Table 3.3.1: Water quality of the Gulf during premonsoon (1993-2004).

Parameter	Level	Okha				Salaya		Vadinar		Sikka		
		Feb 1993	Mar 1995	Apr 2002	July 2004	Feb 1995	April 2002	Mar 1994	Mar 1996	Apr 1994	Apr 2002	Apr 2003
Temp (^{o}C)	S	25.5-26.5 (26.0)	25.3-25.5 (25.4)	24.9-27.5 (26.2)	31.0*	24.0-26.0 (25.0)	25.0-27.5 (26.2)	26.0-28.5 (27.0)	25.0-29.2 (27.1)	25.4-27.8 (26.8)	24.4-27.6 (26.0)	28.0-28.7 (28.4)
	B	25.8-26.5 (26.1)	24.9-25.0 (25.0)	24.9-27.5 (26.2)	30.4*	23.0-25.0 (24.0)	25.9-26.34 (26.3)	26.0-27.5 (27.0)	24.6-29.3 (26.8)	25.3-27.8 (26.6)	24.0-27.5 (25.8)	26.9-27.0 (27.0)
pH	S	8.0-8.3 (8.2)	8.0*	8.0-8.2 (8.1)	8.1*	7.9-8.2 (8.1)	8.2-8.4 (8.3)	7.8-8.0 (7.9)	8.0-8.3 (8.0)	8.0-8.1 (8.0)	8.0-8.4 (8.2)	8.1-8.1 (8.1)
	B	8.2-8.3 (8.3)	8.0*	8.2-8.2 (8.2)	8.1*	8.0-8.3 (8.2)	8.3-8.4 (8.3)	7.8-8.0 (8.0)	8.0-8.3 (8.2)	8.0-8.1 (8.1)	8.2-8.4 (8.3)	8.2-8.2 (8.2)
SS (mg/l)	S	27-31 (29)	17*	16-29 (23)	78	19-38 (28)	15-33 (24)	18-35 (22)	9-17 (13)	18-29 (23)	14-17 (16)	18-22 (20)
	B	31*	16*	16-35 (26)	84	21-46 (33)	16-56 (36)	22-26 (24)	8-20 (13)	19-32 (21)	16-50 (33)	6-18 (12)
Salinity (ppt)	S	37.2-38.5 (37.9)	36.2*	37.5-38 (37.7)	35.7*	36.1-37.5 (36.8)	37.6-38.4 (38.0)	37.4-38.6 (37.9)	36.6-37.4 (37.0)	37.1-37.7 (37.3)	36.9-38.5 (37.7)	39.2-39.4 (39.3)
	B	36.8-38.5 (37.7)	36.8*	37.5-38.0 (37.7)	35.6*	36.2-37.5 (36.8)	37.9-38.4 (38.1)	37.3-38.3 (37.9)	36.4-37.8 (37.2)	36.9-37.5 (37.2)	37.4-38.5 (37.9)	39.4-39.4 (39.4)
DO (ml/l)	S	2.9-3.6 (3.3)	4.0-4.3 (4.1)	2.2-5.2 (2.3)	4.1*	4.3-5.4 (4.8)	1.8-5.6 (3.7)	3.4-5.3 (4.6)	3.8-5.3 (4.6)	3.2-4.8 (4.4)	1.8-5.6 (3.7)	4.6-4.8 (4.7)
	B	2.9-3.3 (3.1)	4.6 (4.6)	2.5-5.8 (4.1)	4.4*	2.9-5.0 (3.9)	1.8-5.6 (3.7)	3.8-4.9 (4.4)	4.0-5.5 (4.7)	3.4-4.8 (4.3)	1.6-5.4 (3.5)	4.6-4.8 (4.7)
BOD (mg/l)	S	1.4-3.7 (2.5)	1.5*	0.2-3.5 (1.8)	3.8*	1.1-4.3 (2.7)	1.0-4.3 (2.6)	1.7-3.3 (2.5)	1.0-1.7 (1.4)	2.7-3.8 (3.2)	1.0-4.1 (2.5)	-
	B	0.2*	-	0.3-4.2 (2.2)	3.0*	0.3-0.6 (0.5)	<0.2-1.9 (1.0)	0.2-0.7 (0.5)	0.3-1.3 (0.8)	2.0-2.1 (2.1)	<0.2-3.4 (1.8)	0.6-0.9 (0.8)
PO_4^{3-}-P (µmol/l)	S	0.3-1.7 (1.0)	0.6-0.9 (0.7)	0.3-1.6 (0.9)	0.4*	0.7-1.4 (1.1)	0.4-1.1 (0.7)	ND-2.9 (0.5)	1.0-2.8 (1.7)	0.2-4.1 (0.8)	0.6-0.8 (0.7)	0.2-0.4 (0.3)
	B		0.5-2.2 (1.3)	0.6-1.4 (1.0)	0.6*	0.7-1.4 (1.1)	0.9-1.3 (1.1)	0.3-3.1 (0.8)	1.4-2.8 (2.1)	0.6-1.1 (0.7)	0.3-1.2 (0.7)	1.0-1.0 (1.0)

Table 3.3.1 (Contd 2)

Parameter	Level	Okha				Salaya		Vadinar		Sikka		
		Feb 1993	Mar 1995	Apr 2002	July2004	Feb 1995	Apr 2002	Mar 1994	Mar 1996	Apr 1994	Apr 2002	Apr 2003
P_{Total} (µmol/l)	S	-	-	-	-	-	-	0.8-3.2 (2.0)	-	-	-	-
	B	-	-	-	-	-	-	1.4-3.2 (2.3)	-	-	-	-
NO_3^--N (µmol/l)	S	1.2-4.4 (2.8)	6.9-7.9 (7.4)	4.2-10.7 (7.4)	13.0*	1.1-3.6 (2.3)	0.7-6.0 (3.3)	0.1-1.4 (0.6)	1.4-8.4 (4.3)	4.0-7.6 (5.3)	0.1-4.3 (2.2)	0.3-1.3 (0.8)
	B	1.4-4.1 (2.8)	5.4-6.1 (5.8)	3.3-6.8 (5.0)	11.8*	1.1-4.1 (2.6)	1.1-5.4 (3.2)	0.1-1.4 (0.9)	2.4-7.8 (4.1)	4.0-6.3 (5.1)	0.1-2.3 (1.2)	1.2-1.5 (1.4)
NO_2^--N (µmol/l)	S	0.1-0.4 (0.3)	0.5-0.6 (0.5)	0.2-0.7 (0.4)	0.8*	0.1-0.6 (0.4)	0.1-0.5 (0.3)	0.1-0.3 (0.2)	ND-0.4 (0.3)	0.2-0.5 (0.3)	0.1-0.2 (0.1)	0.2-0.2 (0.2)
	B	0.2-0.4 (0.3)	0.2-0.4 (0.3)	0.2-0.9 (0.5)	0.9*	0.1-0.6 (0.4)	0.2-0.4 (0.3)	0.1-0.6 (0.3)	ND-0.4 (0.3)	0.1-0.5 (0.3)	0.1-0.2 (0.1)	0.2-0.2 (0.2)
NH_4^+-N (µmol/l)	S	ND-2.9 (1.5)	0.1-0.4 (0.3)	0.1-0.2 (0.1)	2.4*	ND-10.5 (5.2)	0.1-0.1 (0.1)	0.5-0.9 (0.7)	0.1-0.9 (0.5)	0.1-1.2 (0.4)	0.1-0.2 (0.1)	0.9-2.0 (1.5)
	B	ND-2.0 (1.0)	ND-0.2 (0.1)	0.1-0.1 (0.1)	2.2*	ND-5.0 (2.5)	0.1-0.1 (0.1)	0.5-0.9 (0.7)	ND-2.9 (1.2)	0.1-0.6 (0.4)	0.1-0.1 (0.1)	ND-ND (ND)
N_{Total} (µmol/l)	S	-	-	-		-	-	13.4-26.6 (20.0)	-	-	-	-
	B	-	-	-		-	-	13.8-15.9 (14.9)	-	-	-	-
PHc (µmol/l)	1m	-	13.3*	1.0-5.7 (3.3)	54.2*	-	0.8-2.3 (1.5)	3.9-5.7 (4.8)	3-12 (7)	8-18 (10)	2.0-2.0 (2.0)	0.4-0.7 (0.6)
Phenols (µmol/l)	S	-	-	134-190 (163)	89*	-	68-132 (100)	9-20 (15)	31-48 (39)	5-13 (9)	61-168 (114)	24.5-32.6 (28.6)

Table 3.3.1 (Contd 3)

