

# Modelo de previsão de cheias e determinação de áreas alagáveis na bacia hidrográfica do rio Paraíba do Meio, no estado de Alagoas

Maceió – AL 16 de Maio de 2019

**ipea** Instituto de Pesquisa  
Econômica Aplicada

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*III*

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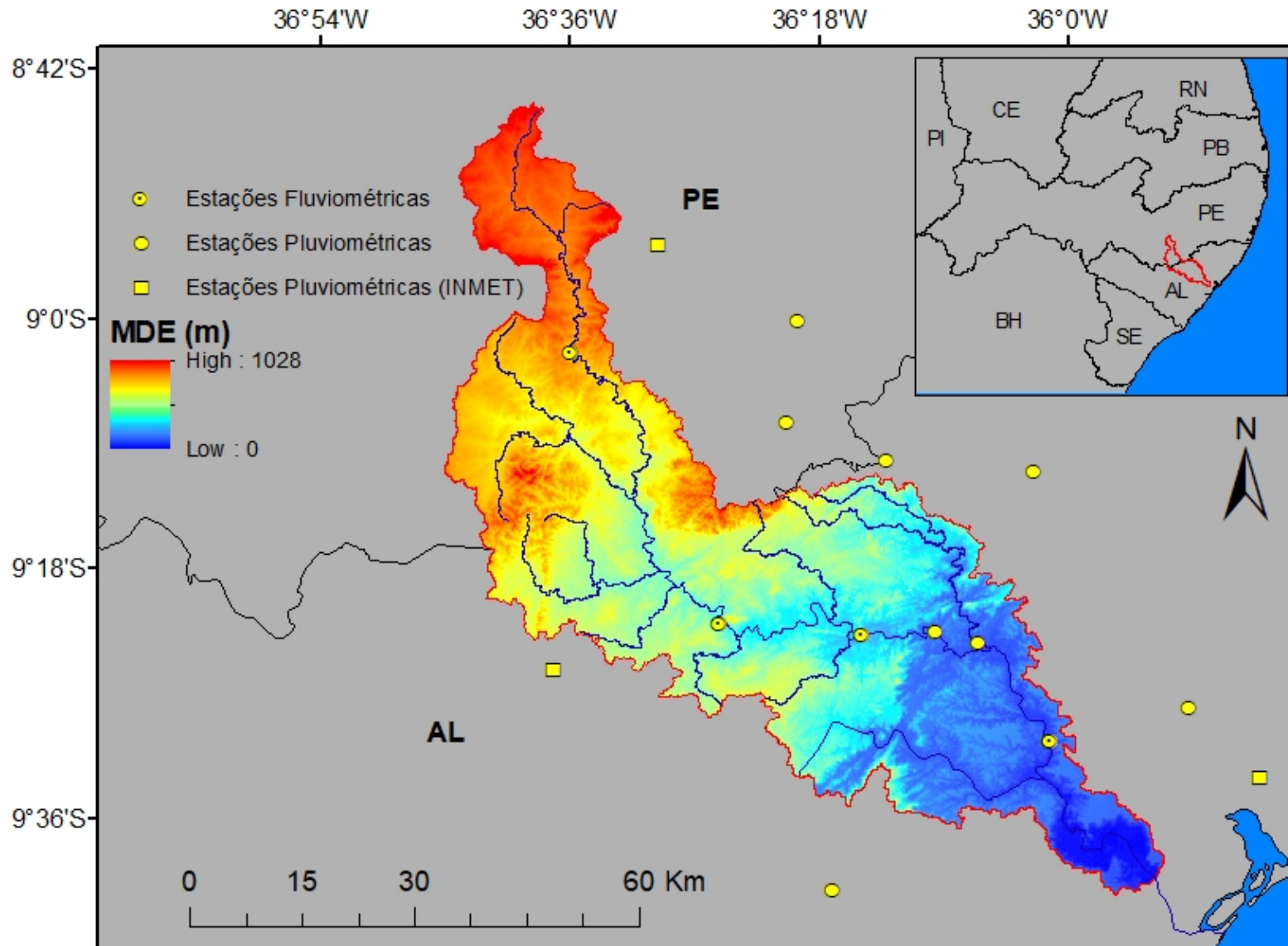
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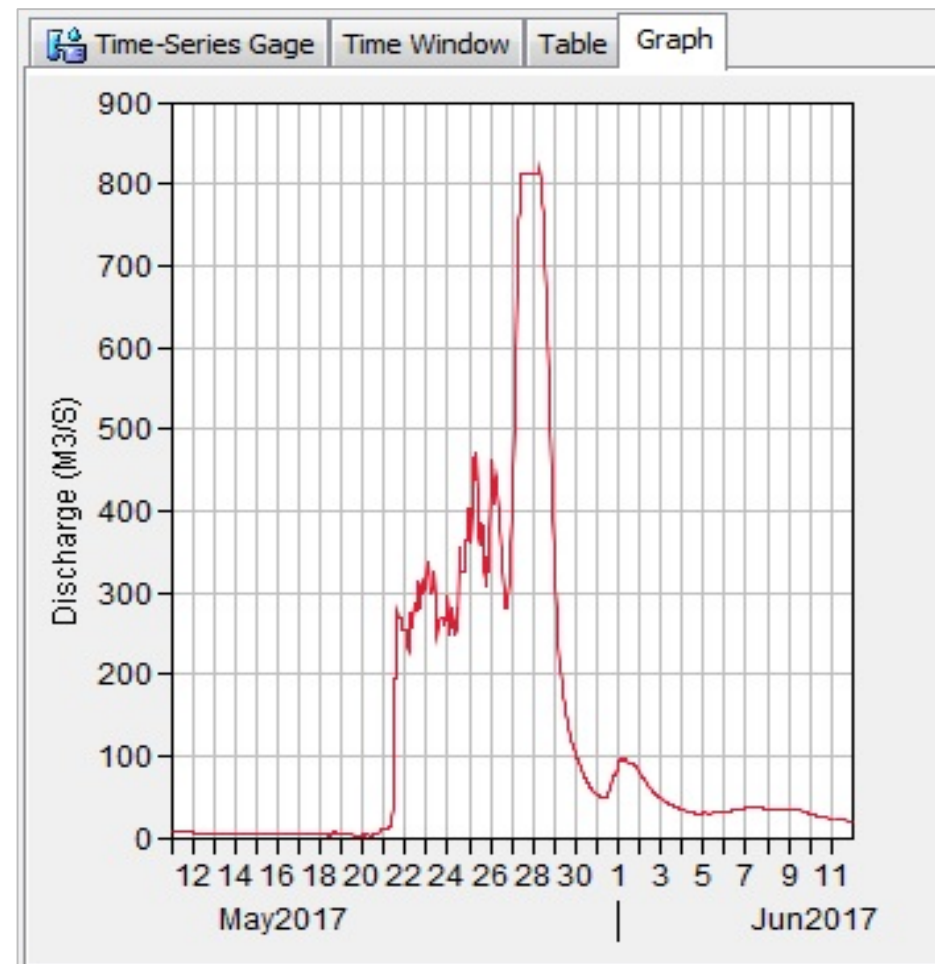
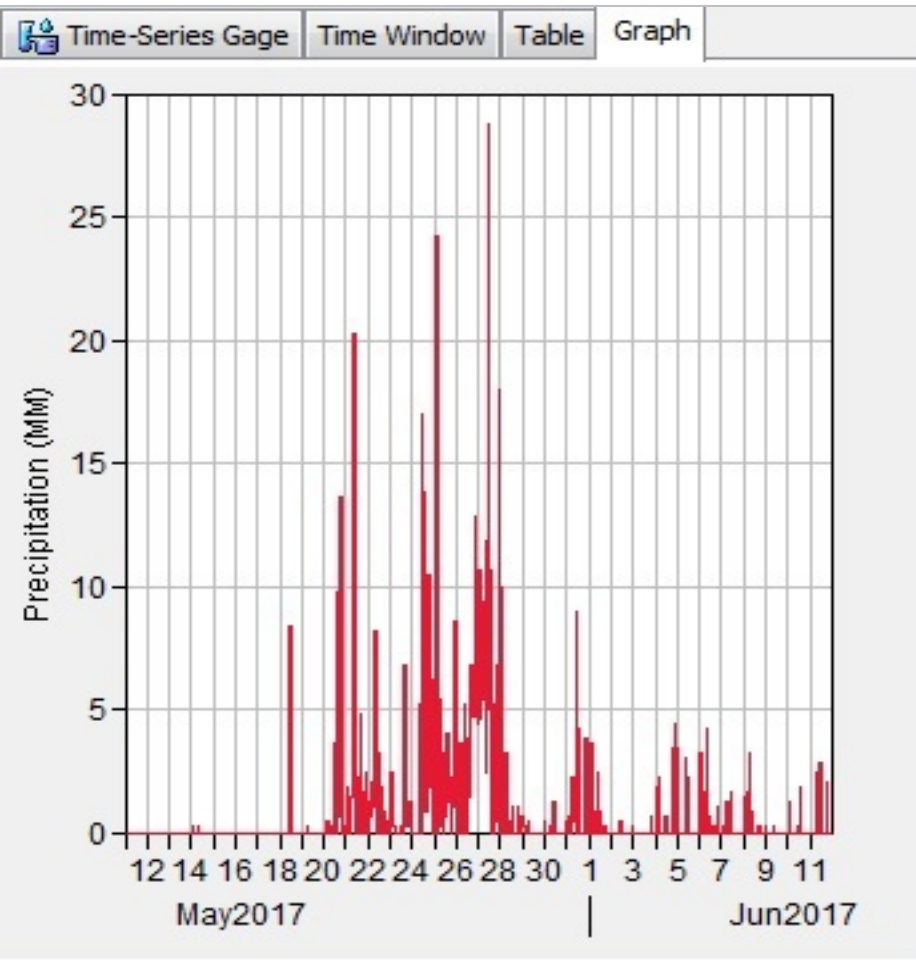
## Processamento de dados e evento de chuva utilizado

# Estações Utilizadas

Código	Nome	Estado	Fonte	Latitude	Longitude
A327	Palmeira dos Índios	AL	INMET	-9.4500	-36.700
A303	Maceió	AL	INMET	-9.6700	-3.5700
A322	Garanhuns	PE	INMET	-8.8830	-36.5170
39870000 / 936110	Atalaia	AL	ANA	-9.5100	-36.0100
39770000 / 935056	Fazenda Boa Fortuna	AL	ANA	-9.4672	-35.8564
39860000 / 936111	Viçosa	AL	ANA	-93.7910	-35.700
39852000 / 936121	Vila São Francisco	AL	ANA	-9.3356	-36.4194
39800000 / 936119	Brejão	PE	ANA	-9.0391	-36.5952
39689000 / 936120	Correntes II	PE	ANA	-9.1308	-36.3307
39863000 / 936122	Cajueiro	AL	ANA	-9.3756	-36.1608
39866000 / 936124	Capela	AL	ANA	-9.3889	-36.1100
39715000 / 936117	Palmeirina	PE	ANA	-9.0047	-36.3288
39745000 / 936127	Usina Laginha	AL	ANA	-9.1831	-36.0436
39950000 / 936125	Fazenda São Pedro	AL	ANA	-9.6858	-36.2853
936114	Santana do Mandaú	AL	ANA	-9.1689	-36.2197

