

Chapter 13

Oceans and Fisheries

Data Table 13.1

Marine and Freshwater Catches, Aquaculture, Balance of Trade, and Fish Consumption

Sources: Food and Agriculture Organization of the United Nations and United Nations Population Division

	Average Annual Marine Catch (a)		Average Annual Freshwater Catch (a)		Average Annual Aquaculture Production				Average Annual Balance of Trade (b)			Per Capita Annual Food Supply from	
	(000 metric tons)	Percent Change Since 1983-85	(000 metric tons)	Percent Change Since 1983-85	1993-95 (metric tons)				1993-95 (million US\$)			Total 1993-95 (kg)	% Change 1983-85
					Marine Fish	Dia- dromous Fish	Fresh- water Fish	Molluscs & Crus- taceans	Fish	Molluscs & Crustaceans	Fish Meal		
	1993-95	1983-85	1993-95	1983-85									
WORLD (c)	91,219.2	23	17,152.7	102	472,243	1,287,589	11,204,330	5,590,184				13.4	9.2
AFRICA	3,916.9	31	1,373.1	19	14,597	1,788	54,785	4,511	299.6	868.2	(62.4)	6.8	(13.6)
Algeria	114.2	74	0.3	862	53	14	254	31	(6.7)	2.3	(0.3)	3.5	1.8
Angola	77.5	(1)	6.7	(11)	X	X	X	X	(6.6)	(2.7)	(0.0)	12.4	(51.1)
Benin	13.5	192	25.2	(18)	X	X	98	X	(9.0)	0.6	(0.0)	10.2	(5.8)
Botswana	X	X	2.0	41	X	X	X	X	(4.6)	(0.6)	(0.1)	7.1	98.4
Burkina Faso	X	X	7.7	5	0	0	0	0	(3.6)	(0.0)	(0.0)	1.3	(22.3)
Burundi	20.9	246	0.4	(92)	0	0	53	0	(0.6)	(0.0)	(0.0)	3.8	39.3
Cameroon	41.9	(25)	23.2	15	0	0	51	0	(22.2)	1.7	(0.3)	8.5	(41.2)
Central African Rep	X	X	13.3	1	0	0	367	0	(0.7)	(0.0)	(0.0)	4.5	(19.7)
Chad	X	X	75.8	57	X	X	X	X	(0.3)	(0.0)	(0.0)	5.9	102.1
Congo, Dem Rep	4.0	140	166.7	27	0	0	733	0	(40.1)	(0.1)	(0.0)	5.1	(44.1)
Congo, Rep	17.5	(8)	18.8	38	0	0	5	0	(18.5)	0.0	(0.0)	31.4	(23.9)
Côte d'Ivoire	57.5	(22)	14.1	(41)	0	0	255	0	12.1	4.4	0.8	12.5	(22.6)
Egypt	116.1	225	190.0	33	11,732	0	26,859	0	(64.4)	0.4	(5.4)	6.9	4.0
Equatorial Guinea	3.3	15	0.4	48	X	X	X	X	(1.6)	(0.0)	(0.0)	X	X
Eritrea	2.4	X	0.0	X	X	X	X	X	0.0	X	0.0	X	X
Ethiopia (d)	0.3	X	5.0	X	0	0	39	0	(0.3)	(0.0)	(0.0)	X	X
Gabon	24.0	28	2.5	39	0	0	6	0	(10.3)	3.2	(0.0)	44.0	(18.8)
Gambia, The	19.5	124	2.5	(9)	0	0	0	0	0.8	3.1	(0.0)	17.5	8.2
Ghana	299.6	34	52.7	24	0	0	505	0	17.7	5.9	(0.9)	22.8	5.5
Guinea	60.3	130	4.1	130	0	0	5	0	2.0	4.8	(0.0)	6.7	(18.0)
Guinea-Bissau	5.3	75	0.3	317	X	X	X	X	0.6	0.1	(0.0)	5.6	149.4
Kenya	107.6	86	86.0	112	0	314	823	68	20.1	0.9	(0.3)	5.7	12.4
Lesotho	0.0	367	0.0	66	0	5	12	0	0.0	0.0	(0.0)	4.0	13.7
Liberia	3.8	(61)	3.9	(3)	0	0	0	0	(0.9)	0.3	(0.0)	X	X
Libya	33.2	162	0.1	X	0	0	90	0	16.2	(0.5)	(0.8)	3.9	19.1
Madagascar	85.1	180	32.0	(12)	0	0	2,521	911	17.6	60.5	0.5	7.3	21.4
Malawi	X	X	57.5	(11)	0	0	231	5	0.1	(0.0)	(0.6)	6.8	(25.9)
Mali	5.2	53	81.6	53	0	0	84	0	(1.5)	(0.0)	(0.0)	6.4	(12.4)
Mauritania	86.6	(0)	5.2	(14)	X	X	X	X	19.7	(14.0)	(0.0)	16.2	23.4
Mauritius	19.0	74	0.1	270	29	0	42	72	6.9	(3.7)	(2.2)	27.7	56.4
Morocco	738.6	59	1.7	40	1,030	198	200	148	241.0	399.2	(0.4)	7.6	8.7
Mozambique	24.8	(27)	3.4	(15)	0	0	54	0	(10.7)	69.8	(0.1)	2.1	(40.6)
Namibia	304.5	2,336	1.1	183	0	0	4	42	58.7	0.0	6.7	10.8	5.0
Niger	X	X	2.8	0	0	0	29	0	(1.6)	0.4	(0.0)	0.4	(28.1)
Nigeria	187.0	14	114.2	19	1,053	14	15,179	0	(138.6)	35.4	(1.3)	6.9	(27.1)
Rwanda	X	X	3.5	247	0	0	51	0	(0.2)	(0.0)	(0.0)	X	X
Senegal	329.7	43	30.7	45	0	0	29	14	88.7	32.2	0.6	26.8	22.1
Sierra Leone	47.1	34	14.7	(10)	0	0	22	0	3.4	10.6	(0.0)	15.0	(16.8)