Parameter	Level	Bedi	Navlakhi		Kandla		Mundra				
		Mar 1997	Mar 1996	Apr 2002	Feb 1998	Apr 2002	Mar 1997	Feb 1999	Mar 2000	Apr 2002	June 2003
Temp (^{o}C)	S	21.5-24.5 (23.0)	25.9-26.5 (26.0)	27.8-30.5 (28.7)	22.5-24.0 (23.1)	27.0-29.0 (27.9)	22.9-24.0 (23.6)	23.3-28.5 (24.7)	22.0-25.5 (24.1)	25.3-27.5 (26.9)	28.4-29.8 (29.3)
	B	22.0-23.9 (23.0)	25.0-25.9 (25.5)	26.0-29.5 (28.5)	22.5-25.5 (23.4)	26.5-29.0 (27.7)	22.8-23.5 (23.1)	23.2-25.8 (24.2)	22.0-25.5 (23.6)	24.0-29.8 (27.0)	28.7-29.7 (29.2)
pH	S	8.1-8.3 (8.2)	8.1-8.2 (8.2)	8.0-8.3 (8.2)	7.8-8.0 (8.0)	8.0-8.2 (8.1)	8.1-8.2 (8.2)	7.7-8.2 (8.2)	8.1-8.3 (8.3)	8.2-8.2 (8.2)	7.9-8.0 (8.0)
	B	8.0-8.3 (8.2)	8.1-8.2 (8.2)	8.1-8.3 (8.2)	7.9-8.0 (8.0)	8.0-8.2 (8.1)	8.1-8.2 (8.2)	8.1-8.2 (8.2)	8.2-8.3 (8.3)	8.1-8.2 (8.2)	8.0-8.0 (8.0)
SS (mg/l)	S	21-45 (27)	30-41 (36)	75-275 (149)	105-214 (149)	80-366 (162)	25-33 (30)	22-32 (25)	20-72 (32)	16-25 (24)	178-190 (184)
	B	18-45 (28)	47-204 (126)	80-385 (214)	101-272 (184)	115-410 (217)	19-98 (53)	30-54 (40)	24-118 (61)	17-35 (27)	260-440 (350)
Salinity (ppt)	S	37.5-38.6 (38.1)	39.3-40.1 (39.7)	41.0-44.4 (42.7)	37.5-38.0 (37.8)	38.4-39.9 (39.4)	35.8-38.6 (37.6)	35.9-38.1 (37.3)	37.4-38.3 (37.9)	37.6-38.2 (38.0)	37.7-38.6 (38.4)
	B	37.3-38.6 (38.7)	38.5-40.1 (39.3)	41.5-45.0 (43.3)	37.4-37.9 (37.6)	38.4-40.2 (39.4)	36.1-38.5 (37.9)	36.0-38.2 (37.5)	37.6-39.0 (38.0)	37.5-38.3 (38.0)	37.7-38.6 (38.3)
DO (ml/l)	S	4.2-5.3 (4.6)	2.9-5.0 (3.9)	1.8-4.5 (3.1)	2.5-5.0 (4.0)	1.6-5.2 (3.6)	4.1-5.3 (4.9)	1.8-5.7 (3.9)	1.7-5.1 (3.6)	2.5-6.0 (3.9)	1.5-4.6 (3.8)
	B	4.3-5.0 (4.5)	4.3-5.0 (4.6)	2.0-4.7 (3.5)	2.5-4.8 (3.9)	1.8-4.9 (3.7)	3.7-5.1 (4.9)	1.8-5.7 (4.3)	1.7-5.3 (4.0)	4.0-5.9 (4.2)	1.9-4.4 (3.8)
BOD (mg/l)	S	1.0-3.1 (1.9)	<0.1-1.8 (0.9)	0.3-1.2 (0.7)	-	0.2-4.4 (2.7)	0.9-1.9 (1.3)	<0.1-4.4 (2.3)	0.8-3.4 (1.8)	0.6-3.4 (2.9)	2.1-2.7 (2.4)
	B	0.3-2.3 (1.6)	0.2-1.2 (0.7)	0.3-3.5 (2.0)	-	0.4-3.5 (2.2)	<0.1-1.8 (0.8)	<0.1-3.8 (1.8)	0.9-3.1 (1.2)	0.1-5.1 (4.9)	1.5-1.8 (1.7)
PO_4^{3-}-P µmol/l)	S	1.0-2.7 (1.8)	0.3-1.8 (1.2)	0.6-4.1 (2.0)	3.8-8.5 (6.7)	0.4-1.9 (1.2)	0.7-2.7 (1.3)	0.4-4.4 (1.8)	0.8-11.7 (1.9)	0.2-0.5 (0.3)	1.1-3.0 (1.8)
	B	0.9-3.2 (1.8)	1.6-2.7 (2.1)	1.0-3.5 (2.4)	2.8-8.5 (6.1)	1.5-2.2 (1.8)	1.2-1.9 (1.5)	0.6-3.2 (1.6)	0.9-3.1 (2.0)	0.2-0.7 (0.4)	1.6-2.8 (2.0)

Table 3.3.1 (Contd 4)

Parameter	Level	Bedi	Navlakhi		Kandla		Mundra				
		Mar 1997	Mar 1996	Nov 2002	Feb 1998	Apr 2002	Mar 1997	Feb 1999	Mar 2000	Apr 2002	June 2003
P_{Total} (µmol/l)	S	1.7-4.0 (2.6)	-	-	-	-	1.6-2.0 (1.8)	0.7-1.5 (1.2)	-	-	2.0-2.9 (2.5)
	B	1.8-5.4 (3.0)	-	-	-	-	1.7-1.8 (1.7)	1.1-1.7 (1.5)		-	2.4-2.5 (2.5)
NO_3^--N (µmol/l)	S	3.2-15.1 (6.7)	0.6-4.3 (2.4)	3.3-7.3 (5.3)	8.0-10.7 (9.4)	5.5-12.1 (7.7)	1.4-6.9 (4.0)	ND-3.4 (2.1)	1.1-4.9 (2.8)	18.0-18.5 (18.3)	1.0-5.1 (3.1)
	B	3.6-12.9 (6.1)	ND-1.0 (0.5)	3.4-8.7 (5.9)	7.4-9.9 (8.6)	5.0-8.3 (7.1)	2.7-5.4 (3.7)	0.3-6.6 (2.0)	1.3-5.4 (3.0)	5.0-20.2 (19.0)	1.2-4.6 (3.0)
NO_2^--N (µmol/l)	S	0.2-0.6 (0.4)	0.1-0.4 (0.3)	0.3-0.7 (0.5)	0.4-0.6 (0.5)	0.5-0.9 (0.7)	0.2-0.9 (0.4)	0.1-0.9 (0.4)	0.2-0.9 (0.5)	ND-0.2 (0.1)	0.2-0.5 (0.4)
	B	0.2-0.5 (0.4)	0.4-1.1 (0.7)	0.2-0.6 (0.4)	0.4-0.9 (0.6)	0.2-0.4 (0.3)	0.3-0.8 (0.5)	0.1-0.6 (0.5)	0.3-1.3 (0.5)	ND-0.3 (0.2)	0.2-0.4 (0.4)
NH_4^+-N (µmol/l)	S	0.1-1.2 (0.6)	0.9-1.2 (1.1)	0.2-0.5 (0.3)	0.2-0.9 (0.6)	0.2-1.9 (0.5)	0.5-1.7 (1.0)	0.4-6.4 (1.9)	ND-0.6 (0.4)	0.1-0.2 (0.2)	ND-1.9 (0.8)
	B	0.1-1.2 (0.4)	0.6-1.9 (1.2)	0.1-0.8 (0.4)	0.5-0.9 (0.7)	0.2-2.1 (0.5)	0.3-2.8 (1.4)	0.4-1.5 (1.0)	0.1-0.7 (0.5)	0.1-0.5 (0.3)	0.2-2.8 (1.4)
N_{Total} (µmol/l)	S	3.2-16.7 (6.9)	-	-	16.4-59.3 (29.6)	-	7.1-8.0 (7.8)	52.4-60.4 (55.9)	-	-	7.8-11.1 (9.5)
	B	3.3-16.4 (7.1)	-	-	17.1-82.9 (35.7)	-	5.6-8.6 (7.0)	37.6-57.1 (51.1)	-	-	7.3-8.5 (7.9)
PHc (µmol/l)	1m	1.5-4.8 (2.7)	1.0-2.1 (1.6)	1.9-5.9 (3.9)	2.6-3.5 (2.9)	1.4* (1.4)	2-3 (2)	0.7-4.4 (1.8)	1.3-9.9 (3.3)	3.3-4.1 (3.7)	4.5-4.7 (4.6)
Phenols (µmol/l)	S	7-29 (17)	1-25 (13)	16-114 (37)	39-60 (49)	73* (73)	ND-23 (15)	ND-176 (83)	ND-92 (35)	1.9-3.5 (2.7)	20-23 (22)

Average given in parenthesis
ND: Not Detected
* Single value

Table 3.3.2 : Water quality of the Gulf during postmonsoon (1993-2004)

Parameter	Level	Okha				Vadinar				Sikka		
		Nov 1995	Nov 1999	Nov 2002	Jan 2004	Nov 1994	Nov 1995	Jan 2000	Jan 2004	Dec 1993	Oct 1996	Nov 2002
Temp (^oC)	S	25.0-25.1 (25.1)	26.0-26.0 (26.0)	25.5-28.8 (26.7)	23.6-23.6 (23.6)	28.8-29.0 (29.0)	24.0-30.0 (26.8)	22.5-22.5 (22.5)	22.0-22.0 (22.0)	25.1-25.9 (25.3)	29.0-29.8 (29.4)	25.0-27.4 (26.2)
	B	25.0-25.2 (25.1)	26.0-26.0 (26.0)	25.2-27.5 (26.5)	23.7-23.7 (23.7)	29.0-29.2 (29.1)	24.0-29.9 (26.7)	22.5-22.5 (22.5)	21.7-21.7 (21.7)	24.6-25.7 (25.1)	29.0-29.2 (29.1)	26.0-26.8 (26.4)
pH	S	8.1-8.1 (8.1)	8.0-8.0 (8.0)	8.1-8.3 (8.3)	8.2-8.2 (8.2)	8.1-8.2 (8.1)	8.0-8.3 (8.2)	8.2-8.3 (8.3)	8.2-8.2 (8.2)	8.1-8.3 (8.2)	8.1*-	8.2-8.3 (8.2)
	B	8.0-8.1 (8.1)	8.0-8.1 (8.0)	8.2-8.3 (8.3)	8.2-8.2 (8.2)	8.0-8.2 (8.1)	8.0-8.3 (8.1)	8.2.-8.3 (8.3)	8.2-8.2 (8.2)	8.2-8.3 (8.3)	8.1*	8.3-8.3 (8.3)
SS (mg/l)	S	7-25 (16)	59*	4-10 (7)	22*	16-29 (22)	13-21 (16)	25-25 (25)	22*	15-23 (19)	40*	10-34 (22)
	B	14-24 (19)	68*	6-308 (69)	90*	18-29 (24)	8-16 (12)	23-24 (24)	58*	17-24 (21)	36*	20-36 (22)
Salinity (ppt)	S	35.4-35.7 (37.6)	36.8-36.9 (36.8)	37.1-38.4 (37.6)	36.0-36.2 (36.1)	34.3-34.6 (34.6)	36.2-37.8 (36.9)	37.4-38.0 (37.7)	37.0-37.0 (37.0)	37.1-38.5 (38.0)	36.3*	37.1-38.6 (37.8)
	B	37.4-37.7 (36.8)	36.7-36.8 (34.6)	37.1-38.2 (37.6)	35.7-35.9 (35.8)	34.3-34.6 (34.6)	36.6-37.4 (37.0)	37.4-39.6 (38.0)	37.0-37.0 (37.0)	35.5-37.8 (36.9)	36.5*	37.0-38.7 (37.8)
DO (ml/l)	S	4.3-4.7 (4.5)	3.6-3.8 (3.7)	2.5-4.9 (4.2)	4.5-4.5 (4.5)	4.1-4.8 (4.3)	4.0-5.5 (4.8)	5.3-5.7 (5.4)	4.5-4.8 (4.7)	3.6-5.4 (4.2)	4.3-4.5 (4.4)	2.6-4.7 (3.6)
	B	4.3-4.5 (4.4)	3.2-3.8 (3.5)	2.7-4.8 (4.2)	4.5-4.8 (4.7)	4.3-5.0 (4.4)	4.0-5.3 (4.6)	5.0-5.3 (5.3)	4.8-5.0 (4.9)	3.5-5.5 (4.1)	4.3-4.5 (4.4)	2.1-4.4 (3.2)
BOD (mg/l)	S	1.0-4.0 (3.0)	-	0.1-2.5 (0.8)	2.9*	1.5-2.5 (2.0)	0.8-1.8 (1.2)	2.9-3.6 (3.0)	1.0*	2.0-2.4 (2.2)	4.8*	<0.2-1.5 (0.8)
	B	0.3-1.5 (0.9)	-	0.1-1.5 (0.9)	2.9*	0.3-1.0 (0.7)	0.5-2.2 (1.0)	2.3-2.6 (2.5)	1.6*	0.7-1.6 (1.1)	2.6*	<0.2-1.1 (0.5)
PO_4^{3-}-P (µmol/l)	S	1.2-1.3 (1.3)	1.8-1.8 (1.8)	0.9-2.2 (1.9)	1.1-1.1 (1.1)	1.0-2.4 (1.4)	0.6-1.7 (1.1)	1.4-1.7 (1.6)	1.2-1.2 1.2	0.7-4.0 (1.6)	0.9-1.2 (1.1)	0.8-2.8 (1.8)
	B	1.3-1.3 (1.3)	2.1-2.2 (2.2)	0.8-2.3 (1.9)	1.1-1.1 (1.1)	0.1-2.7 (0.5)	0.7-2.3 (1.5)	1.7-1.8 (1.7)	1.2-1.4 1.3	1.2-1.8 (1.5)	- (1.9)*	1.5-2.3 (1.9)