# Estações Utilizadas

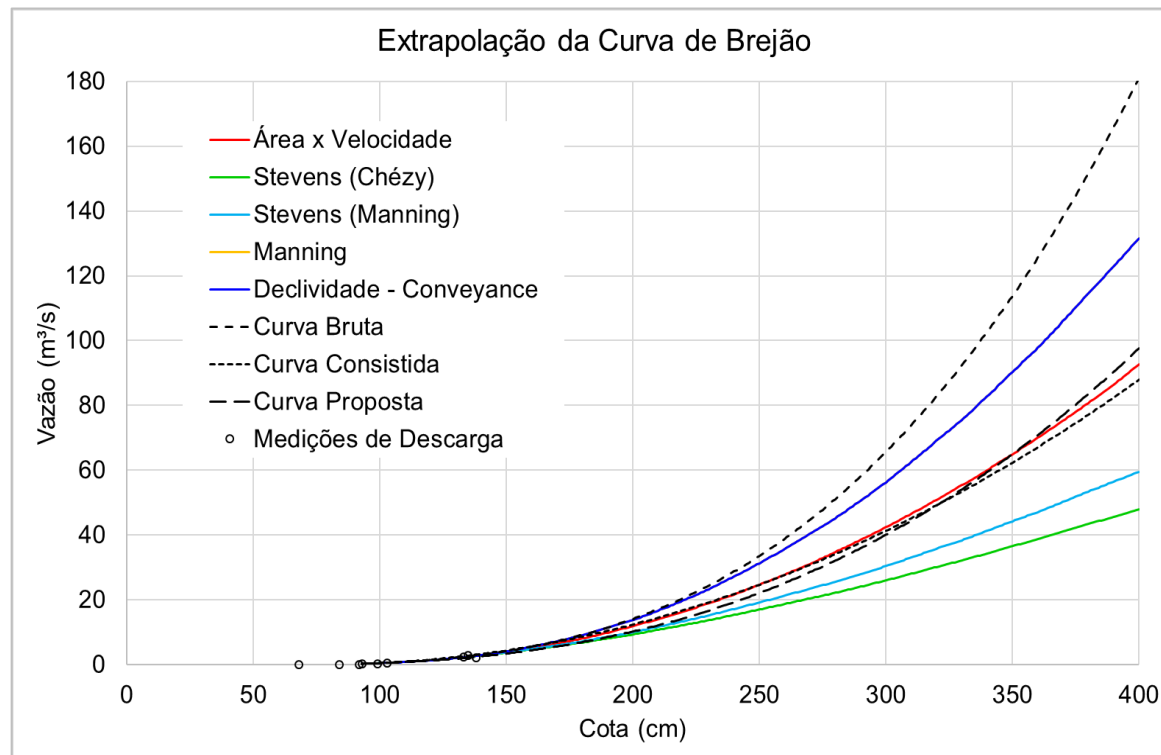




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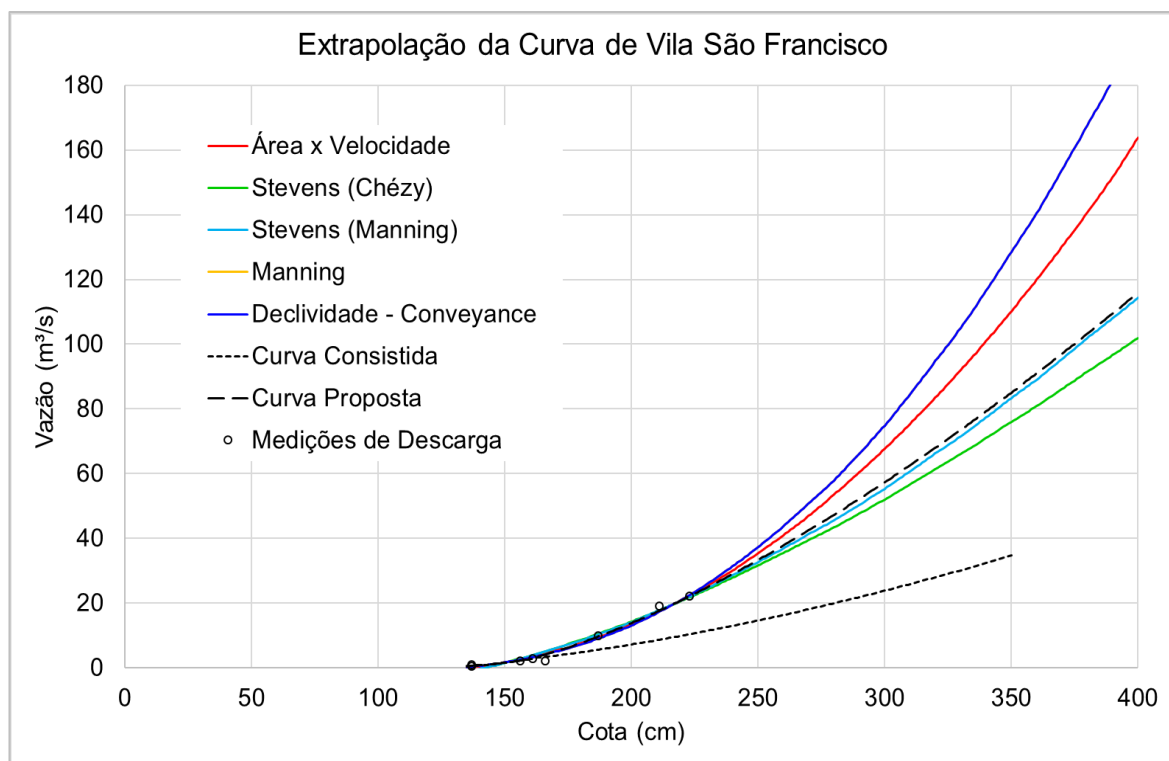
## Curvas-chave

Curva	Validade	Início da Validade	Fim da Validade	Cota Máxima	Cota Mínima	Tramo	Coef. a	Coef. H0	Coef. n
<b>Bruta</b>	1	27/06/2005	31/12/2016	400	50	01/01	4.0669	0.49	3.023
<b>Consistida</b>	1	01/10/2004	31/12/2014	400	50	01/01	7.7050	0.74	2.060
<b>Proposta</b>	1	01/10/2004	31/12/2018	400	55	01/01	3.9000	0.55	2.600



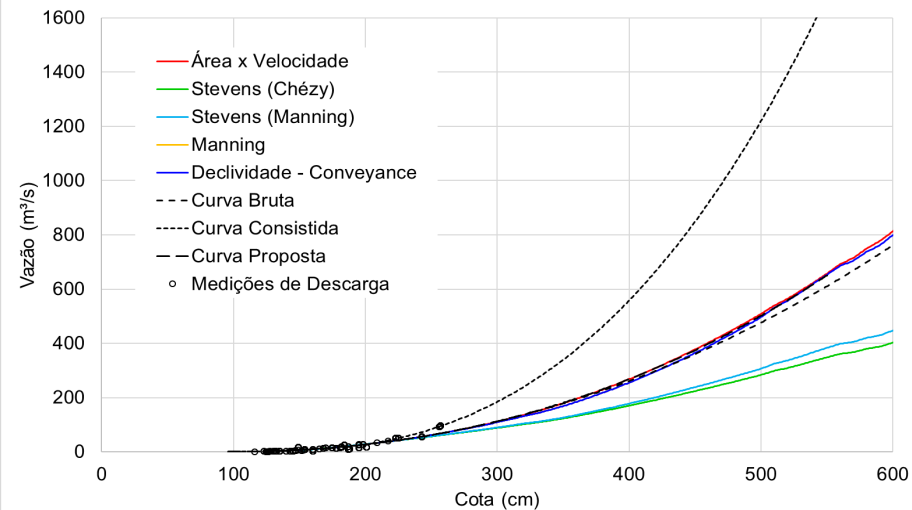


Curva	Validade	Início da Validade	Fim da Validade	Cota Máxima	Cota Mínima	Tramo	Coef. a	Coef. H0	Coef. n
<b>Consistida</b>	1	01/01/2011	31/12/2014	162	110	01/02	15.3643	1.1	2.500
				350	162	02/02	8.5411	1.1	1.600
<b>Proposta</b>	1	01/01/2011	31/12/2018	157	100	01/02	6.2000	0.81	3.680
				420	157	02/02	29.0000	1.4	1.450

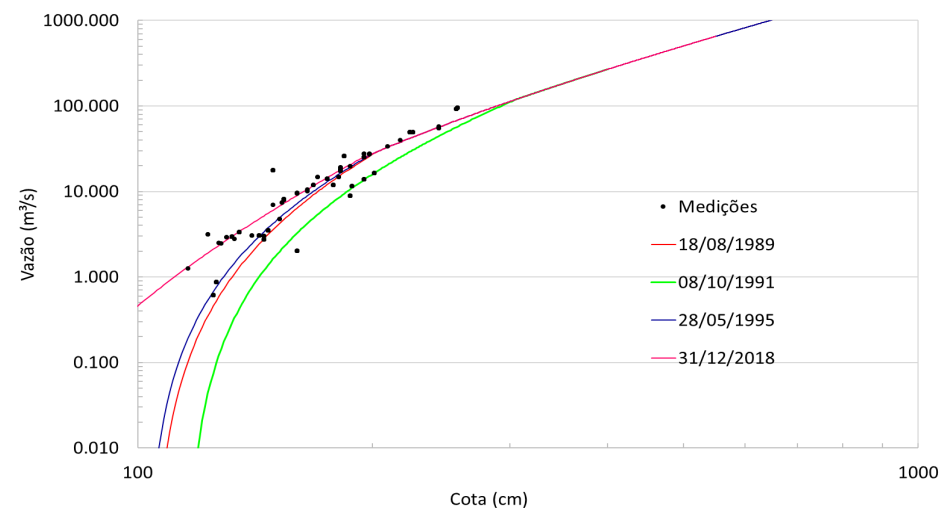


Curva	Validade	Início da Validade	Fim da Validade	Cota Máxima	Cota Mínima	Tramo	Coef. a	Coef. H0	Coef. n
<b>Bruta</b>	1	01/09/2004	25/08/2011	500	65	01/01	24.4000	0.95	2.125
<b>Consistida</b>	1	01/01/1989	18/08/1989	450	130	01/01	30.2672	1.04	2.686
	2	19/08/1989	08/10/1991	254	140	01/02	29.7261	1.15	3.362
				450	254	02/02	30.2672	1.04	2.686
	3	09/10/1991	22/06/1994	209	100	01/02	29.0256	1.02	2.556
				450	209	02/02	30.2672	1.04	2.686
<b>Proposta</b>				202	60	01/02	21.6460	0.89	2.299
				450	202	02/02	30.2672	1.04	2.686
	1	01/01/1989	18/08/1989	202	104	01/02	30.2672	1.04	2.686
				650	202	02/02	18.6000	0.81	2.300
	2	19/08/1989	08/10/1991	304	115	01/02	23.9000	1.15	2.500
			400	304	02/02	18.6000	0.81	2.300	
3	09/10/1991	28/05/1995	200	102	01/02	29.0256	1.02	2.556	
			650	200	02/02	18.6000	0.81	2.300	
4	29/05/1995	31/12/2018	193	50	01/02	6.2600	0.50	3.770	
			550	193	02/02	18.6000	0.81	2.300	