Somalia	15.4	(3)	0.3	(6)	X	X	X	X	5.0	2.5	(0.0)	X	X
South Africa	552.2	(32)	0.9	16	23	937	117	2,942	119.5	50.2	(56.1)	7.6	(14.7)
Sudan	3.5	70	39.6	50	0	0	467	0	(2.4)	0.0	(0.0)	1.7	23.9
Swaziland	X	X	0.1	29	0	0	23	0	X	X	X	0.0	X
Tanzania	243.4	68	100.1	(21)	0	0	183	0	9.8	6.9	(0.0)	11.8	(8.5)
Togo	8.7	(23)	5.9	69	0	0	607	0	(12.4)	1.5	(0.0)	10.7	(12.0)
Tunisia	84.0	7	0.4	X	676	206	174	108	17.7	56.3	(0.0)	7.9	(18.6)
Uganda	96.3	6	117.6	29	0	0	153	0	18.9	0.0	(0.0)	10.4	(17.6)
Zambia	11.0	(1)	57.1	3	0	0	4,422	0	(1.0)	(0.0)	(0.4)	9.2	(17.1)
Zimbabwe	19.6	72	1.1	(74)	0	100	37	13	(8.4)	(0.7)	(0.5)	2.2	7.1
EUROPE (e)	17,507.2	X	544.1	X	34,235	557,258	258,074	623,426	(504.4)	(2,194.5)	(200.4)	17.8	X
Albania	2.3	(65)	0.8	(73)	1	20	92	284	1.4	(0.2)	(0.0)	1.3	(58.3)
Austria	3.0	(0)	1.5	(11)	0	2,997	1,137	4	(137.8)	(21.3)	(10.5)	12.4	62.7
Belarus, Rep	0.0	X	14.4	X	0	9	13,727	0	(1.2)	(1.5)	(0.6)	0.0	X
Belgium	35.5	(25)	0.7	307	0	546	300	0	(327.3)	(224.8)	(23.7)	19.8	f 5.8
Bosnia and Herzegovina	0.0	X	2.5	X	X	X	X	X	(4.7)	(0.0)	(0.0)	X	X
Bulgaria	13.3	(87)	9.0	(28)	0	744	7,355	0	(0.4)	0.8	(1.2)	2.4	(73.6)
Croatia, Rep	19.6	X	4.0	X	264	301	3,706	252	29.8	0.0	(8.6)	0.0	X
Czech Rep	0.9	X	21.7	X	0	609	20,888	0	(32.9)	(1.1)	(8.8)	5.0	X
Denmark	1,870.8	2	0.3	(12)	0	42,397	0	0	702.9	93.9	140.7	23.2	(9.0)
Estonia, Rep	131.2	X	3.2	X	0	288	66	0	74.4	(0.4)	0.4	0.0	X
Finland	129.0	2	50.9	(18)	0	17,160	24	0	(61.3)	(16.7)	(19.1)	35.0	9.4
France	822.1	2	13.1	175	3,504	50,702	8,653	216,671	(1,155.7)	(743.0)	(35.3)	28.5	13.9
Germany	267.4	(44)	28.3	(2)	0	25,300	13,233	16,249	(1,220.8)	(290.2)	(0.6)	16.1	24.9
Greece	192.8	93	14.1	77	15,471	2,309	223	14,799	7.0	(24.1)	(17.3)	26.2	56.9
Hungary	0.4	180	23.0	(42)	0	38	9,579	0	(11.6)	(0.3)	(19.8)	4.2	(23.1)
Iceland	1,630.6	21	0.0	X	32	3,176	0	0	893.1	207.1	81.8	99.3	8.2
Ireland	344.7	61	1.9	X	6	13,439	0	17,931	179.2	53.7	(4.5)	19.8	26.4
Italy	571.6	1	11.5	21	8,117	41,294	5,441	134,892	(1,241.4)	(641.4)	(40.3)	22.7	15.6
Latvia, Rep	142.4	X	1.2	X	0	7	468	0	35.3	(0.2)	0.6	36.4	X
Lithuania, Rep	70.3	X	3.2	X	0	0	2,165	0	3.1	0.4	(1.9)	33.2	X
Macedonia, FYR	0.6	X	0.7	X	0	617	579	0	(5.2)	(0.1)	(2.1)	3.3	X
Moldova, Rep	0.0	X	4.8	X	0	0	4,754	0	(2.5)	0.0	(0.4)	1.1	X
Netherlands	526.3	(2)	1.6	(6)	0	1,545	973	85,479	295.6	118.6	(54.4)	15.8	18.7
Norway	2,640.1	7	X	X	527	223,887	0	20	2,266.5	92.7	(1.0)	45.3	5.6
Poland, Rep	397.1	(42)	47.8	53	0	4,500	18,240	0	(43.2)	2.2	(1.1)	10.1	(26.8)
Portugal	276.3	(5)	0.0	636	580	1,513	3	3,754	(352.4)	(107.8)	(3.1)	59.2	27.3
Romania	19.9	(89)	29.0	(46)	0	387	20,057	0	(8.3)	(0.1)	(9.3)	1.9	(79.6)
Russian Federation	4,032.5	X	170.4	X	60	2,442	72,504	1,273	936.8	355.3	(4.8)	15.4	X
Slovak Rep	0.9	X	2.4	X	0	841	847	0	(16.7)	0.1	(3.9)	X	X
Slovenia, Rep	2.6	X	0.4	X	47	497	179	29	(9.5)	(5.5)	(2.6)	5.9	X
Spain	1,304.3	(9)	11.3	68	4,660	21,462	318	123,117	(855.2)	(905.6)	(23.1)	41.0	21.1
Sweden	383.1	49	1.6	(17)	0	5,515	0	1,462	(131.5)	(130.0)	(3.0)	32.4	11.7
Switzerland	1.9	(8)	0.9	(56)	X	1,142	35	0	(280.4)	(84.8)	(13.8)	16.3	36.9
Ukraine	307.6	X	61.4	X	148	415	51,039	396	99.1	1.5	(0.3)	9.6	X
United Kingdom	965.4	13	0.1	(16)	X	76,918	55	5,798	(404.4)	(114.4)	(109.9)	20.3	13.4
Yugoslavia, Fed Rep	0.3	X	6.3	X	X	6	1,433	1	(0.3)	(0.0)	(0.3)	2.0	X

