

Full Planet, Empty Plates

Supporting Data for Chapter 8: Rising Temperature, Rising Food Prices

[Average Global Temperature, 1880-2011](#)

GRAPH: Average Global Temperature, 1880-2011

[Average Global Temperature by Decade, 1880-2011](#)

[Atmospheric Carbon Dioxide Concentration, 1000-2011](#)

GRAPH: Atmospheric Carbon Dioxide Concentration, 1000-2011

[Global Carbon Dioxide Emissions from Fossil Fuel Burning by Fuel Type, 1900-2011](#)

GRAPH: Global Carbon Dioxide Emissions from Fossil Fuel Burning by Fuel Type, 1900-2011

[Net Carbon Emissions from Land Use Change, 1850-2005](#)

GRAPH: Net Carbon Emissions from Land Use Change Worldwide, 1850-2005

GRAPH: Net Carbon Emissions from Land Use Change in Africa and the Middle East, 1850-2005

GRAPH: Net Carbon Emissions from Land Use Change in the Americas, 1850-2005

GRAPH: Net Carbon Emissions from Land Use Change in Asia and the Pacific, 1850-2005

GRAPH: Net Carbon Emissions from Land Use Change in Europe and the Former Soviet Union, 1850-2005

[Mean Cumulative Specific Mass Balance of Mountain Glaciers Worldwide, 1980-2010](#)

[Effects of 1 to 5 Meters of Sea Level Rise on Populations and Land Area around the World](#)

[Effects of 10 Meter Rise in Sea Level on Populations and Land Area around the World](#)

A full listing of data for the entire book is on-line at:

http://www.earth-policy.org/books/fpep/fpep_data

This is part of a supporting dataset for Lester R. Brown, **Full Planet, Empty Plates: The New Geopolitics of Food Scarcity** (New York: W.W. Norton & Company, 2012). For more information, see Earth Policy Institute on-line at www.earth-policy.org.

Average Global Temperature, 1880-2011

<u>Year</u>	<u>Temperature</u> Degrees Celsius
1880	13.73
1881	13.81
1882	13.76
1883	13.74
1884	13.70
1885	13.71
1886	13.74
1887	13.66
1888	13.73
1889	13.84
1890	13.61
1891	13.74
1892	13.68
1893	13.67
1894	13.66
1895	13.74
1896	13.84
1897	13.88
1898	13.75
1899	13.86
1900	13.92
1901	13.86
1902	13.76
1903	13.70
1904	13.66
1905	13.76
1906	13.82
1907	13.61
1908	13.68
1909	13.66
1910	13.68
1911	13.67
1912	13.70
1913	13.72
1914	13.87
1915	13.92
1916	13.72
1917	13.63
1918	13.68
1919	13.81
1920	13.81
1921	13.87
1922	13.76
1923	13.79
1924	13.79
1925	13.84
1926	13.99
1927	13.86
1928	13.88
1929	13.75

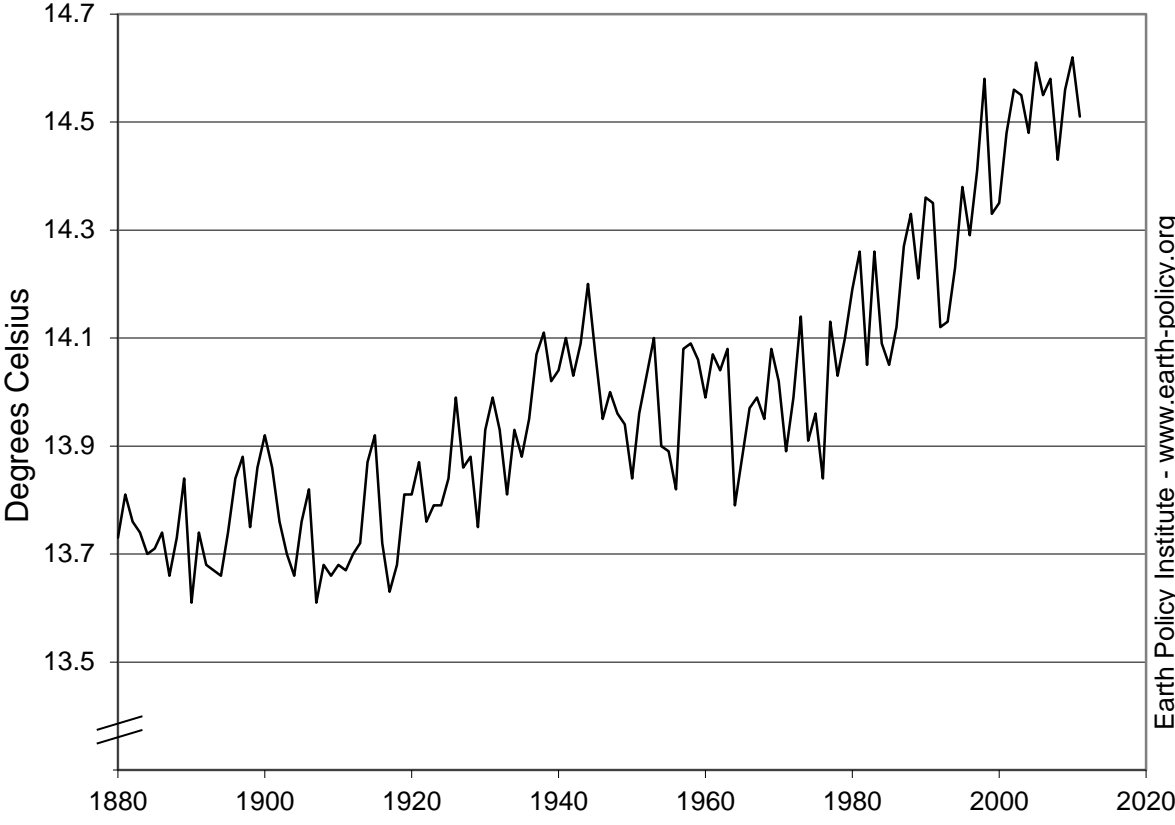
1930	13.93
1931	13.99
1932	13.93
1933	13.81
1934	13.93
1935	13.88
1936	13.95
1937	14.07
1938	14.11
1939	14.02
1940	14.04
1941	14.10
1942	14.03
1943	14.09
1944	14.20
1945	14.07
1946	13.95
1947	14.00
1948	13.96
1949	13.94
1950	13.84
1951	13.96
1952	14.03
1953	14.10
1954	13.90
1955	13.89
1956	13.82
1957	14.08
1958	14.09
1959	14.06
1960	13.99
1961	14.07
1962	14.04
1963	14.08
1964	13.79
1965	13.88
1966	13.97
1967	13.99
1968	13.95
1969	14.08
1970	14.02
1971	13.89
1972	13.99
1973	14.14
1974	13.91
1975	13.96
1976	13.84
1977	14.13
1978	14.03
1979	14.10
1980	14.19
1981	14.26
1982	14.05
1983	14.26
1984	14.09

1985	14.05
1986	14.12
1987	14.27
1988	14.33
1989	14.21
1990	14.36
1991	14.35
1992	14.12
1993	14.13
1994	14.23
1995	14.38
1996	14.29
1997	14.41
1998	14.58
1999	14.33
2000	14.35
2001	14.48
2002	14.56
2003	14.55
2004	14.48
2005	14.61
2006	14.55
2007	14.58
2008	14.43
2009	14.56
2010	14.62
2011	14.51

Source: Compiled by Earth Policy Institute from National Aeronautics and Space Administration, Goddard Institute for Space Studies, "Global Land-Ocean Temperature Index in 0.01 Degrees Celsius," at data.giss.nasa.gov/gistemp/tabledata/GLB.Ts+dSST.txt, updated May 2012.

