

Supplementary material

Table 1 – Modeled monthly CO<sub>2</sub> fluxes in the western and eastern tropical Atlantic Ocean. We consider here surface salinities lower than 34.9 as corresponding to the Amazon-Orinoco river plumes in the western Atlantic, and surface salinities lower than 34 as corresponding to the Congo River plume in the eastern Atlantic.

Scenario	Western tropical Atlantic (70°W-35°W 5°S-20°N)	CO <sub>2</sub> flux (in g C m <sup>-2</sup> a <sup>-1</sup> )	CO <sub>2</sub> flux (in g C m <sup>-2</sup> a <sup>-1</sup> )
		<i>All salinities</i>	<i>SSS&lt;34.9</i>
TODAY	January	-3.80	-2.55
	February	-4.93	4.51
	March	-2.77	-1.22
	April	-0.64	-7.92
	May	1.72	-9.35
	June	3.20	-7.86
	July	5.28	-3.44
	August	7.97	1.96
	September	9.16	5.08
	October	8.74	5.57
	November	5.29	2.40
	December	0.98	-2.70
		<b><i>Average (1998-2005)</i></b>	<b><i>2.51</i></b>
		<i>All Salinities</i>	<i>SSS &lt; 34.9</i>
NO_RIVER	January	-4.74	-11.16
	February	-5.78	-15.61
	March	-3.51	-21.74
	April	-1.22	-19.55
	May	1.09	-18.11
	June	2.49	-14.64
	July	4.67	-7.92
	August	7.39	-1.29
	September	8.51	2.10
	October	7.92	2.43
	November	4.27	-1.41
	December	-0.07	-6.92
		<b><i>Average (1998-2005)</i></b>	<b><i>1.75</i></b>
	Eastern tropical Atlantic, Gulf of Guinea (10°W- 20°E, 10°S-7°N)	CO <sub>2</sub> flux (in g C m <sup>-2</sup> a <sup>-1</sup> )	CO <sub>2</sub> flux (in g C m <sup>-2</sup> a <sup>-1</sup> )

		<i>All salinities</i>	<i>SSS&lt;34.9</i>
TODAY	January	3.71	-0.35
	February	7.03	1.67
	March	8.50	1.91
	April	6.51	0.12
	May	0.93	-4.24
	June	-5.79	-9.26
	July	-10.03	-9.64
	August	-11.42	-9.14
	September	-8.21	-9.36
	October	-3.69	-5.30
	November	-0.40	-2.33
	December	1.16	-2.17
	<b><i>Average (1998-2005)</i></b>		<b><i>-0.97</i></b>
		<i>All salinities</i>	<i>SSS&lt;34.0</i>
NO_RIVER	January	4.82	1.51
	February	8.07	3.39
	March	9.61	3.79
	April	7.80	2.24
	May	2.50	-1.72
	June	-4.18	-6.28
	July	-8.60	-5.01
	August	-10.18	-5.63
	September	-7.08	-7.22
	October	-2.61	-3.23
	November	0.75	-0.26
	December	2.38	0.19
	<b><i>Average (1998-2005)</i></b>		<b><i>0.27</i></b>

Table 2 – Relative contribution of plankton functional types to total surface chlorophyll (chl<sub>a</sub>) in the tropical Atlantic Ocean in scenarios TODAY and NO\_RIVER.

<i>Plankton functional type</i>	% of total chl <sub>a</sub> whole tropical Atlantic		% of total chl <sub>a</sub> coastal tropical Atlantic	
	<i>Scenario</i>		<i>Scenario</i>	
	<b>TODAY</b>	<b>NO_RIVER</b>	<b>TODAY</b>	<b>NO_RIVER</b>
Diatoms	10.0	9.9	14.2	5.8
Picophytoplankton	61.1	55.4	75.7	73.6
Mixed phytoplankton	11.8	13.9	3.5	7.8
DMS-producers	5.1	6.5	2.4	4.6
N-Fixers	2.5	3.2	1.1	1.9
Calcifiers	9.5	11.0	3.1	6.3
<i>Total</i>	100.0	100.0	100	100.0

Table 3 – Whole and coastal tropical Atlantic Ocean average values of PP, EP, CFLX (Tmoles C yr<sup>-1</sup>) and N-fixation rates (Tmoles N yr<sup>-1</sup>).