	Average Annual Marine Catch (a)		Average Annual Freshwater Catch (a)		Average Annual Aquaculture Production				Average Annual Balance of Trade (b)			Per Capita Annual Food Supply from Fish and Seafood	
	(000 metric tons)	Percent Change Since 1983-85	(000 metric tons)	Percent Change Since 1983-85	Marine Fish	Diadromous Fish	Freshwater Fish	Molluscs & Crustaceans	Fish	Molluscs & Crustaceans	Fish Meal	Total (kg)	% Change Since 1983-85
	1993-95	1983-85	1993-95	1983-85		1993-95 (metric tons)			1993-95 (million US\$)			1993-95	1983-85
NORTH AMERICA	6,574.6	11	289.3	45	3,310	79,087	219,207	162,664	10.7	(2,275.6)	(50.2)	22.2	16.0
Canada	1,046.9	(22)	18.4	(23)	0	42,254	0	14,788	680.6	(17.4)	0.0	23.9	17.5
United States	5,527.7	21	270.9	54	3,310	36,833	219,207	147,876	(669.9)	(2,876.2)	(35.3)	22.0	15.9
CENTRAL AMERICA	1,512.1	(1)	205.0	59	944	1,632	47,735	65,507	(39.0)	846.5	(21.9)	12.6	0.9
Belize	2.1	48	0.0	260	0	0	5	731	(0.1)	13.1	0.0	7.7	26.5
Costa Rica	18.3	19	4.2	921	0	68	2,996	1,588	56.1	31.5	(0.4)	5.3	15.6
Cuba	71.2	(62)	20.5	34	15	0	18,701	442	(18.9)	98.4	0.0	11.4	(42.7)
Dominican Rep	15.8	21	4.7	59	469	29	1,320	694	(34.4)	0.1	0.0	12.3	22.5
El Salvador	9.4	(8)	4.6	160	403	0	116	246	(0.3)	26.9	(0.6)	2.3	21.7
Guatemala	6.7	142	4.7	5,575	0	0	430	3,126	(1.8)	25.6	(3.8)	0.9	111.6
Haiti	4.9	(22)	0.5	78	X	X	X	X	(3.7)	1.9	0.0	X	X
Honduras	24.2	149	0.3	119	0	0	190	7,377	5.7	60.1	(0.7)	0.9	(47.3)
Jamaica	9.7	8	3.6	525	0	0	2,900	72	(28.3)	9.2	0.0	22.1	(14.3)
Mexico	1,113.0	9	160.4	49	47	1,535	20,698	43,746	34.4	419.5	(21.0)	11.9	18.9
Nicaragua	10.9	161	0.6	229	0	0	4	1,801	7.7	45.0	(0.1)	1.6	56.9
Panama	171.9	(14)	0.4	169	0	0	228	5,409	11.1	78.8	4.9	14.4	1.0
Trinidad and Tobago	12.5	182	0.0	X	0	0	4	7	0.6	2.8	0.0	9.4	(60.5)
SOUTH AMERICA	19,750.8	104	388.2	13	31	114,991	46,402	120,376	1,211.9	1,422.4	1,128.7	8.8	15.4
Argentina	998.3	171	11.8	6	0	921	0	11	417.0	304.5	2.5	8.1	33.5
Bolivia	1.4	338	4.7	25	0	521	106	0	(1.4)	(0.2)	(0.0)	1.7	7.8
Brazil	585.9	(19)	214.1	2	0	867	26,500	3,033	(225.1)	115.9	(0.1)	5.9	(8.7)
Chile	7,109.4	61	0.0	1,100	30	106,922	0	13,543	643.2	182.6	484.8	31.1	76.1
Colombia	100.2	389	46.0	(6)	0	4,273	16,350	8,127	51.7	103.4	(25.2)	3.8	22.2
Ecuador	418.6	(46)	2.4	164	0	443	1,253	88,868	158.0	551.1	6.2	8.0	(30.0)
Guyana	44.8	25	0.8	(4)	0	0	140	63	4.2	13.1	0.0	42.1	(4.0)
Paraguay	X	X	14.8	178	0	0	98	0	(1.5)	(0.2)	0.0	4.0	139.5
Peru	9,939.5	234	43.7	45	1	841	2,766	4,394	56.8	64.1	666.7	20.0	28.7
Suriname	12.2	225	0.2	21	0	0	2	0	4.9	0.1	0.0	19.2	60.7
Uruguay	121.2	(12)	0.8	111	0	0	4	4	73.6	3.4	0.6	7.9	141.8
Venezuela	398.6	82	48.8	51	0	203	1,673	2,332	27.8	46.5	(6.7)	15.5	31.9
ASIA (e)	40,904.7	X	14,336.7	X	417,825	521,450	10,577,856	4,546,936	(3,635.0)	(667.2)	(1,078.3)	13.4	X
Afghanistan, Islamic State	X	X	1.3	58	X	X	X	X	X	X	X	X	X
Armenia, Rep	2.0	X	2.5	X	0	1,810	1,870	0	(0.3)	X	X	1.2	X
Azerbaijan	33.3	X	2.7	X	10	0	1,946	0	(0.1)	(0.0)	X	4.8	X
Bangladesh	388.5	72	713.5	36	0	0	250,988	30,439	29.7	195.1	0.0	8.7	15.3
Bhutan	X	X	0.3	32	0	0	30	0	X	X	X	X	X
Cambodia	31.8	237	76.4	31	0	0	7,940	597	15.9	0.1	0.0	8.5	(9.9)