This is part of a supporting dataset for Lester R. Brown, **Full Planet, Empty Plates: The New Geopolitics of Food Scarcity** (New York: W.W. Norton & Company, 2012). For more information, see Earth Policy Institute on-line at www.earth-policy.org.

Average Global Temperature, 1880-2011



Source: NASA GISS

Earth Policy Institute - www.earth-policy.org

Average Global Temperature by Decade, 1880-2011

<u>Decade</u>	<u>Average Temperature</u> Degrees Celsius
1880-1889	13.74
1890-1899	13.74
1900-1909	13.74
1910-1919	13.74
1920-1929	13.83
1930-1939	13.96
1940-1949	14.04
1950-1959	13.98
1960-1969	13.98
1970-1979	14.00
1980-1989	14.18
1990-1999	14.32
2000-2009	14.52
<u>2010-2011 *</u>	<u>14.57</u>

* Note: Includes first two years of decade.

Source: Compiled by Earth Policy Institute from National Aeronautics and Space Administration, Goddard Institute for Space Studies, "Global Land-Ocean Temperature Index in 0.01 Degrees Celsius," at data.giss.nasa.gov/gistemp/tabledata/GLB.Ts+dSST.txt, updated August 2012.

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Atmospheric Carbon Dioxide Concentration, 1000-2011

<u>Year</u>	<u>Concentration</u>
	Parts Per Million by Volume
1000	277.00
1001	277.01
1002	277.02
1003	277.03
1004	277.04
1005	277.05
1006	277.06
1007	277.07
1008	277.08
1009	277.09
1010	277.10
1011	277.11
1012	277.12
1013	277.13
1014	277.14
1015	277.15
1016	277.16
1017	277.17
1018	277.18
1019	277.19
1020	277.20
1021	277.21
1022	277.22
1023	277.23
1024	277.24
1025	277.25
1026	277.26
1027	277.27
1028	277.28
1029	277.29
1030	277.30
1031	277.31
1032	277.32
1033	277.33
1034	277.34
1035	277.35
1036	277.36
1037	277.37
1038	277.38
1039	277.39
1040	277.40
1041	277.41
1042	277.42
1043	277.43
1044	277.44
1045	277.45
1046	277.46
1047	277.47
1048	277.48
1049	277.49

1050	277.50
1051	277.53
1052	277.56
1053	277.59
1054	277.62
1055	277.65
1056	277.68
1057	277.71
1058	277.74
1059	277.77
1060	277.80
1061	277.83
1062	277.86
1063	277.89
1064	277.92
1065	277.95
1066	277.98
1067	278.01
1068	278.04
1069	278.07
1070	278.10
1071	278.13
1072	278.16
1073	278.19
1074	278.22
1075	278.25
1076	278.28
1077	278.31
1078	278.34
1079	278.37
1080	278.40
1081	278.43
1082	278.46
1083	278.49
1084	278.52
1085	278.55
1086	278.58
1087	278.61
1088	278.64
1089	278.67
1090	278.70
1091	278.73
1092	278.76
1093	278.79
1094	278.82
1095	278.85
1096	278.88
1097	278.91
1098	278.94
1099	278.97
1100	279.00
1101	278.98
1102	278.96
1103	278.94
1104	278.92

1105	278.90
1106	278.88
1107	278.86
1108	278.84
1109	278.82
1110	278.80
1111	278.78
1112	278.76
1113	278.74
1114	278.72
1115	278.70
1116	278.68
1117	278.66
1118	278.64
1119	278.62
1120	278.60
1121	278.58
1122	278.56
1123	278.54
1124	278.52
1125	278.50
1126	278.48
1127	278.46
1128	278.44
1129	278.42
1130	278.40
1131	278.38
1132	278.36
1133	278.34
1134	278.32
1135	278.30
1136	278.28
1137	278.26
1138	278.24
1139	278.22
1140	278.20
1141	278.18
1142	278.16
1143	278.14
1144	278.12
1145	278.10
1146	278.08
1147	278.06
1148	278.04
1149	278.02
1150	278.00
1151	277.97
1152	277.94
1153	277.91
1154	277.88
1155	277.85
1156	277.82
1157	277.79
1158	277.76
1159	277.73

1160	277.70
1161	277.67
1162	277.64
1163	277.61
1164	277.58
1165	277.55
1166	277.52
1167	277.49
1168	277.46
1169	277.43
1170	277.40
1171	277.37
1172	277.34
1173	277.31
1174	277.28
1175	277.25
1176	277.22
1177	277.19
1178	277.16
1179	277.13
1180	277.10
1181	277.07
1182	277.04
1183	277.01
1184	276.98
1185	276.95
1186	276.92
1187	276.89
1188	276.86
1189	276.83
1190	276.80
1191	276.77
1192	276.74
1193	276.71
1194	276.68
1195	276.65
1196	276.62
1197	276.59
1198	276.56
1199	276.53
1200	276.50
1201	276.45
1202	276.40
1203	276.35
1204	276.30
1205	276.25
1206	276.20
1207	276.15
1208	276.10
1209	276.05
1210	276.00
1211	276.07
1212	276.14
1213	276.21
1214	276.28

1215	276.35
1216	276.42
1217	276.48
1218	276.55
1219	276.62
1220	276.69
1221	276.76
1222	276.83
1223	276.90
1224	276.97
1225	277.04
1226	277.11
1227	277.18
1228	277.25
1229	277.32
1230	277.38
1231	277.45
1232	277.52
1233	277.59
1234	277.66
1235	277.73
1236	277.80
1237	277.87
1238	277.94
1239	278.01
1240	278.08
1241	278.15
1242	278.22
1243	278.28
1244	278.35
1245	278.42
1246	278.49
1247	278.56
1248	278.63
1249	278.70
1250	278.77
1251	278.84
1252	278.91
1253	278.98
1254	279.05
1255	279.12
1256	279.18
1257	279.25
1258	279.32
1259	279.39
1260	279.46
1261	279.53
1262	279.60
1263	279.67
1264	279.74
1265	279.81
1266	279.88
1267	279.95
1268	280.02
1269	280.08

1270	280.15
1271	280.22
1272	280.29
1273	280.36
1274	280.43
1275	280.50
1276	280.57
1277	280.64
1278	280.71
1279	280.78
1280	280.85
1281	280.92
1282	280.98
1283	281.05
1284	281.12
1285	281.19
1286	281.26
1287	281.33
1288	281.40
1289	281.47
1290	281.54
1291	281.61
1292	281.68
1293	281.75
1294	281.82
1295	281.88
1296	281.95
1297	282.02
1298	282.09
1299	282.16
1300	282.23
1301	282.30
1302	282.37
1303	282.44
1304	282.51
1305	282.58
1306	282.65
1307	282.72
1308	282.78
1309	282.85
1310	282.92
1311	282.99
1312	283.06
1313	283.13
1314	283.20
1315	283.27
1316	283.34
1317	283.41
1318	283.48
1319	283.55
1320	283.62
1321	283.68
1322	283.75
1323	283.82
1324	283.89

