

# II Congresso Internacional e VI Encontro Nacional de **RISCOS**

Auditório da Reitoria  
Universidade de Coimbra

22 a 25 de Maio de 2010

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Auditório da Reitoria

22 a 25 de Maio de 2010

**As cheias rápidas de 15 de Dezembro de 2009 na  
costa norte da ilha Terceira (Açores)**

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# Contéudo

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- ▶ Introdução
- ▶ Tipos de Tempo
- ▶ Factos Históricos
- ▶ Caso de estudo: As cheias rápidas na costa norte da ilha Terceira (Açores)
- ▶ Conclusões



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“A vida açoreana não data espiritualmente da colonização das ilhas; antes se projecta num passado telúrico que os geólogos reduzirão a tempo se quiserem... Como homens estamos soldados historicamente ao povo de onde viemos e enraizados pelo habitat a uns montes de lava que soltam da própria entranha uma substância que nos penetra. A geografia, para nós, vale tanto como a história, e não é de balde que as nossas recordações escritas inserem 50% de relatos de sismos e enchentes. Como as sereias temos uma dupla natureza: somos de carne e de pedra. Os nossos ossos mergulham no mar.”

*Vitorino Nemésio (1932, p.57)*

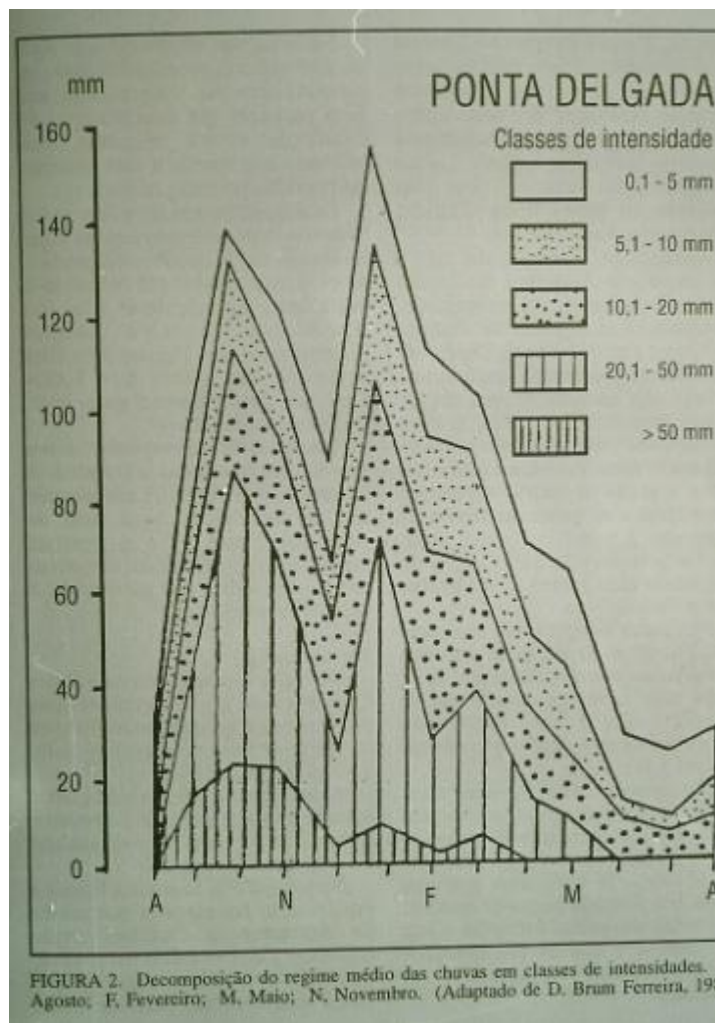
# O Enquadramento dos Açores



# Costa Norte da Ilha Terceira

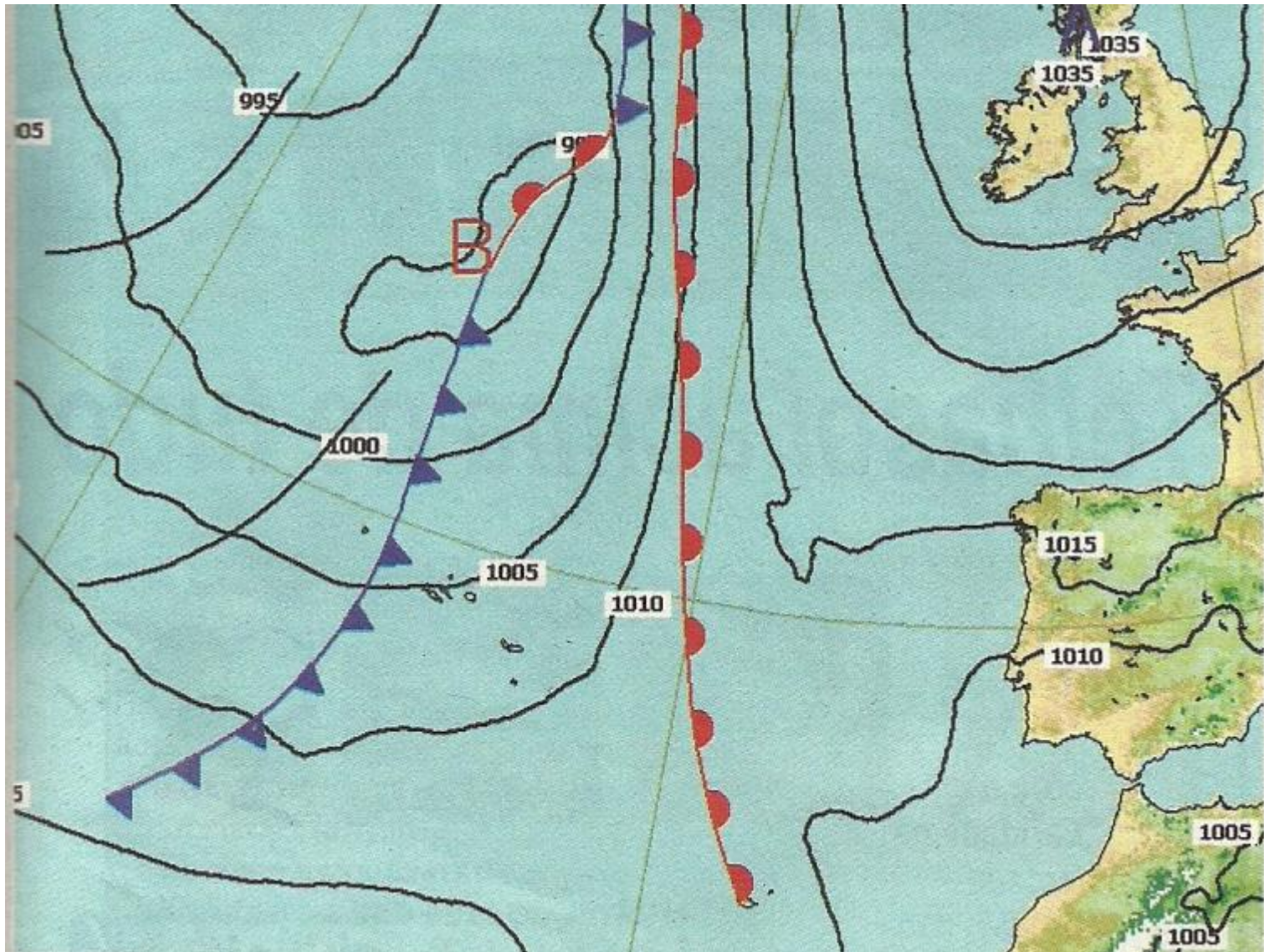


# Tipos de Tempo



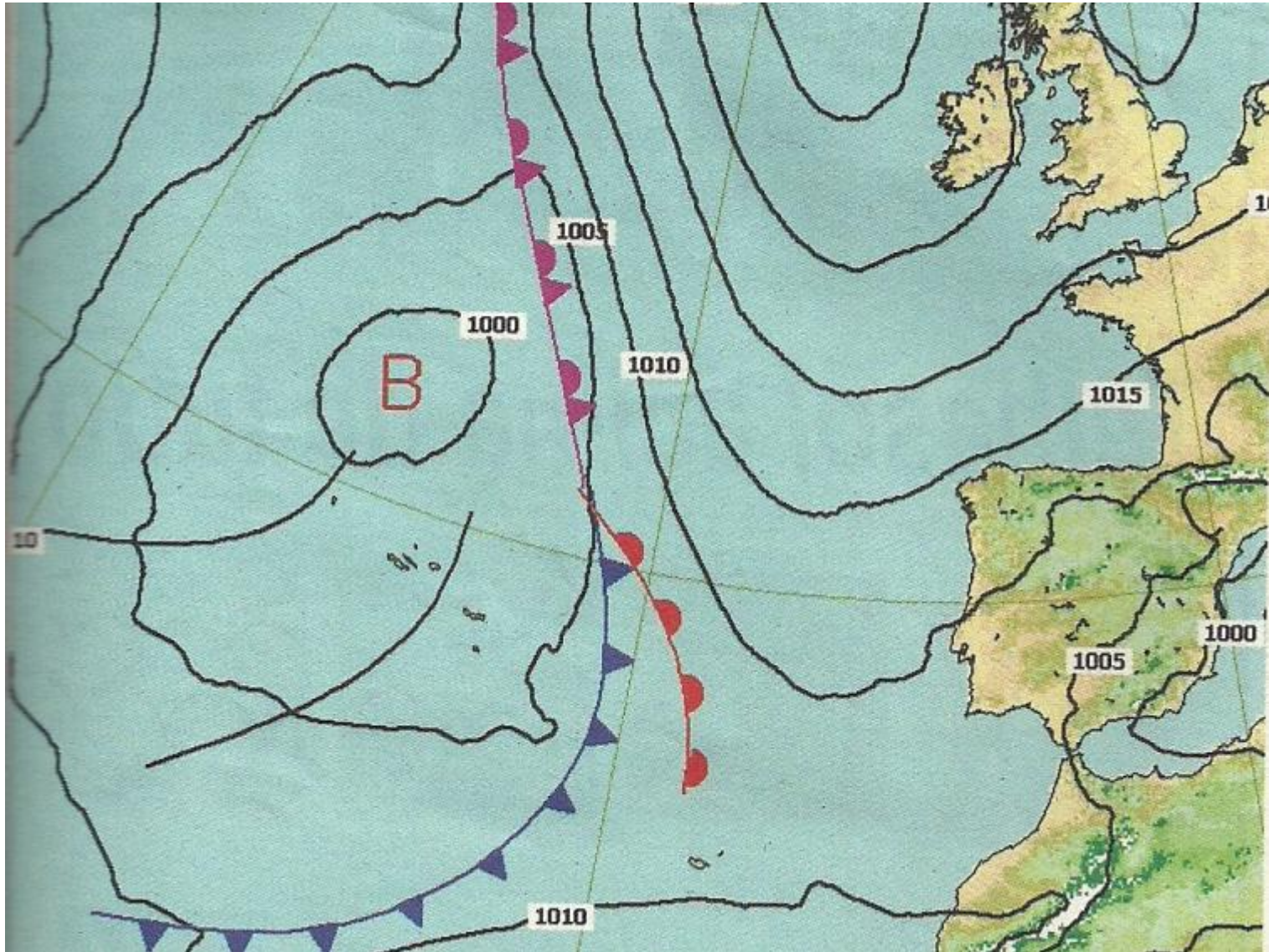


## COSTA SINÓPTICA DE SUPERFÍCIE DE 13-12-2009



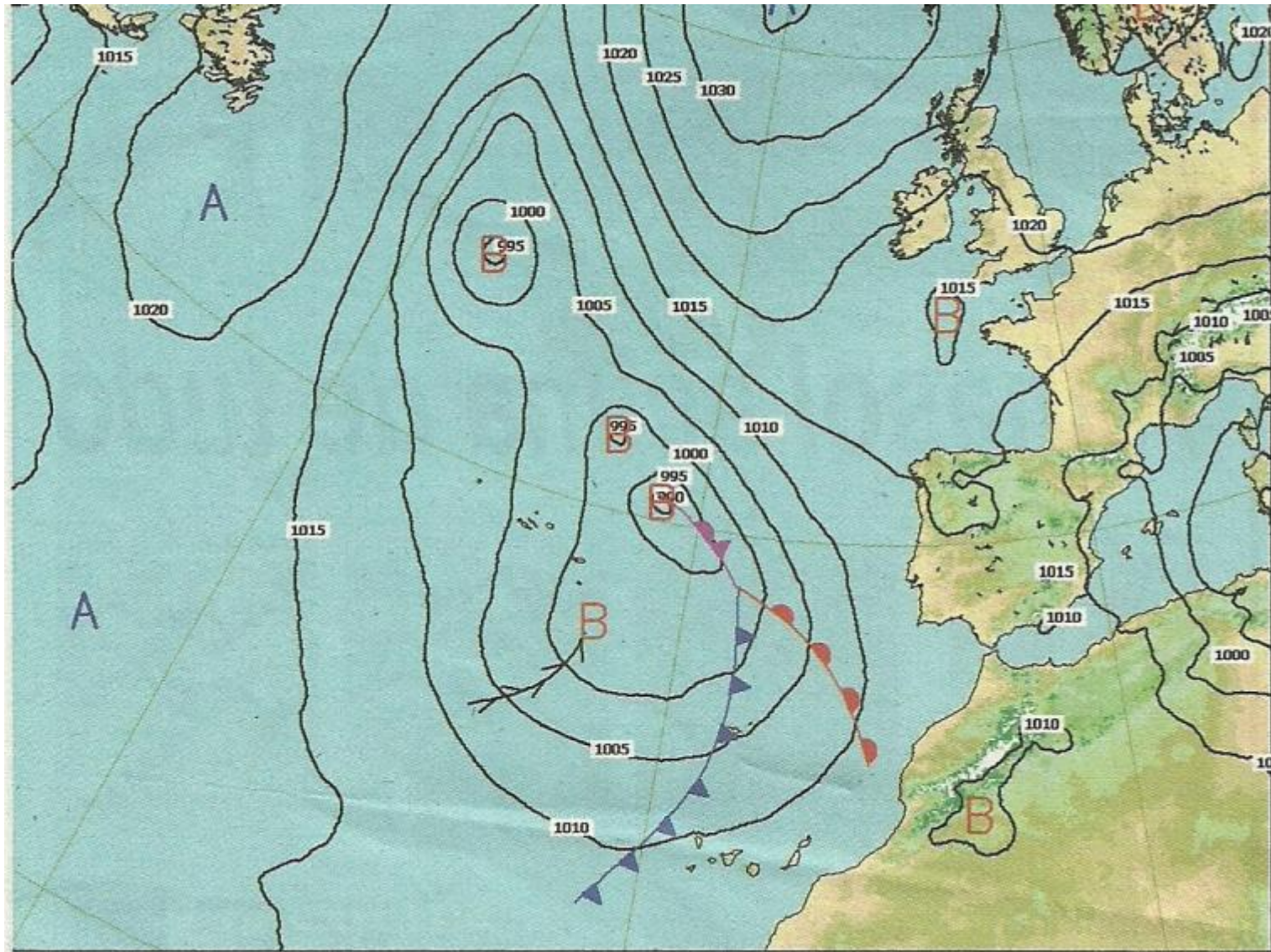


## COSTA SINÓPTICA DE SUPERFÍCIE DE 14-12-2009





## COSTA SINÓPTICA DE SUPERFÍCIE DE 15-12-2009





Dia	Temperatura (C)			Hr. Med (%)	Vento (km/h)			Pres. n. mar (Hp)	Prec. (mm)	Nub Oct	Sol D-1 (h)	Vis Km
