

# Nitrous oxide mixing rate during Dry and Wet Seasons in vertical profile over Central Amazon.



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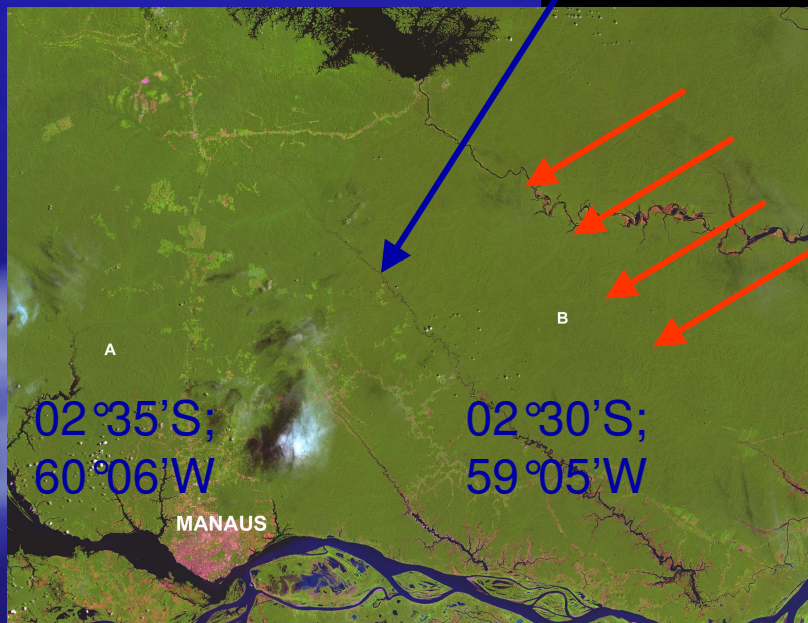
# Recent Studies

- Studies outside Amazonia have shown that compared to original forest, elevated  $\text{N}_2\text{O}$  and NO fluxes may occur in young pastures (Keller et al., 1993; Veldkamp et al., 1999).
- Pastures older than 10 years all have show very low emissions (Keller et al., 1993; Veldkamp et al., 1999; Erickson et al., 2001) unless they are fertilized (Veldkamp et al., 1998; Mosier and Delgado, 1997).