1325	283.96
1326	284.03
1327	284.10
1328	284.17
1329	284.24
1330	284.31
1331	284.38
1332	284.45
1333	284.52
1334	284.58
1335	284.65
1336	284.72
1337	284.79
1338	284.86
1339	284.93
1340	285.00
1341	285.00
1342	285.00
1343	285.00
1344	285.00
1345	285.00
1346	285.00
1347	285.00
1348	285.00
1349	285.00
1350	285.00
1351	284.94
1352	284.89
1353	284.83
1354	284.77
1355	284.71
1356	284.66
1357	284.60
1358	284.54
1359	284.49
1360	284.43
1361	284.37
1362	284.31
1363	284.26
1364	284.20
1365	284.14
1366	284.09
1367	284.03
1368	283.97
1369	283.91
1370	283.86
1371	283.80
1372	283.74
1373	283.69
1374	283.63
1375	283.57
1376	283.51
1377	283.46
1378	283.40
1379	283.34

1380	283.29
1381	283.23
1382	283.17
1383	283.11
1384	283.06
1385	283.00
1386	282.98
1387	282.96
1388	282.94
1389	282.92
1390	282.89
1391	282.87
1392	282.85
1393	282.83
1394	282.81
1395	282.79
1396	282.77
1397	282.75
1398	282.73
1399	282.71
1400	282.68
1401	282.66
1402	282.64
1403	282.62
1404	282.60
1405	282.58
1406	282.56
1407	282.54
1408	282.52
1409	282.49
1410	282.47
1411	282.45
1412	282.43
1413	282.41
1414	282.39
1415	282.37
1416	282.35
1417	282.33
1418	282.31
1419	282.28
1420	282.26
1421	282.24
1422	282.22
1423	282.20
1424	282.18
1425	282.16
1426	282.14
1427	282.12
1428	282.09
1429	282.07
1430	282.05
1431	282.03
1432	282.01
1433	281.99
1434	281.97

1435	281.95
1436	281.93
1437	281.91
1438	281.88
1439	281.86
1440	281.84
1441	281.82
1442	281.80
1443	281.78
1444	281.76
1445	281.74
1446	281.72
1447	281.69
1448	281.67
1449	281.65
1450	281.63
1451	281.61
1452	281.59
1453	281.57
1454	281.55
1455	281.53
1456	281.51
1457	281.48
1458	281.46
1459	281.44
1460	281.42
1461	281.40
1462	281.38
1463	281.36
1464	281.34
1465	281.32
1466	281.29
1467	281.27
1468	281.25
1469	281.23
1470	281.21
1471	281.19
1472	281.17
1473	281.15
1474	281.13
1475	281.11
1476	281.08
1477	281.06
1478	281.04
1479	281.02
1480	281.00
1481	281.04
1482	281.08
1483	281.12
1484	281.16
1485	281.20
1486	281.24
1487	281.28
1488	281.32
1489	281.36

1490	281.40
1491	281.44
1492	281.48
1493	281.52
1494	281.56
1495	281.60
1496	281.64
1497	281.68
1498	281.72
1499	281.76
1500	281.80
1501	281.84
1502	281.88
1503	281.92
1504	281.96
1505	282.00
1506	281.98
1507	281.96
1508	281.94
1509	281.91
1510	281.89
1511	281.87
1512	281.85
1513	281.83
1514	281.81
1515	281.79
1516	281.77
1517	281.74
1518	281.72
1519	281.70
1520	281.68
1521	281.66
1522	281.64
1523	281.62
1524	281.60
1525	281.57
1526	281.55
1527	281.53
1528	281.51
1529	281.49
1530	281.47
1531	281.45
1532	281.43
1533	281.40
1534	281.38
1535	281.36
1536	281.34
1537	281.32
1538	281.30
1539	281.28
1540	281.26
1541	281.23
1542	281.21
1543	281.19
1544	281.17

1545	281.15
1546	281.13
1547	281.11
1548	281.09
1549	281.06
1550	281.04
1551	281.02
1552	281.00
1553	280.98
1554	280.96
1555	280.94
1556	280.91
1557	280.89
1558	280.87
1559	280.85
1560	280.83
1561	280.81
1562	280.79
1563	280.77
1564	280.74
1565	280.72
1566	280.70
1567	280.68
1568	280.66
1569	280.64
1570	280.62
1571	280.60
1572	280.57
1573	280.55
1574	280.53
1575	280.51
1576	280.49
1577	280.47
1578	280.45
1579	280.43
1580	280.40
1581	280.38
1582	280.36
1583	280.34
1584	280.32
1585	280.30
1586	280.28
1587	280.26
1588	280.23
1589	280.21
1590	280.19
1591	280.17
1592	280.15
1593	280.13
1594	280.11
1595	280.09
1596	280.06
1597	280.04
1598	280.02
1599	280.00

1600	280.00
1601	280.00
1602	280.00
1603	280.00
1604	280.00
1605	280.00
1606	280.00
1607	280.00
1608	280.00
1609	280.00
1610	280.00
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1612	280.00
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1625	280.00
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1630	280.00
1631	280.00
1632	280.00
1633	280.00
1634	280.00
1635	280.00
1636	280.00
1637	280.00
1638	280.00
1639	280.00
1640	280.00
1641	280.00
1642	280.00
1643	280.00
1644	280.00
1645	280.00
1646	280.03
1647	280.06
1648	280.09
1649	280.11
1650	280.14
1651	280.17
1652	280.20
1653	280.23
1654	280.26

1655	280.29
1656	280.31
1657	280.34
1658	280.37
1659	280.40
1660	280.43
1661	280.46
1662	280.49
1663	280.51
1664	280.54
1665	280.57
1666	280.60
1667	280.63
1668	280.66
1669	280.69
1670	280.71
1671	280.74
1672	280.77
1673	280.80
1674	280.83
1675	280.86
1676	280.89
1677	280.91
1678	280.94
1679	280.97
1680	281.00
1681	280.97
1682	280.94
1683	280.91
1684	280.89
1685	280.86
1686	280.83
1687	280.80
1688	280.77
1689	280.74
1690	280.71
1691	280.69
1692	280.66
1693	280.63
1694	280.60
1695	280.57
1696	280.54
1697	280.51
1698	280.49
1699	280.46
1700	280.43
1701	280.40
1702	280.37
1703	280.34
1704	280.31
1705	280.29
1706	280.26
1707	280.23
1708	280.20
1709	280.17

1710	280.14
1711	280.11
1712	280.09
1713	280.06
1714	280.03
1715	280.00
1716	279.89
1717	279.78
1718	279.67
1719	279.56
1720	279.45
1721	279.34
1722	279.23
1723	279.12
1724	279.01
1725	278.90
1726	278.79
1727	278.68
1728	278.57
1729	278.46
1730	278.34
1731	278.23
1732	278.12
1733	278.01
1734	277.90
1735	277.79
1736	277.68
1737	277.57
1738	277.46
1739	277.35
1740	277.24
1741	277.13
1742	277.02
1743	276.91
1744	276.80
1745	276.80
1746	276.79
1747	276.79
1748	276.78
1749	276.78
1750	276.77
1751	276.77
1752	276.76
1753	276.76
1754	276.75
1755	276.75
1756	276.74
1757	276.74
1758	276.73
1759	276.73
1760	276.72
1761	276.72
1762	276.71
1763	276.71
1764	276.70

1765	276.81
1766	276.92
1767	277.03
1768	277.14
1769	277.26
1770	277.37
1771	277.48
1772	277.59
1773	277.70
1774	277.81
1775	277.92
1776	278.03
1777	278.14
1778	278.26
1779	278.37
1780	278.48
1781	278.59
1782	278.70
1783	278.81
1784	278.92
1785	279.03
1786	279.14
1787	279.26
1788	279.37
1789	279.48
1790	279.59
1791	279.70
1792	279.86
1793	280.03
1794	280.19
1795	280.36
1796	280.52
1797	280.68
1798	280.85
1799	281.01
1800	281.18
1801	281.34
1802	281.50
1803	281.67
1804	281.83
1805	282.00
1806	282.16
1807	282.32
1808	282.49
1809	282.65
1810	282.82
1811	282.98
1812	283.14
1813	283.31
1814	283.47
1815	283.64
1816	283.80
1817	283.77
1818	283.74
1819	283.71