China	11,699.6	223	9,060.5	291	118,394	0	7,875,707	2,756,841	854.9	865.2	(269.1)	14.5	147.2
Georgia	28.1	X	2.7	X	0	10	2,661	0	(0.5)	(0.0)	(0.0)	6.8	X
India	2,731.1	62	1,998.0	90	0	0	1,434,302	86,910	191.2	874.4	(4.3)	4.0	23.5
Indonesia	3,277.5	79	611.5	45	9,273	161,268	292,635	139,936	510.2	1,027.9	(87.2)	15.7	18.6
Iran, Islamic Rep	288.6	195	51.0	188	0	1,188	24,215	0	23.5	6.8	(25.5)	5.1	100.1
Iraq	4.2	(24)	18.5	15	0	0	13,967	0	0.0	0.0	0.0	1.2	(18.4)
Israel	4.9	(60)	15.1	19	1,481	497	12,803	2	(81.4)	(0.8)	(21.4)	20.3	23.5
Japan	7,221.4	(36)	70.0	(32)	250,770	79,903	17,270	454,891	(7,989.3)	(7,080.1)	(225.1)	67.6	(1.2)
Jordan	X	(71)	0.1	251	0	0	105	0	(19.7)	(0.5)	(0.3)	3.4	(16.5)
Kazakhstan, Rep	13.3	X	39.0	X	0	0	1,763	X	3.6	(0.1)	(0.0)	3.5	X
Korea, Dem People's Rep	1,697.7	10	113.6	14	0	2,267	11,500	69,317	26.7	40.1	(0.1)	46.3	12.7
Korea, Rep	2,610.6	7	25.5	(47)	6,825	4,957	14,841	307,853	470.4	297.2	(11.4)	51.2	11.9
Kuwait	8.3	(12)	0.0	X	33	0	0	0	(9.8)	(2.6)	0.0	10.4	(24.6)
Kyrgyz Rep	0.1	X	0.3	X	0	17	171	0	(0.3)	X	X	0.1	X
Lao People's Dem Rep	X	X	35.3	36	0	0	13,067	0	(0.2)	0.0	(0.0)	6.6	(11.4)
Lebanon	3.0	95	0.0	X	0	227	0	0	0.0	0.0	0.0	0.7	30.5
Malaysia	1,164.6	50	16.1	52	3,111	5,970	14,468	93,812	(74.8)	111.1	(10.3)	28.3	(23.6)
Mongolia	X	X	0.1	(65)	X	X	X	X	(1.8)	0.0	0.0	0.9	(34.0)
Myanmar	610.6	30	220.7	50	0	0	70,987	7	6.8	69.5	0.0	16.1	12.0
Nepal	X	X	18.3	195	0	0	9,672	0	0.0	0.0	0.0	X	X
Oman	125.0	19	0.0	X	0	0	0	0	46.4	3.5	0.0	X	X
Pakistan	441.1	44	130.3	90	0	20	14,365	43	73.9	88.9	(0.0)	2.4	40.5
Philippines	1,961.9	24	305.3	(10)	1,283	147,934	95,931	127,670	142.0	298.8	(49.0)	33.5	(3.8)
Saudi Arabia	51.6	32	2.3	X	0	0	2,343	135	(51.5)	(5.7)	(6.0)	6.7	(38.2)
Singapore	13.0	(43)	0.0	(90)	315	239	22	2,203	(15.7)	(52.7)	(2.8)	X	X
Sri Lanka	213.6	37	15.0	(55)	0	0	2,833	2,876	(25.9)	26.8	(2.7)	15.7	(0.5)
Syrian Arab Rep	2.0	67	8.0	96	0	0	4,732	0	(1.1)	(0.1)	(1.4)	0.6	(75.2)
Tajikistan, Rep	0.0	X	3.8	X	0	0	3,550	0	(0.1)	0.0	X	0.6	X
Thailand	3,081.8	56	332.5	103	1,080	3,128	138,224	335,820	628.7	2,676.7	(110.3)	26.3	28.8
Turkey	573.3	7	30.1	(3)	6,713	9,464	419	85	15.0	22.1	(11.2)	7.9	6.0
Turkmenistan, Rep	16.5	X	2.5	X	0	0	1,142	0	0.0	(0.0)	X	8.4	X
United Arab Emirates	102.9	42	0.0	X	0	0	0	0	(6.0)	(2.6)	(0.1)	21.5	(2.0)
Uzbekistan, Rep	0.0	X	21.7	X	0	18	14,582	0	0.3	X	X	1.0	X
Vietnam	862.4	55	287.6	29	0	0	141,667	58,300	44.1	399.9	(0.4)	13.1	4.7
Yemen	90.4	35	0.9	X	X	X	X	X	(5.4)	72.4	0.0	6.2	(7.9)
OCEANIA	910.0	83	16.3	4	1,301	11,384	273	66,763	294.0	741.2	(13.0)	21.6	5.7
Australia	228.0	39	1.4	(35)	1,298	8,684	25	11,751	(129.9)	503.7	(16.5)	21.1	20.6
Fiji	28.8	14	3.3	44	0	X	71	100	6.7	1.8	0.0	33.4	(15.0)
New Zealand	523.3	146	0.5	158	X	2,618	X	54,006	444.1	224.6	3.9	16.0	(15.6)
Papua New Guinea	14.7	71	11.0	(1)	X	7	9	2	(43.6)	9.9	(0.4)	27.4	(5.5)
Solomon Islands	46.4	(1)	X	X	X	X	X	9	28.0	0.9	0.0	21.3	(64.7)
DEVELOPING	58,676.4	78	16,159.1	120	181,116	556,751	10,669,150	4,280,501	5,852.0	9,697.6	276.0	10.1	36.3
DEVELOPED	32,542.6	(21)	993.7	(13)	291,126	730,838	535,180	1,309,683	(7,895.8)	(10,912.1)	(557.6)	25.0	22.5