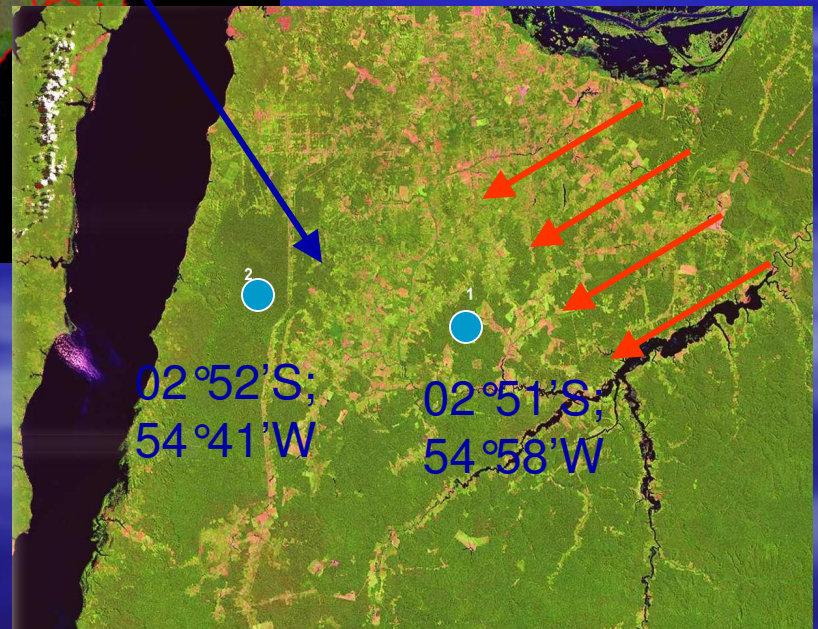
start December 2004

AMAZONAS



start December 2000

PARÁ



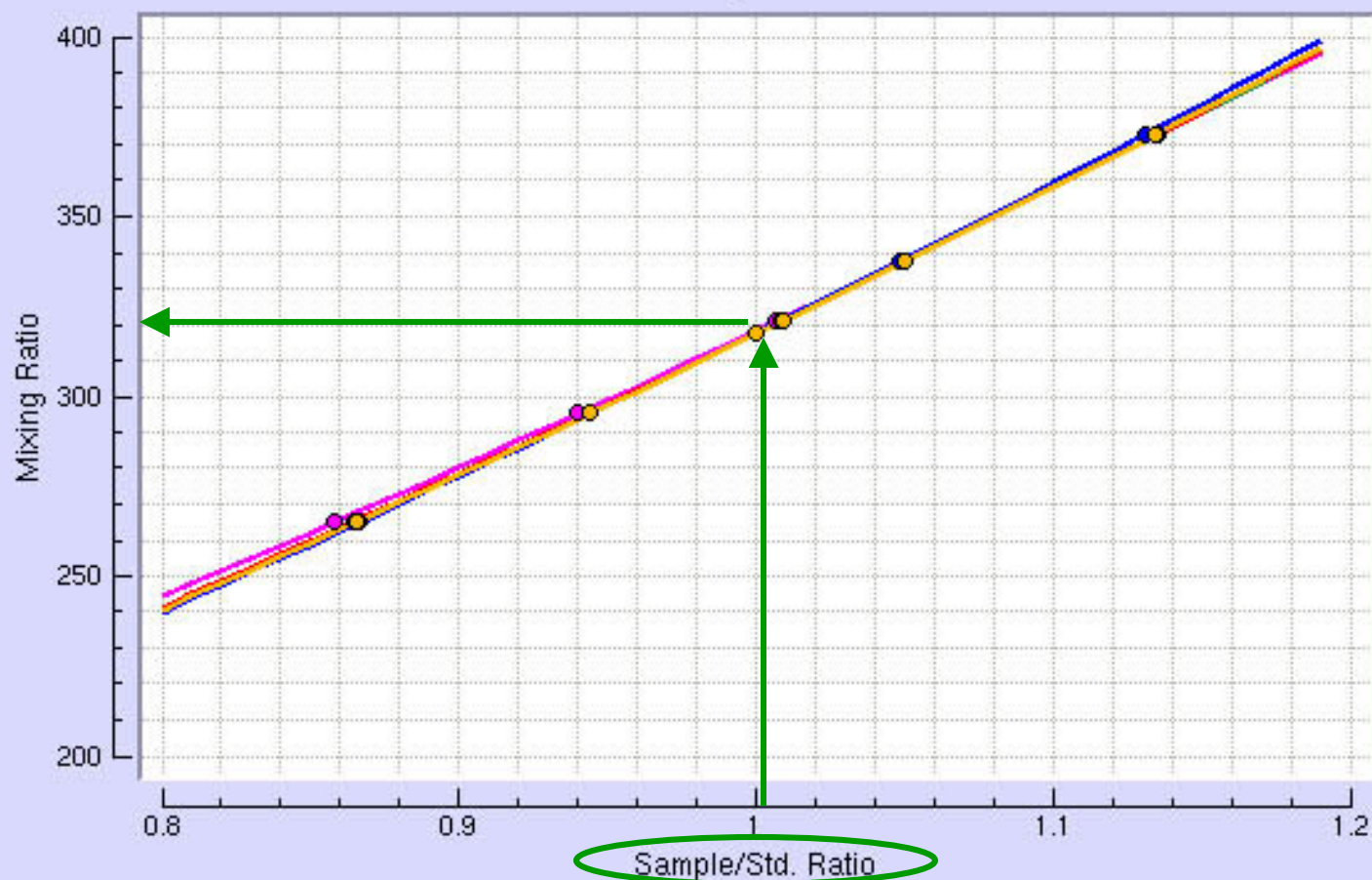
## MATERIAL AND METHODS

Non-Linearity

N2O

CO

N2O Response Curve



Sample/Std. Ratio

2006-07-25.0910

2005-12-22.1037

2005-06-15.1631

2006-05-10.1504

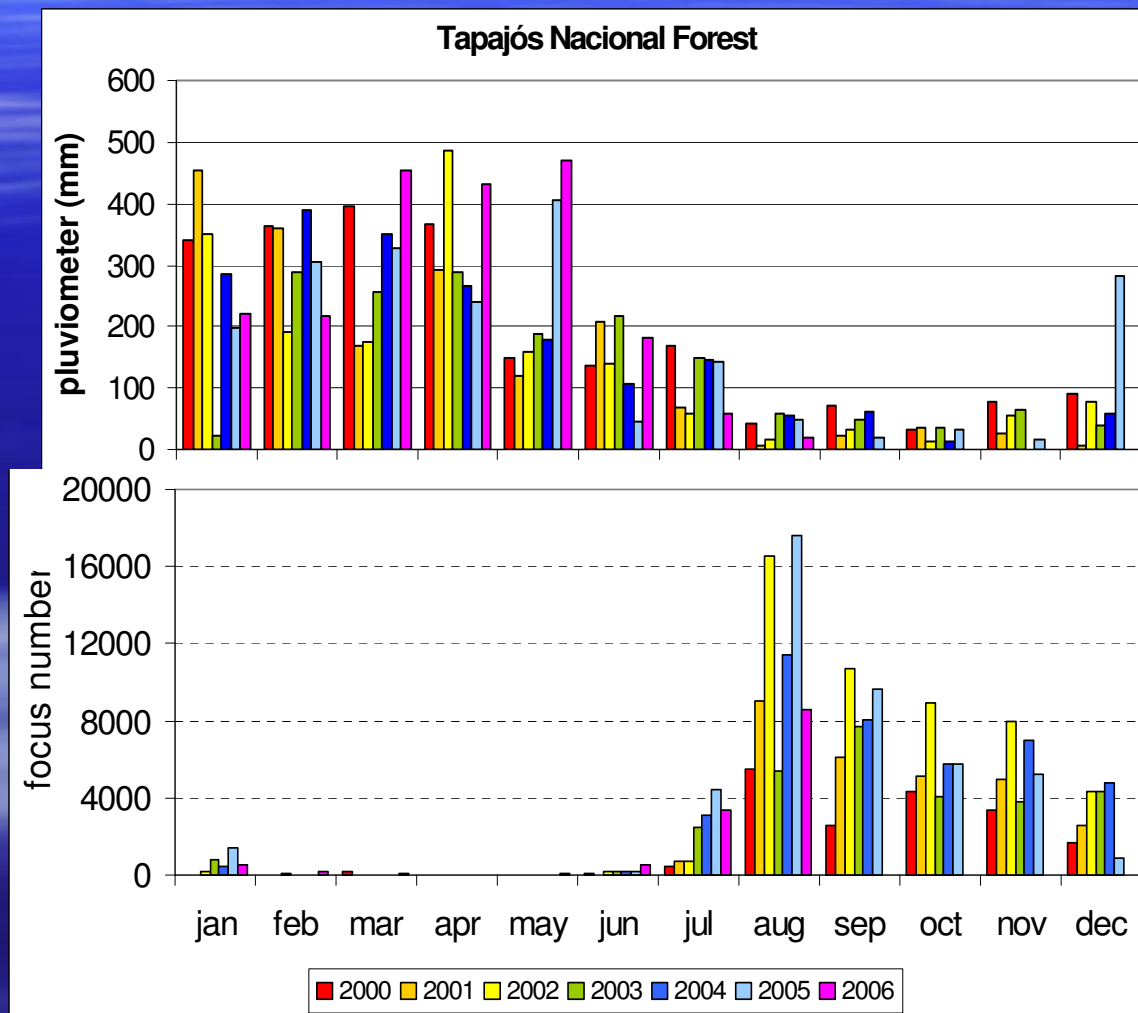