1820	283.68
1821	283.65
1822	283.62
1823	283.59
1824	283.56
1825	283.53
1826	283.50
1827	283.47
1828	283.43
1829	283.40
1830	283.37
1831	283.34
1832	283.31
1833	283.28
1834	283.25
1835	283.22
1836	283.19
1837	283.16
1838	283.13
1839	283.10
1840	284.18
1841	285.25
1842	286.33
1843	287.40
1844	287.25
1845	287.10
1846	286.95
1847	286.80
1848	287.00
1849	287.20
1850	287.40
1851	287.60
1852	287.80
1853	288.00
1854	288.20
1855	288.27
1856	288.35
1857	288.42
1858	288.49
1859	288.57
1860	288.64
1861	288.71
1862	288.79
1863	288.86
1864	288.93
1865	289.01
1866	289.08
1867	289.15
1868	289.23
1869	289.30
1870	289.34
1871	289.38
1872	289.42
1873	289.46
1874	289.50

1875	289.70
1876	289.90
1877	290.10
1878	290.30
1879	290.52
1880	290.74
1881	290.97
1882	291.19
1883	291.41
1884	291.63
1885	291.86
1886	292.08
1887	292.30
1888	292.59
1889	292.88
1890	293.18
1891	293.47
1892	293.76
1893	294.05
1894	294.34
1895	294.63
1896	294.93
1897	295.22
1898	295.51
1899	295.80
1900	295.55
1901	295.30
1902	295.05
1903	294.80
1904	295.85
1905	296.90
1906	297.48
1907	298.05
1908	298.63
1909	299.20
1910	299.42
1911	299.63
1912	299.85
1913	300.07
1914	300.28
1915	300.50
1916	300.68
1917	300.87
1918	301.05
1919	301.23
1920	301.42
1921	301.60
1922	302.25
1923	302.90
1924	303.55
1925	304.20
1926	304.85
1927	305.50
1928	305.64
1929	305.78

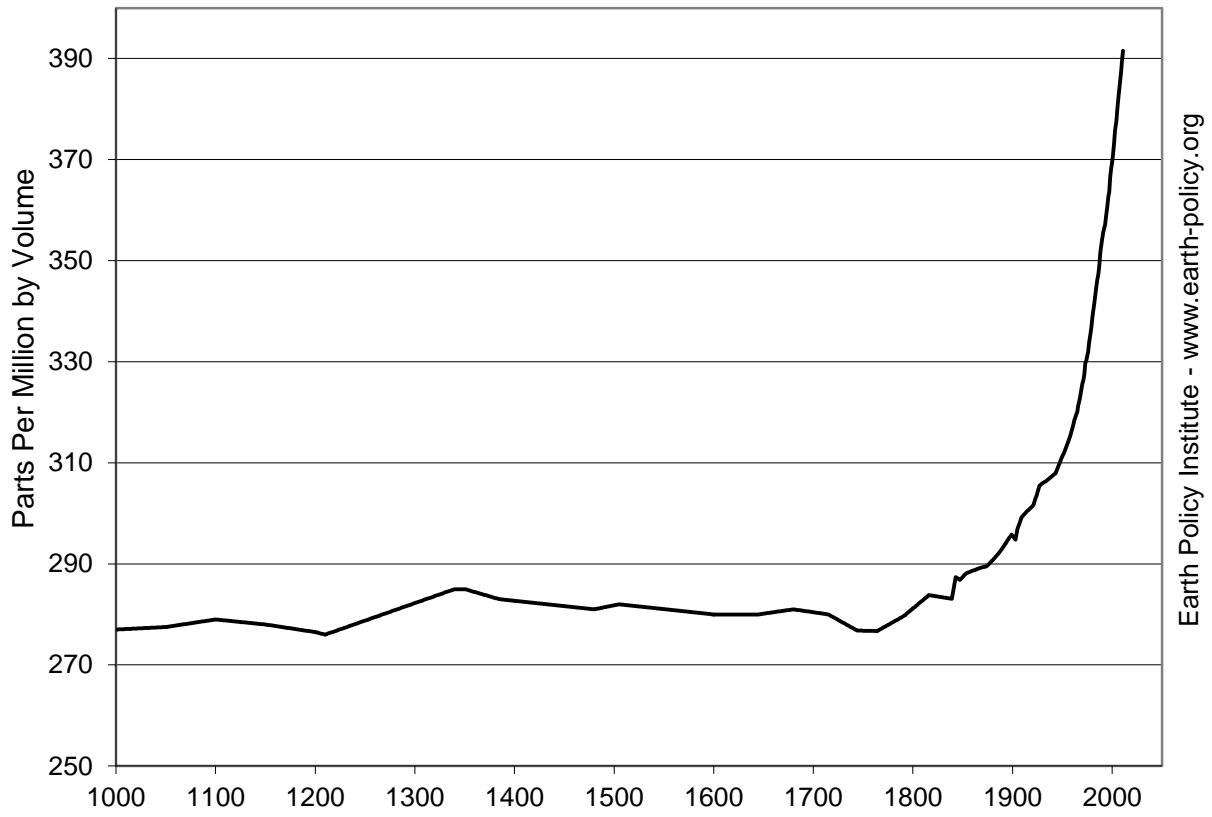
1930	305.91
1931	306.05
1932	306.19
1933	306.33
1934	306.46
1935	306.60
1936	306.76
1937	306.93
1938	307.09
1939	307.25
1940	307.41
1941	307.58
1942	307.74
1943	307.90
1944	308.38
1945	308.86
1946	309.34
1947	309.82
1948	310.30
1949	310.78
1950	311.26
1951	311.74
1952	312.22
1953	312.70
1954	313.22
1955	313.73
1956	314.25
1957	314.77
1958	315.28
1959	315.97
1960	316.91
1961	317.64
1962	318.45
1963	318.99
1964	319.62
1965	320.04
1966	321.38
1967	322.16
1968	323.04
1969	324.62
1970	325.68
1971	326.32
1972	327.45
1973	329.68
1974	330.18
1975	331.08
1976	332.05
1977	333.78
1978	335.41
1979	336.78
1980	338.68
1981	340.10
1982	341.44
1983	343.03
1984	344.58

1985	346.04
1986	347.39
1987	349.16
1988	351.56
1989	353.07
1990	354.35
1991	355.57
1992	356.38
1993	357.07
1994	358.82
1995	360.80
1996	362.59
1997	363.71
1998	366.65
1999	368.33
2000	369.52
2001	371.13
2002	373.22
2003	375.77
2004	377.49
2005	379.80
2006	381.90
2007	383.76
2008	385.59
2009	387.38
2010	389.78
2011	391.57

Source: Compiled by Earth Policy Institute, with long term historical data from Worldwatch Institute, *Signposts 2001*, CD-Rom (Washington, DC: 2001); 1959 to 2011 from NOAA/ESRL, "Atmospheric Carbon Dioxide - Mauna Loa," at www.esrl.noaa.gov/gmd/ccgg/trends/co2_data_mlo.html, updated 13 August 2012.

This is part of a supporting dataset for Lester R. Brown, **Full Planet, Empty Plates: The New Geopolitics of Food Scarcity** (New York: W.W. Norton & Company, 2012). For more information, see Earth Policy Institute on-line at www.earth-policy.org.