	Max	Min	Med		Dir.	Vel.	Rch.					
<a href="#">31-Out</a>	22.2	17.6	20.3	91.1	SSE	22.5	97.3	1012.3	45.0	7.9	0.5	7.9
<a href="#">30-Out</a>	20.2	15.0	16.6	78.5	SW	14.9	39.6	1006.3	2.0	6.1	0.8	9.6
<a href="#">29-Out</a>	19.6	15.6	17.4	76.4	SW	20.7	64.8	1002.6	13.0	7.4	2.3	9.9
<a href="#">28-Out</a>	21.8	16.4	19.0	74.3	SSW	21.6	86.5	1004.1	15.0	6.4	5.1	9.6
<a href="#">27-Out</a>	22.0	14.8	17.6	75.7	W	12.2	50.4	1008.1	0.1	3.0	8.9	10.0
<a href="#">26-Out</a>	22.4	16.2	18.4	67.3	WSW	16.7	43.2	1007.3	Ip	4.4	7.1	10.0
<a href="#">25-Out</a>	22.2	18.6	20.2	76.5	S	23.0	90.1	1010.3	2.0	6.5	7.0	9.8
<a href="#">24-Out</a>	22.5	15.2	18.5	80.1	W	9.5	43.2	1014.2	0.0	3.4	1.7	10.0
<a href="#">23-Out</a>	23.0	20.4	21.4	84.5	SSW	20.3	68.4	1007.6	7.6	6.9	2.5	10.0