2005-10-06.1603

Refresh



## RESULTS

# Dry and Wet Classification Flona Tapajós



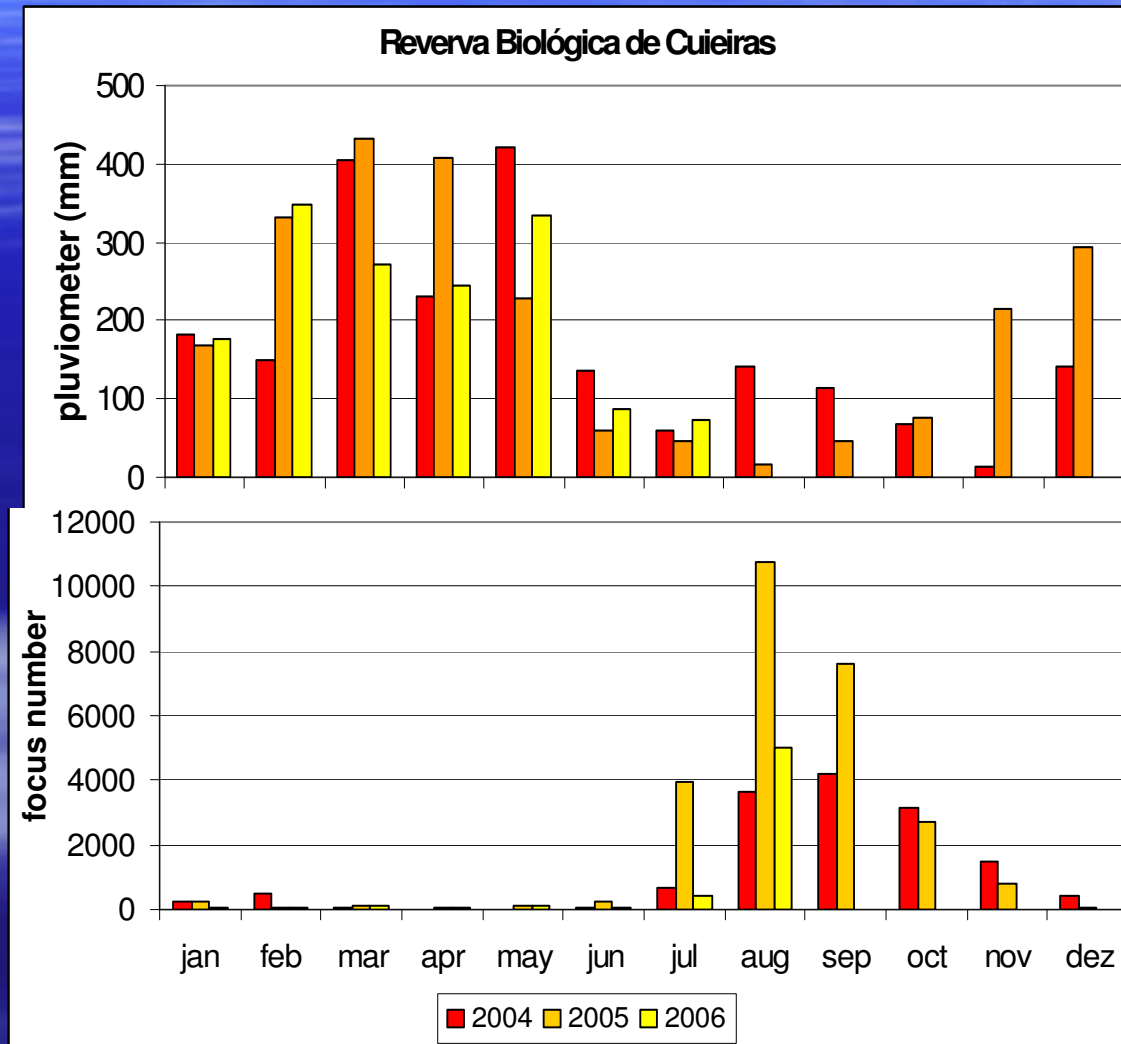
**Wet Season:**  
**January to July**

**Dry Season:**  
**August to December**

We considered delay  
and anticipation

## RESULTS

# Dry and Wet Classification Reserva Biológica de Cuieiras

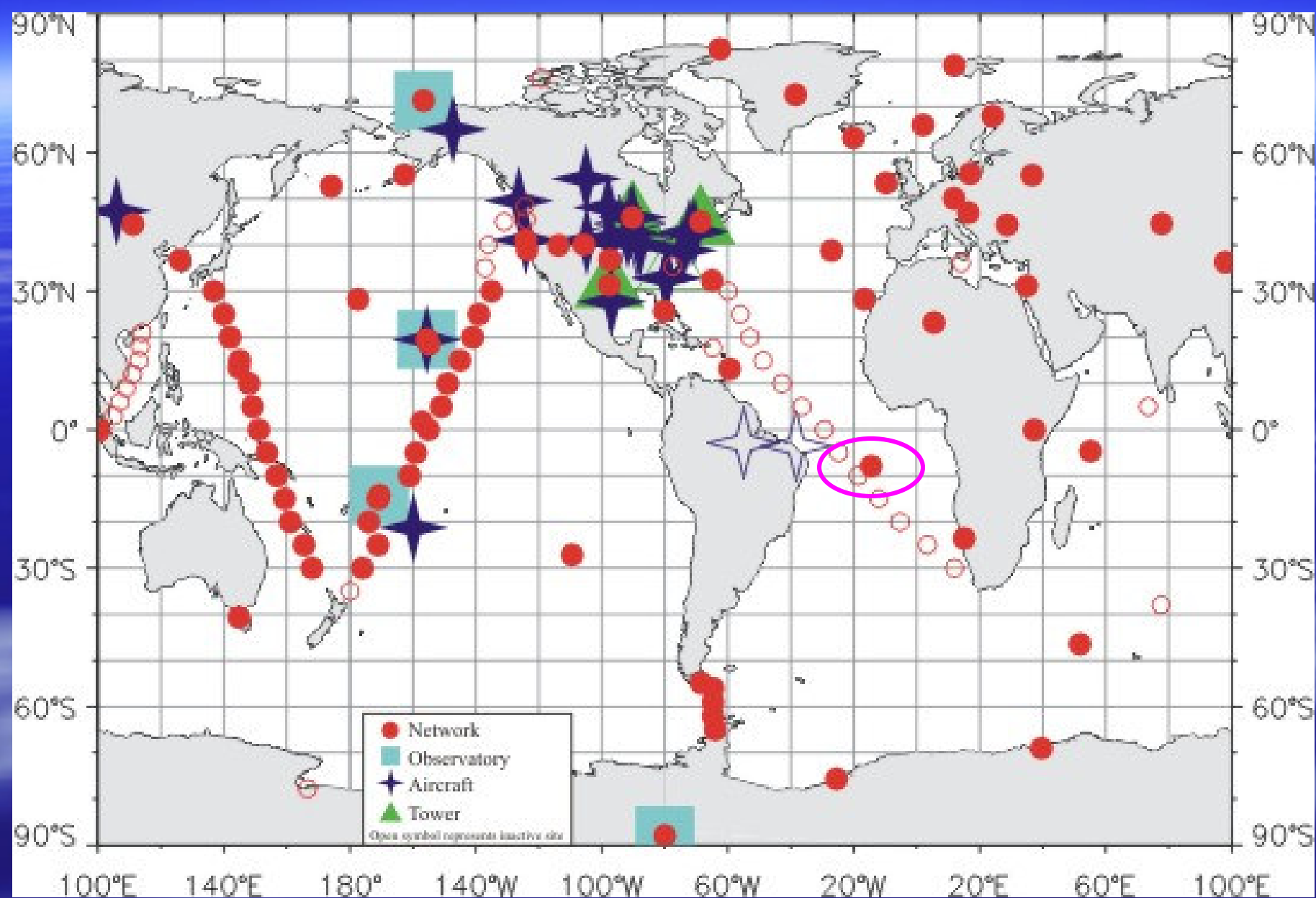


