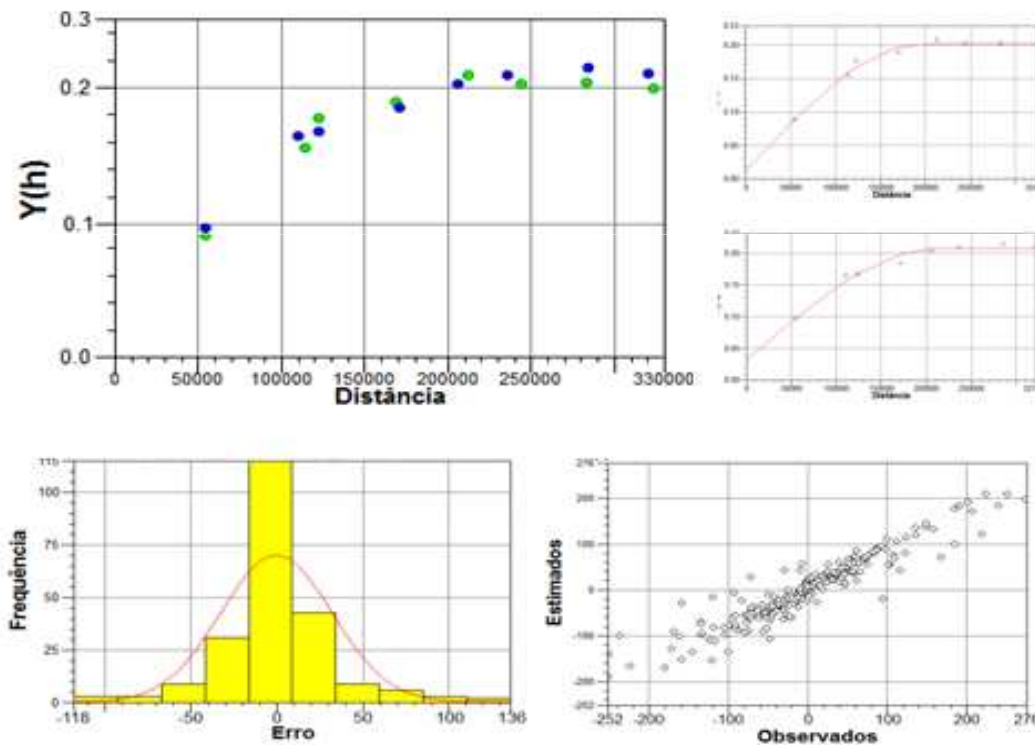


# Krigeagem Ordinária



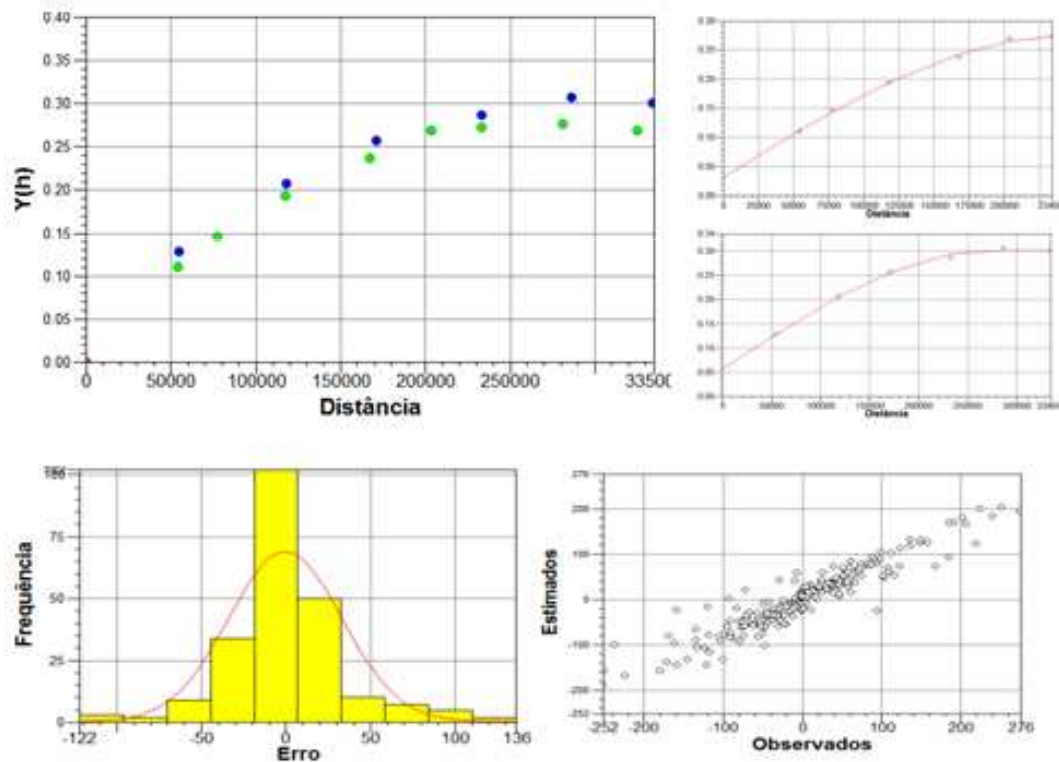
# Análise estrutural indicativa

## Precipitação sem tendência corte I (-50.12)



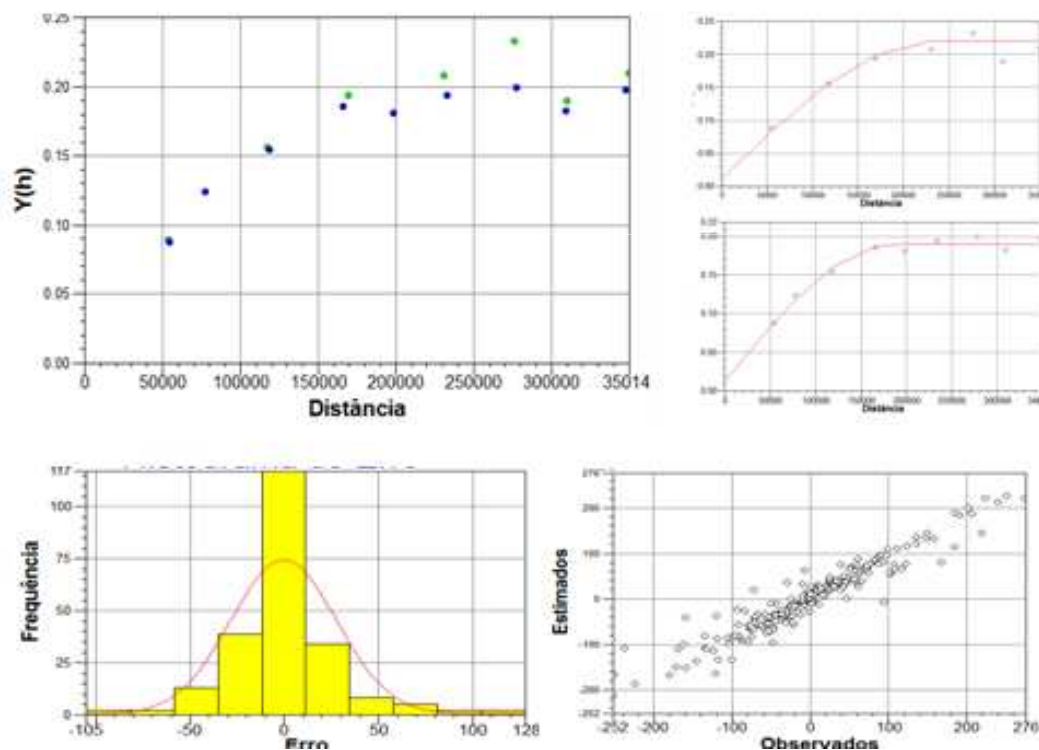
# Análise estrutural indicativa

## Precipitação sem tendência