<a href="#">22-Out</a>	23.2	18.8	20.2	83.1	W	12.6	43.2	1011.8	Ip	4.5	9.5	10.0
<a href="#">21-Out</a>	21.4	15.8	17.9	71.1	NW	16.2	39.6	1014.6	0.0	3.0	7.6	10.0
<a href="#">20-Out</a>	25.2	17.3	19.7	70.7	NW	27.9	46.8	1017.4	8.0	5.9	7.8	8.9
<a href="#">19-Out</a>	22.8	16.6	19.1	82.8	WSW	8.6	----	1020.7	0.0	4.5	8.2	10.0
<a href="#">18-Out</a>	23.4	16.6	19.5	87.4	ENE	5.9	----	1022.7	Ip	4.4	5.5	10.0
<a href="#">17-Out</a>	23.6	19.4	20.6	89.1	NE	9.5	----	1020.6	0.0	5.2	8.0	10.0
<a href="#">16-Out</a>	21.8	18.0	20.0	93.6	NE	9.9	28.8	1017.7	Ip	6.2	1.3	10.0
<a href="#">15-Out</a>	21.0	18.2	19.4	93.2	NNE	13.1	39.6	1015.8	15.0	7.1	3.9	8.9
<a href="#">14-Out</a>	26.6	18.0	20.2	84.3	NNW	9.0	----	1014.7	0.0	4.5	8.7	10.0
<a href="#">13-Out</a>	23.0	18.4	19.9	91.0	SSE	14.9	61.2	1012.9	19.0	5.8	1.7	8.1