**Wet Season:**  
**November to May**

**Dry Season:**  
**June to October**

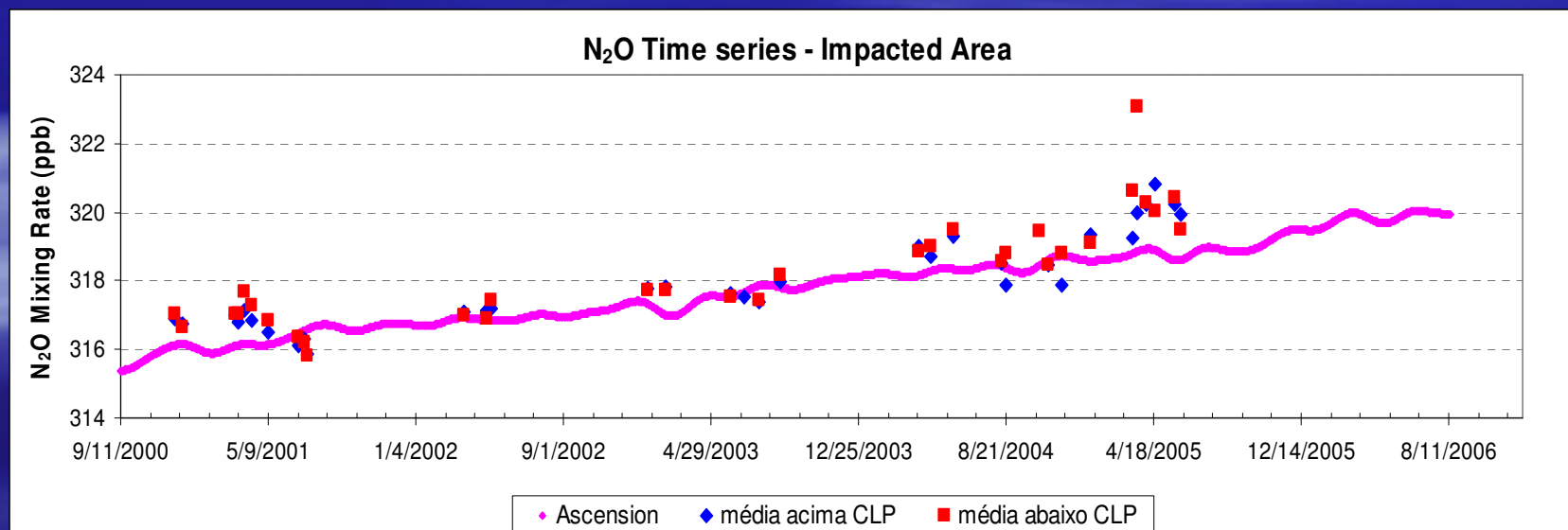
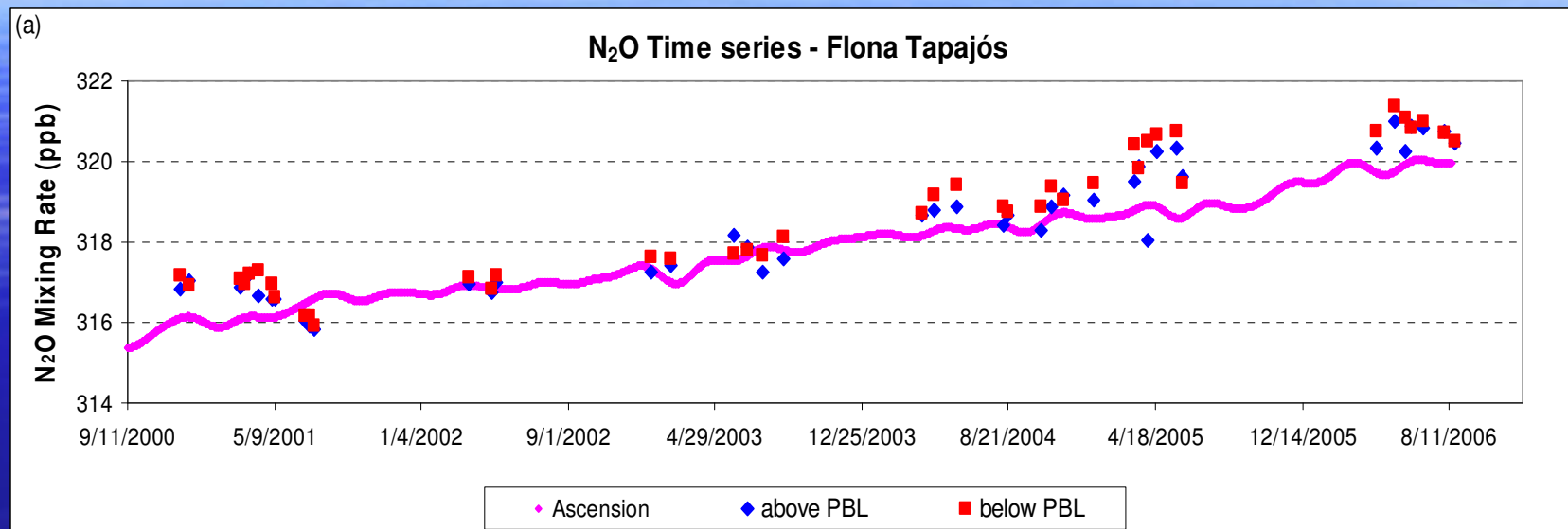
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## RESULTS



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# Time Serie – Flona Tapajós