Extrapolação da Curva de Viçosa

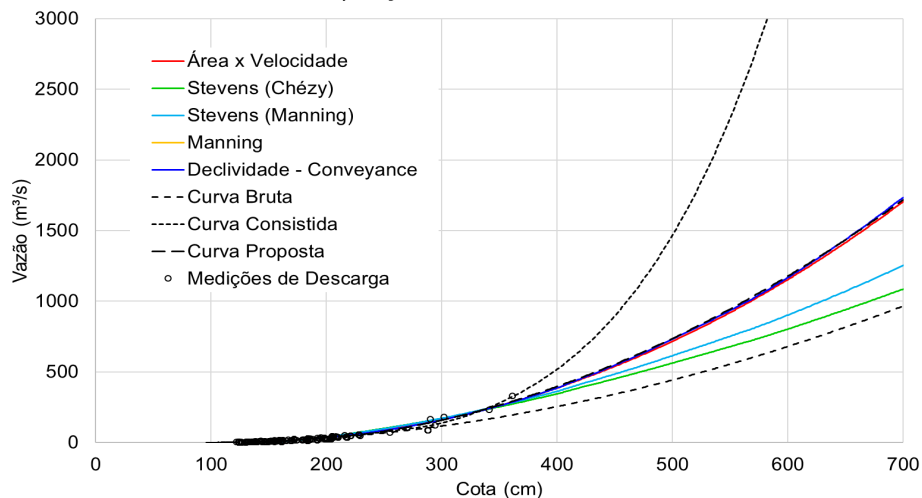


Curva Proposta para Viçosa

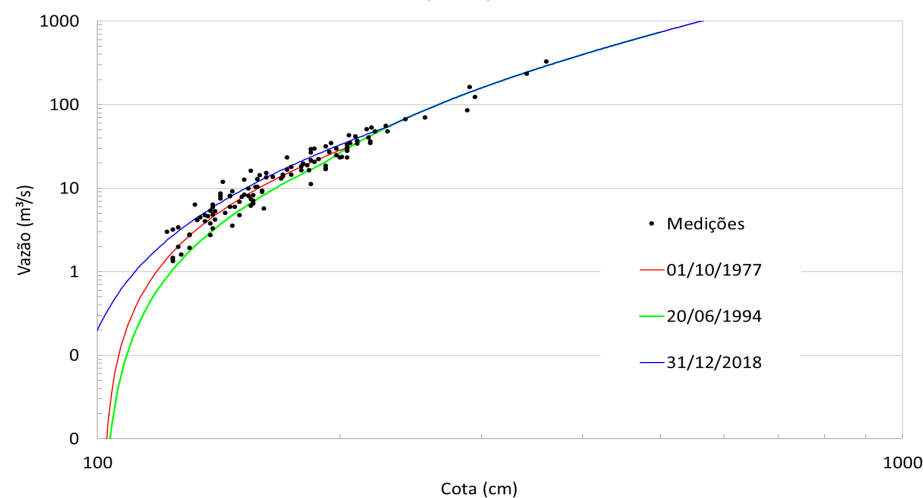


Curva	Validade	Início da Validade	Fim da Validade	Cota Máxima	Cota Mínima	Tramo	Coef. a	Coef. H0	Coef. n
<b>Bruta</b>	1	01/01/2014	31/12/2016	800	97	01/01	29.7500	0.97	1.937
	1	01/10/1977	17/08/1989	160	110	01/03	24.2929	1.05	1.600
				290	160	02/03	19.9336	0.86	2.500
				700	290	03/03	0.4428	-0.23	4.900
<b>Consistida</b>	2	18/08/1989	20/06/1994	160	120	01/03	17.2463	1.09	1.400
				291	160	02/03	16.3728	0.87	2.800
				700	291	03/03	0.4428	-0.23	4.900
	3	21/06/1994	31/12/2014	187	90	01/03	31.6573	0.93	2.250
				291	187	02/03	26.4014	0.85	2.100
				700	291	03/03	0.4428	-0.23	4.900
<b>Proposta</b>	1	01/10/1977	17/08/1989	207	101	01/02	29.0000	1.01	1.920
				700	207	02/02	59.5120	1.34	1.940
	2	18/08/1989	20/06/1994	190	101	01/02	25.0000	1.01	2.150
				500	190	02/02	59.5120	1.34	1.940
	3	21/06/1994	31/12/2018	231	90	01/02	27.0000	0.9	2.130
				700	231	02/02	59.5120	1.34	1.940

