

Table 3. Integrated annual N<sub>2</sub>-fixation rates for the BATS site computed from model solutions 1 and 2 for each year and compared to direct and indirect rate estimates from various sources

Year	Solution 1	Solution 2
	mmoles N m <sup>-2</sup> yr <sup>-1</sup>	
1989	242	27
1990	204	26
1991	176	22
1992	136	12
1993	177	14
1994	201	18
1995	91	5.4
1996	71	1.9
model 1989-1994 mean	189	20
model 1995-1996 mean	81	3.6
Michaels <i>et al.</i> (1996)†		133-230
Gruber and Sarmiento (1997)‡		72
derived from Carpenter and Romans (1991)††		128-256
Orcutt <i>et al.</i> (this issue)‡‡		25
derived from Carpenter and McCarthy (1975)*		0.5
derived from Carpenter and Romans (1977)*		2.26

† Based on vertical N\* distribution at BATS

‡ Based on vertical N\* distribution from 10° to 50°N and 90° to 10°W

†† Based upon concentrations of 1000-2000 colonies/m<sup>3</sup> measured in the western Atlantic in 1990 between 29° and 32°N and assuming a uniform 50 meter vertical distribution and a 6 month growing season

‡‡ Based upon colony concentrations and direct rate measurements at BATS from 1995-1997 and including contributions from free trichomes

\* Based on a range of estimated rates from the 1970s for a suite of stations from 23° to 36°N in the Sargasso Sea and assuming no seasonal variations