<a href="#">12-Out</a>	22.5	20.2	21.0	93.9	SE	40.5	72.0	1013.0	6.0	7.5	0.8	8.6
<a href="#">11-Out</a>	23.2	20.4	21.2	90.0	SE	34.7	50.4	1016.4	0.0	6.2	8.4	10.0
<a href="#">10-Out</a>	24.8	19.8	21.4	85.6	SSE	24.8	50.4	1018.5	0.0	3.6	8.5	10.0
<a href="#">09-Out</a>	24.5	21.2	22.0	78.1	SSW	21.6	57.6	1018.4	0.0	3.1	9.4	10.0
<a href="#">08-Out</a>	22.4	17.5	19.6	82.1	WSW	10.4	46.8	1020.1	0.0	3.4	9.4	10.0
<a href="#">07-Out</a>	22.5	18.0	19.6	88.8	NW	27.0	57.6	1014.7	2.4	5.4	6.2	9.8
<a href="#">06-Out</a>	21.4	16.0	18.3	86.9	WNW	27.8	79.3	1002.7	8.0	5.1	5.8	10.0
<a href="#">05-Out</a>	22.8	18.4	20.1	87.1	WNW	21.2	50.4	1001.2	5.0	4.0	6.6	9.4
<a href="#">04-Out</a>	24.4	19.6	21.0	87.7	SSE	16.2	43.2	1001.5	5.8	6.5	3.6	9.5
<a href="#">03-Out</a>	24.5	20.8	22.2	77.3	S	13.5	39.6	1005.4	0.2	6.1	8.1	10.0
<a href="#">02-Out</a>	24.2	19.8	21.2	87.5	SE	27.9	61.2	1000.8	----	6.4	4.4	10.0