Extrapolação da Curva de Atalaia

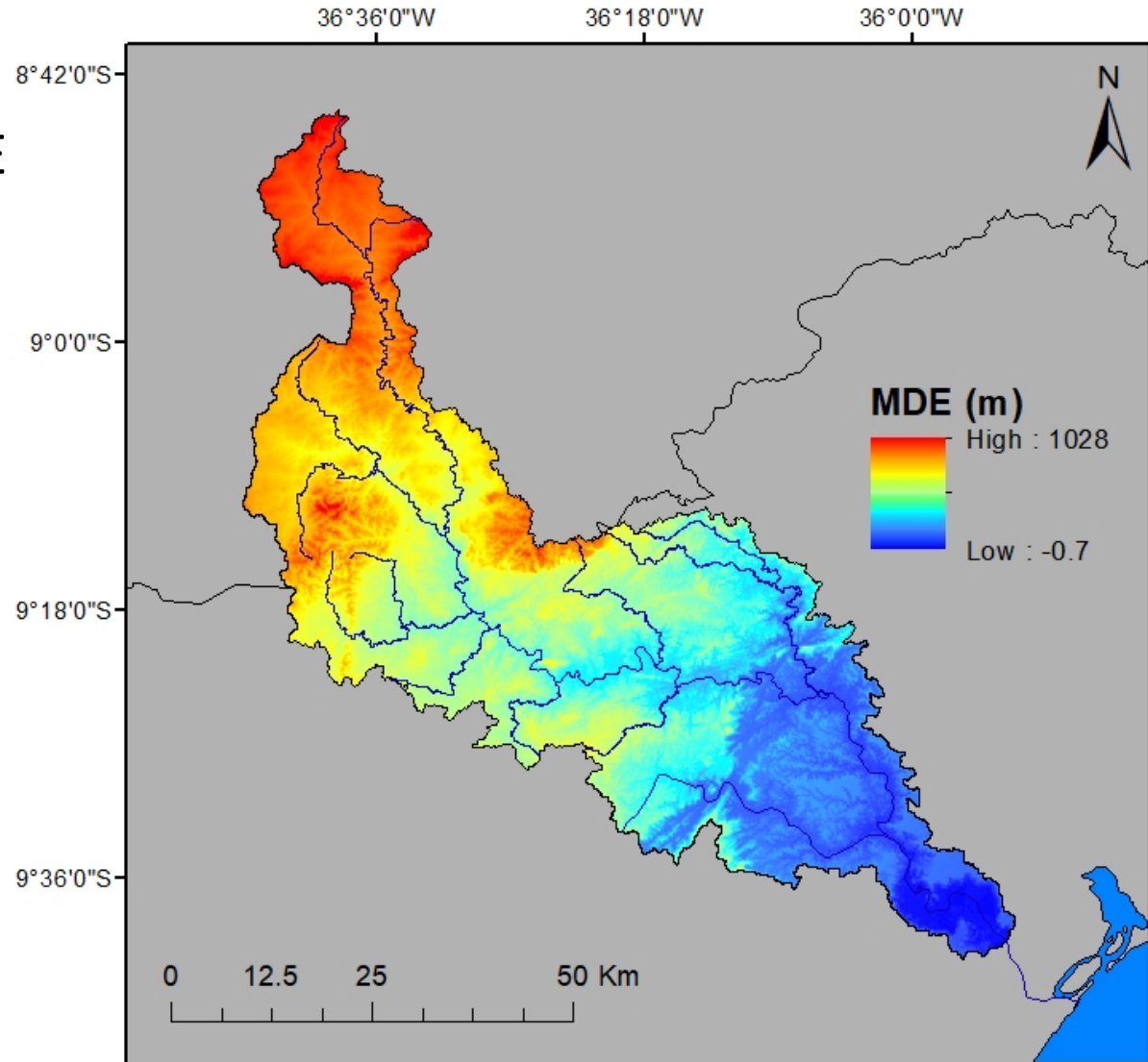


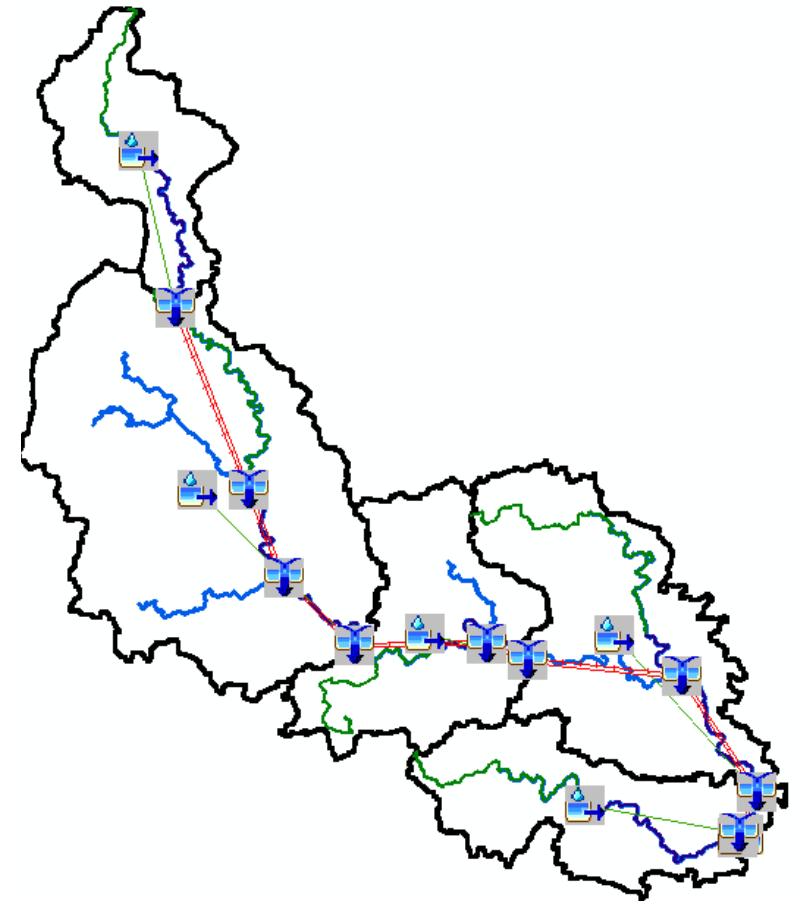
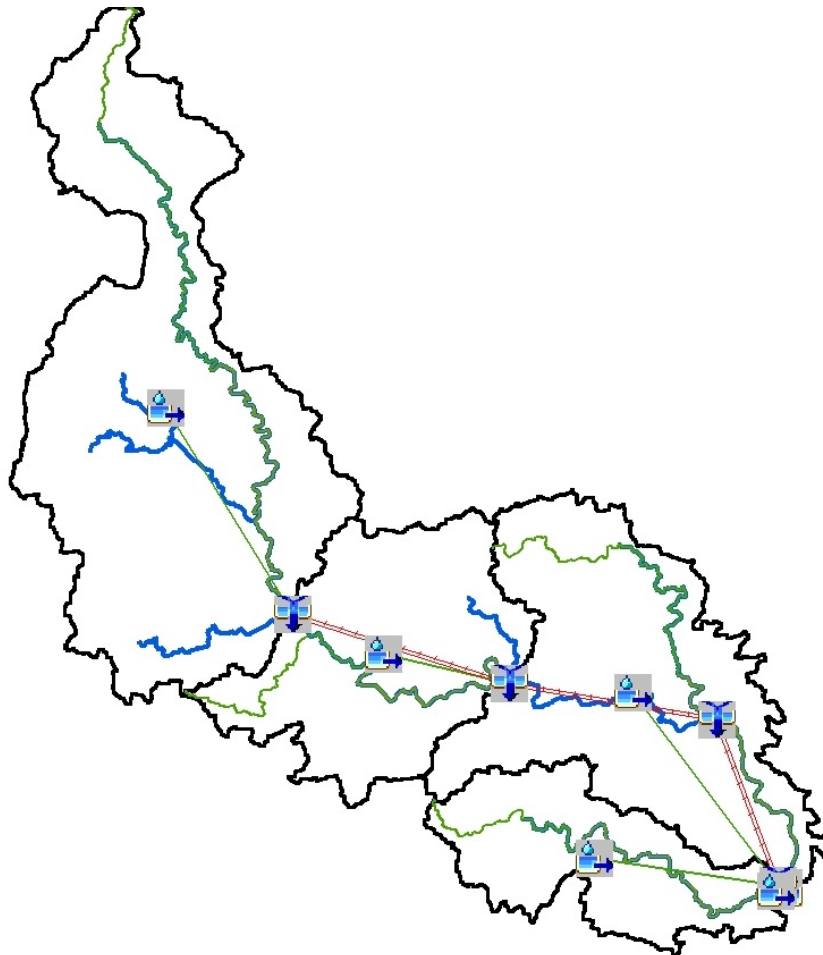
Curva Proposta para Atalaia