Notes: a. Aquaculture production is included in country totals. b. Exports minus imports. Surpluses of imports over exports are shown in parentheses. c. World and regional totals include countries not listed here. d. Prior to 1992, Ethiopia included Eritrea, therefore percent change since 1983-85 is not meaningful and has been omitted. e. Due to recent independence of Soviet republics, percent change since 1983-85 is not meaningful and therefore has been omitted. f. Data are for Belgium and Luxembourg.

Data Table 13.2

Marine Fisheries, Yield and State of Exploitation, 1950s–1990s

Source: Food and Agriculture Organization of the United Nations

	Average Marine Fish Catch (000 metric tons)								Total Average Marine Catch (c) (000 metric tons)				Status (d) in 1995	Fully Fished by	Discards (as a % of overall catch (e)) 1988-92
	Demersal Fishes (a)				Pelagic Fishes (b)										
	1953-55	1973-75	1983-85	1993-95	1953-55	1973-75	1983-85	1993-95	1953-55	1973-75	1983-85	1993-95			
WORLD	7,018	18,836	18,998	18,219	9,505	24,966	34,818	42,753	21,978	56,910	71,378	87,380	X	1999	24
ATLANTIC OCEAN	4,870	9,510	8,429	7,177	5,145	11,467	10,308	9,909	11,693	24,046	23,091	21,669	I-F	1983	25
Northeast	3,179	5,698	5,200	4,832	3,252	4,973	4,782	4,963	6,937	11,557	11,266	10,938	O	1983	19
Northwest	1,388	1,856	1,275	457	693	1,408	625	628	2,645	4,013	2,756	2,114	O	1971	27
Eastern Central	46	504	403	322	190	2,190	1,892	2,165	340	3,288	2,836	2,999	O	1984	47
Western Central	61	182	145	183	356	762	1,192	927	670	1,488	2,355	2,012	O	1987	14
Southeast	102	871	583	299	586	1,824	1,499	1,011	887	2,817	2,198	1,352	O	1978	27
Southwest	95	399	823	1,083	68	310	318	215	213	883	1,681	2,256	I	X	14
PACIFIC OCEAN	1,755	8,409	9,370	9,290	3,592	11,703	21,456	29,014	8,486	28,458	41,313	56,147	I-F	1999	24
Northeast	181	1,658	2,003	2,320	173	132	88	92	416	2,003	2,273	2,714	O	1990	26
Northwest	1,175	5,712	6,185	4,930	2,612	5,012	8,931	6,910	6,334	16,367	22,364	24,768	I	1998	22
Eastern Central	25	120	70	76	249	682	1,073	885	349	983	1,373	1,389	O	1988	27
Western Central	250	550	659	1,031	380	1,844	2,878	4,356	1,021	4,380	5,861	8,911	I	2003	33
Southeast	96	251	204	477	172	3,926	8,386	16,635	311	4,430	8,936	17,558	I	2001	21
Southwest	28	118	249	456	6	107	100	136	54	296	506	807	O	1991	15
INDIAN OCEAN	290	698	811	1,402	430	1,115	1,829	2,856	1,140	3,207	4,785	7,643	I	X	26
Eastern	67	181	268	485	140	312	703	1,109	434	1,273	2,330	3,742	I	X	30
Western	223	518	543	917	289	803	1,126	1,748	706	1,934	2,455	3,901	I	X	22
MEDITERRANEAN AND BLACK SEA	103	167	266	343	339	680	1,224	974	659	1,123	1,871	1,818	F	X	25
ANTARCTIC	0	51	122	7	0	0	1	0	0	75	317	103	O	1980	10
ARCTIC	0	0	0	0	X	X	X	X	X	X	X	X	X	X	X