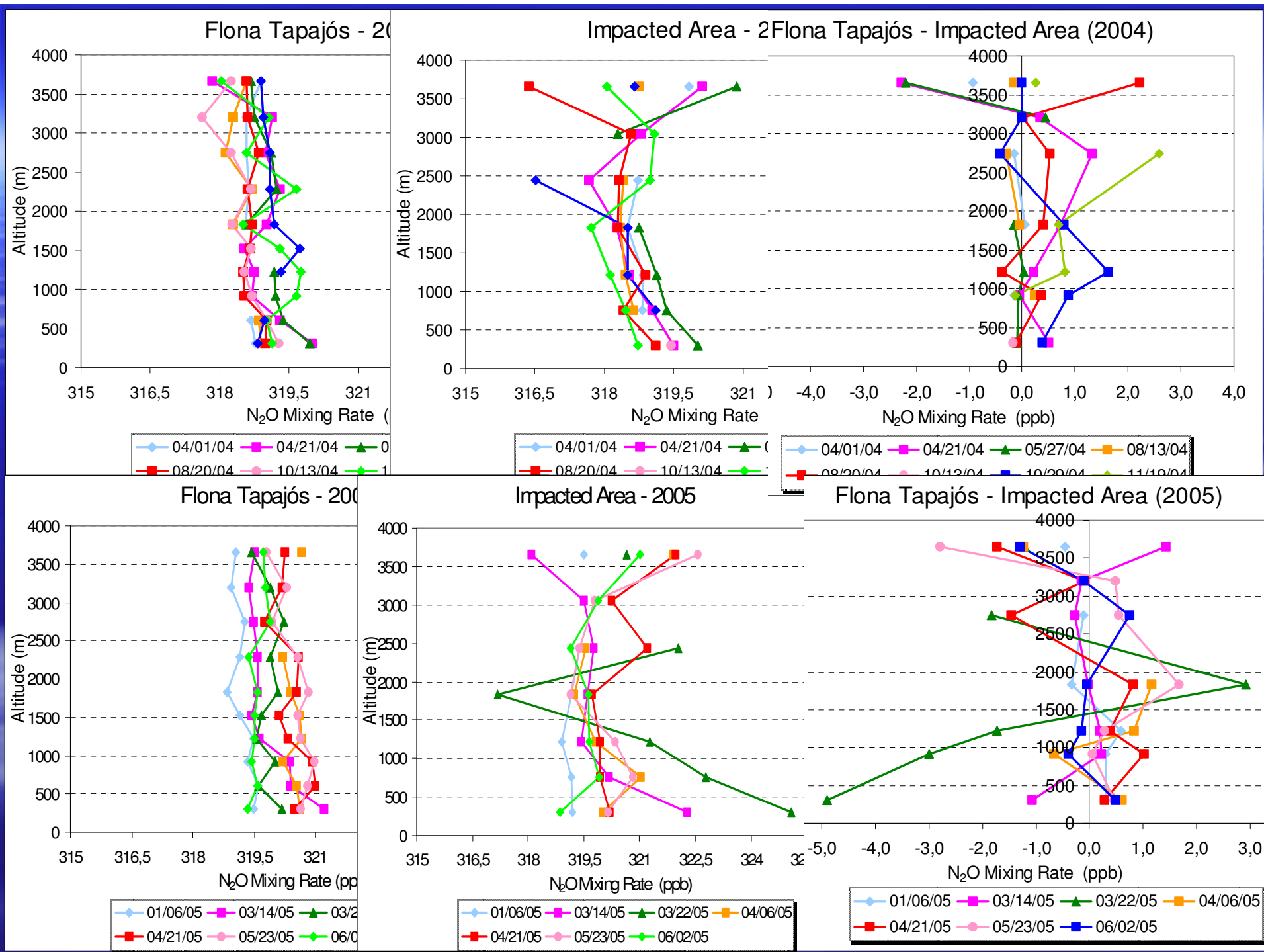


Altitude (m)	N <sub>2</sub> O Mixing Rate (ppb) - 12/07/00	N <sub>2</sub> O Mixing Rate (ppb) - 12/21/00
3650	-	316.0
2750	316.2	-
2250	316.8	-
2250	-	317.0
1800	317.2	-
1800	-	317.5
1500	317.0	317.0
1250	316.5	317.0
1200	316.2	316.5
900	316.5	316.5
600	316.5	316.5
300	316.5	316.5

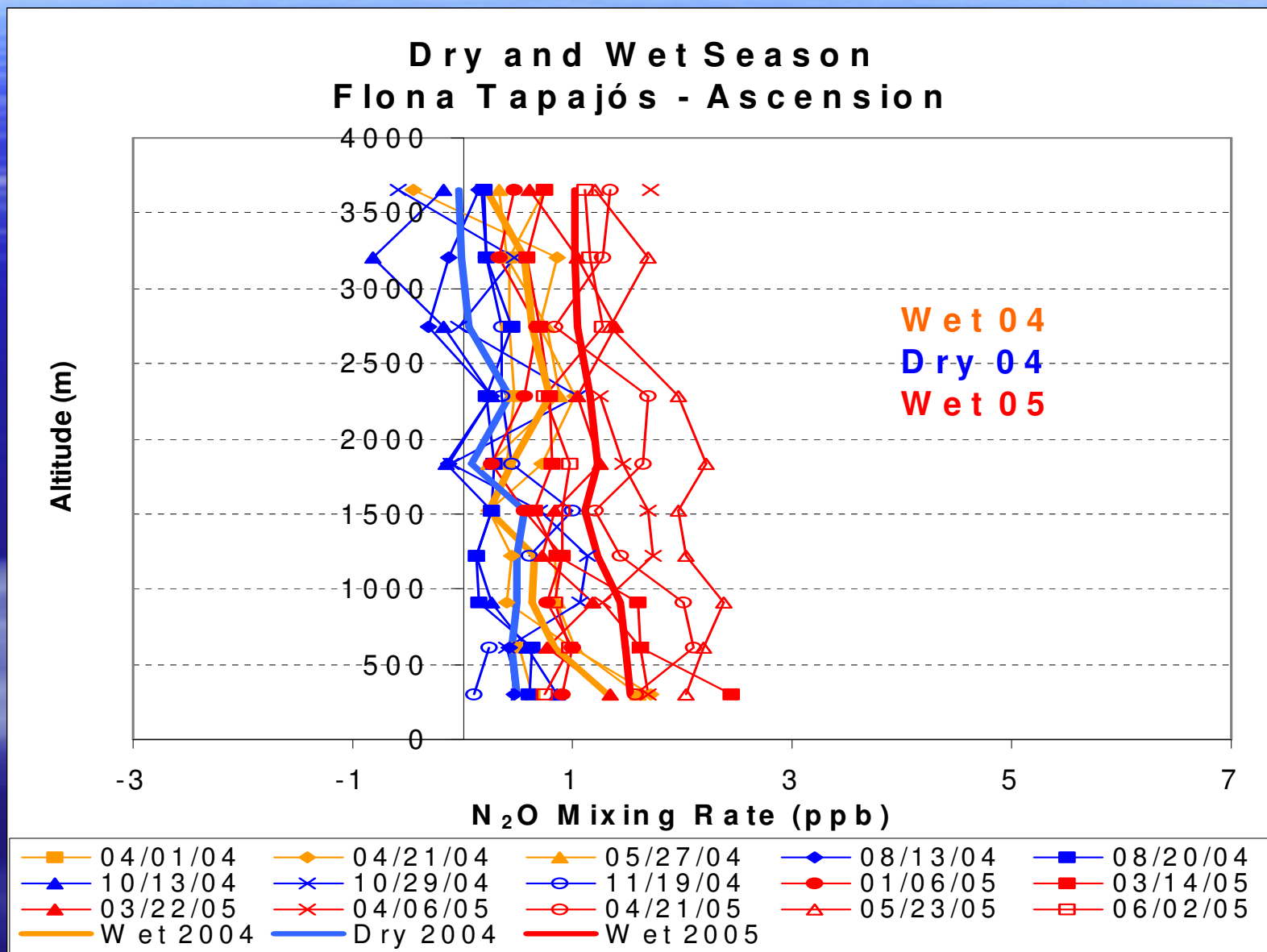
Altitude (m)	03/23/02 (ppb)	04/29/02 (ppb)	05/06/02 (ppb)
300	316.8	316.5	316.8
600	316.8	316.5	316.8
900	316.8	316.5	316.8
1200	316.8	316.5	316.8
1500	316.8	316.5	316.8
1800	316.8	316.5	316.8
2100	316.8	316.5	316.8
2400	316.8	316.5	316.8
2700	316.8	316.5	316.8
3000	316.8	316.5	316.8
3300	316.8	316.5	316.8
3600	316.8	316.5	316.8
3900	316.8	316.5	316.8

Figure 1 is a line graph showing the vertical profile of  $N_2O$  mixing rate (ppb) versus altitude (m) for six different dates in 2003. The y-axis represents altitude from 0 to 4000 meters, and the x-axis represents the  $N_2O$  mixing rate from 315 to 325.5 ppb. The data series are: 01/15/03 (light blue diamonds), 02/15/03 (magenta squares), 05/30/03 (green triangles), 06/21/03 (orange squares), 07/17/03 (red squares), and 08/20/03 (pink circles). The profiles show a general decrease in altitude as the  $N_2O$  mixing rate increases, with a notable peak in altitude around 317.5 ppb for most dates.