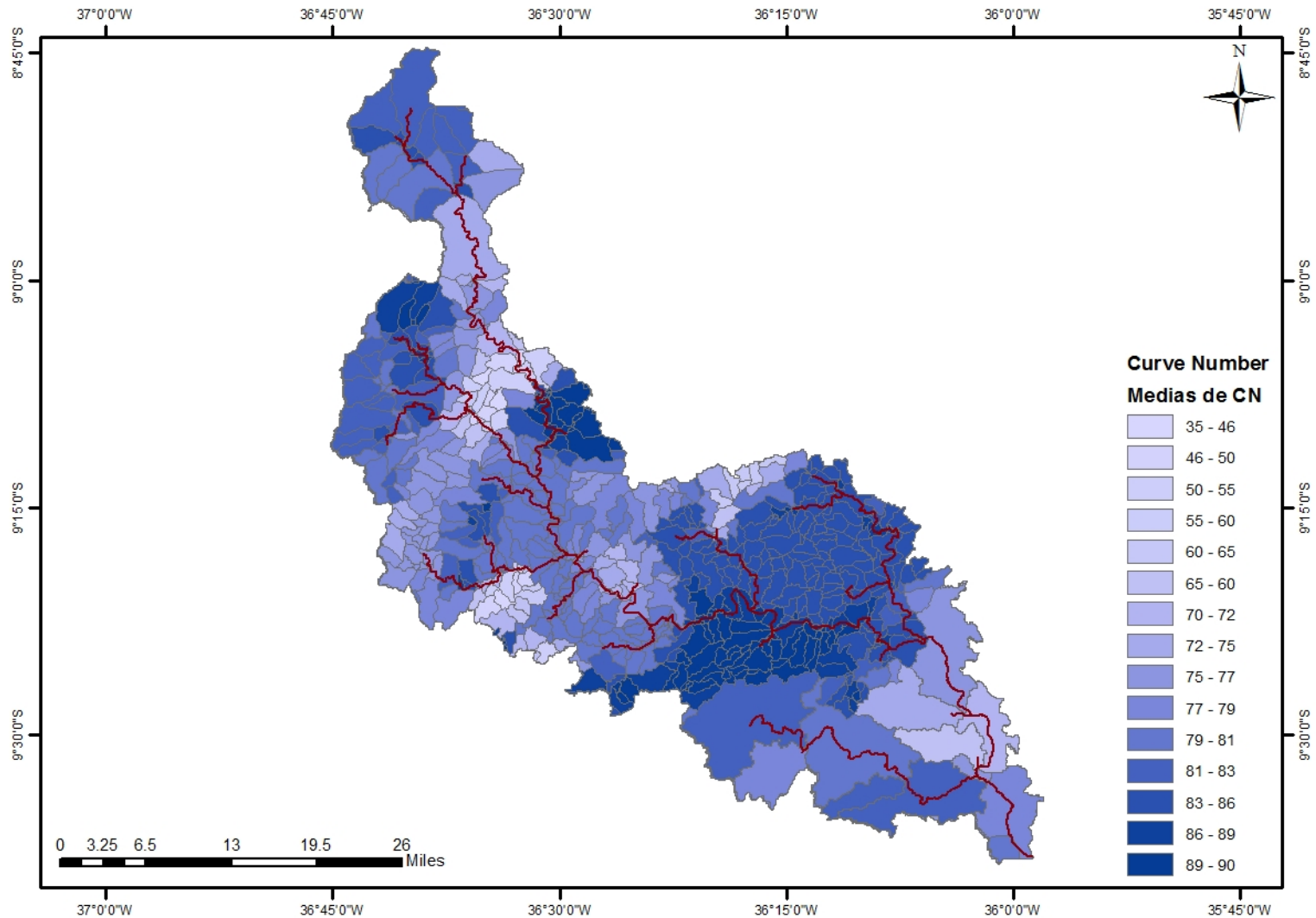
## **3 Modelagem Hidrológica HEC-HMS**

- Topodata do INPE  
(SRTM 30 m)
- BHO da ANA

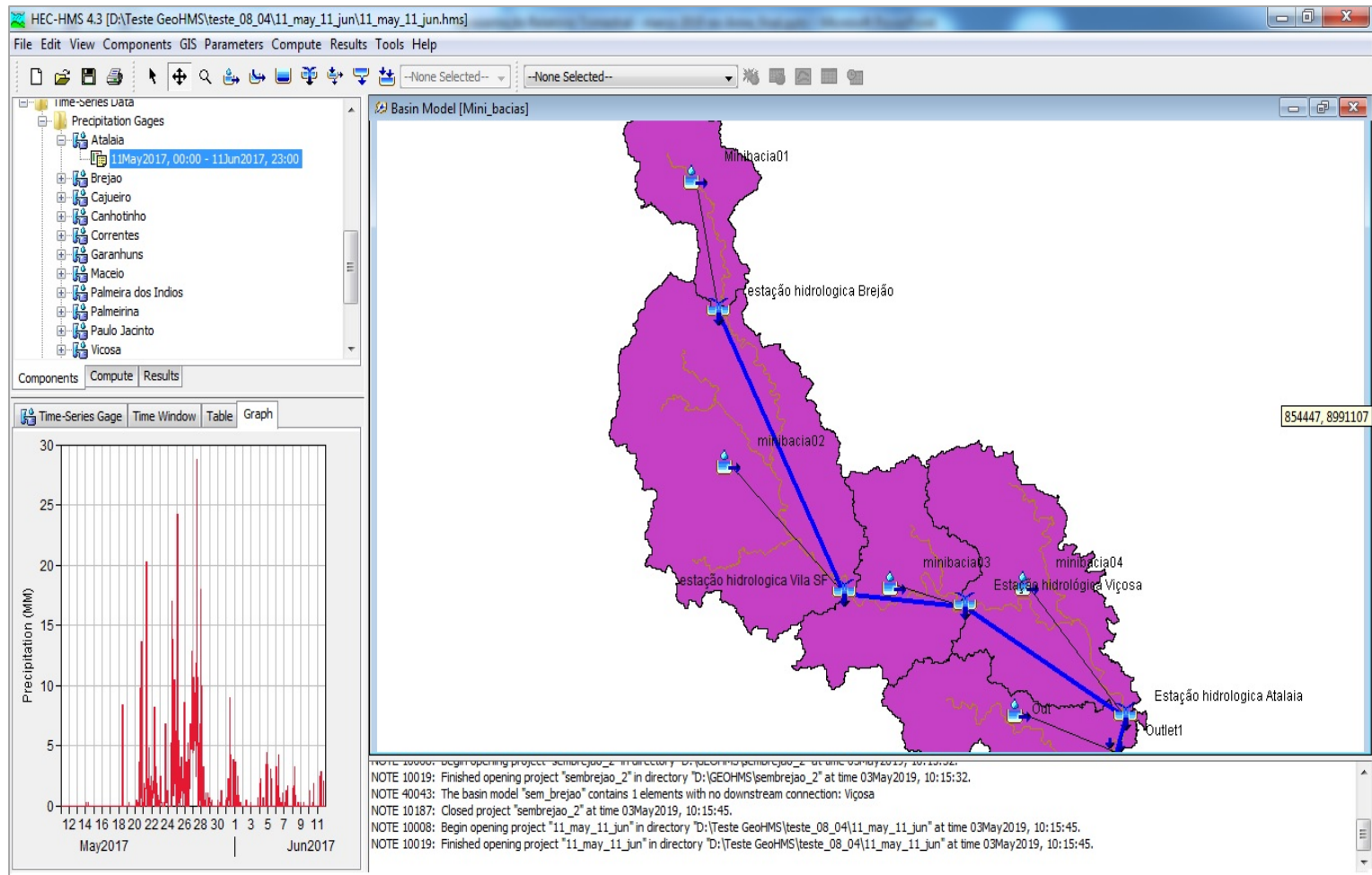




# Curve Number ANA



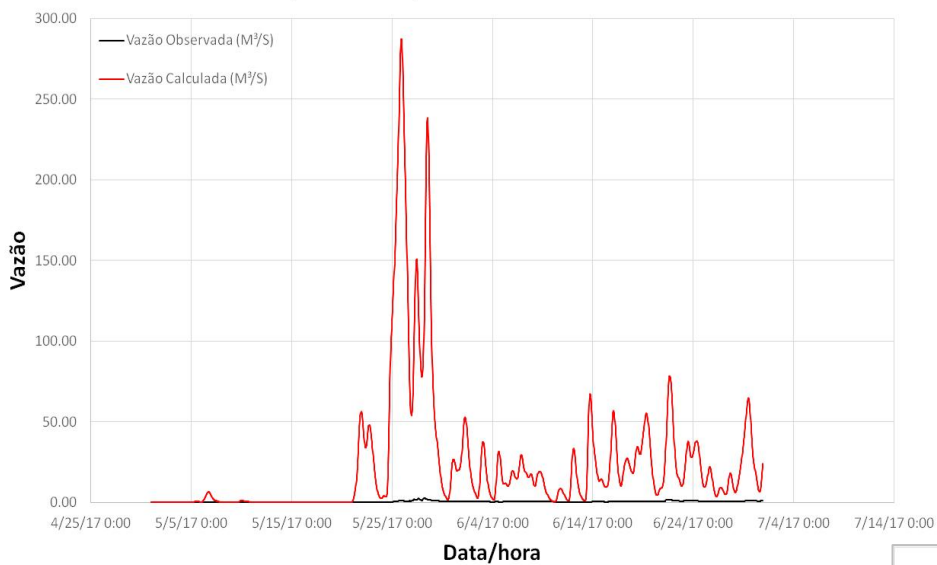
# Interface modelo HEC-HMS





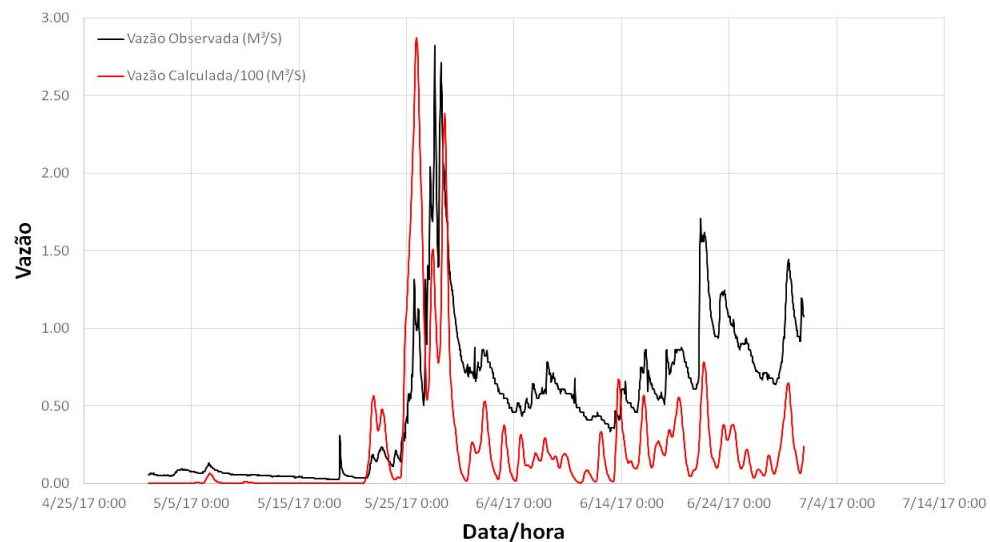
# SIMULAÇÕES HEC-HMS

Município de Brejão - Estado de Pernambuco



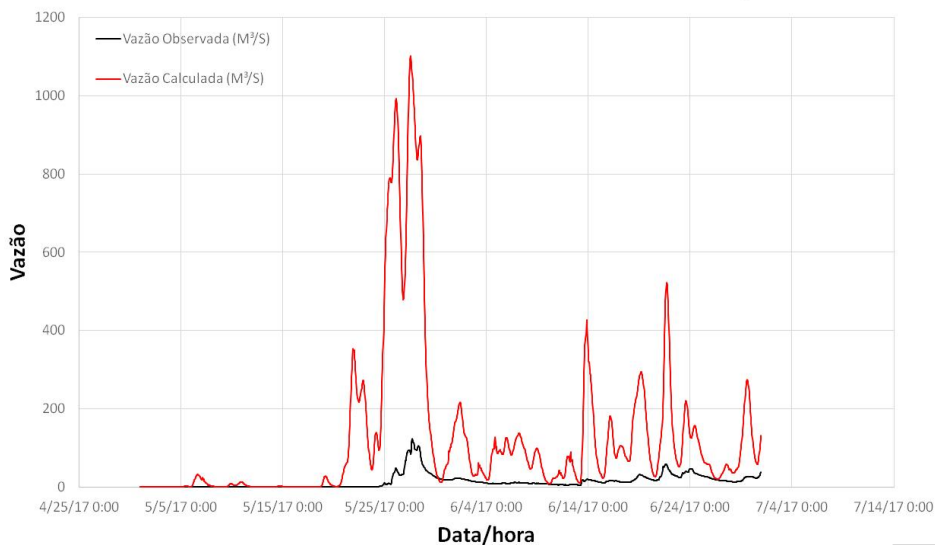
**Qcal/100**

Município de Brejão - Estado de Pernambuco



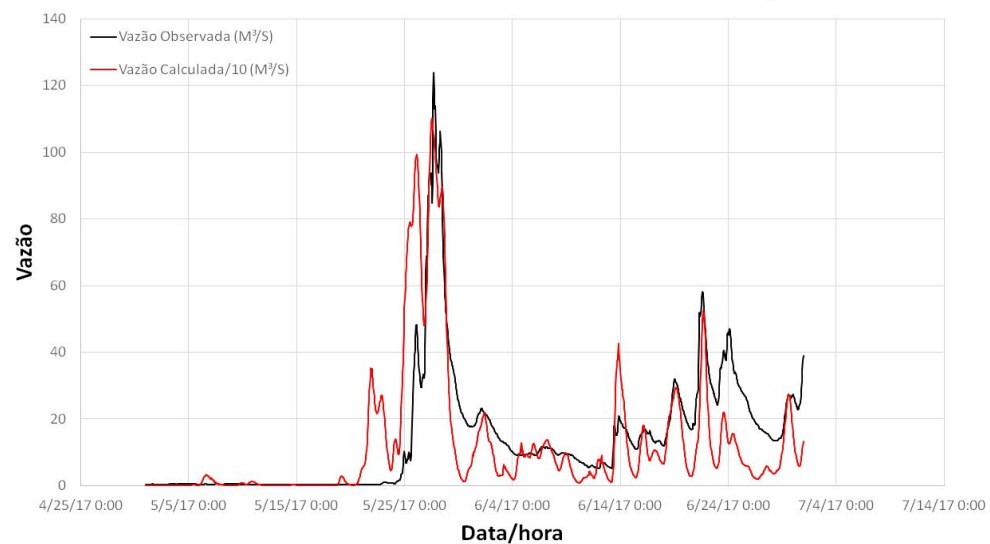
# SIMULAÇÕES HEC-HMS

Povoado de Vila São Francisco - Estado de Alagoas