Table 3.3.2 (Contd 2)

Parameter	Level	Okha				Vadinar				Sikka		
		Nov 1995	Nov 1999	Nov 2002	Jan 2004	Nov 1994	Nov 1995	Jan 2000	Jan 2004	Dec 1993	Oct 1996	Nov 2002
P_{Total} (µmol/l)	S	-	-	-	-	-	-	-	-	-	-	-
	B	-	-	-	-	-	-	-	-	-	-	-
NO_3^--N (µmol/l)	S	3.6-6.6 (5.1)	3.4-9.5 (9.0)	7.9-13.0 (9.5)	4.8-8.7 (6.8)	3.1-7.9 (5.5)	2.1-10.6 (6.7)	7.7-8.7 (8.2)	2.9-3.3 (3.1)	4.4-8.1 (6.5)	17.1-18.1 (17.6)	8.0-12.3 (10.1)
	B	4.6-7.2 (5.9)	9.3-9.7 (9.5)	7.1-12.1 (9.2)	6.5-6.9 (6.7)	3.3-7.3 (4.6)	4.2-11.1 (8.0)	7.2-10.0 (8.9)	2.7-3.6 (3.2)	3.7-8.1 (6.1)	16.5-18.9 (17.7)	7.5-11.5 (9.5)
NO_2^--N (µmol/l)	S	0.6-0.7 (0.7)	0.3-0.4 (0.4)	0.4-0.5 (0.4)	0.3-0.3 (0.3)	0.4-1.1 (0.8)	0.1-0.5 (0.3)	0.3-0.3 (0.3)	0.3-0.3 (0.3)	0.2-1.1 (0.4)	0.2-0.6 (0.4)	0.2-0.4 (0.3)
	B	0.6-0.7 (0.7)	0.2-0.2 (0.2)	0.4-0.6 (0.5)	0.2-0.3 (0.3)	0.6-0.9 (0.8)	0.1-0.4 (0.3)	0.3-0.4 (0.4)	0.2-0.3 (0.3)	0.1-2.8 (0.4)	0.4-0.6 (0.5)	0.1-0.7 (0.4)
NH_4^+-N (µmol/l)	S	ND	0.8-1.7 (1.3)	0.3-1.8 (0.6)	0.8-2.1 (1.5)	0.3-2.8 (1.1)	0.1-1.5 (0.6)	0.2-0.5 (0.3)	1.0-1.3 (1.2)	2.0-7.8 (3.7)	0.3-0.5 (0.4)	0.3-1.0 (0.6)
	B	-	0.6-0.8 (0.7)	0.2-7.8 (1.2)	ND-0.2 (0.2)	0.4-4.9 (1.3)	ND-1.2 (0.6)	0.1-0.2 (0.2)	ND-1.2 (0.6)	1.6-4.8 (3.2)	- (0.5)	0.1-0.8 (0.4)
N_{Total} (µmol/l)	S	-	56*	-	-	38.1-100.5 (69.3)	-	-	-	-	-	-
	B	-	62*	-	-	80.5-124.9 (102.7)	-	-	-	-	-	-
PHc (µg/l)	1m	0.5-0.7 (0.6)	1.8*	0.7-1.5 (1.2)	-	2-5 (4)	4-5 (5.0)	0.1-0.3 (0.2)	-	5-7 (6)	(2.3)*	0.9-1.7 (1.3)
Phenols (µg/l)	S	10-19 (15)	37*	1-15 (8)	-	28-34 (31)	18-42 (31)	11-31 (21)	-	19-22 (21)	(18)*	ND-21 (21)

Table 3.3.2 (Contd 3)

Parameter	Level	Bedi	Salaya	Navlakhi		Kandla			Mundra			
		Oct 1997	Nov 2002	Nov 1994	Nov 2002	Oct 1996	Nov 2002	Jan 2004	Sep 1999	Nov 2002	Oct 2003	Dec 2004
Temp (^{o}C)	S	28.0-30.1 (29.2)	23.0-27.9 (25.4)	25.5-26.1 (25.8)	23.0-27.5 (25.7)	29.5-29.5 (29.5)	24.8-30.0 (27.2)	20.1-20.1 (20.1)	28.5-31.0 (29.9)	24.0-27.0 (25.5)	28.5-30.0 (28.8)	24.0-24.0 (24.0)
	B	28.0-30.9 (29.1)	23.0-26.4 (24.7)	24.7-26.5 (25.2)	24.0-27.0 (25.6)	29.5-30.5 (30.0)	24.9-29.0 (26.9)	19.9-19.9 (19.9)	28.5-31.6 (30.1)	23.2-26.9 (25.5)	28.0-29.9 (28.7)	23.5-23.5 (23.5)
pH	S	8.2-8.4 (8.3)	8.1-8.3 (8.2)	7.8-7.9 (7.9)	8.3-8.6 (8.5)	8.0-8.2 (8.1)	7.9-8.3 (8.2)	8.2-8.2 8.2	7.9-8.3 (8.2)	8.0-8.3 (8.1)	8.1-8.2 (8.1)	8.4-8.4 8.4
	B	8.2-8.4 (8.3)	8.2-8.3 (8.2)	(7.9)*	8.3-8.6 (8.5)	8.0-8.1 (8.0)	8.1-8.3 (8.2)	8.2-8.2 (8.2)	7.9-8.3 (8.2)	8.1-8.3 (8.2)	8.1-8.2 (8.2)	8.4-8.4 8.4
SS (mg/l)	S	32-63 (44)	28-304 (166)	(698)*	16-110 (742)	156-336 (244)	28-104 (60)	164*	49-170 (108)	30-162 (96)	38-86 (62)	44*
	B	26-136 (78)	208-490 (349)	(689)*	80-190 (126)	252-373 (312)	42-94 (72)	178*	70-207 (128)	108-214 (161)	72-166 (95)	60*
Salinity (ppt)	S	36.3-37.8 (37.1)	41.2-46.3 (43.7)	32.1-32.8 (32.4)	37.3-39.0 (38.1)	40.0-40.4 (40.2)	36.5-40.1 (38.3)	38.2-38.2 (38.2)	36.9-39.2 (38.2)	40.7-42.4 (41.5)	36.5-37.0 (36.7)	37.2-37.8 (37.5)
	B	36.3-37.8 (37.3)	41.6-45.8 (43.7)	32.1-32.1 (32.1)	37.5-39.0 (38.0)	40.2-40.2 (40.2)	37.4-40.1 (38.4)	38.0-38.0 (38.0)	37.1-39.0 (38.2)	41.0-42.3 (41.6)	36.2-37.0 (36.7)	37.4-37.6 (37.5)
DO (ml/l)	S	3.7-4.9 (4.3)	3.0-5.1 (4.0)	4.8-4.8 (4.8)	4.8-7.6 (6.2)	4.3-4.7 (4.5)	6.1-7.8 (6.9)	4.5-4.5 (4.5)	1.5-5.7 (3.6)	2.2-5.0 (3.6)	3.8-5.4 (4.5)	4.9-4.9 (4.9)
	B	3.5-4.7 (4.1)	2.6-5.0 (3.8)	4.8-5.0 (4.8)	3.6-7.6 (5.7)	4.7-4.7 (4.7)	5.8-8.0 (7.0)	4.5-4.8 (4.7)	2.0-5.1 (3.5)	2.2-5.3 (3.7)	2.9-5.2 (4.1)	4.7-4.9 (4.8)
BOD (mg/l)	S	2.2-6.3 (4.9)	0.9-1.4 (1.2)	(2.0)*	0.1-2.5 (0.8)	3.9-4.1 (4.0)	0.2-5.9 (2.1)	0.6*	<0.1-4.1 (1.4)	0.8-1.3 (1.0)	2.3-4.8 (3.6)	2.6*
	B	0.7-4.7 (2.5)	0.5-1.5 (1.0)	<0.1*	0.1-1.5 (0.9)	3.2-3.5 (3.4)	0.2-4.5 (1.6)	0.6*	<0.1-4.0 (0.9)	0.9-2.0 (1.4)	0.9-2.3 (1.6)	1.7*

Table 3.3.2 (Contd 4)