Atmospheric Carbon Dioxide Concentration, 1000-2011



Source: EPI from Worldwatch; NOAA/ESRL

Earth Policy Institute - www.earth-policy.org

Global Carbon Dioxide Emissions from Fossil Fuel Burning by Fuel Type, 1900-2011

Year	Coal	Oil	Natural Gas	Total*
Million Tons of Carbon				
1900	515	16	3	534
1901	531	18	4	552
1902	543	19	4	566
1903	593	20	4	617
1904	597	23	4	624
1905	636	23	5	663
1906	680	23	5	707
1907	750	28	5	784
1908	714	30	5	750
1909	747	32	6	785
1910	778	34	7	819
1911	792	36	7	836
1912	834	37	8	879
1913	895	41	8	943
1914	800	42	8	850
1915	784	45	9	838
1916	842	48	10	901
1917	891	54	11	955
1918	873	53	10	936
1919	735	61	10	806
1920	843	78	11	932
1921	709	84	10	803
1922	740	94	11	845
1923	845	111	14	970
1924	836	110	16	963
1925	842	116	17	975
1926	846	119	19	983
1927	905	136	21	1,062
1928	890	143	23	1,065
1929	947	160	28	1,145
1930	862	152	28	1,053
1931	759	147	25	940
1932	675	141	24	847
1933	708	154	25	893
1934	775	162	28	973
1935	811	176	30	1,027
1936	893	192	34	1,130
1937	941	219	38	1,209
1938	880	214	37	1,142
1939	918	222	38	1,192
1940	1,017	229	42	1,299
1941	1,043	236	42	1,334
1942	1,063	222	45	1,342
1943	1,092	239	50	1,391
1944	1,047	275	54	1,383
1945	820	275	59	1,160
1946	875	292	61	1,238
1947	992	322	67	1,392
1948	1,015	364	76	1,469
1949	960	362	81	1,419
1950	1,070	423	97	1,630
1951	1,129	479	115	1,767
1952	1,119	504	124	1,795
1953	1,125	533	131	1,841
1954	1,116	557	138	1,865
1955	1,208	625	150	2,043
1956	1,273	679	161	2,177
1957	1,309	714	178	2,270
1958	1,336	731	192	2,330
1959	1,382	789	206	2,454
1960	1,410	849	227	2,569
1961	1,349	904	240	2,580
1962	1,351	980	263	2,686
1963	1,396	1,052	286	2,833
1964	1,435	1,137	316	2,995
1965	1,460	1,219	337	3,130

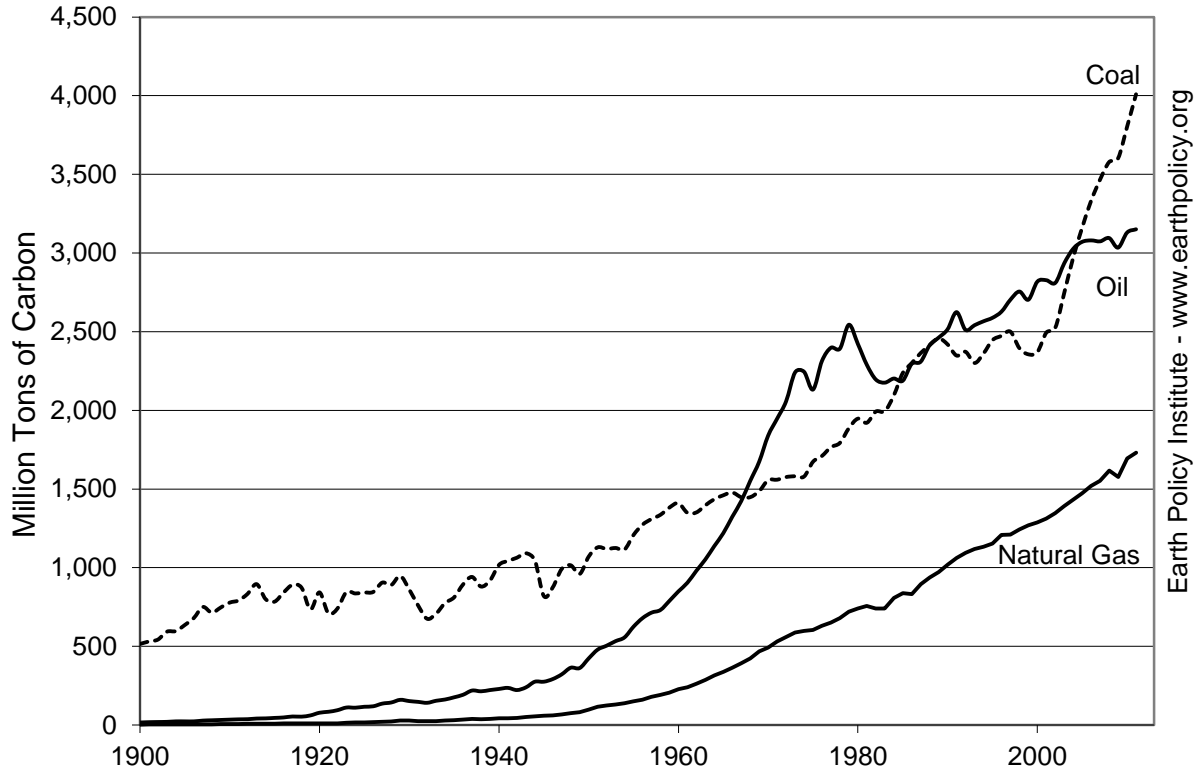
1966	1,478	1,323	364	3,288
1967	1,448	1,423	392	3,393
1968	1,448	1,551	424	3,566
1969	1,486	1,673	467	3,780
1970	1,556	1,839	493	4,053
1971	1,559	1,947	530	4,208
1972	1,576	2,057	560	4,376
1973	1,581	2,241	588	4,615
1974	1,579	2,245	597	4,623
1975	1,673	2,132	604	4,596
1976	1,710	2,314	630	4,864
1977	1,766	2,398	650	5,026
1978	1,793	2,392	680	5,087
1979	1,887	2,544	721	5,369
1980	1,947	2,422	740	5,316
1981	1,921	2,289	756	5,152
1982	1,992	2,196	740	5,113
1983	1,995	2,176	741	5,095
1984	2,094	2,202	808	5,283
1985	2,237	2,188	837	5,441
1986	2,300	2,295	831	5,609
1987	2,364	2,309	894	5,755
1988	2,414	2,414	937	5,968
1989	2,457	2,462	973	6,088
1990	2,419	2,515	1,020	6,151
1991	2,348	2,624	1,062	6,239
1992	2,372	2,511	1,094	6,178
1993	2,301	2,541	1,119	6,172
1994	2,361	2,566	1,133	6,284
1995	2,446	2,588	1,154	6,422
1996	2,473	2,627	1,208	6,550
1997	2,500	2,703	1,210	6,663
1998	2,395	2,755	1,243	6,638
1999	2,356	2,703	1,270	6,584
2000	2,370	2,818	1,288	6,750
2001	2,494	2,827	1,311	6,916
2002	2,525	2,810	1,346	6,981
2003	2,747	2,935	1,391	7,397
2004	2,971	3,027	1,431	7,782
2005	3,162	3,071	1,473	8,086
2006	3,333	3,080	1,519	8,350
2007	3,468	3,074	1,551	8,543
2008	3,578	3,095	1,616	8,749
2009	3,602	3,034	1,575	8,605
2010	3,802	3,130	1,694	8,995
2011	4,009	3,151	1,731	9,265

*Note: Annual totals also include emissions from gas flaring and cement production.