Notes: a. Demersal fish species include: flounders, halibuts, soles, cods, hakes, haddocks, redfishes, basses, congers, sharks, rays, and chimeras. b. Pelagic fish species include: jacks, mullets, sauries, herrings, sardines, anchovies, tunas, bonitos, billfishes, mackerels, snooks, and cutlassfishes. c. Marine catch includes marine fish (except diadromous fish), marine crustaceans, cephalopods, and molluscs. Marine catch includes aquaculture production. d. Status assessed by FAO. O = overfished; I = catch is increasing; F = fully fished. e. Overall catch refers to total catch plus discards.

Data Table 13.3

Marine Biodiversity of Regional Seas, 1990s

Source: World Conservation Monitoring Centre

Regional Seas	Seagrasses		Corals		Molluscs		Shrimps & Lobsters		Sharks		Seabirds		Marine Mammals (a)		
	No. of Species		No. of Genera		No. of Species		No. of Species		No. of Species		No. of Species		No. of Species		% Endemic Threatened
	Endemic	Total	Endemic	Total	Endemic	Total	Endemic	Total	Endemic	Total	Endemic	Total	Endemic	Total	
Africa, East	0	11	0	63	0	80	2	91	3	73	2	44	0	28	0
Africa, South (b)	0	7	0	46	0	145	2	42	7	93	X	39	0	36	0
Africa, West & Central	0	1	1	10	1	238	3	47	1	89	2	51	2	44	100
Antarctica (b)	X	0	X	0	0	7	2	3	X	0	14	51	6	20	0
Arctic (b)	0	1	X	0	0	44	0	9	0	5	0	27	0	23	0
Asia, South	0	9	1	63	0	246	0	117	6	58	0	26	0	29	0
Atlantic, North (b)	0	5	0	13	0	432	1	77	4	87	4	56	3	48	0
Atlantic, Southwest	0	1	1	10	0	299	2	46	6	68	1	33	2	49	0
Australia, Southwest (b)	5	17	0	62	0	197	1	25	7	64	0	22	1	43	0
Black Sea	X	4	X	0	0	6	0	7	X	1	1	17	0	4	0
Caribbean	2	7	9	25	0	633	8	68	14	76	1	23	0	31	0
East Asian Seas	1	17	4	82	0	1,114	6	210	23	140	2	39	0	29	0
Kuwait Marine Area (b)	0	5	1	37	0	66	0	26	1	34	0	21	0	27	0
Mediterranean Sea	1	5	X	0	0	138	0	42	0	43	1	22	0	17	0
Pacific, Northeast (b)	3	7	0	7	0	517	6	45	5	57	14	66	3	50	100
Pacific, Northwest	5	13	0	69	4	404	7	128	9	93	6	69	1	45	0
Pacific, South	2	19	0	76	7	984	13	105	35	128	39	115	4	52	100
Pacific, Southeast	0	5	0	8	2	393	2	33	9	67	21	68	4	47	100
Red Sea & Gulf of Aden	0	11	1	53	0	57	0	38	0	39	0	22	0	26	0

Notes: a. Marine mammals include: cetaceans, sirenians, and pinnipeds. b. Indicates marine areas (regional seas) defined for the WCMC report "The Diversity of the Seas: A Regional Approach." These areas do not coincide with UNEP Regional Seas areas. For a description of each area, please refer to the Sources and Technical Notes. c. Krill are not included in this category.

Sources and Technical Notes

Data Table 13.1

Marine and Freshwater Catches, Aquaculture, Balance of Trade, and Fish Consumption

Sources: Marine, freshwater, and aquaculture catches: Food and Agriculture Organization of the United Nations (FAO), *Fishstat-PC* and *Aquacult-PC* (FAO, Rome, 1997). Balance of trade in fish and seafood: *Fishcomm-PC* (FAO, Rome, 1997). Food supply from fish and seafood: FAO, *FAOSTAT Statistics Database*, available online at <http://www.fao.org> (FAO, Rome, 1997), and *United Nations (U.N.) Population Division, World Population Prospects, 1950–2050 (The 1996 Revision)*, on diskette (U.N., New York, 1996).

Marine and *freshwater catch* data refer to marine and freshwater fish killed, caught, trapped, collected, bred, or cultivated for commercial, industrial, and subsistence use (catches from recreational activities are included where available). Crustaceans and molluscs are included. Statistics for mariculture, aquaculture, and other kinds of fish farming are included in the country totals. Figures are the national totals averaged over a 3-year period; they include fish caught by a country's fleet anywhere in the world. Catches of freshwater species caught in low-salinity seas are included in the statistics of the appropriate marine area. Marine catch includes catches of diadromous (migratory between saltwater and freshwater) species (please refer to the Sources and Technical Notes to Data Table 13.2 for a listing of the species groupings in this category).

Data are represented as nominal catches, which are the landings converted to a live-weight basis, that is, the weight when caught.