corte II (0)



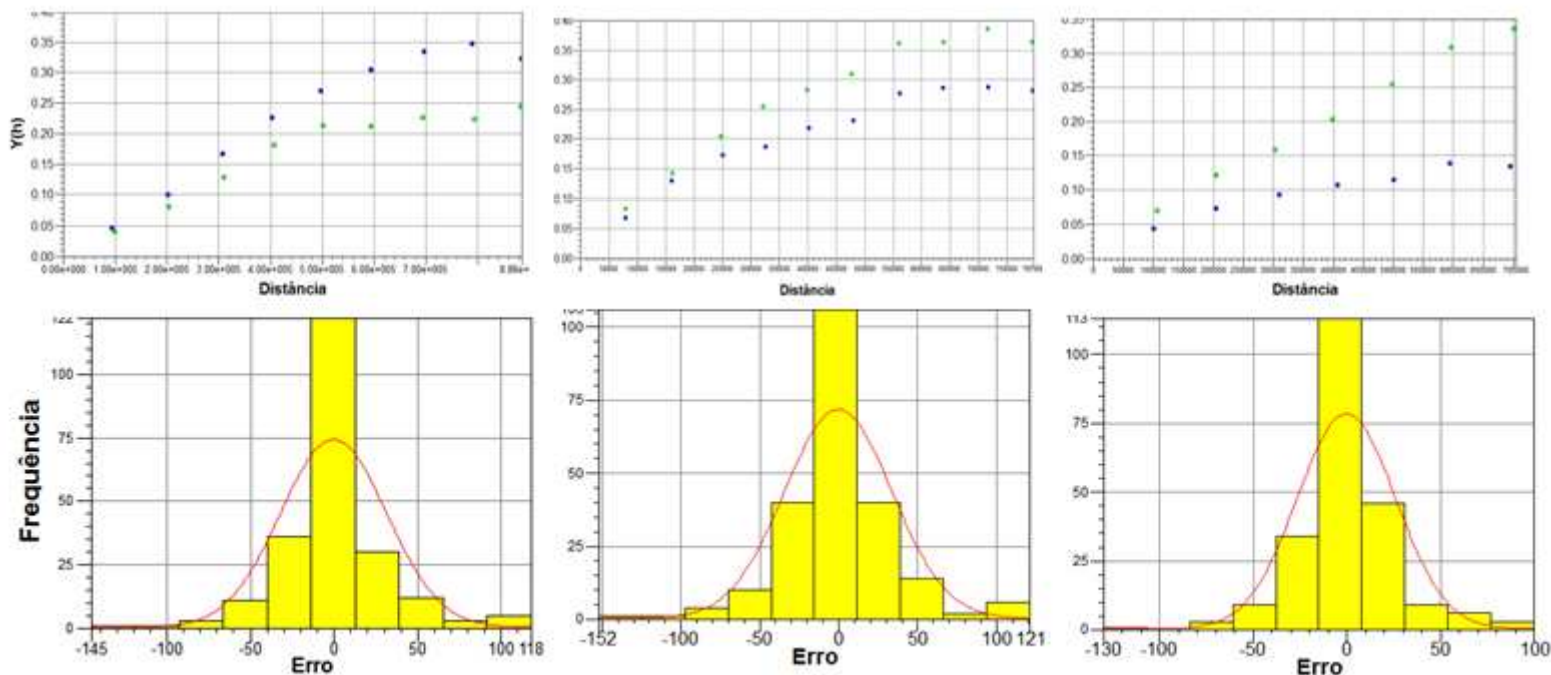
# Análise estrutural indicativa

## Precipitação sem tendência corte III (47.68)



# Análise estrutural indicativa

## Dados originais de Precipitação

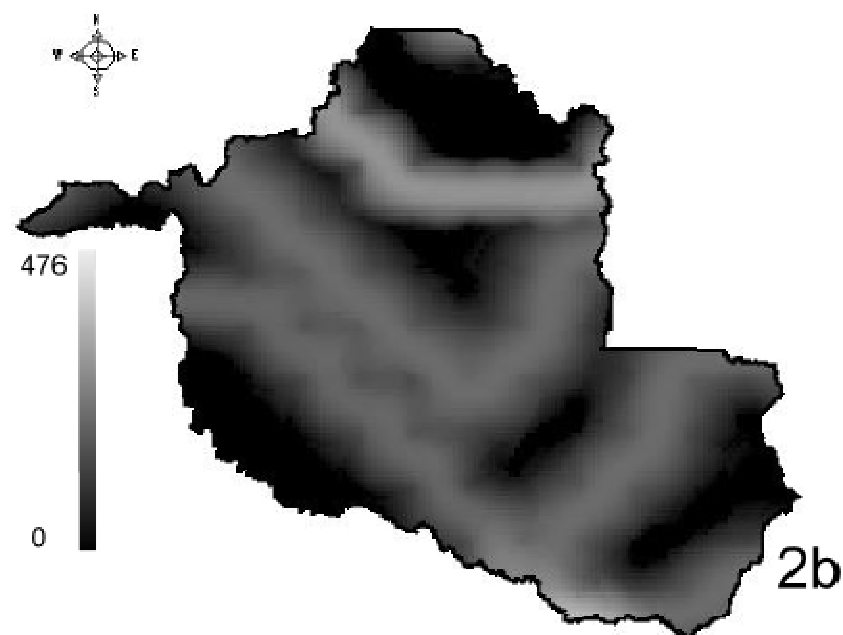
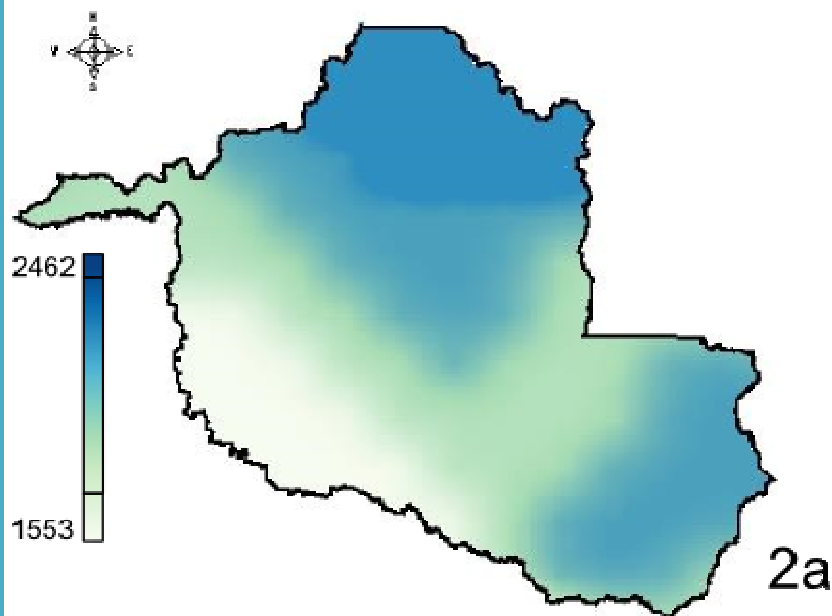