Source: Compiled by Earth Policy Institute with 1900 to 2008 from T. A. Boden, G. Marland, and R. J. Andres, "Global, Regional, and National CO₂ Emissions," (Oak Ridge, TN: Carbon Dioxide Information Analysis Center, 10 June 2011); 2009 to 2011 emissions calculated by Earth Policy Institute from energy consumption in BP, *Statistical Review of World Energy* (London: 2012), and cement production in U.S. Geological Survey (USGS), *Mineral Commodity Summaries 2012* (Washington, DC: 2012), p. 39.

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Global Carbon Dioxide Emissions from Fossil Fuel Burning by Fuel Type, 1900-2011



Source: EPI from CDIAC; BP

Earth Policy Institute - www.earthpolicy.org

Net Carbon Emissions from Land Use Change, 1850-2005

Year	United States	South and Central America		Europe	North Africa and Middle East		Tropical Africa	Former USSR	China	South and Southeast Asia		Developing Pacific	World
		Canada	America		Middle East	Africa				Southeast Asia	Pacific		
Million Tons of Carbon													
1850	164.1	5.5	23.5	55.0	4.0	-1.3	58.6	101.8	87.3	2.0	500.6		
1851	165.7	5.4	23.2	55.0	4.0	-1.1	58.6	93.1	86.9	2.0	492.7		
1852	230.7	5.3	22.9	55.0	4.0	-1.0	58.9	83.8	86.9	2.0	548.5		
1853	238.5	5.3	22.6	55.0	4.0	-1.1	59.2	74.2	87.0	2.0	546.8		
1854	246.2	5.3	22.4	54.9	4.0	-1.0	59.6	64.3	87.1	2.0	544.8		
1855	253.6	5.3	22.2	54.9	4.0	-1.1	60.0	54.2	87.1	2.0	542.1		
1856	260.5	5.2	22.0	54.9	4.0	-1.1	60.3	52.6	87.2	2.0	547.7		
1857	267.2	5.2	21.8	54.8	4.0	-1.1	60.7	51.3	87.3	2.0	553.3		
1858	273.6	5.2	21.7	54.8	4.0	-1.4	61.1	50.2	87.4	2.0	558.6		
1859	279.7	5.2	21.5	54.8	4.0	-1.6	61.5	49.4	87.5	2.0	564.0		
1860	285.7	5.2	21.1	54.8	4.0	-1.8	61.9	48.7	87.6	2.0	569.0		
1861	290.7	5.1	21.9	54.8	9.0	-2.1	62.2	48.1	87.7	2.1	579.6		
1862	237.7	6.8	22.1	54.9	10.0	-1.9	53.7	47.8	87.8	2.2	520.9		
1863	236.8	7.3	22.2	55.0	10.8	-1.7	53.7	46.6	87.9	2.3	521.1		
1864	236.0	7.8	22.3	55.1	11.3	-1.2	53.8	46.2	88.0	2.4	521.6		
1865	235.2	8.4	22.3	55.2	11.6	-0.7	53.9	45.8	88.1	2.6	522.4		
1866	234.8	8.9	21.9	55.3	12.0	-0.5	53.7	45.4	88.2	2.7	522.5		
1867	232.5	9.4	21.5	55.5	12.3	-0.2	53.6	45.2	88.2	2.8	520.8		
1868	230.6	9.9	21.1	55.6	12.6	-0.2	53.5	44.9	88.3	3.0	519.2		
1869	228.6	10.4	20.7	55.8	12.9	-0.4	53.4	44.7	88.4	3.1	517.5		
1870	226.8	10.8	20.7	56.0	13.2	-0.6	53.3	44.5	88.4	3.2	516.3		
1871	224.2	11.3	20.6	50.5	13.4	-0.8	53.2	44.3	110.0	9.9	536.7		
1872	303.9	11.8	20.5	49.6	13.6	-1.0	53.5	44.2	115.2	11.9	623.2		
1873	309.3	12.3	20.4	48.8	13.9	-0.8	53.7	44.1	118.9	13.7	634.1		
1874	314.4	12.7	20.3	47.9	14.1	-0.4	54.0	42.0	121.7	14.3	641.1		
1875	319.3	13.2	20.3	47.2	14.3	-0.3	54.3	41.4	123.9	14.9	648.4		
1876	324.1	13.6	20.4	46.5	14.5	-0.1	54.9	40.9	125.2	15.4	655.5		
1877	330.1	13.3	20.9	45.9	14.6	0.0	55.0	40.4	126.4	15.8	662.4		
1878	335.8	13.2	21.3	45.4	14.8	0.0	55.1	40.3	127.4	16.1	669.5		
1879	341.3	13.1	21.7	44.9	14.9	0.0	55.2	40.4	128.3	16.4	676.4		
1880	346.7	13.1	22.1	44.4	15.1	-0.2	55.3	40.6	129.1	16.7	682.9		
1881	350.7	13.0	54.1	43.9	15.2	-0.3	55.4	40.3	129.5	17.0	718.9		
1882	295.6	12.9	63.0	43.5	15.4	-0.5	55.5	40.1	129.9	17.3	672.7		
1883	294.0	12.8	70.2	43.1	15.5	-0.7	55.6	39.9	130.2	17.6	678.3		
1884	292.7	12.7	76.1	42.7	15.6	-0.4	55.8	39.7	130.5	17.9	683.4		
1885	291.6	12.6	81.2	42.4	15.8	-0.2	55.9	39.6	130.7	18.2	687.7		
1886	290.3	12.5	84.1	42.6	15.9	0.0	56.0	39.4	131.0	18.5	690.4		