Parameter	Level	Bedi	Salaya	Navlakhi		Kandla			Mundra			
		Oct 1997	Nov 2002	Nov 1994	Nov 2002	Oct 1996	Nov 2002	Jan 2004	Sep 1999	Nov 2002	Oct 2003	Dec 2004
PO_4^{3-}-P (µmol/l)	S	1.0-3.0 (2.1)	0.2-2.0 (1.1	1.5-2.0 (1.7)	0.9-2.2 (1.9)	0.8-1.3 (1.1)	0.4-3.1 (1.7)	1.8-1.8 (1.8)	0.5-2.5 (1.4)	1.0-1.6 (1.3)	0.5-1.3 (0.9)	1.3-1.4 (1.4)
	B	1.3-5.2 (2.9)	1.2-4.1 (2.6)	2.0-2.1 (2.0)	0.8-2.3 (1.9)	1.2-1.6 (1.4)	1.9-2.6 (2.2)	2.0-2.1 (2.1)	0.7-3.0 (1.7)	1.6-2.1 (1.8)	0.8-1.3 (1.1)	1.5-1.7 (1.6)
P_{Total} (µmol/l)	S	1.6-3.8 (2.7)	-	-	-	-	-	-	-	-	-	-
	B	1.8-5.7 (4.2)	-	-	-	-	-	-	-	-	-	-
NO_3^--N (µmol/l)	S	2.9-16.7 (7.4)	6.9-15.2 (11.0)	25.4-38.4 (31.9)	8.8-12.3 (10.6)	7.3-9.9 (9.6)	5.4-18.7 (10.4)	10.5-12.1 (11.3)	0.7-10.0 (4.3)	6.9-28.6 (17.7)	1.3-3.7 (2.5)	4.3-5.4 (4.9)
	B	2.4-15.1 (8.9)	8.1-12.2 (10.1)	30.4-30.8 (30.6)	8.0-12.3 (9.8)	10.9-11.5 (11.2)	5.9-18.4 (10.4)	12.6-12.7 (12.7)	0.3-7.1 (4.0)	17.0-25.9 (21.4)	0.2-3.3 (2.0)	3.1-4.2 (3.7)
NO_2^--N (µmol/l)	S	0.1-1.5 (0.9)	0.3-0.7 (0.5)	0.1-0.2 (0.1)	0.1-0.3 (0.2)	0.8-0.9 (0.9)	0.1-0.5 (0.3)	ND-0.1 (0.1)	0.1-0.9 (0.4)	0.3-0.6 (0.4)	0.2-0.6 (0.4)	0.3-0.3 (0.3)
	B	0.3-1.6 (1.1)	0.2-0.9 (0.5)	0.1-0.1 (0.1)	0.1-0.3 (0.2)	0.6-0.9 (0.8)	0.2-0.5 (0.3)	ND-ND (ND)	0.2-1.0 (0.4)	0.2-0.8 (0.5)	0.1-0.3 (0.2)	0.3-0.3 (0.3)
NH_4^+-N (µmol/l)	S	0.4-2.1 (1.2)	0.5-2.4 (1.4)	0.8-3.0 (1.9)	0.3-1.5 (0.6)	0.5-1.1 (0.8)	0.2-1.3 (0.7)	2.1-2.6 (2.4)	ND-3.6 (0.6)	1.1-5.4 (3.2)	0.2-3.9 (1.6)	0.5-1.3 (0.9)
	B	0.4-3.9 (2.1)	ND-3.1 (1.5)	1.1-1.3 (1.2)	0.2-1.0 (0.6)	0.5-0.9 (0.7)	0.2-1.1 (0.5)	2.3-2.7 (2.5)	ND-2.1 (0.5)	0.7-2.1 (1.4)	0.1-1.4 (0.5)	0.1-0.2 0.2
N_{Total} (µmol/l)	S	3.7-17.9 (10.0)	-	-	-	-	-	-	-	-	8.7-12.8 (10.8)	-
	B	7.1-17.1 (13.3)	-	-	-	-	-	-	-	-	6.1-8.0 (7.1)	-
PHc (µmol/l)	1m	1.2-8.0 (5.1)	1.3-3.0 (2.1)	-	0.9-1.4 (1.1)	1.6-2.0 (1.8)	0.7-1.9 (1.1)	-	0.3-2.5 (1.1)	1.3-4.6 (2.9)	8.6-19.4 (14.0)	26.3*
Phenols (µmol/l)	S	6-32 (20)	ND-53 (27)		9-13 (15)	11-16 (14)	ND-44 (31)	-	ND-133 (38)	4-23 (13)	2-10 (6)	57*

Average given in parenthesis, ND: Not Detected, * Single value

Table 3.3.3 : Subtidal sediment quality of the Gulf during premonsoon (1994-2005)

Constituents	Premonsoon								
	Okha		Vadinar		Sikka				Bedi
	Mar 1999	Apr 2002	Apr 1994	Mar 1996	Apr 1994	Mar 1997	Apr 2002	Apr 2003	Mar 1997
Al (%)	0.8-2.0 (1.6)	1.8-8.1 (4.9)	3.7-9.6 (7.0)	5.0-6.2 (5.5)	-	1.5-5.7 (3.4)	4.7	0.4-8.4 (5.2)	2.9-6.6 (4.4)
Cr (µg/l)	12-39 (20)	20-112 (67)	30-87 (63)	41-59 (47)	27-127 (48)	28-112 (75)	68	6-51 (23)	48-189 (133)
Mn (µg/l)	257-1696 (639)	425-726 (580)	517-1229 (802)	287-512 (399)	443-936 (633)	408-987 (692)	590	508-3065 (1450)	493-775 (664)
Fe (%)	0.9-1.1 (1.0)	0.8-4.4 (2.5)	1.4-4.3 (3.2)	3.6-4.9 (4.1)	2.0-6.1 (3.0)	1.0-4.6 (3.2)	2.3	0.1-9.8 (3.3)	2.0-5.2 (3.8)
Co (µg/g)	20-29 (24)	1-29 (10)	24-44 (36)	2-78 (44)	37-65 (38)	11-36 (25)	9	12-47 (26)	28-53 (41)
Ni (µg/g)	11-17 (15)	10-60 (33)	31-61 (47)	59-70 (64)	21-75 (34)	11-67 (51)	29	32-112 (68)	24-67 (51)
Cu (µg/g)	8-16 (12)	5-34 (16)	32-70 (51)	41-51 (44)	24-90 (32)	9-52 (34)	19	11-97 (44)	16-72 (40)
Zn (µg/g)	17-25 (22)	13-92 (43)	44-134 (92)	48-94 (77)	39-101 (59)	15-84 (50)	23	109-401 (227)	39-122 (72)
Hg (µg/g)	0.04-0.12 (0.07)	0.009-0.04 (0.02)	-	-	-	0.09-0.40 (0.17)	0.009	ND-0.26 (0.07)	0.1-0.3 (0.2)
Pb (µg/g)	-	-	1-12 (7)	17-21 (20)	ND-5 (1.2)	-	-	-	-
C (%)	0.1-0.8 (0.3)	0.2-0.7 (0.7)	-	-	-	0.1-0.8 (0.4)	0.4	0.2-1.0 (0.6)	-
P (µg/g)	425-736 (646)	349-545 (455)	-	-	-	580-832 (731)	470	210-953 (525)	-
PHc (µg/g)	ND-3.1 (1.2)	0.7-1.4 (1.0)	0.2-2.3 (0.6)	0.2-0.4 (0.3)	0.3-1.0 (0.5)	0.08-0.33 (0.20)	0.7	0.1 (0.1)	0.3-1.0 (0.4)

Table 3.3.3 (Contd. 2)

Constituents	Premonsoon								
	Kandla			Mundra				Salaya	Navlakhi
	Mar 1996	Feb 1998	Apr 2002	Mar 1999	Mar 2000	Apr 2002	Jun 2003	April 2002	Apr 2002
Al (%)	1.7-6.9 (4.6)	1.7-7.9 (5.4)	7.5	0.5-9.3 (5.7)	2.4-8.5 (4.6)	8.7	1.4-9.6 (4.9)	6.8	7.3
Cr (µg/l)	9-103 (63)	26-76 (45)	98	7-175 (110)	26-139 (86)	140	27-123 (73)	87	113
Mn (µg/l)	594-1321 (985)	428-757 (597)	623	431-900 (700)	316-837 (603)	681	536-1182 (767)	677	808
Fe (%)	0.9-4.7 (2.9)	1.2-6.2 (4.1)	3.6	1.1-5.0 (3.5)	1.5-46 (38)	5.0	1.3-5.1 (3.6)	3.7	5.0
Co (µg/g)	9-31 (23)	16-32 (26)	18	15-70 (35)	15-39 (29)	27	ND-20 (8)	20	24
Ni (µg/g)	15-58 (41)	9-60 (38)	45	ND-68 (39)	15-59 (38)	64	7-59 (35)	48	65
Cu (µg/g)	11-45 (28)	6-51 (32)	31	6-47 (24)	6-44 (26)	54	5-44 (19)	29	50
Zn (µg/g)	18-89 (60)	12-77 (58)	50	14-106 (62)	33-92 (70)	76	31-151 (87)	61	74
Hg (µg/g)	0.13-0.26 (0.18)	0.07-0.13 (0.11)	0.04	0.07-0.66 (0.62)	0.19-0.76 (0.34)	0.02	ND-0.05 (0.03)	0.05	0.05
Pb (µg/g)	6.8-17.2 (12.3)	-	-	-	-	-	-	-	-
C (%)	-	-	0.7	0.1-0.9 (0.5)	0.1-0.7 (0.4)	0.9	ND-0.8 (0.4)	0.5	0.8
P (µg/g)	-	-	417	341-882 (607)	493-755 (633)	589	465-1822 (751)	581	629
PHc (µg/g)	0.2-21.6 (3.0)	0.1-0.4 (0.2	<0.1	0.1-2.8 (1.8)	0.7-1.7 (1.3)	0.2	ND-0.4 (0.2)	0.6	1.0

Dry wt basis except PHc which is wet wt basis, ND : Not Detected, Average in parenthesis

Table 3.3.4 : Subtidal sediment quality of the Gulf during postmonsoon (1993-2004)