Corte I 1690

Corte II 1930

Corte III (2240)

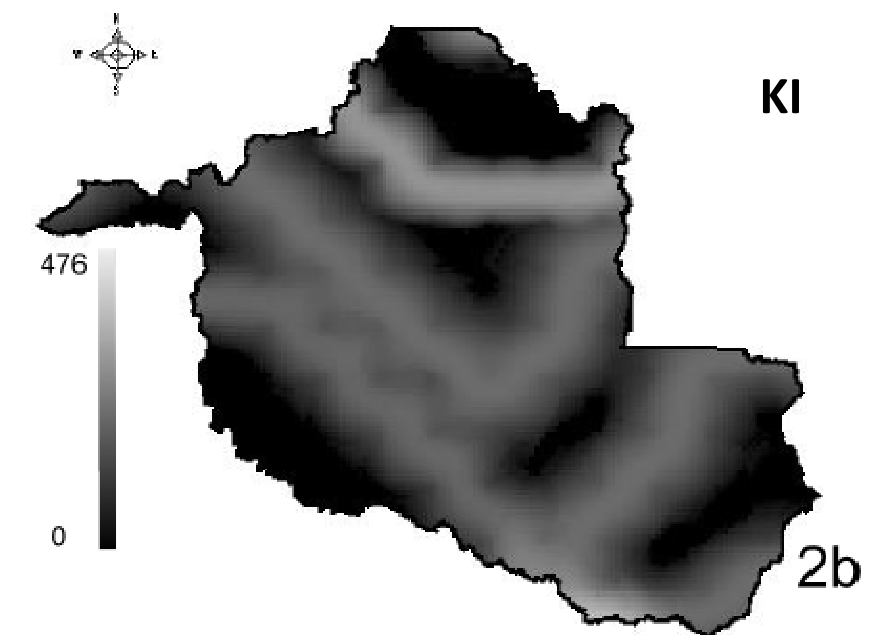
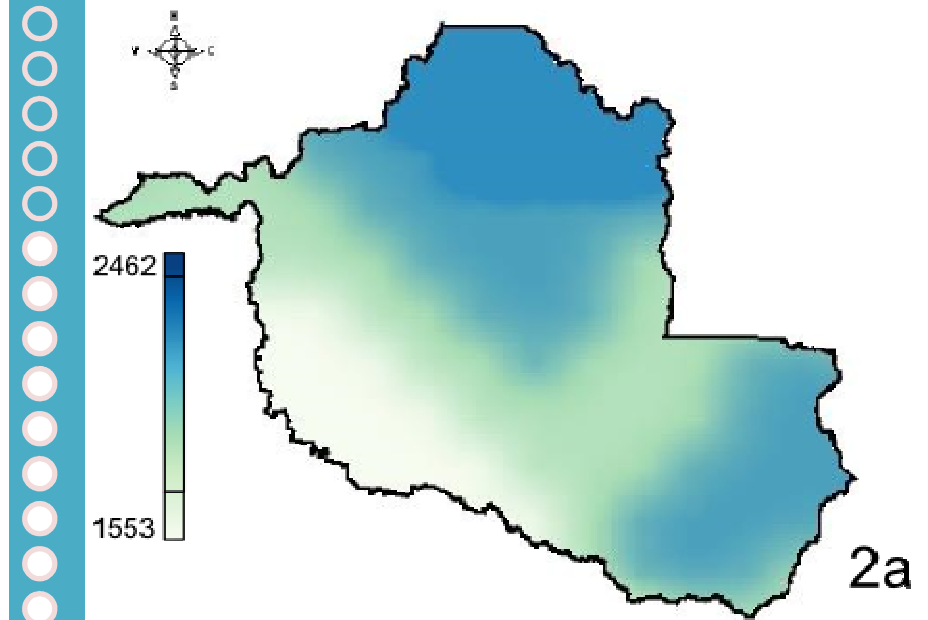
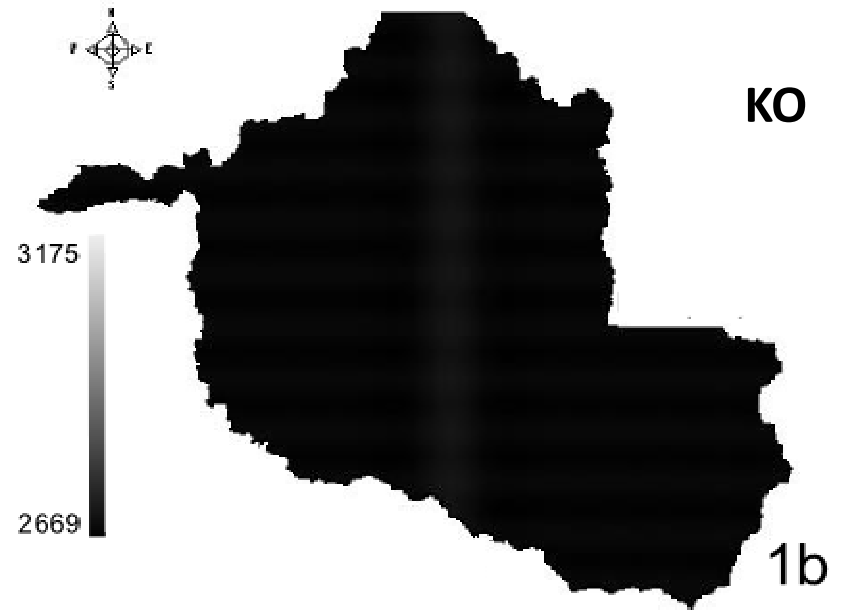
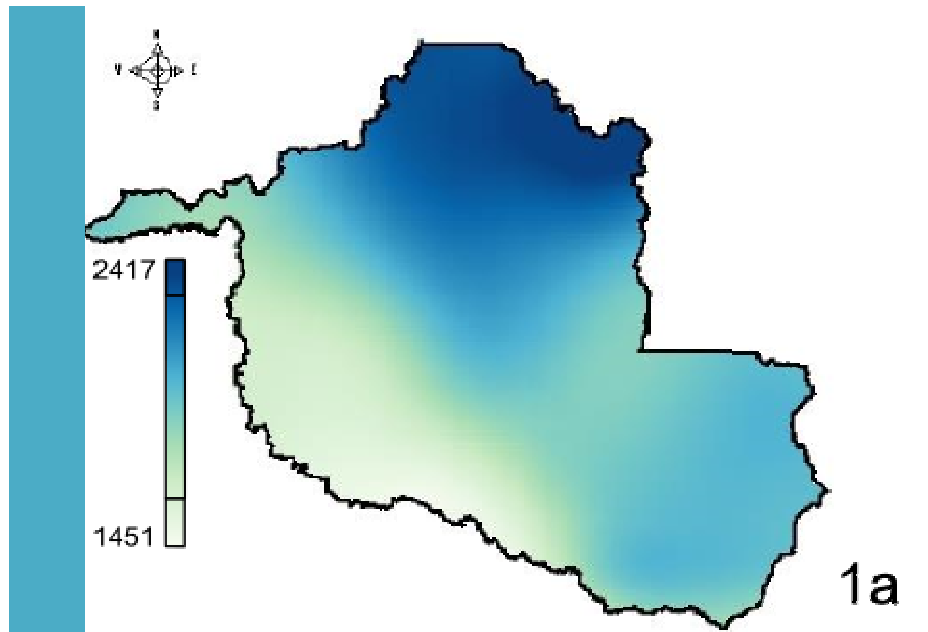
# *Krigeagem* indicativa