Date	Altitude (m)	$N_2O$ Mixing Rate (ppb)
01/15/03	1850	316.5
	1500	317.0
	900	318.0
02/15/03	3700	317.5
	2750	317.0
	300	317.5
05/30/03	3200	318.0
	2700	318.0
	300	317.5
06/21/03	3650	318.0
	2700	317.5
	300	318.0
07/17/03	3700	318.0
	2750	317.5
	300	316.5
08/20/03	3700	318.0
	2700	317.5
	900	318.0

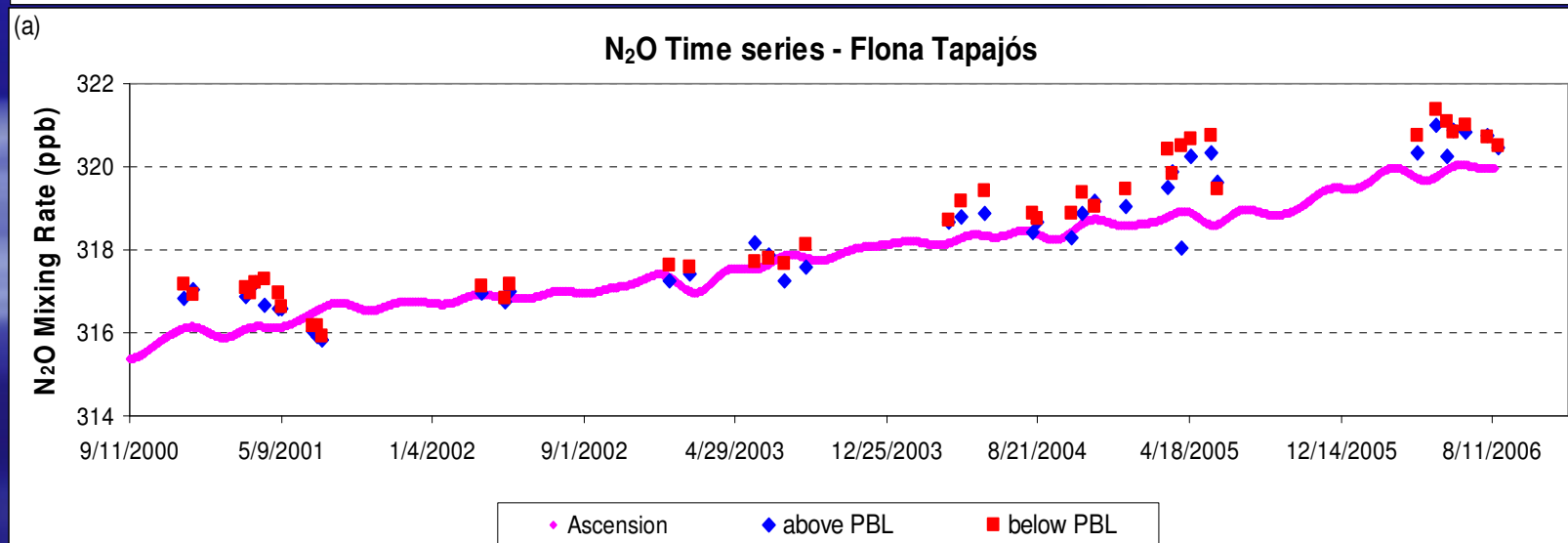
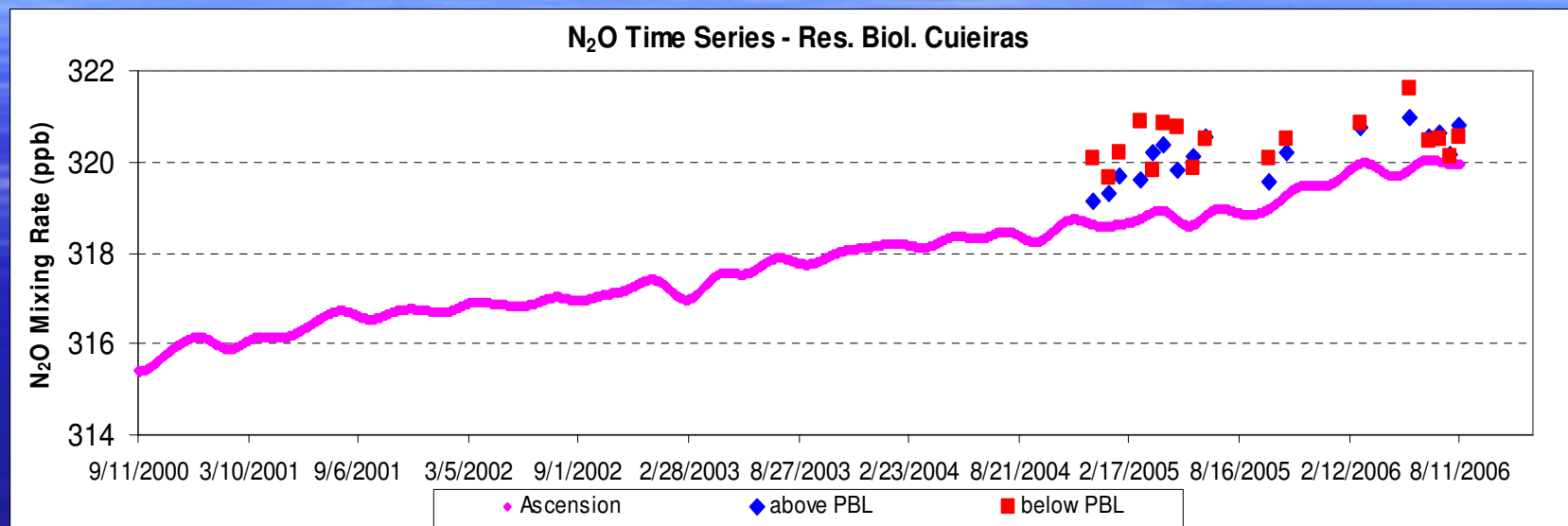