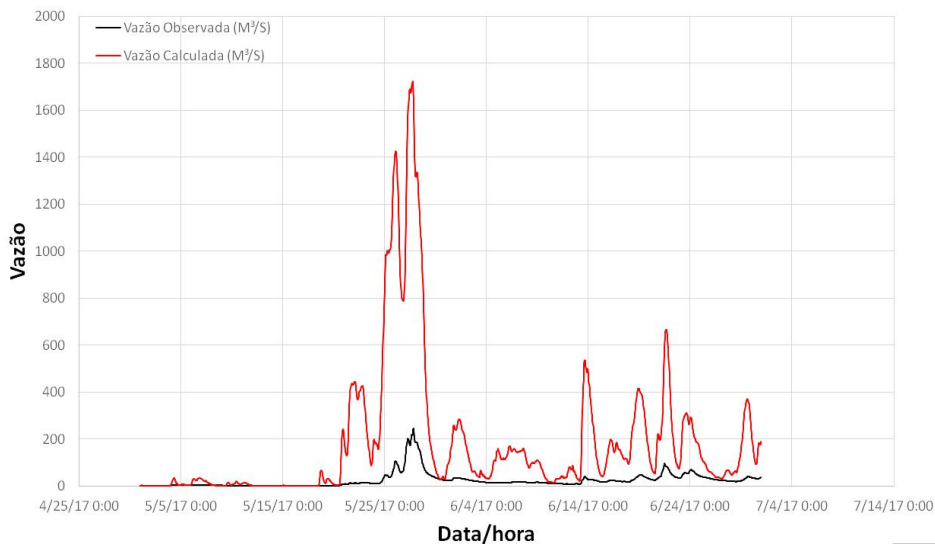
**Qcal/10**

Povoado de Vila São Francisco - Estado de Alagoas



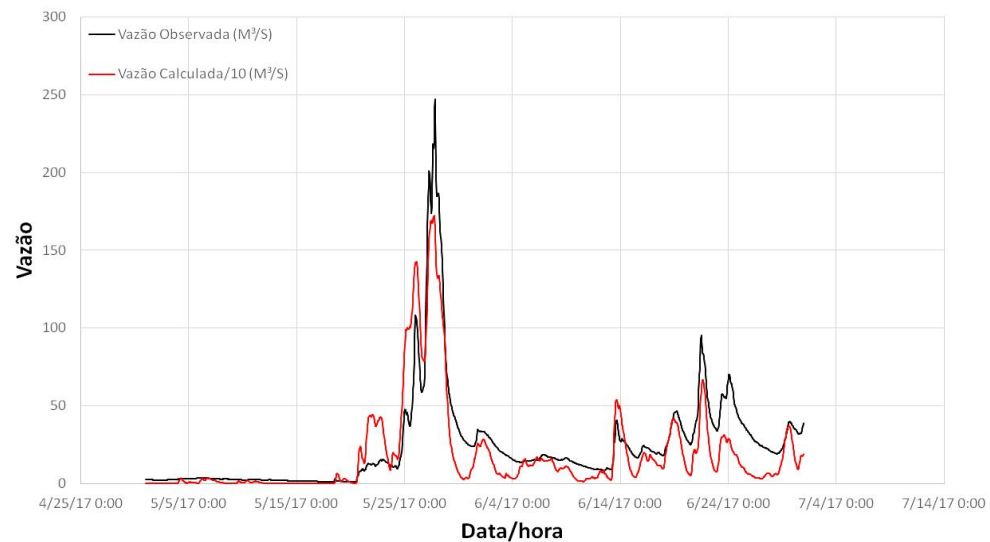
# SIMULAÇÕES HEC-HMS

Município de Viçosa - Estado de Alagoas

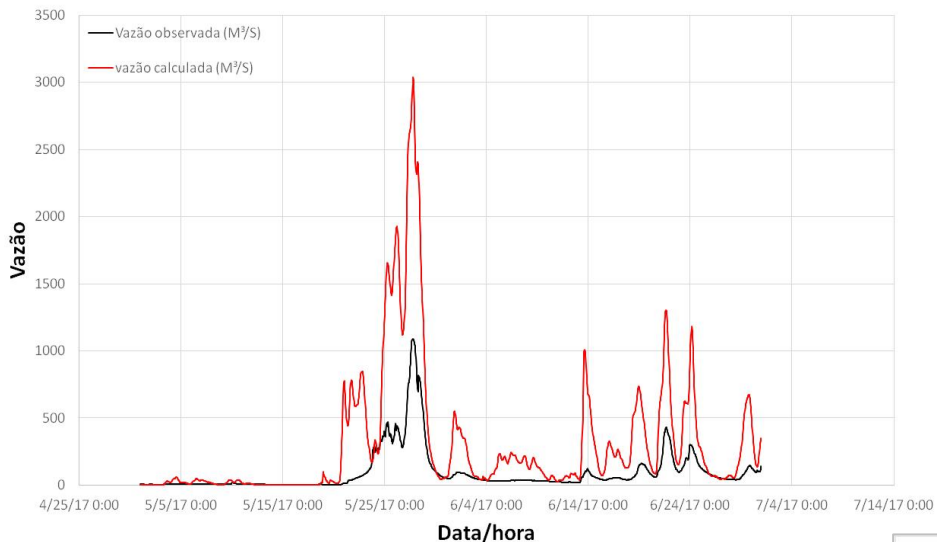


**Qcal/10**

Município de Viçosa - Estado de Alagoas

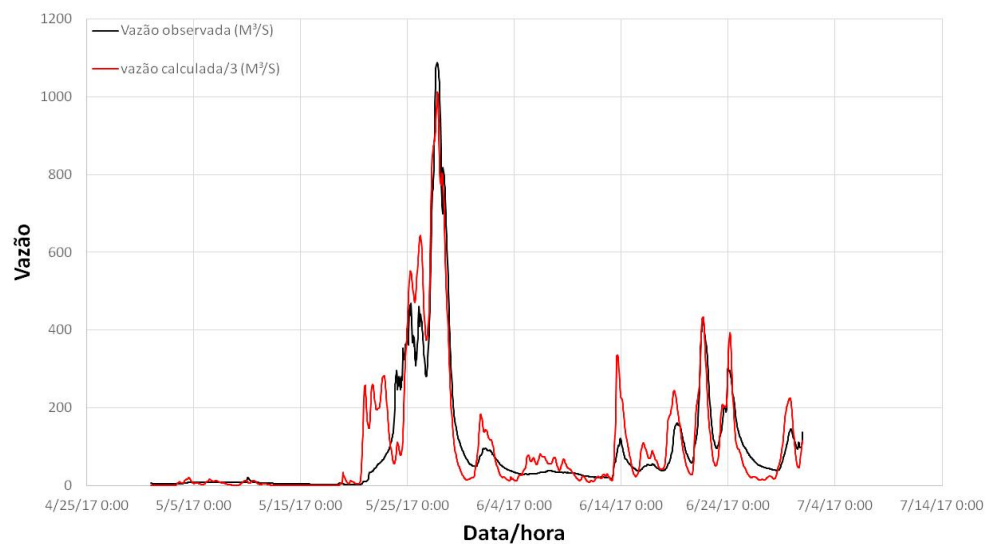


Município de Atalaia - Estado de Alagoas



**Qcal/3**

Município de Atalaia - Alagoas

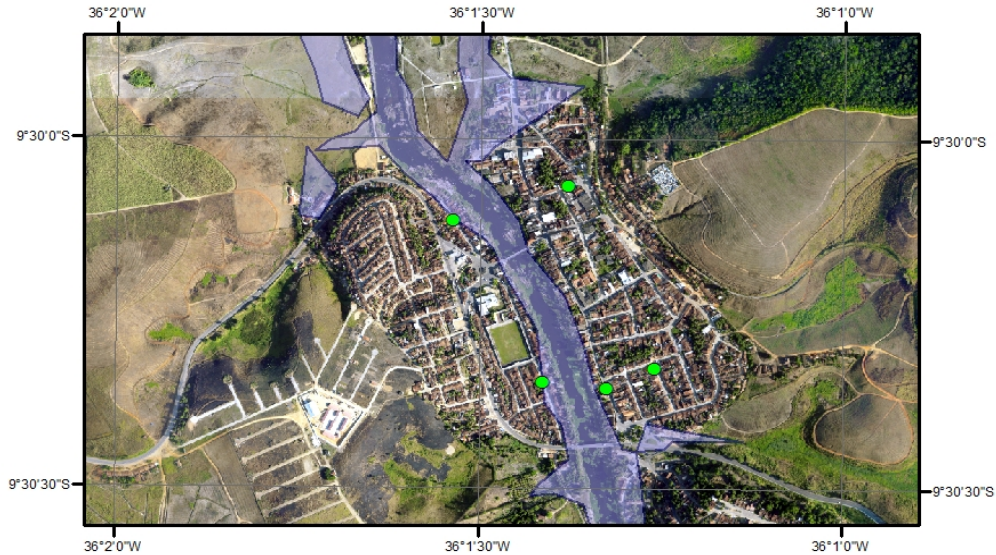
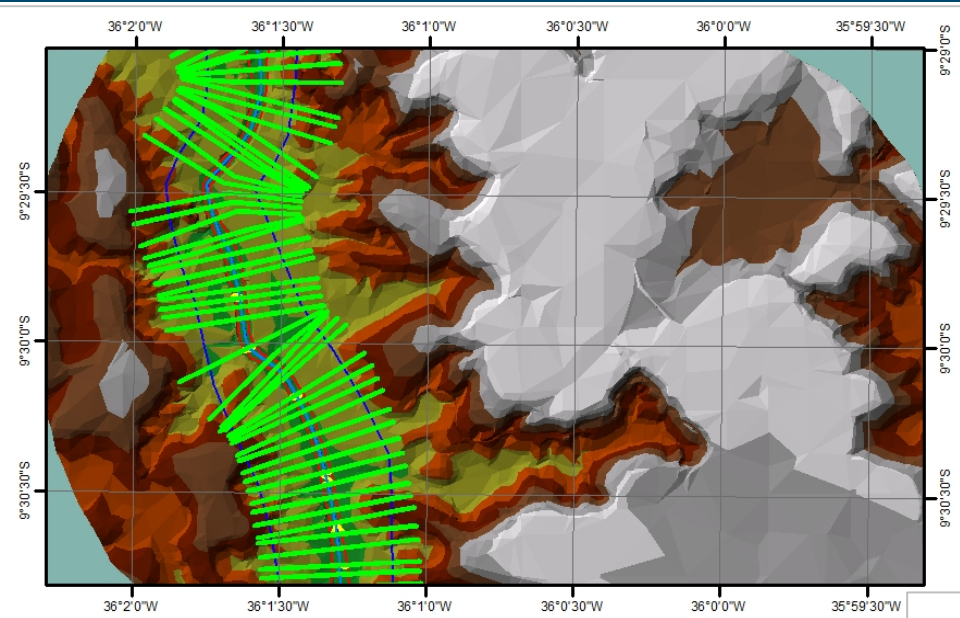