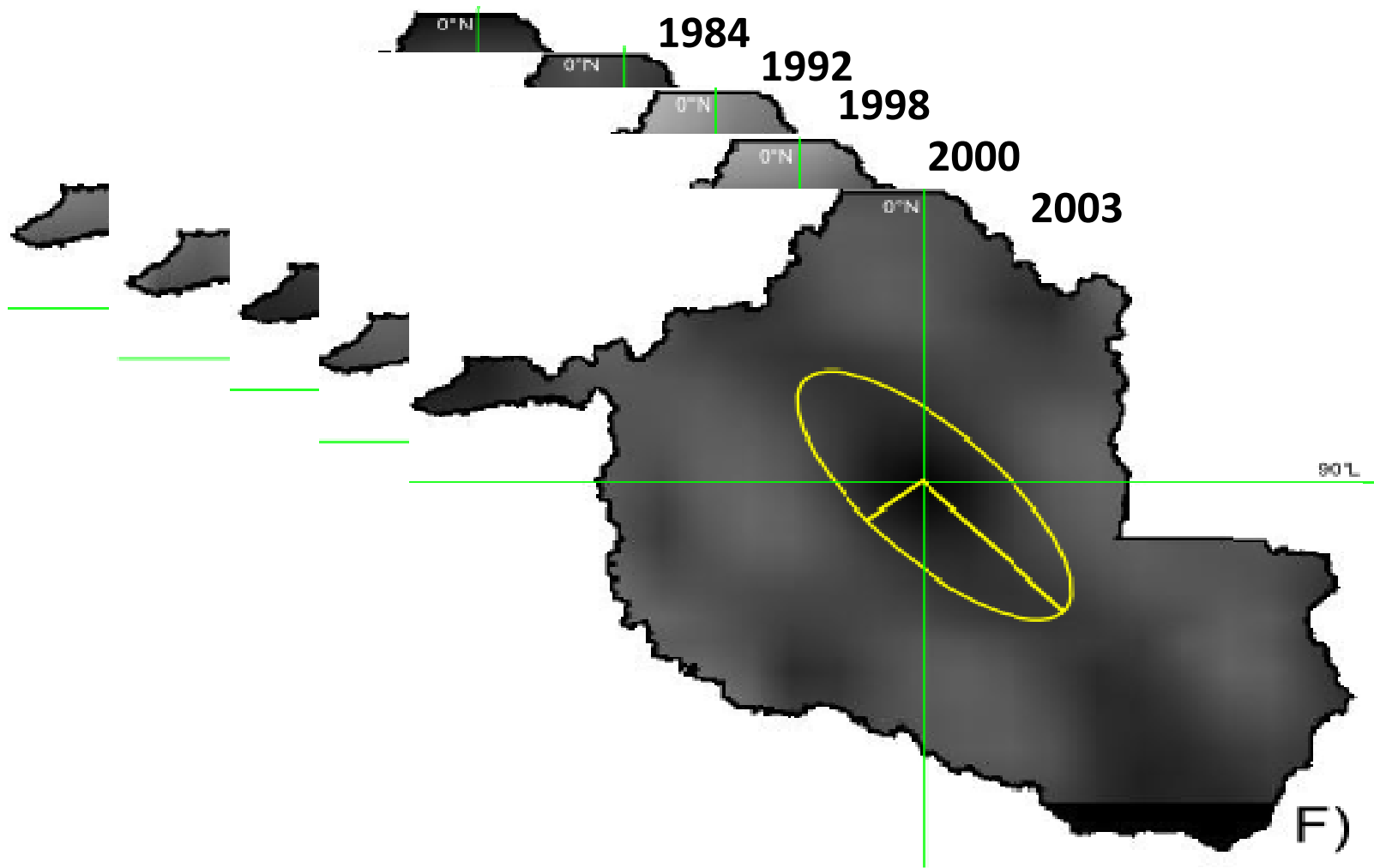
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Projeção UTM Datum SIRGAS 2000





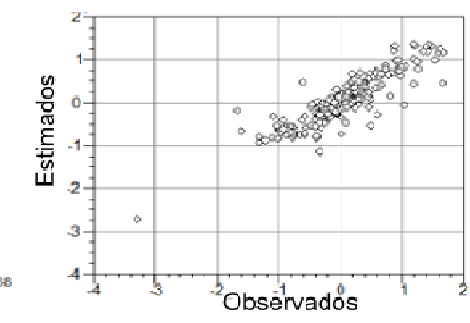
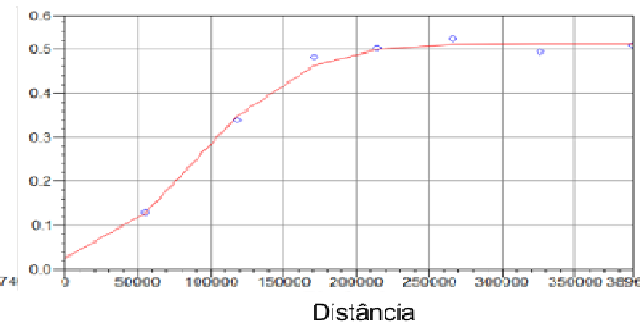
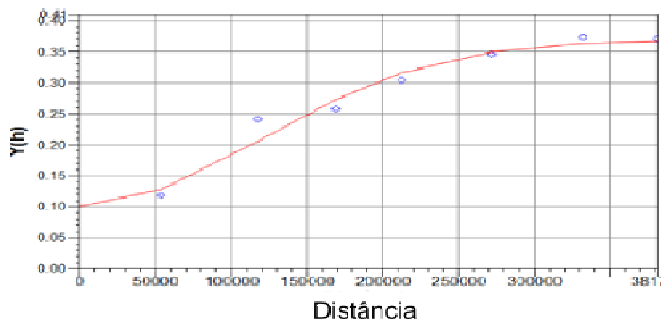
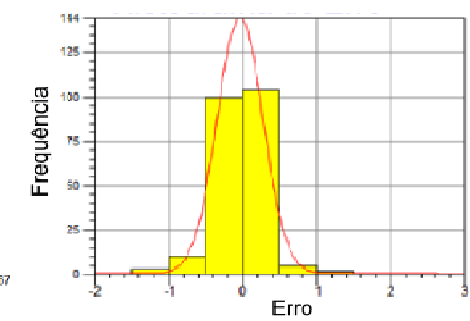
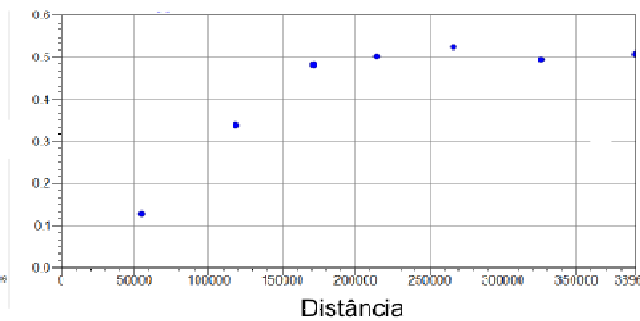
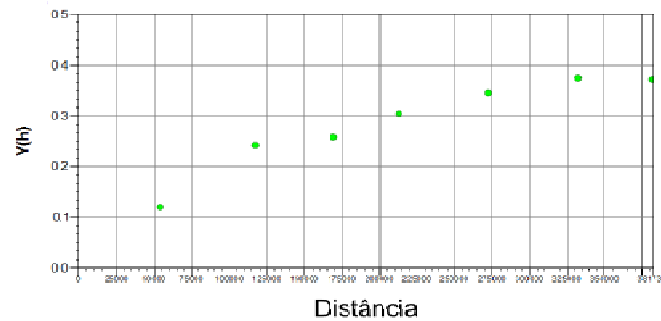