1887	286.8	12.4	86.2	42.7	16.0	0.1	56.2	39.2	131.2	18.8	689.8
1888	283.3	12.3	87.9	42.9	16.2	0.0	56.3	39.1	131.4	19.1	688.6
1889	279.9	12.2	89.4	43.1	16.3	-0.2	56.4	39.0	131.6	19.4	687.2
1890	276.6	12.1	90.6	43.3	16.4	-0.2	56.6	39.0	131.8	19.6	685.9
1891	272.6	12.0	73.4	43.5	16.5	-0.4	56.7	39.0	148.3	19.8	681.5
1892	285.2	11.9	70.0	43.7	16.7	-0.7	56.8	39.0	152.3	20.1	695.0
1893	285.6	11.8	67.3	43.9	16.8	-1.1	57.0	39.1	155.2	20.3	695.8
1894	287.1	11.7	65.2	44.1	16.9	-1.4	57.1	54.6	157.4	20.5	713.3
1895	288.7	11.7	63.6	44.3	17.0	-1.3	57.2	56.4	159.2	20.7	717.5
1896	288.3	11.6	62.6	44.5	17.1	-1.3	57.3	58.1	160.2	20.9	719.4
1897	289.2	11.5	61.7	44.7	17.2	-1.0	57.5	59.8	161.1	21.1	723.0
1898	288.2	11.4	61.1	44.9	17.3	-0.6	57.6	61.4	161.9	21.3	724.5
1899	287.2	11.3	60.6	45.0	17.4	-0.6	57.7	62.9	162.6	21.6	725.8
1900	286.3	11.3	60.3	45.2	17.6	-0.7	57.8	64.4	163.1	21.7	726.9
1901	285.9	11.2	121.8	45.4	20.1	-0.8	57.9	65.8	163.5	22.0	792.8
1902	240.4	24.0	139.4	45.7	20.6	-0.3	58.0	82.7	163.8	22.3	796.8
1903	231.8	26.8	153.8	46.0	21.0	1.0	58.2	100.6	164.1	22.7	825.9
1904	222.2	29.5	165.8	46.3	21.3	2.7	58.3	119.0	164.4	23.0	852.4
1905	213.1	32.1	176.1	46.6	21.5	4.8	58.5	137.9	164.6	23.3	878.5
1906	205.9	34.6	180.8	46.9	21.7	7.4	58.6	157.1	172.8	23.6	909.5
1907	198.5	37.1	184.7	47.3	21.9	10.2	58.6	161.6	174.9	23.9	918.6
1908	193.3	39.4	187.9	47.6	22.1	12.9	58.6	165.5	176.4	24.3	927.9
1909	188.2	41.8	190.5	48.0	22.2	15.5	58.6	168.4	177.5	24.6	935.3
1910	183.0	44.1	192.6	48.3	22.3	17.9	58.5	170.9	178.4	24.9	941.0
1911	178.8	46.3	130.5	48.7	22.5	20.2	58.5	173.2	179.0	25.1	882.9
1912	153.5	48.6	112.6	49.1	22.6	22.7	58.5	173.6	179.6	25.4	846.2
1913	147.6	50.8	98.0	49.5	22.7	25.0	63.7	173.8	159.2	25.7	815.9
1914	142.9	52.9	85.5	49.8	22.8	27.2	65.2	177.8	154.7	25.9	804.8
1915	138.3	55.1	74.6	50.2	22.9	29.4	66.6	178.4	151.4	26.2	793.0
1916	133.5	57.2	70.5	50.7	22.9	31.5	67.9	178.8	155.8	26.4	795.1
1917	130.0	57.8	67.2	51.1	23.0	34.1	69.2	183.7	155.5	26.6	798.2
1918	126.1	58.4	64.5	51.5	23.0	36.4	70.5	188.8	155.4	26.8	801.4
1919	124.4	58.9	62.2	51.9	23.0	38.7	71.8	193.9	155.2	27.1	807.1
1920	118.6	59.5	60.0	52.3	23.0	41.1	73.1	199.0	154.9	27.3	808.8
1921	112.5	60.0	104.8	52.8	23.1	43.0	74.4	204.1	154.6	27.6	856.7
1922	85.5	60.6	117.3	53.2	23.1	44.9	75.7	206.7	154.3	27.8	849.1
1923	76.4	61.1	127.4	53.6	23.1	46.7	77.1	209.2	154.4	28.0	857.0
1924	67.2	61.6	135.9	54.0	23.1	48.2	78.4	211.6	154.5	28.2	862.7
1925	56.5	62.1	143.3	54.4	23.1	49.6	79.8	213.8	154.6	28.3	865.6
1926	49.8	62.6	145.4	54.1	31.7	51.0	81.2	216.0	150.1	28.6	870.5
1927	93.2	52.6	147.0	53.6	33.6	52.3	82.5	216.9	149.2	28.8	909.7
1928	92.9	51.0	148.1	53.0	35.4	54.1	83.1	217.8	148.6	29.1	913.0
1929	117.0	49.4	149.0	52.4	35.8	55.8	83.7	219.5	148.2	29.3	940.0
1930	191.7	47.8	150.1	51.6	36.1	57.4	84.3	221.6	148.0	29.5	1,018.1
1931	187.6	46.3	161.8	50.7	36.7	59.1	84.9	223.7	148.0	29.8	1,028.7

1932	85.0	44.9	165.0	49.7	37.3	60.8	85.5	224.6	148.0	30.0	930.8
1933	77.4	43.5	167.5	48.6	37.8	62.8	86.1	225.4	148.1	30.3	927.6
1934	70.2	42.1	169.5	47.4	38.3	64.7	84.6	220.0	148.2	30.5	915.3
1935	67.8	40.8	171.1	46.1	38.8	67.5	82.8	219.8	148.3	30.8	913.7
1936	59.4	39.5	172.8	44.8	39.2	69.2	80.9	219.8	165.5	31.0	922.0
1937	32.8	38.2	174.6	43.4	39.6	71.1	78.8	219.7	169.7	31.3	899.3
1938	33.4	36.9	176.3	42.0	40.0	73.0	76.7	219.8	172.8	31.5	902.4
1939	29.5	35.6	177.8	40.6	40.3	75.3	74.5	219.8	175.2	31.7	900.5
1940	16.5	34.4	179.2	39.1	40.7	77.6	71.1	219.8	177.1	32.0	887.5
1941	15.0	33.1	177.8	37.7	41.0	79.5	54.4	219.8	179.6	32.2	870.2
1942	27.6	33.1	177.3	36.2	41.3	81.7	47.5	231.9	182.2	32.4	891.3
1943	13.2	33.1	176.9	34.8	41.7	84.0	40.8	244.6	184.7	32.6	886.4
1944	9.0	33.1	176.6	33.3	41.9	86.3	34.4	257.7	187.2	32.8	892.3
1945	0.1	33.1	176.4	31.9	42.1	88.6	28.0	271.2	189.6	33.0	894.1
1946	-4.8	33.1	179.4	30.4	42.3	91.2	24.0	284.9	263.1	33.2	976.9
1947	5.9	32.9	182.5	29.0	42.6	93.5	20.4	286.9	281.7	33.4	1,008.9
1948	-5.2	32.7	185.8	27.5	42.8	97.3	17.2	288.7	295.4	33.6	1,015.8
1949	-10.6	32.5	189.2	26.1	43.0	101.2	14.3	290.2	305.1	33.8	1,024.9
1950	-11.4	32.4	192.8	24.7	43.2	105.2	13.1	290.1	313.4	34.0	1,037.3
1951	3.2	32.2	251.7	23.5	34.4	109.3	126.9	289.8	319.8	67.5	1,258.3
1952	-42.0	32.9	270.4	22.5	32.6	105.9	149.6	308.1	327.8	76.9	1,284.7
1953	-66.3	32.6	285.8	21.7	30.8	108.9	171.5	327.0	284.3	84.5	1,280.9
1954	-64.4	32.4	298.7	21.0	28.6	112.0	192.7	346.5	281.0	86.6	1,335.0
1955	-73.6	32.1	309.8	20.4	26.4	115.3	213.7	366.3	281.0	87.9	1,379.5
1956	-65.5	31.9	316.5	20.0	25.7	118.6	236.1	386.5	280.4	88.8	1,438.9
1957	-68.0	31.6	322.0	19.7	25.0	122.0	258.2	388.6	280.7	89.3	1,469.1
1958	-33.0	31.4	326.7	19.5	24.4	124.8	280.0	381.7	275.9	89.5	1,520.8
1959	-71.8	31.1	330.7	19.4	23.8	127.6	208.3	362.1	276.8	89.6	1,397.8
1960	-74.9	30.9	334.3	19.4	23.2	130.5	210.9	343.1	278.9	89.6	1,385.8
1961	-88.5	30.6	449.6	16.7	22.6	132.7	205.2	323.1	282.4	89.5	1,463.9
1962	-86.2	30.7	484.4	16.3	22.1	133.6	201.9	296.2	271.8	89.3	1,460.0
1963	-92.3	30.8	512.0	16.0	21.5	138.9	198.8	285.6	274.4	89.1	1,474.9
1964	-95.4	30.9	534.4	15.8	21.0	140.7	196.2	285.0	269.7	88.8	1,487.1
1965	-99.9	31.1	553.7	15.6	20.5	143.4	192.9	284.3	274.8	88.6	1,505.0
1966	-67.9	31.2	563.7	15.5	21.6	142.5	181.2	283.1	280.1	88.3	1,539.3
1967	-63.8	31.2	572.4	15.4	21.8	143.6	169.5	282.2	285.6	87.9	1,545.8
1968	-62.8	31.2	580.3	15.3	22.0	139.4	157.9	281.7	225.0	87.6	1,477.7
1969	-51.6	31.1	587.0	15.3	21.7	146.5	147.8	281.2	216.9	87.0	1,483.1
1970	-53.0	31.1	593.1	13.6	21.5	139.8	114.5	280.8	212.0	86.5	1,439.7
1971	-89.3	31.1	536.8	11.2	21.5	143.1	100.1	280.7	206.4	50.2	1,291.7
1972	-80.9	30.1	524.9	8.6	21.6	146.8	85.4	282.8	205.7	39.1	1,264.2
1973	-92.9	30.2	515.6	6.0	21.6	150.8	71.3	284.7	231.8	29.7	1,248.7
1974	-92.1	30.2	508.3	3.2	21.7	154.7	64.9	287.2	250.4	26.1	1,254.5
1975	-81.5	30.3	502.6	0.2	21.7	144.5	58.8	291.3	254.0	23.2	1,245.1
1976	-64.8	30.4	503.0	-2.6	21.8	159.0	55.9	303.4	284.9	20.8	1,311.9