Constituents	Postmonsoon									
	Okha				Vadinar			Sikka		
	Nov 95	Nov 99	Nov 2002	Nov 2004	Nov 94	Nov 95	Nov 2004	Dec 93	Oct 96	Nov 2002
Al (%)	0.8-3.4 (2.2)	1.6-4.3 (2.5)	0.4-5.1 (2.8)	3.7-6.1 (4.5)	4.1-9.6 (6.9)	4.7-5.8 (5.2)	2.1-11.0 (6.9)	-	4.8-5.2 (5.0)	5.0-7.8 (6.4)
Cr (µg/g)	18-49 (31)	ND-55 (19)	9-92 (51)	36-68 (48)	30-69 (52)	38-65 (49)	40-118 (94)	29-104 (68)	80-137 (102)	154-197 (176)
Mn (µg/g)	340-700 (592)	290-470 (389)	607-610 (609)	365-497 (415)	743-1222 (924)	720-1010 (815)	210-1103 (596)	497-900 (775)	1117-1539 (1258)	817-1054 (936)
Fe (%)	1.5-3.0 (2.4)	0.9-2.6 (1.5)	0.3-3.3 (1.8)	1.4-2.1 (1.7)	1.4-3.5 (2.7)	1.9-3.6 (2.7)	0.8-5.6 (3.8)	2.0-6.5 (4.8)	4.1-4.7 (4.7)	4.7-5.8 (5.3)
Co (µg/g)	7-27 (19)	21-38 (30)	ND-8 (4)	4-96 (35)	24-44 (34)	20-70 (45)	6-23 (17)	37-65 (54)	31-48 (37)	ND-18 (9)
Ni (µg/g)	13-29 (20)	10-28 (17)	ND-34 (17)	14-28 (19)	38-61 (49)	33-50 (38)	35-73 (55)	21-75 (58)	65-86 (70)	58-67 (63)
Cu (µg/g)	8-26 (16)	5-24 (12)	5-43 (24)	20-21 (21)	33-70 (52)	36-65 (48)	7-59 (41)	27-90 (73)	50-85 (62)	64-92 (78)
Zn (µg/g)	21-32 (28)	15-44 (25)	62-69 (66)	27-63 (41)	79-134 (110)	69-131 (101)	63-154 (126)	39-101 (75)	88-93 (91)	83-85 (84)
Hg (µg/g)	0.01-0.10 (0.04)	-	0.06-0.09 (0.07)	0.05-0.17 (0.09)	-	-	ND-0.02 (0.01)	-	-	0.09-0.11 (0.10)
Pb (µg/g)	2-15 (10)	-	-	-	6-12 (9)	6-10 (8)	-	ND	3.5-11.8 (8.5)	-
C (%)	-	0.1-1.6 (0.5)	0.2-0.6 (0.4)	0.4-0.7 (0.6)	-	-	-	-	-	0.5-0.8 (0.7)
P (µg/g)	-	410-709 (555)	626-688 (657)	594-738 (657)	694-815 (771)	-	76-985 (701)	-	-	650-704 (677)
PHc (µg/g)	ND-0.3 (0.1)	0.3-0.8 (0.4)	-	0.4-1.0 (0.7)	ND-0.9 (0.4)	0.2-1.0 (0.3)	0.2-1.0 (0.4)	0.3-1.0 (0.6)	0.3-0.5 (0.4)	-

Table 3.3.4 (Contd 2)

Constituents	Postmonsoon									
	Bedi	Navlakhi		Kandla		Mundra				Salaya
	Oct 97	Nov 94	Nov 2002	Oct 96	Nov 2002	Sep 99	Nov 2002	Oct 2003	Dec 2004	Nov 2002
Al (%)	2.9-6.6 (4.4)	-	6.6	2.9-6.3 (4.4)	7.0	2.5-6.7 (5.6)	0.4	1.3-4.8 (3.1)	1.4-9.6 (4.3)	5.9
Cr (µg/g)	48-189 (133)	75-194 (100)	94	50-103 (69)	83	18-80 (53)	12	18-41 (30)	27-123 (73)	86
Mn (µg/g)	493-775 (664)	549-1188 (944)	834	797-1321 (1033)	838	361-832 (684)	353	312-490 (401)	536-1182 (766)	611
Fe (%)	2.0-5.2 (3.8)	1.4-3.6 (2.4)	3.8	1.6-3.4 (2.6)	3.5	1.5-4.7 (3.8)	0.5	0.8-2.4 (1.6)	1.3-5.1 (3.6)	3.3
Co (µg/g)	28-53 (41)	34-39 (36)	7	14-29 (23)	10	11-34 (28)	ND	2-8 (5)	ND-20 (8)	8
Ni (µg/g)	24-67 (51)	37-63 (51)	47	20-58 (40)	41	15-59 (46)	ND	6-21 (14)	7-59 (35)	39
Cu (µg/g)	16-72 (46)	24-46 (34)	36	11-36 (25)	34	3-39 (27)	7	10-16 (13)	5-44 (20)	41
Zn (µg/g)	39-122 (72)	33-157 (78)	96	34-88 (61)	93	13-79 (61)	15	20-48 (34)	31-151 (87)	68
Hg (µg/g)	0.1-0.3 (0.2)	Nd-0.40 (0.20)	0.11	0.13-0.26 (0.18)	0.08	0.3-0.69 (0.44)	0.08	-	ND-0.01 (0.01)	0.12
Pb (µg/g)	-	7.0-11.0 (10.0)	-	8.6-17.2 (12.9)		-	-	-	-	-
C (%)	-	-	0.7	-	0.6	0.1-0.8 (0.6)	0.1	0.1-0.2 (0.2)	ND-0.2 (0.1)	1.0
P (µg/g)	-	-	786	-	703	337-1402 (1027)	327	102-275 (189)	469-1822 (812)	1049
PHc (µg/g)	0.3-1.0 (0.4)	0.2-1.2 (0.5)	-	0.7-1.4 (1.0)	-	0.1-0.4 (0.3)	-	-	ND-0.2 (0.1)	-

Dry wt basis except PHc which is wet wt basis, ND : Not Detected, Average in parenthesis

Table 3.3.5 : List of algae recorded along the intertidal zone of the Gulf

Name	Status*
Chlorophyceae	
Boodlea composita	C
Bryopsis indica	C
B. plumose	C
B. ramulosa	C
Caulerpa crassifolia	C
C. cupressoides	C
C. racemosa	C
C. scalpelliformis	C
C. sertularioides	C
C. taxiformes	C
C. verticillata	C
Chaetomorpha indica	C
Chamaedoris auirculata	C
Cladophora glomerata	C
C. prolifera	C
Codium decorticatum	R
C. dwarkensis	C
C. elongatum	C
Dictyosphaeria cavernosa	C
Enteromorpha intenstinalis	C
Halideda tuna	C
Pseudobryopsis mucronata	R
Spongomorpha sp.	C
Udoea indica	C
Ulva fasciata	C
U. lactuca	C
U. reticulata	R
Valonia utricularis	R
Valloniopsis spachynema	R

Table 3.3.5 (Contd 2)

Name	Status*
Valonia utricularis	R
Valloniopsis spachynema	R
Phaeophyceae	
Colpomenia sinuosa	C
Cystoceira indica	C
Dictyota atomaria	C
D. bartayrisiana	R
D. cervicornis	R
D. ciliolate	C
D. dichotoma	C
D. divaricata	R
Dictyopteris australis	C
D. woodwardii	C
Ectocarpus sp.	C
Hinskia mitchelle	C
Hormophysa triquetra	R
Hydroclathrus clathratus	R
Iyengaria stellata	C
Myriogloea sciurus	R
Nemacystus decipiens	R
Padina gymnospora	R
P. tetrastromatica	C
Pocockiella sp.	C
Rosenvingia intricata	R
Sargassum johnstonii	C
S. tenerrimum	C
S. plagiophyllum	R
S. swartzii	C
S. wisghtii	R
Spathoglossum asperum	R
S. variabile	C

Table 3.3.5 (Contd 3)

Name	Status*
Stoechospermum marginatum	C
Spathoglossum asperum	R
S. variabile	C
Stoechospermum marginatum	C
Turbinaria ornata	R
Rhodophyceae	
Acanthophora delilei	C
A. specifera	R
Amphiroa fragilissima	R
Asparogopsis taxiformis	C
Botroycladia leptapoda	C
Calaglossa bombayance	R
Ceramium sp.	C
Champia indica	C
Chondria ornata	R
C.dasyphylla	R
Coelarthrum opuntia	C
Corallina officinalis	C
Corynomorpha prismatica	R
Cryptopleur sp.	R
Dasya sp.	R
Desmia hornmanni	R
Gastroclonium iyengarii	R
Galaxaura oblongata	C
Gelidiella acerosa	C
Gelidiospsis gracilis	C
Gigartina sp	R
Gracilaria corticata	R
G. pygmaea	C
Gastroclonium iyengarii	R
Galaxaura oblongata	C
Gelidiella acerosa	C

Table 3.3.5 (Contd 4)

Name	Status*
Gelidiospsis gracilis	C
Gigartina sp	R
Gracilaria corticata	R
G. pygmaea	C
G. verrucossa	R
Grateloupia inica	C
G. felicina	R
Haloplegma sp.	R
Halymenia floresia	R
H. porphyroides	C
H. venusta	C
Helminthocladia clayadosii	C
Heterosiphonia muelleri	C
Hypnea cervicornis	C
H. musciformis	C
Hypoglossum spathulatum	R
Laurencia papillosa	C
L. pedicularioides	C
Liagora cerenoides	R
Lophocladia lallemandi	R
Neurymenia fraxinifolia	R
Polysiphonia sp.	C
Rhodymenia australis	C
R. palmate	C
Scinaia indica	C
S. furcellata	R
Sebdenia polydactyla	C
Spyridia alternans	C
Soleria robusta	C

*C: common; R : rare
Source: Saurashtra University (1991)

Table 3.3.6 : Biological characteristics of the Gulf during premonsoon (1981-2005).