Landings for some countries are identical to catches. Catch data are provided annually to the FAO Fisheries Department by national fishery offices and regional fishery commissions. Some countries' data are provisional for the latest year. If no data are submitted, FAO uses the previous year's figures or makes estimates based on other information. For details on data quality, please refer to the Sources and Technical Notes to Data Table 13.2.

Years are calendar years except for Antarctic fisheries data, which are for split years (July 1–June 30). Data for Antarctic fisheries are given for the calendar year in which the split year ends.

Aquaculture is defined by FAO as "the farming of aquatic organisms, including fish, molluscs, crustaceans, and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, and protection from predators, etc. [It] also implies ownership of the stock being cultivated. . . ." Aquatic organisms that are exploitable by the public as a common property resource are included in the harvest of fisheries.

FAO's global collection of aquaculture statistics by questionnaire was begun in 1984; today, these data are a regular feature of the annual FAO survey of world fishery statistics.

FAO's *Aquacult-PC* has 301 "species items" that are grouped into six categories. *Marine fish* include a variety of species groups such as mullets, seabasses, groupers, snappers, tunas, mackerels, etc. *Diadromous fish* include sturgeons, river eels, salmon, trouts, etc. *Freshwater fish* include carps, perches, catfish, and tilapias, among others. *Molluscs* include freshwater molluscs, oysters, mussels, scallops, clams, abalones, and cephalopods. *Crustaceans* include, among others, freshwater crustaceans, crabs, lobsters, shrimps, and prawns. Data on whales and other marine mammals are excluded from this table. For a detailed listing of species, please refer to *Aquacult-PC* or the most recent *FAO Yearbook of Fishery Statistics* (FAO, Rome).

Balance of trade is defined as exports minus imports. Figures are the national totals averaged over a 3-year period in millions of U.S. dollars. Imports are usually on a cost, insurance, and freight basis (c.i.f.) (i.e., insurance and freight costs added in). Exports are generally on a free-on-board basis (FOB) (i.e., not including insurance or freight costs). A surplus of imports over exports is shown in parentheses. Trade in *fish* includes fish that is fresh, frozen, chilled, salted, or smoked as well as fish products and preparations. Trade in *molluscs and crustaceans* includes molluscs and crustaceans that are fresh, chilled, smoked, derived products, etc. Trade in *fish meal* includes meals, solubles, etc.

Per capita annual food supply from fish and seafood is the quantity of both freshwater and marine fish, seafood, and derived products available for human consumption. It was calculated based on the FAO country data on food supply from fish and seafood in metric tons and the country population data from the U.N. Population Division. Data on aquatic plants and whale meat are excluded from the totals. The amount of fish and seafood actually consumed may be lower than the figures provided, depending on how much is lost during storage, preparation, and cooking, and on how much is discarded. Data are presented in kilograms per capita. Years shown are 3-year averages. For more information, please refer to the *FAOSTAT Statistics Database* at: <http://www.fao.org>.

Data Table 13.2

Marine Fisheries, Yield, and State of Exploitation, 1950–1990s

Source: Marine fishery production: Food and Agriculture Organization of the United Nations (FAO), *Fishstat-PC* (FAO, Rome, 1997); fisheries status: R.J.R. Grainger and S.M. Garcia, *Chronicles of Marine Fishery Landings (1950–1994): Trends*

Analysis and Fisheries Potential, FAO Fisheries Technical Paper No. 359 (FAO, Fisheries Department, Rome, 1996); discards: FAO, *The State of World Fisheries and Aquaculture* (FAO, Fisheries Department, Rome, 1995).

FAO divides the world into 27 statistical fishing areas (19 marine and 8 inland) and organizes annual *catch* data by 1,477 "species items"—species groups separated at the family, genus, or species level. "Catch" refers to average landings and does not include discards (see below). Data Table 13.2 only shows data for the marine fishing areas.

FAO species groupings for each category are as follows: *demersal fish*: flounders, halibuts, soles, etc.; cods, hakes, haddock, etc.; redfishes, basses, congers, etc.; and sharks, rays, chimeras, etc.; *pelagic fish*: jacks, mullets, sauries, etc.; herrings, sardines, anchovies, etc.; tunas, bonitos, billfishes, etc.; and mackerels, snooks, cutlassfishes, etc. *Marine catch* includes demersal, pelagic, and miscellaneous marine fishes; cephalopods (squids, cuttlefishes, octopuses, etc.); marine crustaceans (sea-spiders, crabs, etc.); lobsters, spiny-rock lobsters, etc.; squat lobsters; shrimps, prawns, etc.; krill, planktonic crustaceans, etc.; and miscellaneous marine crustaceans; and marine molluscs (abalones, winkles, conchs, etc.; oysters; mussels; scallops, pectens, etc.; clams, cockles, arkshells, etc.; and miscellaneous marine molluscs). Years shown are 3-year averages. *Average marine catch* differs from marine catch in Data Table 13.1 because the following diadromous fish categories are not included: sturgeons, paddlefishes, etc.; river eels; salmon, trouts, smelts, etc.; shads; and miscellaneous diadromous fishes. Please refer to the Technical Notes for Data Table 13.1 for the definition of nominal fish catch and additional information on FAO's fishery database. Fish catch data presented in this table include harvests from marine aquaculture production.