# Análise estrutural (SPI-12)



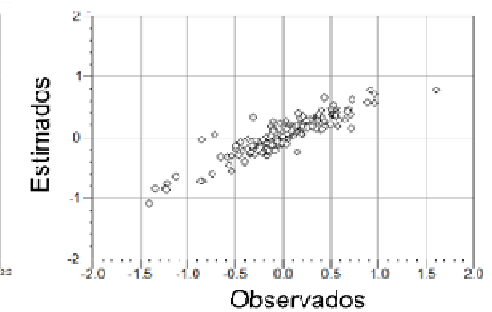
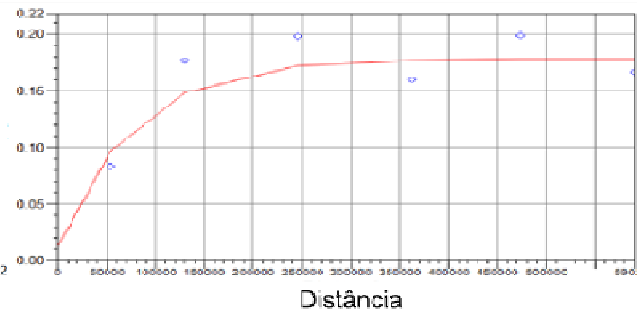
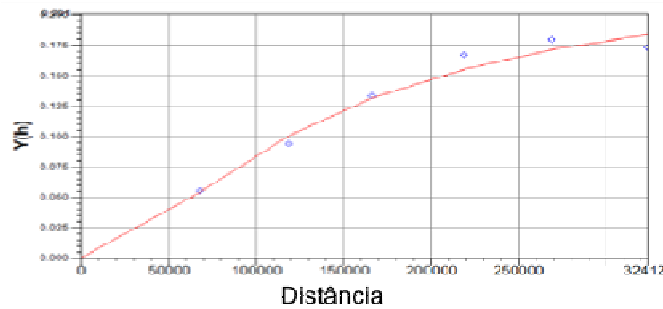
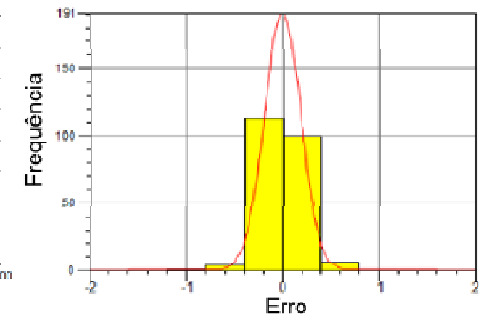
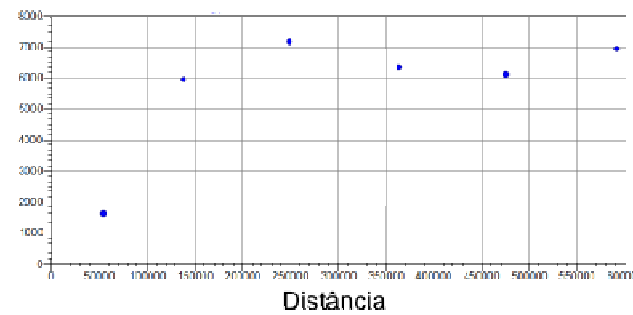
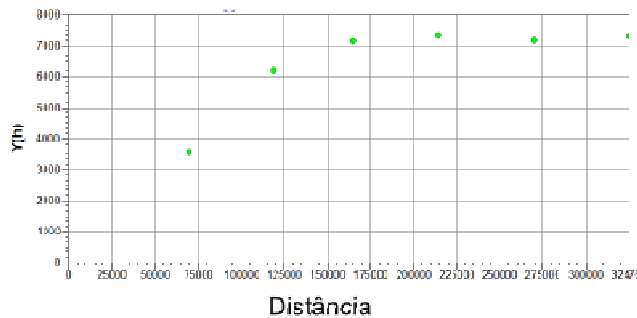
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1984



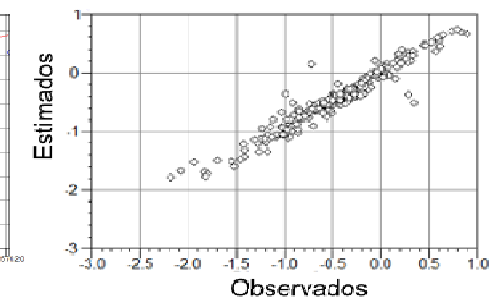
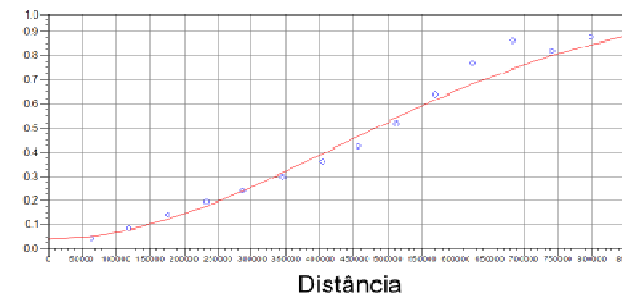
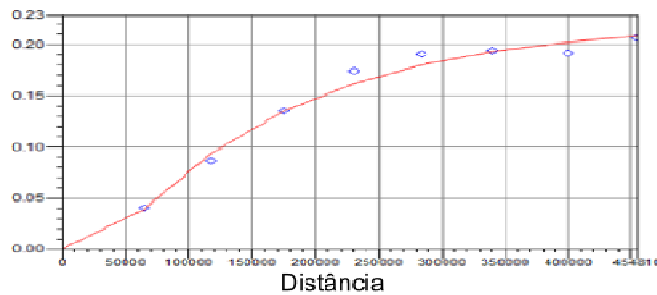
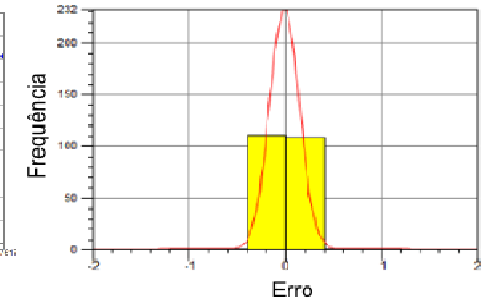
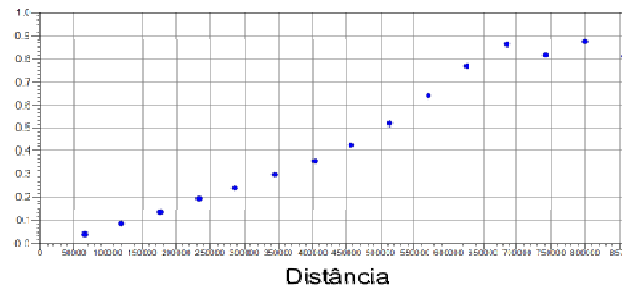
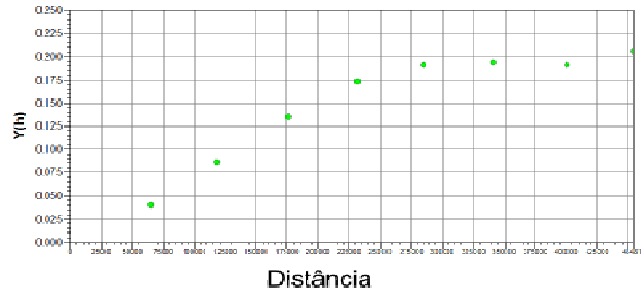
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1992