Parameter	Okha				
	April 1981	**March 1995**	**March 1999**	**April 2002**	**April 2003**
Phytoplankton					
Chlorophyll a (mg/m^3)	1.1-6.9 (4.3)	0.5-1.1 (0.7)	0.5-1.1 (0.6)	0.5-2.7 (1.1)	0.1-0.2 (0.2)
Phaeophytin (mg/m^3)	-	0.4-1.3 (0.7)	0.4-1.3 (0.7)	0.1-0.6 (0.2)	0.5-0.8 (0.6)
Cell counts ($nox10^3/l$)	-	36.6-45.6 (41.1)	49.2-775.2 (412.2)	16.5-116.5 (48.5)	15.3-24.0 (20.5)
Total genera (no)	-	8-8 (8)	7-8 (8)	14-21 (17)	15-19 (18)
Zooplankton					
Biomass ($ml/100m^3$)	0.3-0.6 (0.5)	0.4-0.7 (0.5)	6.9-7.2 (7.0)	0.3-7.5 (2.7)	1.5-4.5 (3.2)
Population ($nox10^3/100m^3$)	-	0.2-0.4 (0.3)	0.4-1.0 (0.7)	2.0-29.3 (14.1)	6.5-13.0 (8.5)
Total groups (no)	-	6-8 (7)	10-11 (11)	9-20 (15)	12-13 (13)
Macrobenthos					
Biomass (g/m^2, wet wt)	-	0.1	<0.1	0.1	2.2-3.7 (3.2)
Population (no/m^2)	2700	200	13	341	375-1250 (828)
Total groups (no)	9	4	1	9	3-8 (7)

Table 3.3.6(Contd 2)

Parameter	Vadinar			
	April 1994	March 1996	April 2002	May 2005
Phytoplankton				
Chlorophyll a (mg/m^3)	1.1-1.1 (1.1)	1.1-2.7 (1.3)	0.5-1.6 (0.8)	0.2-0.6 (0.3)
Phaeophytin (mg/m^3)	0.8-1.6 (1.0)	0.1-3.8 (1.5)	0.2-1.3 (0.8)	0.1-1.7 (0.5)
Cell counts ($nox10^3/l$)	47.2 (47.2)	15.8-42.8 (29.4)	2.5-29.6 (11.9)	6.1-71.2 (21.8)
Total genera (no)	25 (25)	9-11 (10)	8-21 (13)	10-22 (17)
Zooplankton				
Biomass ($ml/100m^3$)	12.1-18.9 (15.5)	3.0 (3.0)	<0.1-3.7 (1.2)	0.9-12.5 (4.6)
Population ($nox10^3/100m^3$)	12.8-16.8 (14.8)	1.6 (1.6)	0.2-23.9 (6.2)	1.6-36.3 (12.3)
Total groups (no)	13-15 (14)	11 (11)	12-20 (16)	6-19 (16)
Macrobenthos				
Biomass (g/m^2, wet wt)	6.1	3.0	10.3	3.1
Population (no/m^2)	2725	1392	3693	739
Total groups (no)	9	8	17	6

Table 3.3.6(Contd 3)

Parameter	Sikka						
	April 1994	**March 1997**	**May 2001**	**April 2002**	**April 2003**	**February 2005**	**April 2005**
Phytoplankton							
Chlorophyll a (mg/m^3)	1.1-2.7 (1.6)	0.5-1.1 (0.8)	0.5-4.8 (1.6)	0.5-1.1 (0.6)	1.1-0.2 (0.2)	0.2-0.4 (0.3)	0.2-0.4 (0.2)
Phaeophytin (mg/m^3)	0.3-3.1 (1.2)	0.1-0.6 (0.3)	0.1-6.2 (1.0)	0.2-1.3 (0.8)	0.5-0.8 (0.6)	0.5-1.2 (0.7)	0.1-0.7 (0.3)
Cell counts ($nox10^3/l$)	35.0-61.0 (58.0)	25.2-41.2 (33.2)	0.5-719 (122)	6.2-28.0 (14.6)	15.3-24.0 (20.5)	10.8-51.6 (28.4)	4.0-54.4 (10.1)
Total genera (no)	4-18 (9)	6-7 (7)	5-21 (18)	12-23 (18)	15-19 (18)	11-16 (14)	8-20 (12)
Zooplankton							
Biomass ($ml/100m^3$)	0.8-13.3 (3.3)	1.5-1.5 (1.5)	1.8-28.2 (8.4)	0.3-8.5 (4.1)	1.5-4.5 (3.2)	0.1-10.0 (2.0)	0.3-22.8 (6.8)
Population ($nox10^3/100m^3$)	1.9-44.8 (9.9)	3.4-4.7 (4.1)	6.9-118 (31.9)	1.9-49.3 (22.8)	6.5-13.0 (8.5)	0.2-28.8 (5.6)	2.4-13.2 (19.1)
Total groups (no)	7-14 (12)	10-14 (12)	11-15 (14)	11-20 (16)	12-13 (13)	4-15 (12)	6-16 (10)
Macrobenthos							
Biomass (g/m^2, wet wt)	25.5	116.0	<0.1-3.04 (0.75)	2.7 (2.7)	2.2-3.7 (3.2)	0.1-4.11 (1.7)	0.2-19.2 (7.2)
Population (no/m^2)	2525	8050	50-834 (292)	1782 (1782)	375-1250 (828)	100-1850 (918)	50-2925 (1138)
Total groups (no)	11	10	1-5 (3)	10 (10)	3-8 (7)	3-9 (6)	2-8 (6)

Table 3.3.6(Contd 4)

Parameter	Bedi	Navlakhi	
	March 1997	February 1987	April 2002
Phytoplankton			
Chlorophyll *a* (mg/m^3)	0.5-5.9 (1.5)	0.5-3.8 (1.6)	0.5-1.1 (0.7)
Phaeophytin (mg/m^3)	0.1-7.6 (1.5)	0.1-0.8 (0.4)	0.2-1.3 (0.8)
Cell counts ($nox10^3/l$)	38.0-936.0 (159.0)	-	1.7-13.5 (7.2)
Total genera (no)	7-15 (10)	-	7-19 (11)
Zooplankton			
Biomass ($ml/100m^3$)	0.5-25.5 (6.4)	18.8-95.0 (53.3)	0.5-3.2 (1.9)
Population ($nox10^3/100m^3$)	1.6-220.0 (48.1)	59.0-192.0 (117.3)	2.8-34.1 (16.9)
Total groups (no)	5-15 (10)	-	11-20 (15)
Macrobenthos			
Biomass (g/m^2, wet wt)	7.8	<0.1	<0.1
Population (no/m^2)	2944	72	25
Total groups (no)	9	-	1

Table 3.3.6(Contd 5)

Parameter	Kandla			
	February 1987	**March 1996**	**February 1998**	**April 2002**
Phytoplankton				
Chlorophyll a (mg/m^3)	0.1-0.5 (0.4)	0.5-0.5 (0.5)	0.5-2.1 (1.1)	0.5-2.1 (1.1)
Phaeophytin (mg/m^3)	0.1-1.7 (1.0)	0.2-0.6 (0.3)	0.1-1.7 (1.0)	0.3-1.3 (0.8)
Cell counts ($nox10^3/l$)		4.6-170.0 (67.7)	30.2-45.1 (36.2)	8.4-22.4 (14.5)
Total genera (no)		7-15 (11)	6-8 (7)	9-19 (13)
Zooplankton				
Biomass ($ml/100\ m^3$)	17.0-56.3 (37.0)	4.4-18.5 (11.5)	3.8-24.1 (14.3)	1.6-6.3 (3.2)
Population ($nox10^3/100\ m^3$)	31.0-98.5 (67.0)	4.2-18.7 (11.4)	13.7-117.1 (42.4)	11.8-139 (40.0)
Total groups (no)	-	10-11 (11)	7-13 (10)	11-17 (14)
Macrobenthos				
Biomass (g/m^2, wet wt)	6.4	0.4	<0.2	<0.1
Population (no/m^2)	264	978	26	143
Total groups (no)	3	8	2	5

Table 3.3.6(Contd 6)

Parameter	Mundra				
	March 1997	March 1999	March 2000	April 2002	June 2003
Phytoplankton					
Chlorophyll *a* (mg/m^3)	0.3-1.1 (0.8)	0.5-2.7 (0.9)	0.5-1.6 (0.8)	0.5-1.6 (0.9)	0.2-4.1 (1.0)
Phaeophytin (mg/m^3)	0.2-0.8 (0.4)	0.1-1.7 (0.6)	0.1-0.6 (0.4)	0.1-1.3 (0.7)	0.1-1.6 (0.5)
Cell counts ($nox10^3/l$)	62.4-293.0 (189.4)	33.6-133.2 (79.6)	14.0-196.0 (57.0)	16.6-82.8 (45.8)	12.9-427 (90.8)
Total genera (no)	7-14 (12)	6-14 (10)	8-14 (11)	20-26 (24)	8-13 (10)
Zooplankton					
Biomass ($ml/100m^3$)	0.4-72.7 (32.0)	0.8-8.0 (4.3)	0.2-28.2 (6.4)	0.2-25.3 (9.1)	0.9-9.6 (2.7)
Population ($nox10^3/100m^3$)	1.6-144.1 (74.8)	2.1-40.4 (19.6)	1.9-145.1 (25.0)	2.2-156 (45.5)	7.7-58.9 (18.7)
Total groups (no)	9-16 (12)	6-16 (12)	6-17 (10)	9-21 (15)	12-18 (15)
Macrobenthos					
Biomass (g/m^2, wet wt)	4.4	0.2-2.0 (0.8)	0.1-43.1 (4.3)	12.8	0-4.5 (0.4)
Population (no/m^2)	5700	302-515 (380)	100-20600 (2100)	3494	0-1300 (240)
Total groups (no)	7	5-5 (5)	2-7 (4)	15	0-6 (3)

Average given in parenthesis

Table 3.3.7 : Biological characteristics of the Gulf during postmonsoon.