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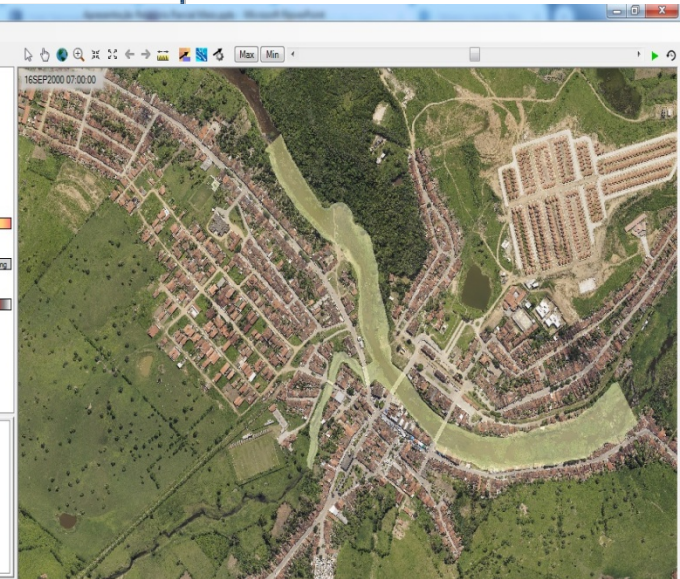
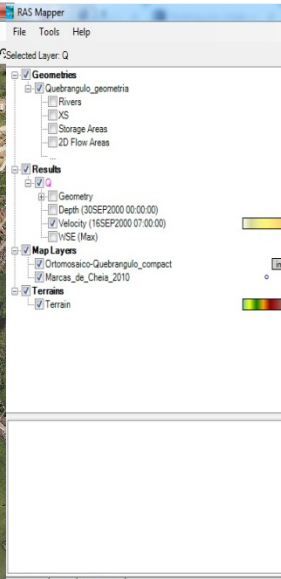
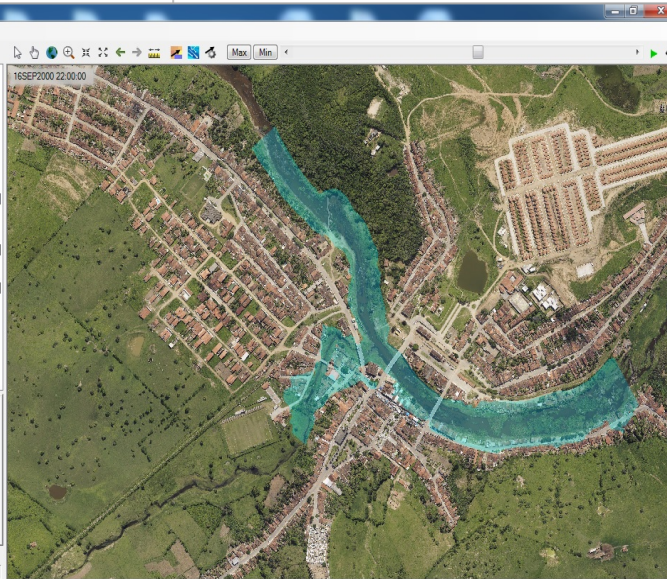
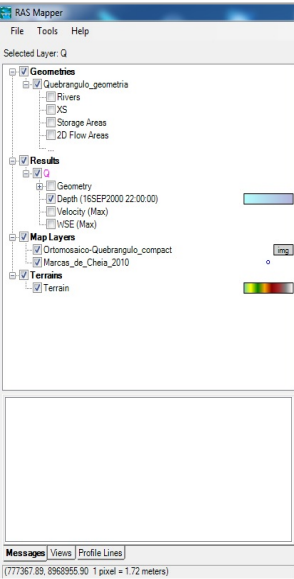
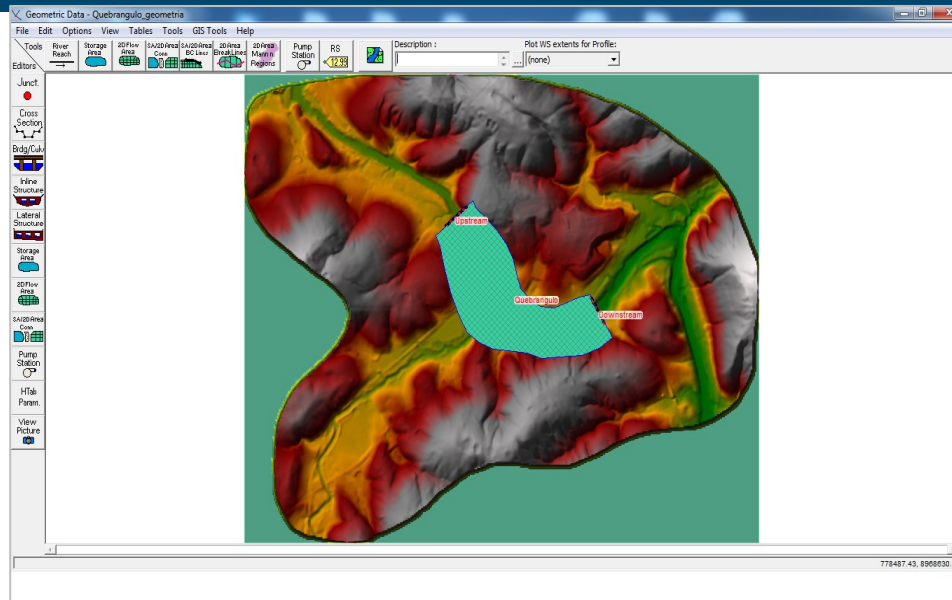
**Modelagem Hidrodinâmica**

**HEC-HAS**

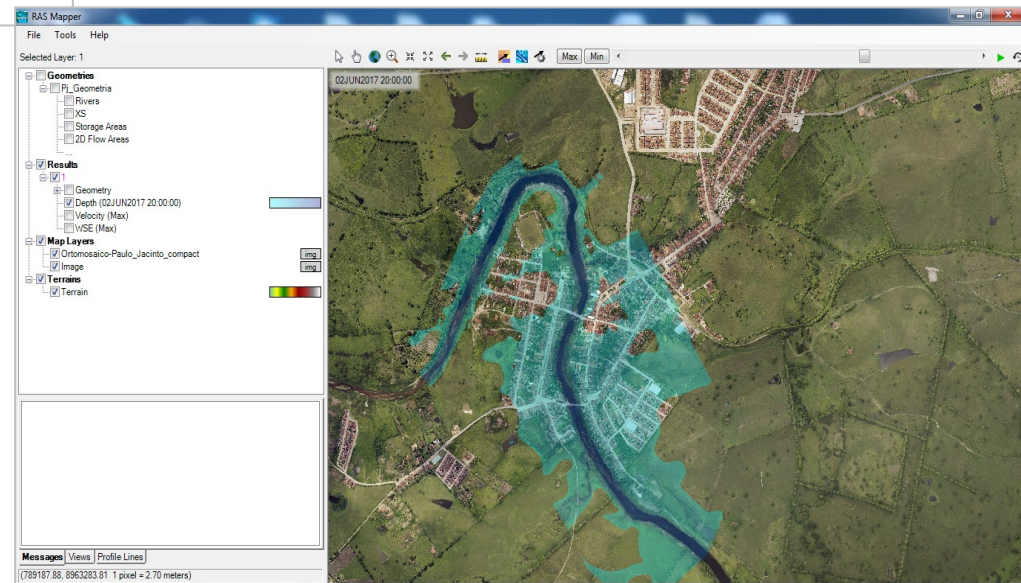
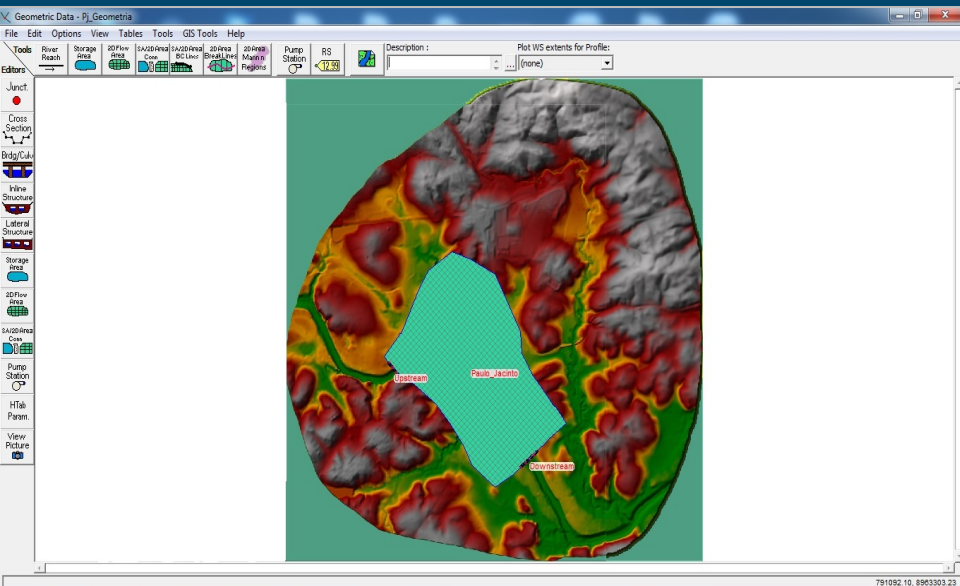
# HEC-RAS 1D