# Comparing Dry and Wet Season removing Global influence



## RESULTS

# Comparing Cuierias and Tapajós

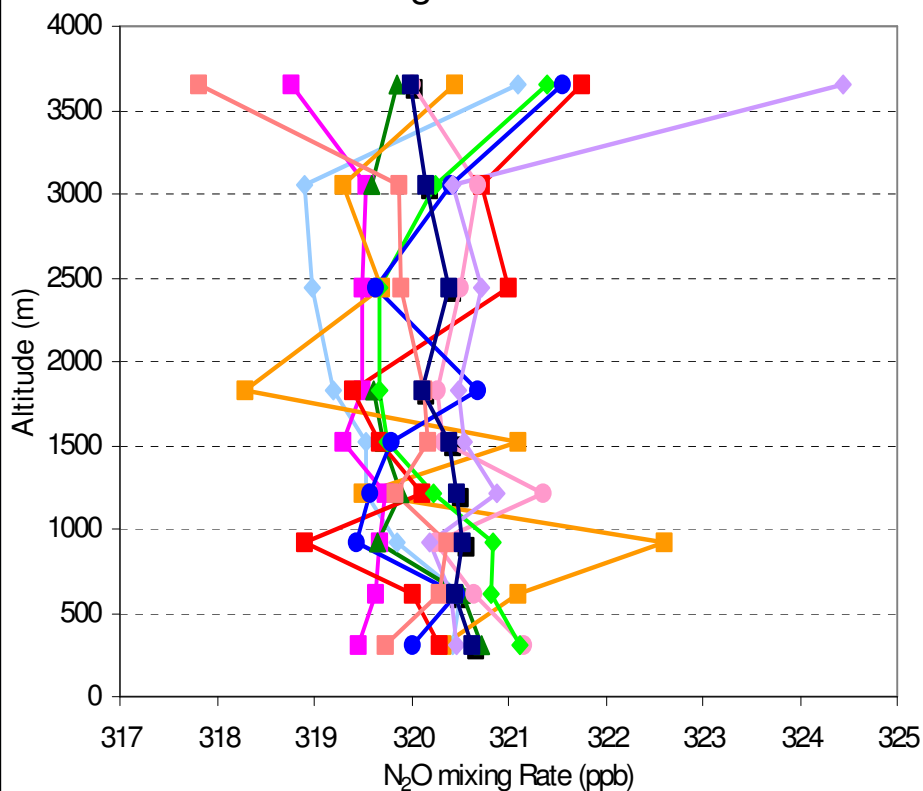




## RESULTS

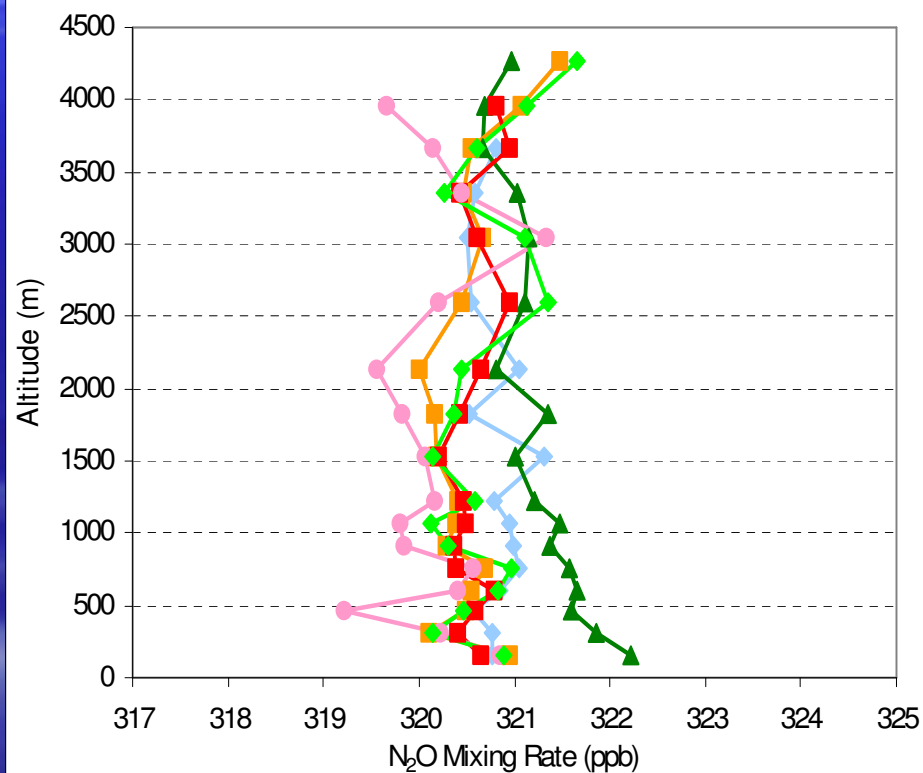
# Vertical Profile - Cuieiras

Reserva Biológica de Cuieiras 2005



12/20/04	01/14/05	02/02/05	03/08/05
03/29/05	04/14/05	05/07/05	06/01/05
06/21/05	10/03/05	11/01/05	