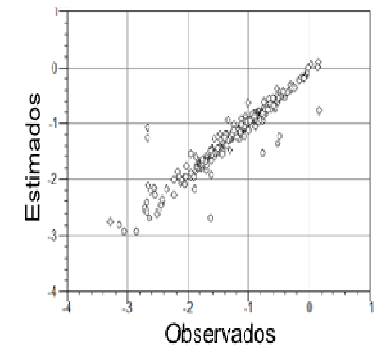
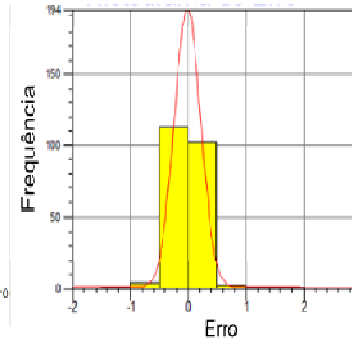
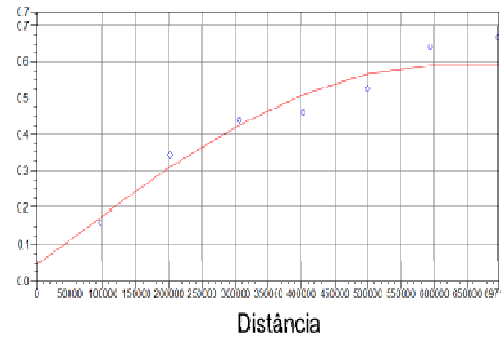
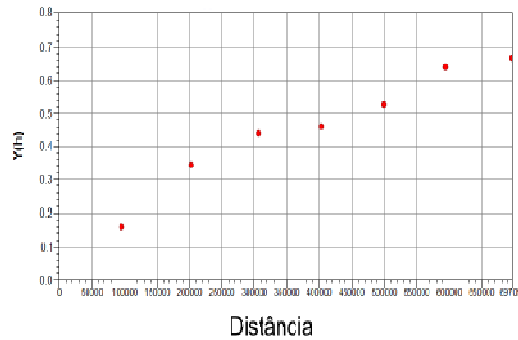
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1998



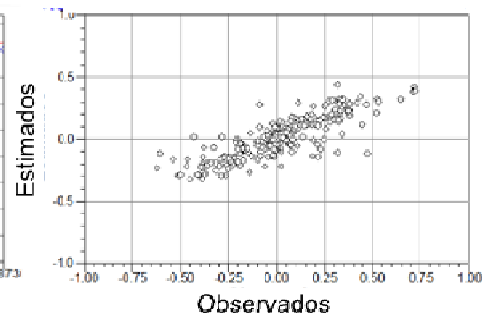
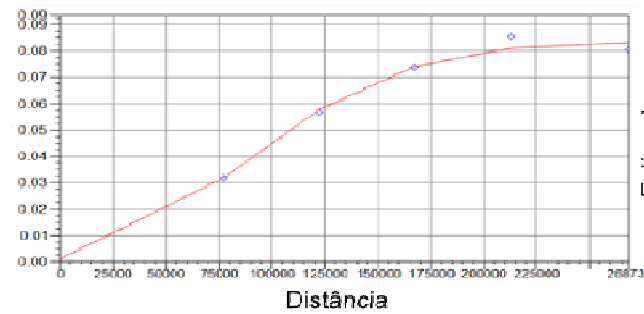
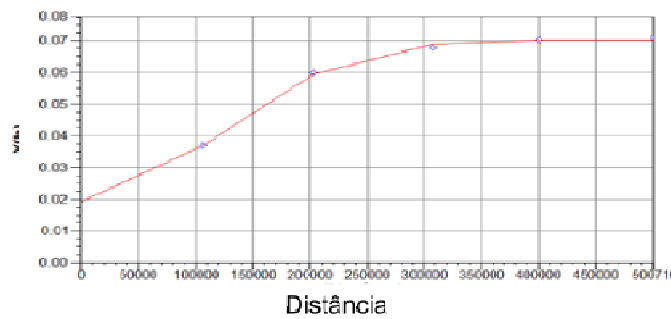
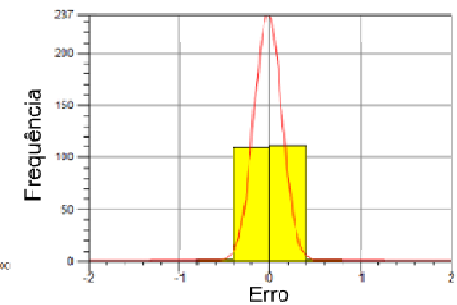
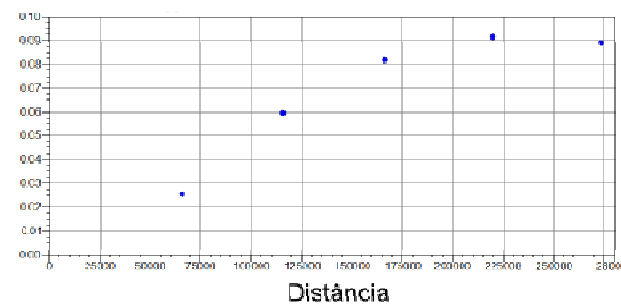
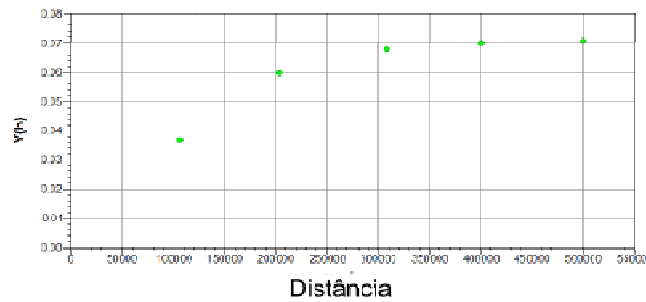
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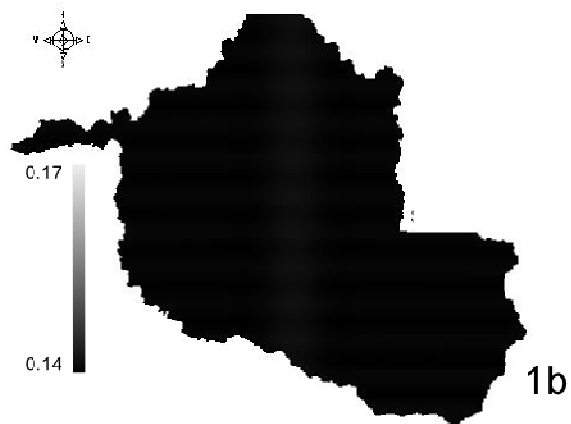
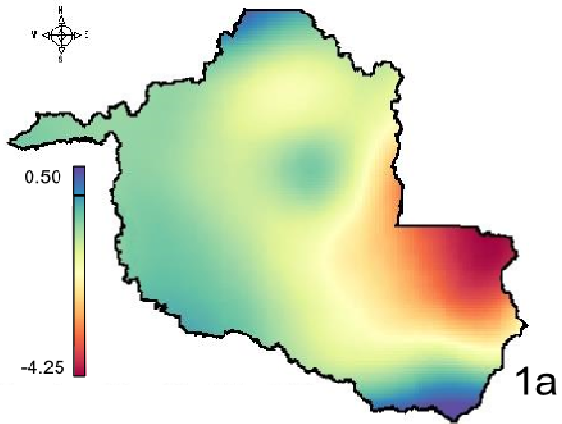
2000