Fecha	Temperatura (C)			Hr. Med (%)	Viento (km/h)			Pres. n. mar (Hp)	Prec. (mm)	Nub Oct	Sol D-1 (h)	Vis Km
	Max	Min	Med		Dir.	Vel.	Rch.					
<a href="#">30-Nov</a>	18.8	15.0	16.4	74.3	WSW	14.0	46.8	1025.5	0.0	5.6	4.5	10.0
<a href="#">29-Nov</a>	18.6	14.6	16.0	72.1	NW	21.6	43.2	1025.5	Ip	6.9	2.7	9.8
<a href="#">28-Nov</a>	17.5	10.2	13.2	78.9	WNW	9.9	32.4	1027.5	0.0	4.2	8.2	10.0
<a href="#">27-Nov</a>	17.4	13.6	14.9	69.4	N	14.9	28.8	1027.9	0.0	3.6	6.1	10.0
<a href="#">26-Nov</a>	16.2	10.2	12.6	73.3	N	2.3	----	1026.6	0.0	5.0	3.6	10.0
<a href="#">25-Nov</a>	15.6	11.2	13.7	64.7	N	14.9	50.4	1023.7	0.0	5.6	0.1	10.0
<a href="#">24-Nov</a>	19.8	14.0	17.3	80.7	SSW	29.3	75.6	1019.4	19.2	6.0	4.2	9.2
<a href="#">23-Nov</a>	18.0	14.4	15.8	67.0	SSW	9.5	39.6	1033.4	0.0	6.6	0.6	10.0
<a href="#">22-Nov</a>	17.4	11.6	14.5	74.1	W	10.8	46.8	1032.7	0.0	5.1	4.8	10.0
<a href="#">21-Nov</a>	17.6	10.2	12.9	72.3	WNW	33.3	82.9	1015.4	5.4	4.4	3.8	9.5
<a href="#">20-Nov</a>	17.5	12.0	15.1	69.3	WSW	25.2	97.3	1008.9	1.0	3.1	5.5	10.0
<a href="#">19-Nov</a>	19.8	15.0	17.6	86.3	SSW	39.2	100.9	1007.5	34.0	7.5	0.8	7.1
<a href="#">18-Nov</a>	19.2	16.5	17.7	74.2	SW	31.5	90.1	1017.0	2.0	6.9	3.2	9.9
<a href="#">17-Nov</a>	17.4	11.0	14.3	76.5	NW	19.4	43.2	1020.7	3.4	4.8	3.0	9.9
<a href="#">16-Nov</a>	16.2	12.0	14.1	67.5	NW	30.6	61.2	1015.2	2.4	4.5	3.8	10.0
<a href="#">15-Nov</a>	17.2	11.2	13.6	73.3	WNW	23.0	39.6	1008.5	2.8	5.0	1.7	10.0
<a href="#">14-Nov</a>	16.6	13.2	14.0	72.4	W	13.5	61.2	1012.5	0.1	4.9	6.6	10.0
<a href="#">13-Nov</a>	21.0	13.2	17.4	70.9	WSW	36.9	90.1	1005.7	10.0	6.2	7.5	10.0
<a href="#">12-Nov</a>	19.8	15.0	17.1	74.5	W	14.9	57.6	1014.2	0.0	4.2	5.0	10.0
<a href="#">11-Nov</a>	20.8	14.8	16.9	81.9	WNW	22.5	68.4	1017.4	12.1	4.8	0.1	8.8
<a href="#">10-Nov</a>	21.8	19.0	20.1	80.6	S	18.9	72.0	1023.5	Ip	6.0	3.8	10.0
<a href="#">09-Nov</a>	21.5	17.6	18.9	84.1	SSE	20.7	39.6	1029.3	Ip	3.2	8.5	10.0
<a href="#">08-Nov</a>	20.2	16.4	17.9	87.4	SE	15.3	----	1032.0	0.0	5.0	1.5	10.0
<a href="#">07-Nov</a>	19.5	16.0	17.3	98.3	E	7.7	----	1032.8	1.5	7.5	0.4	7.0
<a href="#">06-Nov</a>	19.8	16.0	17.7	90.5	NNW	4.5	----	1031.3	0.1	6.1	7.0	9.5
<a href="#">05-Nov</a>	19.5	15.0	17.3	90.4	NNE	6.3	----	1028.8	1.2	6.5	1.3	9.1
<a href="#">04-Nov</a>	20.1	17.4	18.4	90.6	NW	13.1	36.0	1027.3	4.3	7.0	5.0	8.1
<a href="#">03-Nov</a>	19.0	14.8	16.3	73.7	NW	11.7	----	1031.7	0.0	6.2	6.5	10.0
<a href="#">02-Nov</a>	20.0	15.2	16.9	73.5	N	7.7	28.8	1034.3	0.0	5.0	4.1	10.0
<a href="#">01-Nov</a>	23.0	16.4	19.5	93.1	WNW	18.0	64.8	1025.3	5.8	7.0	2.0	7.6