Status of fish resources: fully fished (F), overfished (O), or catch is increasing (I) provides a measure of the degree to which fish stocks within FAO's marine statistical areas were exploited as of 1994. FAO used landings data collected between 1950 and 1994 for the top 200 species/fishing-area combinations to estimate status. These 200 species-area combinations represent 77 percent of the world's marine production. Exploitation levels were determined by comparing the average landings from 1990 to 1994 to the estimated maximum potential landings for each fishing area. FAO estimated the potential landings for each area based on a generalized fishery development model. This model shows that a fishery has four phases: undeveloped (the fishery is being exploited at a very low level), developing (the fishery starts to develop rapidly), mature (fishery yields are at their peak and their annual rate of increase is zero), and senescent (yields are decreasing). Based on this model, FAO estimated the year in which the fishery would be fully fished, that is the mature phase of the development had

been or would be reached (i.e., the rate of increase is zero). For more detailed information on the analysis, please refer to R.J.R. Grainger and S.M. Garcia Technical Paper No. 359, *Chronicles of Marine Fishery Landings (1950–1994): Trends Analysis and Fisheries Potential* (FAO, Rome, 1996).

Discards as a percentage of overall catch refers to the percentage of overall catch (discards plus landings) during the 1988–92 period that consisted of nontarget or low-value species and undersized fish of targeted species.

Individual countries are charged with collecting catch data and reporting them to FAO. The quality of these estimates varies because many countries lack the resources to adequately monitor catch landings within their borders. In addition, fishers sometimes underreport their catches because they have not kept within harvest limits established to manage the fishery. In some cases, catch statistics are inflated to increase the importance of the fishing industry to the national economy.

Data Table 13.3

Marine Biodiversity of Regional Seas, 1990s

Source: World Conservation Monitoring Centre (WCMC), *The Diversity of the Seas: A Regional Approach; Biodiversity Series No. 4* (WCMC, Cambridge, U.K., 1996).

In WCMC's *The Diversity of the Seas* report, the world's oceans were divided into 19 regional seas. Some of these regional seas coincide with FAO's statistical fishing areas and/or with the United Nations Environment Programme's Regional Seas. Other

areas were defined for the purpose of the report. Regional areas defined by WCMC are: *East Africa* (Somali Coastal Current and much of the Agulhas Current); *South Africa* (Benguela Current and the Agulhas Current of the coast of South Africa); *West and Central Africa* (West African coast from Mauritania to Namibia); *Antarctica* (marine area south of the Antarctic Convergence); *Arctic* (Barents Sea and the Arctic Ocean); *South Asia* (Arabian Sea, Bay of Bengal, and central Indian Ocean); *North Atlantic* (Southeast U.S. Continental Shelf, Northeast U.S. Continental Shelf, Scotian Shelf, Newfoundland Shelf, East and West Greenland Shelves, Iceland Shelf, Norwegian Shelf, North Sea, Baltic Sea, Celtic-Biscay Shelf, Iberian Coastal, Canary Current, and Faroe Plateau); *Southwest Atlantic* (Patagonian Shelf, Brazil Current, and the southern part of the Northeast Brazil Shelf); *Southwest Australia* (Australian coastline that extends from Shark Bay to the border of Southern Australia and New South Wales); *Black Sea; Caribbean* (Gulf of Mexico, Caribbean Sea, and northern part of the Northeast Brazil Shelf); *East Asian Seas* (eastern part of the Bay of Bengal, China Sea, Sulu-Celebes Sea, Indonesian Seas, and Northern Australian Shelf); *Kuwait marine area* (Persian [Arabian] Gulf and Gulf of Oman); *Mediterranean Sea; Northeast Pacific* (Eastern Bering Sea, Gulf of Alaska, California Current, and Gulf of California); *Northwest Pacific* (East China Sea, Yellow Sea, Kuroshio Current, Sea of Japan, Oyashio Current, Sea of Okhotsk, and West Bering Sea); *South Pacific* (Insular Pacific-Hawaiian complex, Great Barrier Reef, and New Zealand Shelf); *Southeast Pacific* (Humbolt Current and Easter Island and Sala-y-Gomez areas); *Red Sea and Gulf of Aden*.

These data represent the numbers of *endemic* and *total* species except for corals, which represent endemic and total *genera*. Endemic species are those that are known to be found only in a particular country or region. Marine mammals include cetaceans (whales, etc.), sirenians (sea cows), and pinnipeds (seals, etc.). The *percentage of endemic species threatened* represents endemic marine mammals that fall within The World Conservation Union (IUCN) categories of critically endangered, endangered, or vulnerable. For a description of these IUCN categories, please refer to the Sources and Technical Notes for Data Table 14.2.

As noted in *The Diversity of the Seas: A Regional Approach*, "with some exceptions, the flora and fauna of the coastal and marine regions discussed in this document remain very incompletely known" and, therefore, "the values given for species richness and endemism in the regional accounts must be taken as approximations" (p. 33). The following list of sources for the different species categories is taken from the original source. *Seagrasses*: Phillips and Meñez (1988). *Corals*: data from maps in Veron (1993). *Molluscs*: includes marine molluscs from the classes Gastropoda and Bivalvia found in coastal and shallow waters. *Shrimps and lobsters*: includes shrimps and prawns from the suborder Nantantia and lobsters from the suborder Reptantia that have or may have commercial value. Data were derived from Holthius (1980 and 1991). *Sharks*: data were derived from Compagno (1984). Endemic species information for Australian waters was obtained from Last and Stevens (1994). *Sea-birds*: includes species that breed in the region listed in Croxall *et al.* (1984) and Croxall (1991). *Marine mammals*: Reijnders *et al.* (1993) and Jefferson *et al.* (1993).