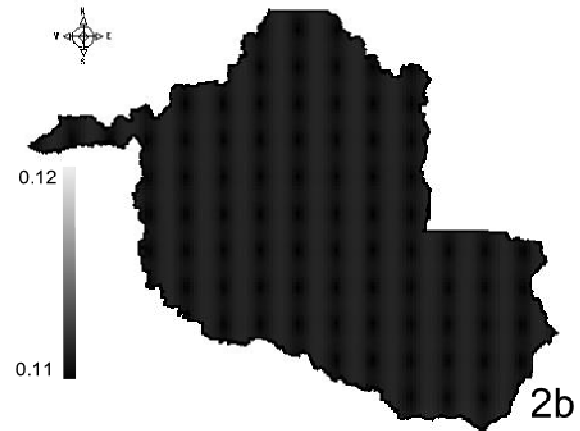
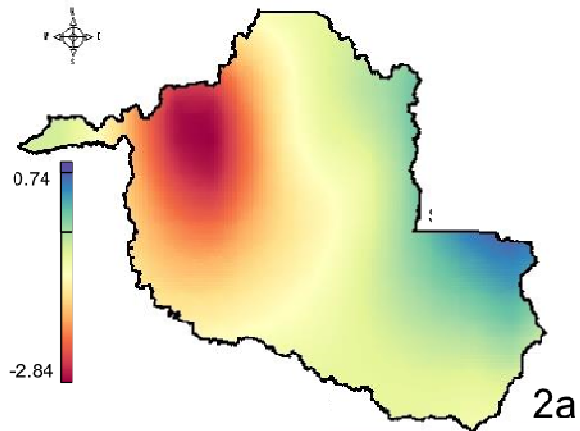
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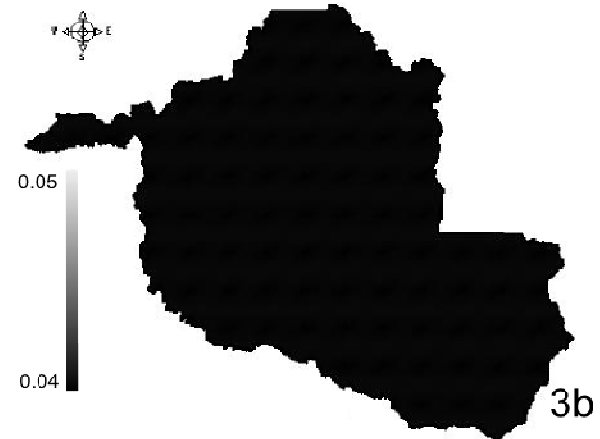
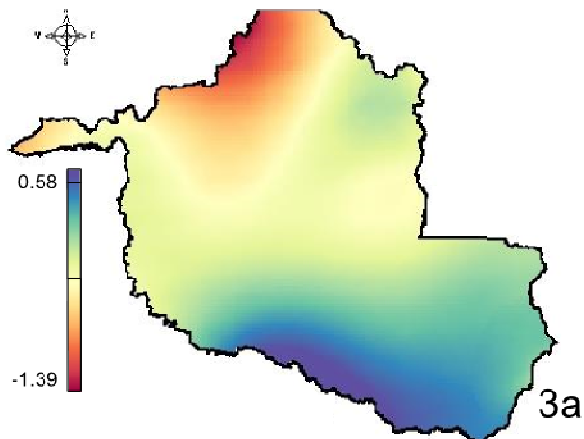




1984

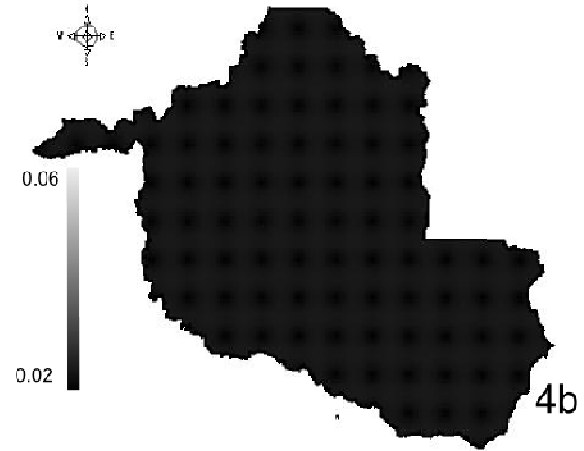
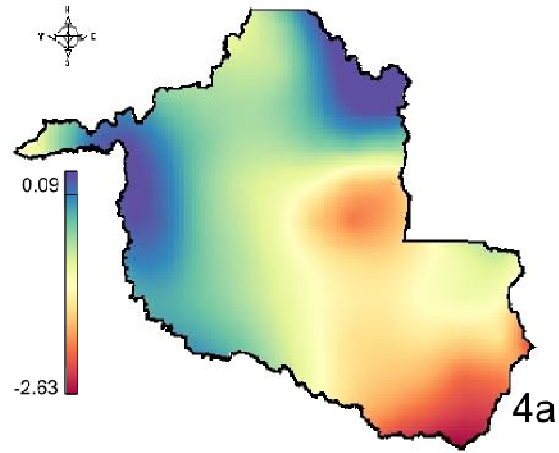