Fecha	Temperatura (C)			Hr. Med (%)	Viento (km/h)			Pres. n. mar (Hp)	Prec. (mm)	Nub Oct	Sol D-1 (h)	Vis Km
	Max	Min	Med		Dir.	Vel.	Rch.					
<a href="#">31-Dez</a>	14.4	7.6	10.9	72.1	NNW	14.0	50.4	1020.7	0.0	5.1	5.2	10.0
<a href="#">30-Dez</a>	13.8	10.2	12.3	70.1	NW	49.1	72.0	1008.6	4.4	5.6	3.8	9.6
<a href="#">29-Dez</a>	16.0	8.6	10.9	81.2	W	18.9	68.4	999.1	7.0	6.6	4.7	9.6
<a href="#">28-Dez</a>	17.8	12.8	15.5	84.3	SW	34.7	108.1	986.2	11.0	5.2	1.0	9.7
<a href="#">27-Dez</a>	17.8	13.4	15.6	87.3	S	49.5	100.9	991.3	26.7	6.6	0.0	9.4
<a href="#">26-Dez</a>	15.0	8.2	12.5	79.8	ESE	13.1	57.6	1010.0	0.1	5.6	2.6	10.0
<a href="#">25-Dez</a>	13.6	11.6	12.4	84.8	ENE	32.4	64.8	999.3	30.0	7.8	0.4	7.6
<a href="#">24-Dez</a>	15.2	11.8	12.6	77.6	NE	34.2	72.0	993.5	6.3	6.2	0.0	9.5
<a href="#">23-Dez</a>	16.4	11.6	13.2	92.0	SSE	9.5	54.0	985.8	13.3	6.5	0.5	9.1
<a href="#">22-Dez</a>	15.0	12.1	13.4	83.0	ENE	23.0	50.4	997.2	9.3	6.9	0.0	8.2
<a href="#">21-Dez</a>	16.2	11.6	13.3	75.4	WNW	29.7	64.8	992.7	2.1	3.6	7.7	10.0
<a href="#">20-Dez</a>	16.5	9.8	13.6	91.6	W	13.5	32.4	997.7	7.4	5.8	0.0	9.9
<a href="#">19-Dez</a>	15.2	9.8	13.2	92.8	NNW	18.0	57.6	1004.4	2.1	6.0	0.2	9.0
<a href="#">18-Dez</a>	16.6	11.2	14.0	87.2	ESE	18.9	50.4	996.3	3.3	4.9	6.1	9.6
<a href="#">17-Dez</a>	15.8	11.0	13.4	72.3	SSE	24.3	57.6	1000.4	3.0	4.1	6.1	10.0
<a href="#">16-Dez</a>	13.9	11.0	12.2	72.0	WNW	32.4	82.9	997.2	24.0	4.9	0.0	9.5
<a href="#">15-Dez</a>	18.5	10.4	14.8	84.5	NW	17.6	36.0	998.2	135.0	6.2	6.1	7.7
<a href="#">14-Dez</a>	19.8	14.8	17.0	81.2	SW	9.5	79.3	1002.2	1.1	5.8	2.1	9.9
<a href="#">13-Dez</a>	18.8	16.0	18.1	89.8	SSW	19.4	61.2	1006.6	1.2	7.9	0.0	9.5