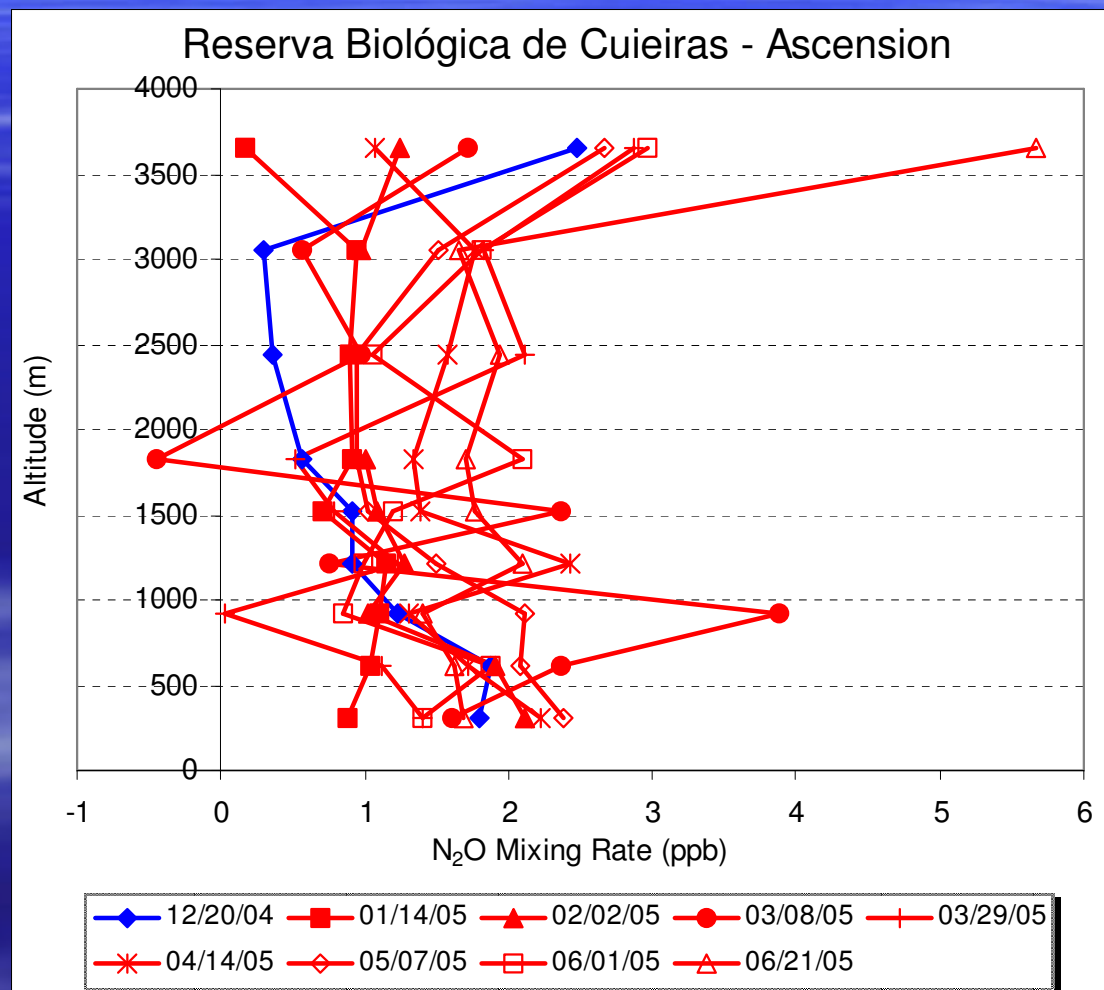
Reserva Biológica de Cuieiras 2006



03/03/06	04/20/06	05/23/06	06/21/06
07/10/06	07/27/06	08/10/06	

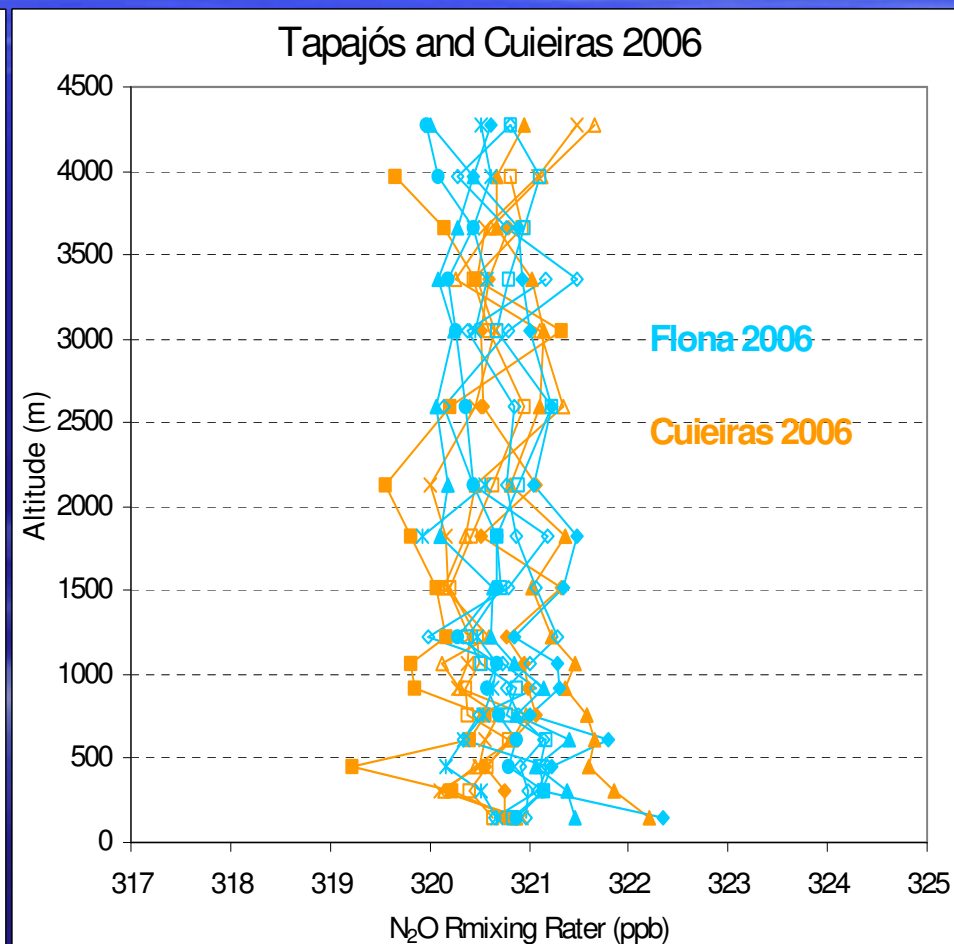
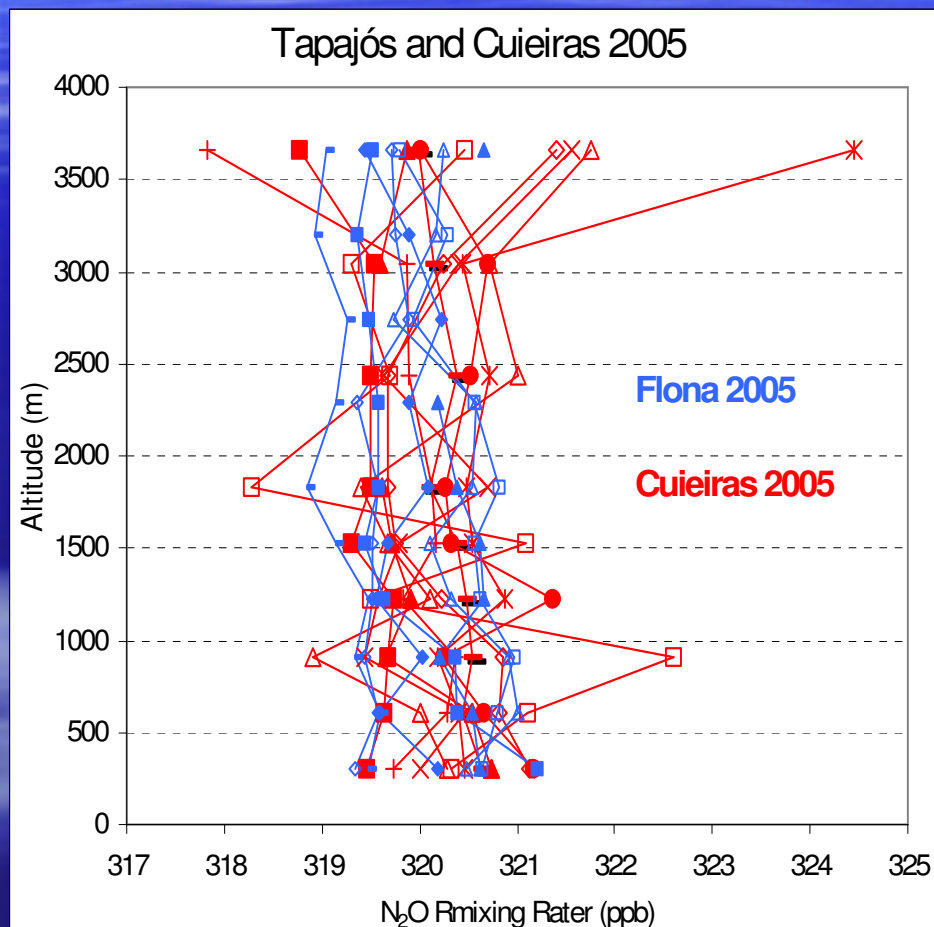
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# Comparing Dry and Wet Season removing Global influence



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# Tapajós vs. Cuieiras 2005 and 2006



# Conclusion

- Both Cuieiras (Am) and Flona Tapajós (Pará) show enhancement relative to background  
→  $\text{N}_2\text{O}$  Flux
- At Flona Tapajós (Pará), enhancement is growing with time since 2003
- Cuieiras (Am) and Flona Tapajós (Pará) shows very similar enhancement  
→ Most flux is from east of Santarem?