Parameter	Okha					
	December 1981	**November 1995**	**November 1999**	**November 2002**	**January 2003**	**January 2004**
Phytoplankton						
Chlorophyll *a* (mg/m^3)	2.7-4.3 (3.5)	1.1-1.1 (1.1)	1.1-1.1 (1.1)	0.5-1.6 (0.7)	0.5-0.5 (0.5)	0.2-0.4 (0.3)
Phaeophytin (mg/m^3)	-	0.2-0.6 (0.3)	0.1-0.4 (0.2)	0.1-1.4 (0.6)	0.2-1.0 (0.5)	0.1-0.3 (0.2)
Cell counts ($nox10^3/l$)	-	27.0-54.8 (41.8)	68.0-80.0 (74.0)	-	1.2-54 (21.0)	3.1-60.0 (19.0)
Total genera (no)	-	13-16 (15)	10-11 (11)	-	9-19 (12)	10-17 (12)
Zooplankton						
Biomass ($ml/100m^3$)	0.5-0.9 (0.7)	0.4-0.8 (0.6)	0.4-1.0 (0.7)	0.2-2.6 (1.6)	2.2-8.2 (4.6)	1.0-56/9 (25.2)
Population ($nox10^3/100m^3$)	-	0.5-0.5 (0.5)	6.9-7.2 (7.0)	0.6-22.8 (8.3)	26.1-86 (54.9)	20.5-69.4 (45.8)
Total groups (no)	-	7-14 (12)	10-11 (11)	10-19 (16)	15-21 (16)	12-20 (15)
Macrobenthos						
Biomass (g/m^2, wet wt)	-	<0.1	0.5	1.89	0.5-24.9 (15.2)	0.2-5.2 (3.3)
Population (no/m^2)	775	89	352	1963	600-2025 (1307)	213-2900 (1597)
Total groups (no)	5	3	4	10	2-6 (5)	2-6 (4)

Table 3.3.7 (Contd 2)

Parameter	Vadinar						
	November 1994	**November 1995**	**January 2000**	**November 2002**	**January 2003**	**January 2004**	**November 2004**
Phytoplankton							
Chlorophyll *a* (mg/m^3)	0.5-0.5 (0.5)	0.5-1.1 (0.7)	0.5-1.1 (0.8)	0.5-1.6 (0.6)	0.5-0.5 (0.5)	0.2-0.2 (0.2)	0.2-0.2 (0.2)
Phaeophytin (mg/m^3)	0.2-1.0 (0.6)	0.1-0.6 (0.4)	0.1-0.6 (0.4)	0.1-1.3 (0.4)	0.2-1.0 (0.6)	0.1-0.2 (0.2)	0.2-1.0 (0.5)
Cell counts ($nox10^3/l$)	-	9.4-32.7 (17.1)	17.2-28.8 (22.0)	3.8-26.4 (9.9)	9.6-70.0 (36.6)	2-20.1 (11.7)	2.0-36.0 (7.6)
Total genera (no)	-	10-12 (11)	8-13 (11)	10-18 (14)	9-21 (14)	11-18 (15)	7-18 (12)
Zooplankton							
Biomass ($ml/100m^3$)	2.1-6.4 (4.6)	1.6 (1.6)	0.6-7.3 (4.0)	0.4-2.5 (1.3)	4.2-11.9 (8.2)	0.1-1.9 (1.0)	0.3-6.7 (1.7)
Population ($nox10^3/100m^3$)	3.7-52.7 (23.7)	7.2 (7.2)	8.7-41.1 (24.9)	2.5-12.2 (7.4)	23.4-125 (66.5)	0.2-9.6 (6.8)	1.4-37.1 (12.5)
Total groups (no)	11-15 (13)	10 (10)	7-8 (8)	9-20 (16)	20-23 (22)	8-12 (9)	11-17 (14)
Macrobenthos							
Biomass (g/m^2, wet wt)	-	1.2	0.2	1.26	0.0-35.5 (10.0)	>0.1-7.2 (2.6)	(2.0)
Population (no/m^2)	-	339	126	1163	0-7425 (2581)	25-1826 (471)	570
Total groups (no)	1	3	3	9	0-9 (5)	(2)	5

Table 3.3.7 (Contd 3)

Parameter	Sikka			
	December 1993	**December 2000**	**November 2002**	**November 2003**
Phytoplankton				
Chlorophyll *a* (mg/m^3)	0.5-4.3 (1.8)	0.5-3.7 (1.3)	0.5-1.1 (0.6)	0.2-0.6 (0.3)
Phaeophytin (mg/m^3)	0.1-2.8 (0.9)	0.1-1.5 (0.6)	0.2-1.0 (0.4)	0.1-1.0 (0.6)
Cell counts ($nox10^3/l$)	4.0-252 (90.0)	8.0-267 (85.4)	-	3.6-59.2 (21.4)
Total genera (no)	4-12 (7)	8-13 (11)	-	7-10 (9)
Zooplankton				
Biomass ($ml/100m^3$)	3.9-29.9 (11.0)	5.0-32.4 (20.7)	0.5-5.7 (2.5)	2.4-11.4 (7.8)
Population ($nox10^3/100m^3$)	1.93-71.3 (44.5)	12.8-83.4 (43.3)	2.3-37.0 (13.5)	27.8-91 (67.5)
Total groups (no)	10-13 (12)	13-19 (16)	11-20 (16)	13-17 (15)
Macrobenthos				
Biomass (g/m^2, wet wt)	12.8	0.02-2.1 (1.0)	14.4	2.2-3.7 (3.2)
Population (no/m^2)	10914	150-777 (483)	544	375-1250 (828)
Total groups (no)	11	2-9 (4)	8	3-8 (6)

Table 3.3.7 (Contd 4)

Parameter	Bedi		Navlakhi		
	October 1997	November 2002	November 1986	November 1994	November 2002
Phytoplankton					
Chlorophyll *a* (mg/m^3)	0.5-1.6 (1.0)	0.5-1.6 (1.0)	1.1-4.6 (2.2)	0.5-1.6 (0.9)	0.5-1.6 (0.6)
Phaeophytin (mg/m^3)	1.3-1.6 (1.4)	0.1-0.5 (0.4)	0.1-1.9 (1.0)	0.1-0.8 (0.4)	0.1-0.8 (0.4)
Cell counts ($nox10^3/l$)	0.2-14.8 (7.5)	3.8-56.1 (22.5)	-	9.0-18.9 (13.1)	6.0-31.4 (14.5)
Total genera (no)	6-7 (7)	10-16 (13)	-	7-9 (8)	8-20 (13)
Zooplankton					
Biomass ($ml/100m^3$)	1.8-7.5 (4.6)	3.9-8.9 (6.6)	13.2-55.2 (30.4)	1.8-13.5 (5.6)	0.8-5.4 (3.5)
Population ($nox10^3/100m^3$)	9.9-14.9 (12.4)	12.8-24.5 (19.4)	2.0-13.0 (6.8)	4.4-31.4 (14.5)	5.5-38.3 (15.1)
Total groups (no)	10-11 (11)	16-19 (17)	-	10-15 (12)	12-19 (16)
Macrobenthos					
Biomass (g/m^2, wet wt)	0.1	5.7	0.1-43.1 (4.3)	0.1	<0.1-0.1
Population (no/m^2)	125	1125	100-20600 (2100)	60	13-125 (82)
Total groups (no)	1	12	2-7 (4)	15	0-6 (3)

Table 3.3.7 (Contd 5)

Parameter	Kandla					
	November 1986	October 1996	November 2002	January 2003	December 2004	January 2004
Phytoplankton						
Chlorophyll *a* (mg/m^3)	0.5-1.1 (0.8)	2.1-4.3 (3.2)	0.5-1.1 (0.8)	0.5-1.1 (0.9)	0.2-0.2 (0.2)	0.2-0.2 (0.2)
Phaeophytin (mg/m^3)	1.0-1.3 (0.6)	0.1-0.6 (0.8)	0.2-1.9 (0.6)	1.2-2.3 (1.6)	0.2-1.0 (0.6)	0.1-0.5 (0.3)
Cell counts ($nox10^3/l$)	-	25.2-37.5 (30.4)	3.6-28.1 (17.6)	37.4-138.4 (103.0)	0.8-45.2 (31.8)	3-11.2 (6.0)
Total genera (no)	-	5-9 (7)	5-14 (10)	9-11 (10)	2-14 (7)	8-12 (11)
Zooplankton						
Biomass ($ml/100m^3$)	8.2-13.7 (11.8)	1.8-5.2 (3.5)	3.1-9.9 (5.2)	3.3-6.1 (4.7)	2.1-8.8 (5.9)	1.2-1.7 (1.5)
Population ($nox10^3/100m^3$)	21.0-32.9 (25.5)	1.2-63.6 (32.4)	16.6-102.1 (40.7)	61.0-63.7 (62.4)	4.5-89.0 (42.6)	4.1-6.7 (5.4)
Total groups (no)	-	8-12 (10)	12-21 (18)	17-17 (17)	14-19 (17)	9-10 (10)
Macrobenthos						
Biomass (g/m^2, wet wt)	0.2	0.4	0.1	0.1	1.2	0.1-1.1 (0.6)
Population (no/m^2)	60	276	6.9	75	177	100-138 (119)
Total groups (no)	2	3	4	2	2	3-5 (4)

Table 3.3.7 (Contd 6)

Parameter	Mundra				
	September 1999	November 2002	January 2003	October 2003	January 2004
Phytoplankton					
Chlorophyll *a* (mg/m^3)	1.1-3.7 (2.6)	0.5-1.1 (0.5)	0.5-1.6 (1.0)	0.2-3.4 (1.0)	0.2-0.2 (0.2)
Phaeophytin (mg/m^3)	0.4-2.8 (1.3)	0.2-0.6 (0.3)	0.1-4.2 (1.8)	0.1-1.5 (0.4)	0.1-0.8 (0.3)
Cell counts ($nox10^3/l$)	96.0-169.0 (150.0)	4.2-24.1 (11.2)	13-148 (53.8)	26-337 (111)	3.7-34.0 (14.6)
Total genera (no)	6-12 (9)	7-17 (11)	12-18 (15)	9-22 (15)	12-18 (14)
Zooplankton					
Biomass ($ml/100m^3$)	0.1-2.5 (0.8)	4.5-15.4 (7.2)	4.0-6.8 (5.7)	1.1-21.8 (5.2)	0.8-3.0 (1.8)
Population ($nox10^3/100m^3$)	0.1-11.0 (2.7)	7.5-60.6 (29.3)	58.2-150.3 (84.3)	11.7-81.5 (38.1)	6.3-22.0 (13.6)
Total groups (no)	9-19 (12)	13-19 (15)	16-17 (17)	12-17 (15)	8-14 (10)
Macrobenthos					
Biomass (g/m^2, wet wt)	0.6	0.3	0.1-15.5 (4.6)	1.4	1.4-2.7 (2.0)
Population (no/m^2)	713	325	125-1425 652	350	550-1450 (75)
Total groups (no)	2	8	2-6 (4)	2	4-6 (5)