<a href="#">12-Dez</a>	16.2	10.5	13.6	80.5	SW	13.1	54.0	1015.1	9.0	6.1	6.9	8.8
<a href="#">11-Dez</a>	13.6	10.4	12.0	71.6	NW	30.2	68.4	1010.0	2.6	4.9	0.5	9.4
<a href="#">10-Dez</a>	17.8	11.4	15.0	84.2	S	28.8	75.6	1005.8	5.0	6.4	5.2	9.2
<a href="#">09-Dez</a>	17.0	9.0	13.1	80.7	W	8.1	----	1017.6	0.0	4.5	1.7	10.0
<a href="#">08-Dez</a>	17.8	14.4	16.0	84.0	SW	25.2	72.0	1014.1	1.0	7.1	1.3	9.1
<a href="#">07-Dez</a>	16.8	10.4	13.2	77.6	WSW	9.9	57.6	1018.9	1p	4.6	4.6	10.0
<a href="#">06-Dez</a>	19.4	11.0	14.6	76.6	NW	24.3	72.0	1014.3	1.6	5.5	0.7	9.1
<a href="#">05-Dez</a>	19.0	15.0	16.9	77.7	SW	24.8	79.3	1015.2	1p	6.6	6.5	10.0
<a href="#">04-Dez</a>	18.8	12.6	16.1	86.8	SSW	17.6	82.9	1023.3	3.0	6.9	1.2	9.8
<a href="#">03-Dez</a>	18.5	11.6	15.0	82.1	SE	17.6	50.4	1027.4	0.0	4.2	8.6	10.0
<a href="#">02-Dez</a>	18.3	11.4	14.6	85.9	NW	10.8	32.4	1028.5	0.0	3.1	4.6	10.0
<a href="#">01-Dez</a>	19.5	16.2	17.4	88.5	W	23.4	46.8	1024.7	0.5	6.2	3.8	9.6



# Factos Históricos

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- ▶ Aqualva 1968
- ▶ As cheias rápidas



## Caso de estudo

As cheias rápidas na costa norte da ilha Terceira (Açores)





























AGUALVA

33-99-ZA



























































































































# Conclusões

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- ▶ Os tipos de tempo e o clima são dinâmicos, não são estáticos.
- ▶ As formas e os processos.
- ▶ Ordenamento?
- ▶ Que posição devem tomar as universidades?
- ▶ Ocupação do espaço!



Fim

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Obrigado!