# HEC-RAS 2D - QUEBRANGULO

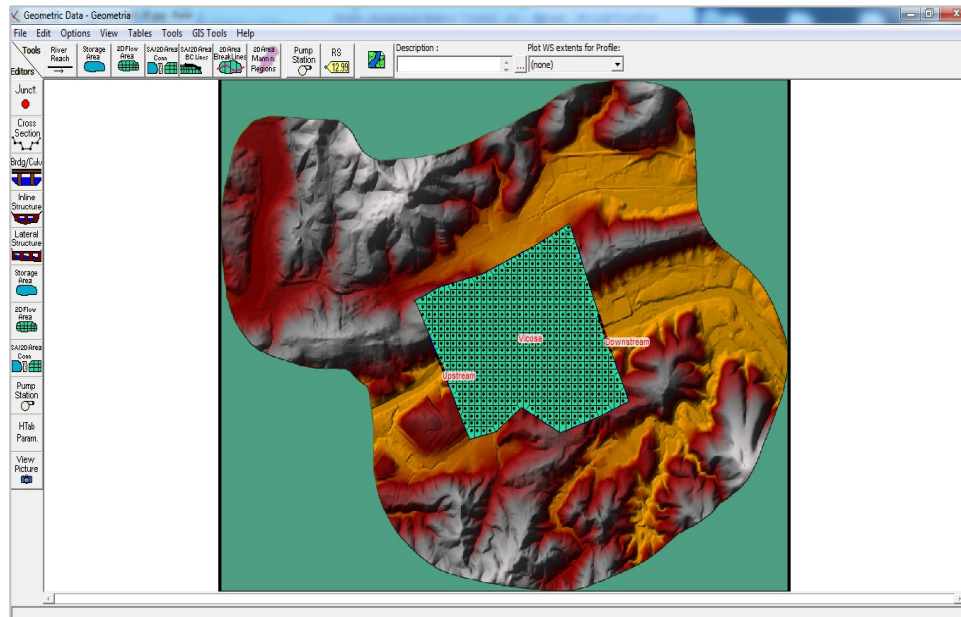


# HEC-RAS 2D – PAULO JACINTO

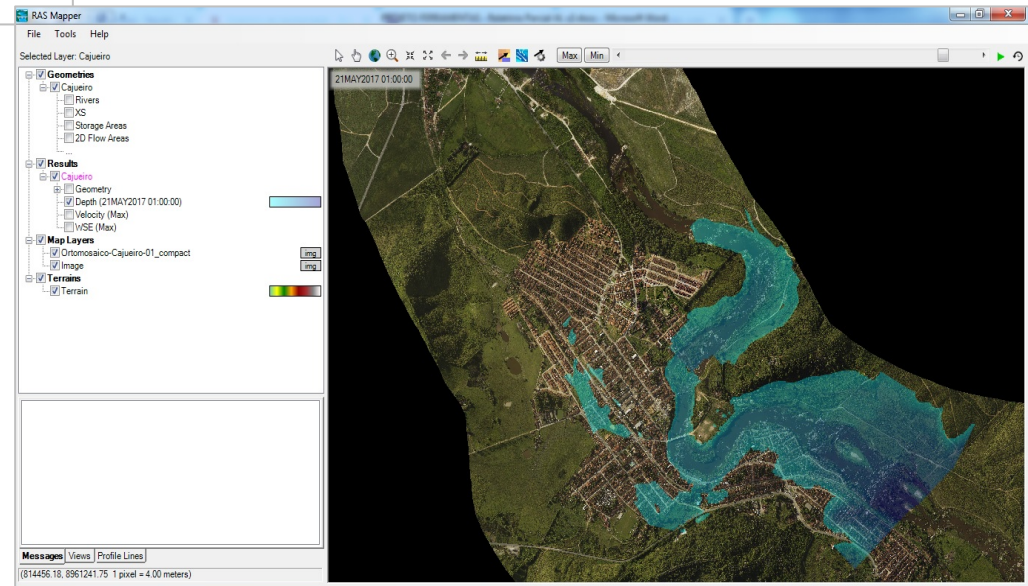
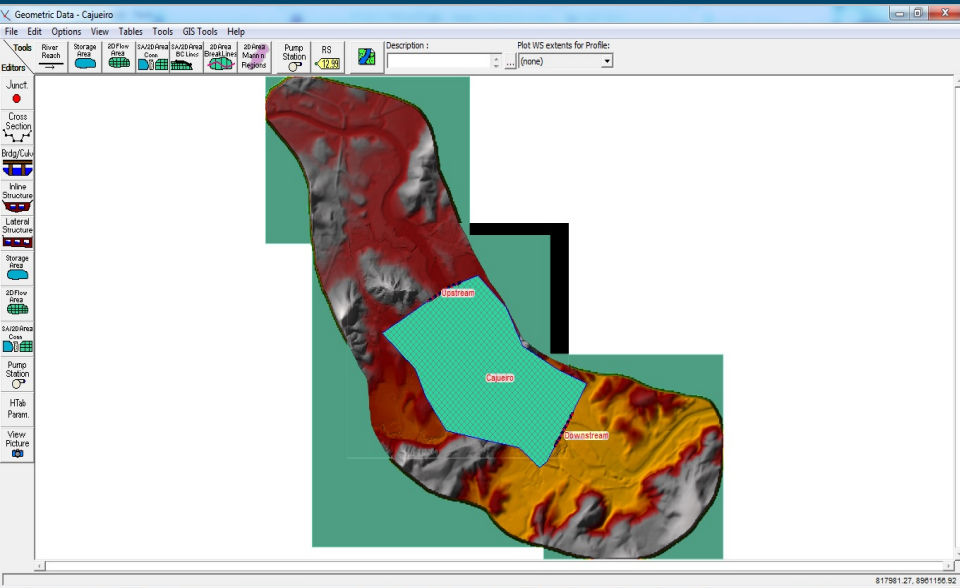




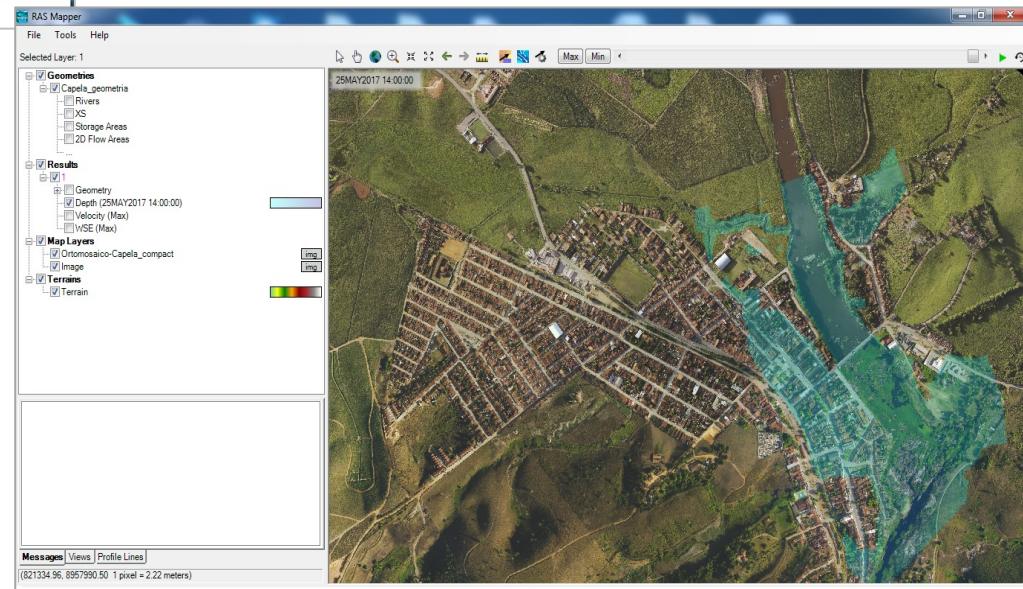
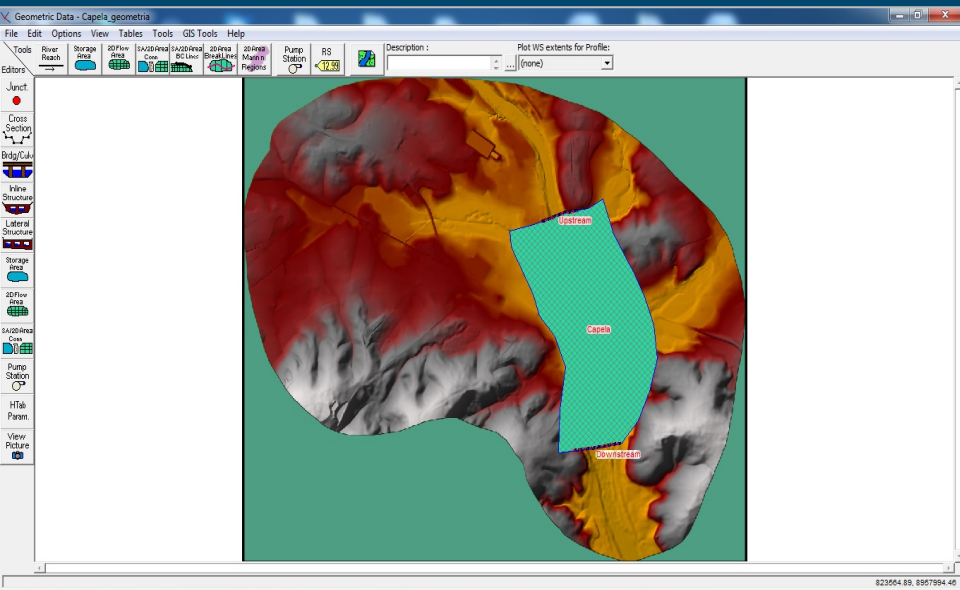
# HEC-RAS 2D - VIÇOSA



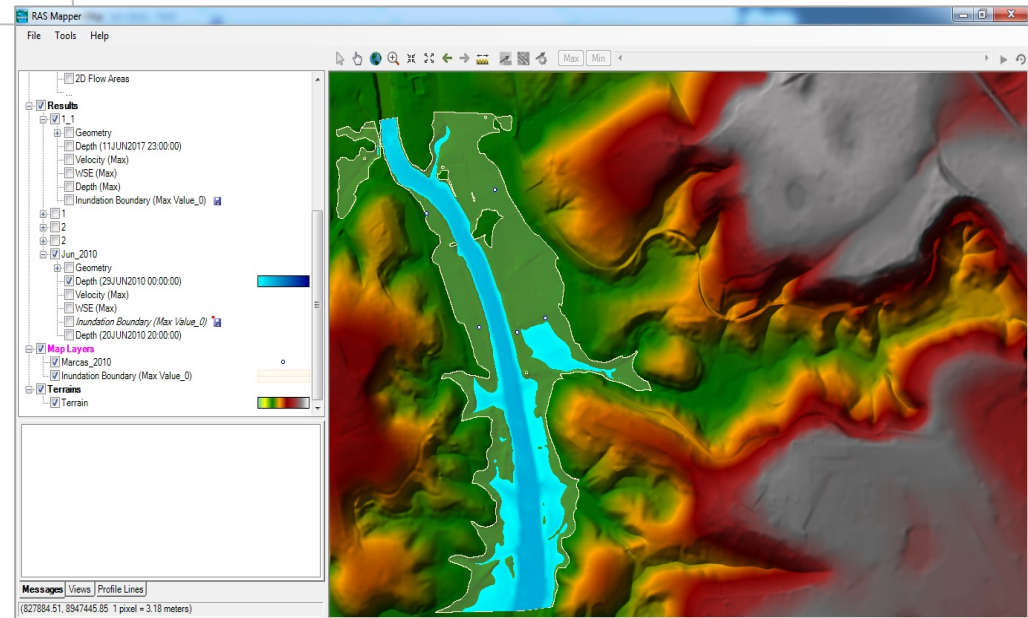
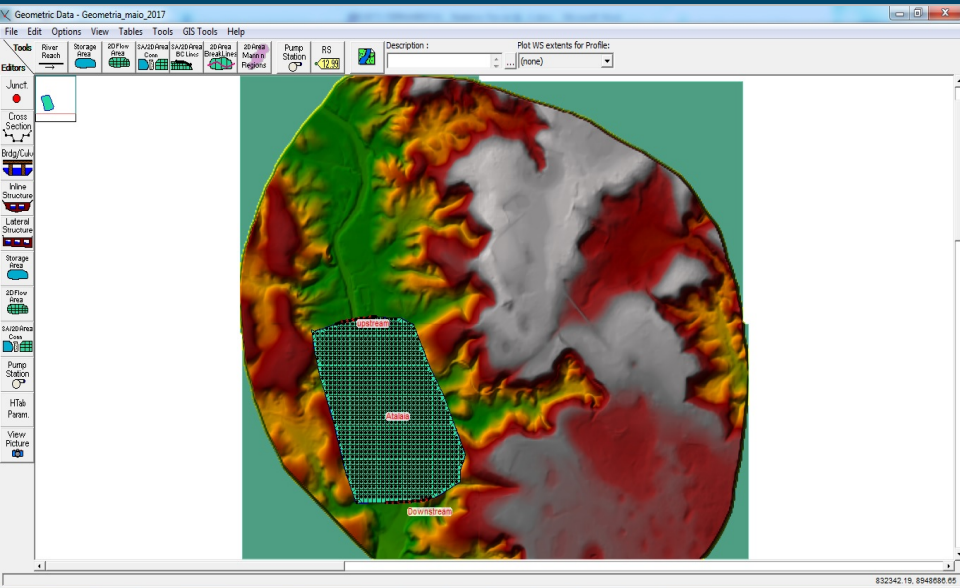
# HEC-RAS 2D - CAJUEIRO



# HEC-RAS 2D - CAPELA



# HEC-RAS 2D - ATALAIA



**5**

## **Continuidade da Pesquisa**

- Definir os valores definitivos das condições de contorno;
- Calibrar e validar o modelo hidrológico HEC-HMS;
- Calibrar e Validar o modelo hidrodinâmico HEC-RAS;
- Fazer simulações considerando diferentes tempos de retorno;
- Elaborar os mapas de inundação;
- Propor um protótipo de um sistema de alerta;
- Sugerir aperfeiçoamento na rede de monitoramento existente;

**Fim**  
**Obrigada!**

Brasília, DF, 16 de Maio de 2019

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