Average given in parenthesis

Table 3.3.9: Distribution of corals in the Gulf

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Esammocora digitata	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Acropora humilis	-	-	+	+	-	-	+	+	-	-	-	-	-	-	-
A.squamosa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Montipora explanata	+	-	+	+	-	+	+	-	+	+	+	+	+	+	+
M.venosa	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
M.turgescons	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
M.hispida	+	+	-	+	+	-	+	+	+	+	+	-	-	-	+
M.foliosa	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
M.monasteriata	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
Coscinaraea monile	+	+	+	+	+	+	+	+	+	-	-	-	-	-	+
Siderastrea savignyana	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pseudosiderastrea tayami	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+
Goniopora planulata	+	+	-	-	+	+	+	-	+	+	-	+	-	-	+
G.minor	-	-	-	+	-	-	+	-	-	-	-	-	-	-	+
G.nigra	+	+	-	+	+	+	+	-	-	+	-	-	-	-	+
Porites leutea	+	+	+	+	-	-	+	-	-	-	-	+	-	-	+
P.lichen	+	-	-	-	-	-	+	-	+	-	-	+	-	+	+
P.compressa	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+
Favia speciosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
F.favus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Favites complanata	+	+	+	+	+	+	+	-	-	+	-	-	-	+	+

Table 3.3.9 (Contd 2)

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
F.melicerus	+	-	+	-	-	-	-	-	+	-	-	-	-	+	+
Goniastrea pectinata	+	+	+	+	+	+	+	-	+	+	+	-	+	+	+
Platygyra sinensis	+	+	+	+	-	-	-	-	-	+	-	-	-	+	+
Hydnophora exesa	+	+	+	+	-	-	-	-	-	+	-	-	+	-	+
Plesiastrea versipora	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-
Leptastrea purpurea	-	-	-	-	-	-	-	-	-	-	-	Sikka point			
Cyphastrea serailia	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+
Symphyllia radian	-	+	-	+	-	+	-	-	+	-	-	-	-	-	-
Acanthastrea simplex	+	+	+	+	-	-	-	-	+	+	-	-	-	-	+
Mycedium elephantotus	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Paracyathus stokesi	+	-	-	-	-	-	-	-	-	-	-	-	-	10	m
Polycyathus verrilli	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-
Tubastraea aurea	+	+	+	+	+	-	-	-	+	+	-	-	-	-	-
Turbinaria crater	+	+	-	+	-	-	+	-	-	-	-	-	-	-	+
T.peltata	-	+	+	+	+	+	+	-	-	+	-	-	+	+	+

1 : Okha 2 : Dholio Gugar 3 : Dona
4 : Boria 5 : Mangunda 6 : Savaj
7 : Paga 8 : Manmarudi Langamarudi 9 : Ajad
10: Bural reef 11 : Dhani 12 : Kalumbhar reef
13: Narara reef 14 : Goose reef 15 : Pirotan island

Source: Pillai, C.S.G. and M.I. Patel (1988)

Table 3.3.10 : List of water birds in the Gulf

English name	Scientific name	Status in habitat*	
		Salt pans	Gulf
Podicipedidae			
Great Crested Grebe	*Podiceps cristatus*	LM	-
Blacknecked Grebe	*Podiceps nigricollis*	M	-
Pelecanidae			
White Pelican	*Pelecanus onocrotalus*	LM	LM
Dalmatian Pelican	*Pelecanus crispus*	M	M
Phalacrocoracidae			
Cormorant	*Phalacrocorax carbo*	LM	LM
Indian Shag	*Phalacrocorax fuscicolli*	LM	LM
Little Cormorant	*Phalacrocorax niger*	LM	R
Darter	*Anhinga rufa*	LM	R
Ardeidae			
Grey Heron	*Ardea cinerea*	LM	R
Purple Heron	*Ardea purpurea*	LM	-
Little Green Heron	*Ardeola striatus*	LM	R
Pond Heron	*Ardeola grayii*	LM	R
Cattle Egret	*Bubulcus ibis*	-	LM
Large Egret	*Ardea alba*	LM	R
Smaller Egret	*Egretta intermedia*	LM	-
Little Egret	*Egretta garzetta*	LM	-
Indian Reef Heron	*Egretta gularis*	LM	R
Night Heron	*Nycticorax mycticorax*	LM	R
Ciconiidae			
Painted Stork	*Mycteria leucocephala*	LM	R
Blacknecked Stork	*Ephippiorhynchus asiaficus*	LM	LM
Threskiornithidae			
White Ibis	*Threskiornis aethiopica*	LM	R
Black Ibis	*Pseudibis papillasa*	-	R
Spoonbill	*Platalea leucorodia*	LM	R

Table 3.3.10 (Contd 2)

English name	Scientific name	Status in habitat*	
		Salt pans	Gulf
Phoenicopteridae			
Flamingo	*Phoenicopterus roseus*	LM	LM
Lesser Flamingo	*Phoeniconatas minor*	LM	R
Anatidae			
Ruddy Shel duck	*Tadorna ferruginea*	-	M
Pintail	*Anas acuta*	M	M
Common Teal	*Anas crecca*	M	-
Spotbill Duck	*Anas poecilorhyncha*	LM	LM
Shoveller	*Anas clypeata*	M	-
Accipitridae			
Brahminy Kite	*Haliastur indus*	LM	R
Marsh Harrier	*Circus aeruginosus*	M	M
Osprey	*Pandian haliaetus*	M	M
Gruidae			
Common Crane	*Grus grus*	M	M
Demoiselle Crane	*Anthropoides virgo*	M	M
Rallidae			
Coot	*Fulica atra*	LM	LM
Jacanidae			
Pheasant - tailed Jacana	*Hydrophasianus chirurgus*	LM	-
Haematopodidae			
Oystercatcher	*Haematopus stralegus*	M	M
Charadriidae			
Redwattled Lapwing	*Vanellus indicus*	R	R
Grey Plover	*Pluvialis sugotarola*	M	M
Eastern Golden Plover	*Pluvialis dominica*	-	M

Table 3.3.10 (Contd 3)

English name	Scientific name	Status in habitat*	
		Salt pans	Gulf
Large Sand Plover	*Charadrius leschenaultii*	M	M
Ringed Plover	*Charadrius hiaticula*	R	-
Kentish plover	*Charadrius alexandrinus*	R	R
Lesser Sand Plover	*Charadrius mongolus*	M	M
Whimbrel	*Numenius phaeopus*	M	M
Curlew	*Numenius arquata*	M	M
Blacktailed Godwit	*Limosa limosa*	M	-
Bartailed Godwit	*Limosa lapponica*	M	M
Spotted Redshank	*Tringa erythropus*	M	M
Common Redshank	*Tringa totanus*	M	M
Marsh Sandpiper	*Tringa stagnatilis*	M	M
Greenshank	*Tringa nebularia*	M	M
Green Sandpiper	*Tringa ochropus*	M	M
Wood Sandpiper	*Tringa glareola*	M	-
Terek Sandpiper	*Tringa terek*	M	M
Common Sandpiper	*Tringa hypoleucos*	M	M
Turnstone	*Arenaria interpres*	M	M
Knot	*Calidris carutus*	-	M
Eastern Knot	*Calidris tenuirostris*	-	V
Sanderling	*Calidris alba*	-	M
Eastern Little Stint	*Calidris ruficollis*	-	V
Little Stint	*Calidris minuta*	M	M
Dunlin	*Calidris alpina*	M	M
Curlew-Sandpiper	*Calidris testacea*	M	M
Broadbilled Sandiper	*Limicola falcinellus*	M	M
Ruff and Reeve	*Philomachus pugnax*	M	M
Rednecked Phalarope	*Phalaropus lobatus*	M	M
Recurvirostidae			
Blackwinged Stilt	*Himantopus himantopus*	R	-
Avocet	*Recurvirostra avosetta*	LM	-

Table 3.3.10 (Contd 4)

English name	Scientific name	Status in habitat*	
		Salt pans	Gulf
Dromadidae			
Crab Plover	*Dromas ardeola*	M	M
Burhinidae			
Great Stone Plover	*Esacus magnirostris*	LM	R
Laridae			
Herring Gull	*Larus argentatus*	M	M
Lesser Blackbacked			
Gull	*Larus fuscus*	M	M
Blackheaded	*Larus ichthyaetus*	M	M
Brownheaded Gull	*Larus brunnicephalus*	M	M
Blackheaded Gull	*Larus ridibunds*	M	M
Slenderbilled Gull	*Larus genei*	M	M
Whiskered Tern	*Chiildonias hybrida*	M	M
Whitewinged Black	*Chiildonias leucopterus*	M	M
Tern			
Gullbilled Tern	*Gelochelidon nilotica*	M	M
Caspian Tern	*Hdroprogne caspia*	LM	LM
Common Tern	*Sterna hirunda*	M	M
Whitecheeked Tern	*Sterna repressa*	M	M
Brownwinged Tern	*Sterna anaethetus*	M	M
Little Tern	*Sterna albitrons*	M	M
Saunders Little Tern	*Sterna saundersi*	LM	R
Large Crested Tern	*Sterna bergii*	M	M
Indian Lesser Crested Tern	*Sterna bengalenis*	M	M
Sandwich Tern	*Sterna sandvicensis*	M	M
Indian skimmer	*Rynchops albicollis*	LM	LM

Table 3.3.10 (Contd 5)

English name	Scientific name	Status in habitat*	
		Salt pans	Gulf
Alcedinidae			
Common Kingfisher	*Alcedo atthis*	LM	LM
Whitebreast	*Halcyon smyrnensisq*	LM	LM
Blackcapped kingfisher	*Halcyon pileata*	M	M

R : Resident, has been recorded breeding during the study.
LM : Local migrant, has not been recorded breeding during the study, but is known to nest within the state.
M : Migrant, does not breed in this area, spends the winter here and also sometimes the summer.
V : Not normally found in the area, one to few records only.

Source : Saurashtra University (1991).

Table 3.3.8 : Mangrove areas and status of occurrence of major species of Gujarat

District	**1992**	**1998**
Mangroves areas (km^2)		
Kachchh	601.8	938.0
Jamnagar	13.12	98.3
Junagad	0.8	0.3
Bhavnagar	14.5	6.2
Bharuch	10.9	17.1
Surat	7.8	5.0
Valsad	-	5.0
Total	**767.0**	**1066.9**
Status of occurrence of major species		
Species	**1950**	**1998**
Avicennia sp	Common	Common
Rhizosolenia	Common	Vulnerable
Aegiceras sp	Common	Endangered
Ceriops tagal	Common	Vulnerable
Sonneratia apetala	Common	Vulnerable
Bruigeria sp.	Common	Absent
*** Based on satellite data**		