Scenario	PP	COASTAL PP	EP	COASTAL EP	CFLX	COASTAL CFLX	N-fix	COASTAL N-fix
NO_RIVER	292.23	33.53	38.93	4.75	3.09	0.32	0.71	0.07
TODAY	326.38	45.03	42.77	6.16	2.67	0.44	0.79	0.08
S_AMERICA	310.98	41.58	41.04	5.67	3.33	0.54	0.76	0.08
AFRICA	309.20	37.01	40.72	5.27	2.46	0.24	0.75	0.07

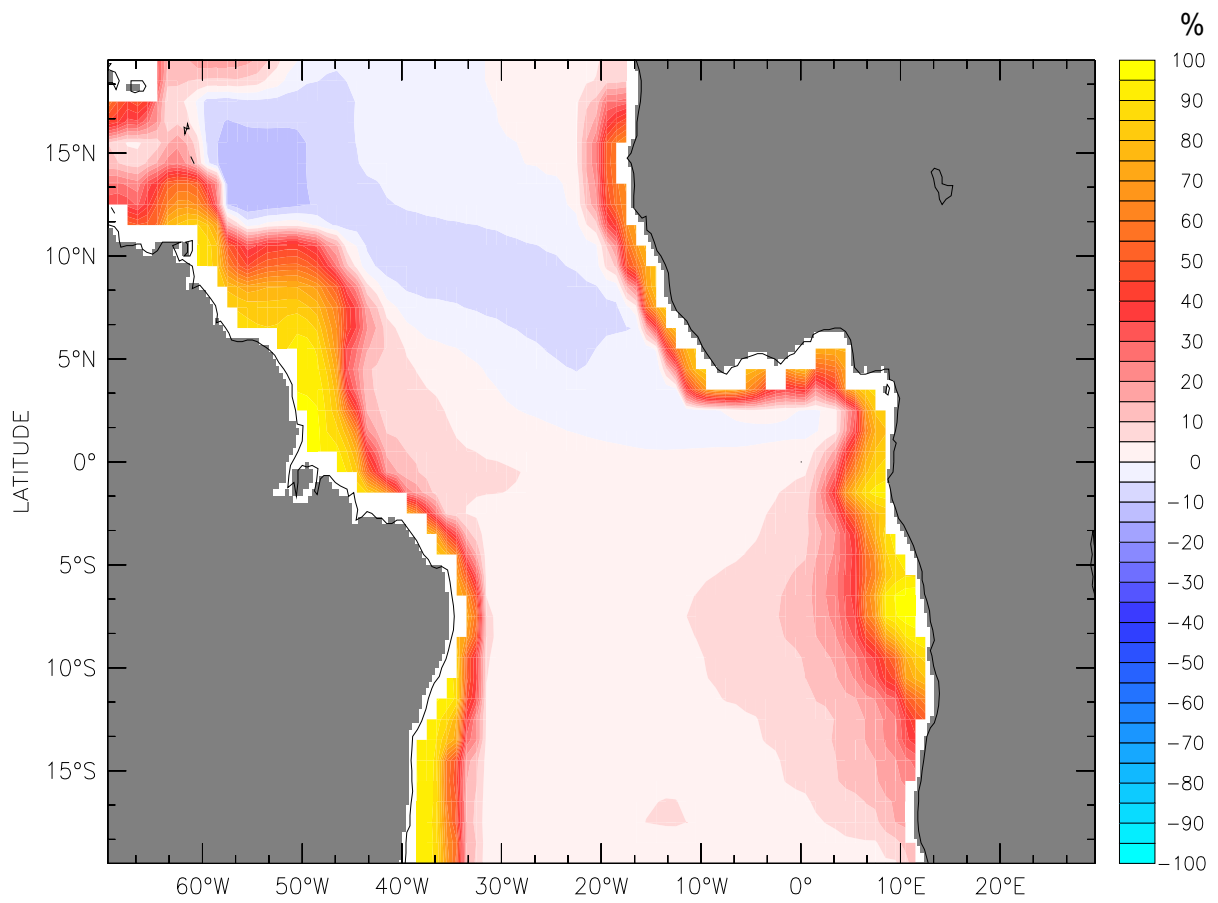
Table 4 – Corresponding carbon amounts from N-fixation, in Tmoles C yr<sup>-1</sup>, considering the model C:N ratio of 122:16.

Scenario	corresponding C (122:16 C:N)	
	Whole Atlantic N-fixation	COASTAL N-fixation
NO_RIVER	5.41	0.57
TODAY	6.03	0.62
S_AMERICA	5.79	0.65
AFRICA	5.73	0.55

Table 5 – Amount of PP and EP (whole and coastal tropical Atlantic Ocean) supported by N-fixation.

Scenario	% supported by N-fixation			
	PP	COASTAL PP	EP	COASTAL EP
NO_RIVER	1.85	1.69	13.90	11.92
TODAY	1.85	1.39	14.11	10.14
S_AMERICA	1.86	1.56	14.11	11.43
AFRICA	1.85	1.50	14.07	10.49

Supplementary Figure 1



Supplementary Figure 1 – Change in % of surface chlorophyll associated to diatoms (average 1998-2005) between scenarios TODAY and NO\_RIVER.