1992

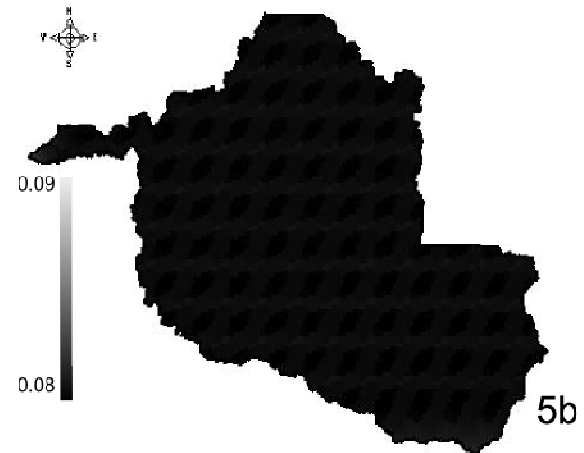
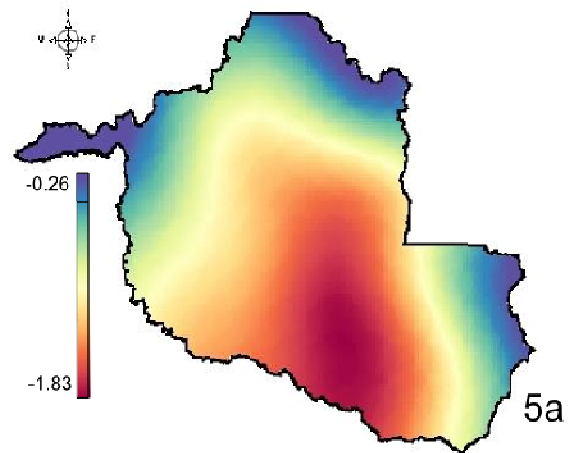


1998





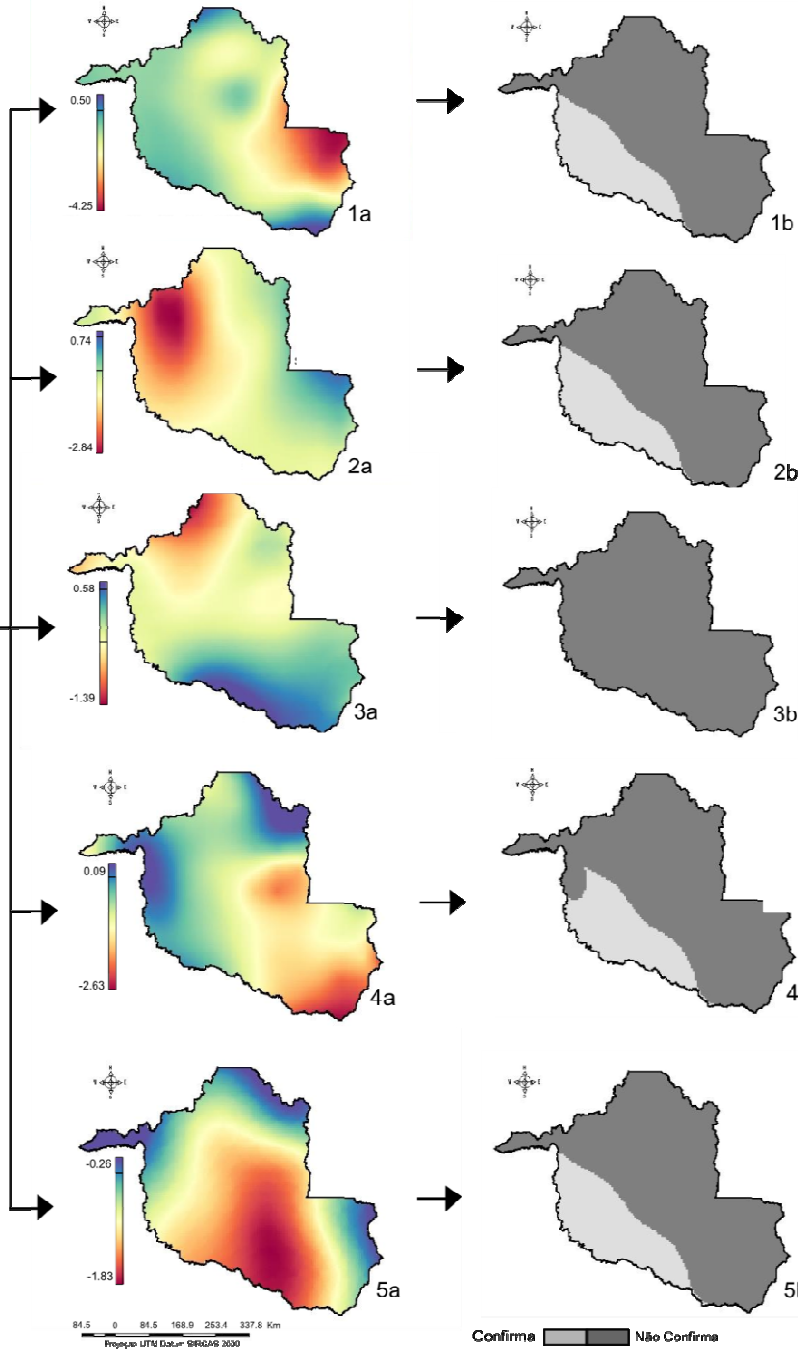
2000



2003

84.5 0 84.5 168.9 253.4 337.8 Km  
Projeção UTM Datum SIRGAS 2000

# TESTE DE HIPÓTESE



1984

1992

1998

2000

2003

84.5 0 84.5 168.9 253.4 337.8 Km  
Projeção UTM Datum SBR2000 2000

Confirma Não Confirma

# Conclusão

- A álgebra de mapas é uma técnica de fácil manipulação e as ferramentas exploradas mostram o potencial do LEGAL para avaliar relações de variáveis ambientais no espaço.
- Como o SPI é um índice normalizado, sugere-se explorar futuramente, expressões de hipótese para o caso extremos de umidade em áreas de alta precipitação no estado.
- A KO é relativamente fácil de ser implementada e no geral, produz um resultado satisfatório para a espacialização da distribuição espacial da precipitação, especialmente, quando considera-se efeito da anisotropia.

# Obrigada !

Agradeço ao:

Dr. Miguel

Dr. Carlos Felgueiras

Dr. Eduardo Camargo

Tabela 6. Parâmetros da validação cruzada da estimativa por *Krigeagem*.

Método	Média dos Dados Observados	Média dos Dados Estimados	Mínimo/ Máximo Observado	Mínimo/ Máximo Estimado	Erro médio	Desvio Padrão do Erro	RMSE
KO	1933.88	1924.34	1503 2418.34	1451.27 2417.43	-4.38	11.92	38.68
KI		1960.88		1553.11 2462	32.83	75.16	289.95

Tabela 7. Parâmetros da validação cruzada da estimativa por *Krigeagem*.

Amostra	Média dos Dados Observados	Média dos Dados Estimados	Mínimo/ Máximo Observado	Mínimo/ Máximo Estimado	Erro médio	Desvio Padrão do Erro	RMSE
SPI-12 (1984)	-1.58	-1.54	-4.31 -0.02	-4.25 0.50	0.020	0.1276	0.17
SPI-12 (1992)	-0.96	-0.96	-3.19 0.73	-2.84 0.74	0.012	0.1122	0.11
SPI-12 (1998)	-0.26	-0.27	-1.20 0.46	-1.40 0.58	0.002	0.0368	0.02
SPI-12 (2000)	-1.18	-1.22	-2.41 -0.09	-2.63 -0.09	-0.004	0.0246	0.04
SPI-12 (2003)	-1.13	-1.14	-1.96 -0.19	-1.83 -0.26	0.003	0.1069	0.03