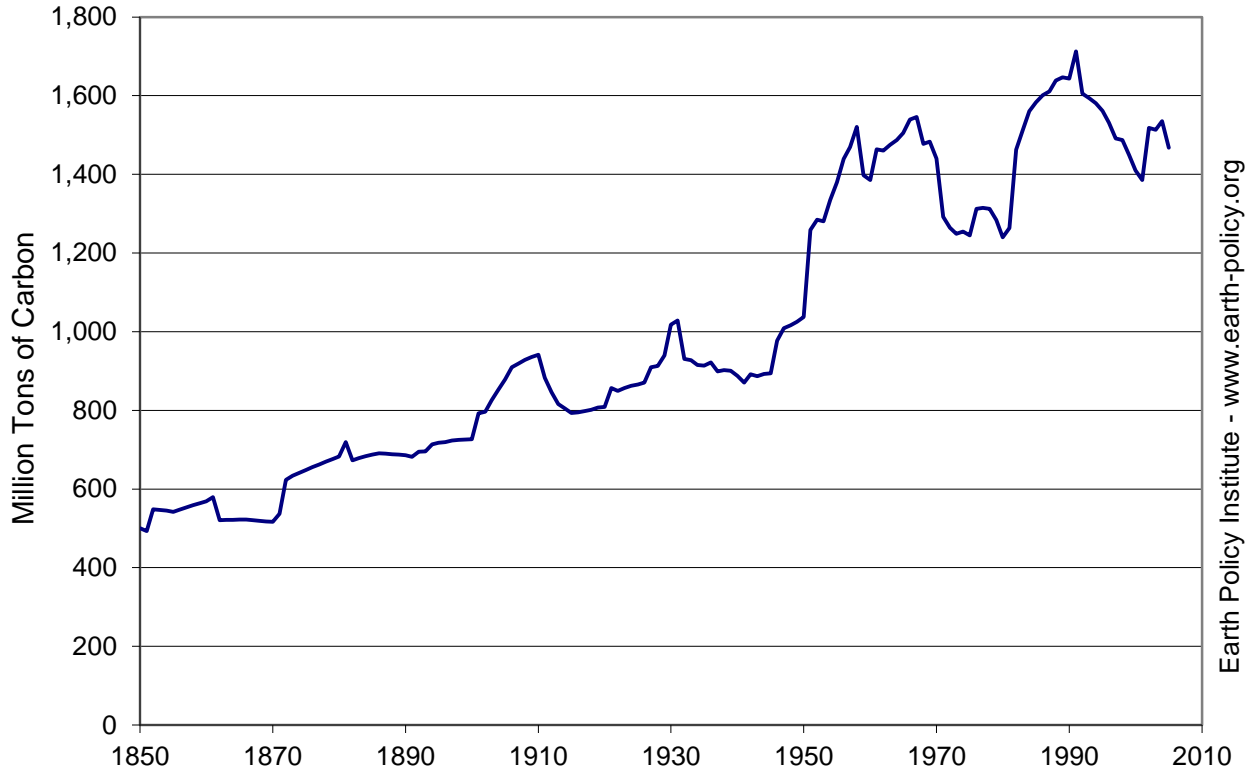
1977	-60.2	30.5	504.2	-5.6	21.8	142.4	50.4	306.4	306.6	18.8	1,315.1
1978	-54.4	30.6	505.3	-8.8	21.8	149.0	44.8	285.3	321.2	16.9	1,311.9
1979	-51.7	30.7	506.2	-12.1	21.8	150.3	39.5	248.1	335.7	15.3	1,283.8
1980	-53.9	30.9	507.8	-14.1	21.9	144.6	35.4	209.5	344.1	13.7	1,239.9
1981	-50.2	31.0	510.0	-15.3	17.0	166.7	33.4	168.8	386.5	15.6	1,263.4
1982	-38.0	27.8	729.4	-16.4	16.6	181.9	30.7	122.9	393.3	14.9	1,463.0
1983	-38.8	27.0	787.5	-17.2	16.4	195.3	28.8	101.5	398.2	14.1	1,512.9
1984	-42.5	26.2	833.6	-17.9	18.0	205.5	27.2	93.8	403.4	12.7	1,560.1
1985	-39.4	25.5	873.0	-18.3	19.8	197.1	25.8	82.7	405.9	11.3	1,583.2
1986	-34.3	24.7	902.5	-18.6	20.4	193.4	23.4	76.8	403.1	9.8	1,601.1
1987	-31.1	24.2	917.0	-18.7	21.0	193.3	22.6	71.0	403.6	8.2	1,611.1
1988	-21.6	23.7	926.4	-18.7	21.7	202.8	21.8	64.8	410.7	6.6	1,638.5
1989	-21.8	23.2	932.6	-18.4	22.5	197.1	21.2	66.6	418.6	5.3	1,647.0
1990	-31.9	22.8	936.8	-18.1	23.2	201.4	20.1	61.1	424.5	3.9	1,643.7
1991	-31.9	22.3	938.6	-18.1	23.2	195.5	20.1	50.9	508.0	3.9	1,712.5
1992	-31.9	21.6	803.7	-18.1	23.2	214.3	20.1	39.8	528.4	3.9	1,605.0
1993	-31.9	20.9	767.5	-18.1	23.2	224.9	20.1	39.5	543.7	3.9	1,593.8
1994	-31.9	20.1	737.3	-18.1	23.2	243.7	20.1	43.0	539.2	3.9	1,580.5
1995	-31.9	19.4	713.4	-18.1	23.2	262.8	20.1	31.1	537.7	3.9	1,561.6
1996	-31.9	18.7	692.1	-18.1	23.2	260.9	20.1	27.3	535.0	3.9	1,531.3
1997	-31.9	18.4	678.5	-18.1	23.2	247.5	20.1	21.1	528.5	3.9	1,491.3
1998	-31.9	18.2	667.1	-18.1	23.2	269.4	20.1	12.1	523.2	3.9	1,487.2
1999	-31.9	17.9	656.4	-18.1	23.2	263.9	20.1	5.0	508.7	3.9	1,449.2
2000	-31.9	17.6	649.6	-18.1	23.2	260.9	20.1	-12.9	497.5	3.9	1,409.9
2001	-31.9	17.6	643.2	-18.1	23.2	261.7	20.1	-12.9	478.5	3.9	1,385.4
2002	-31.9	17.6	625.5	-18.1	23.2	258.5	20.1	-12.9	631.7	3.9	1,517.7
2003	-31.9	17.6	616.5	-18.1	23.2	225.5	20.1	-12.9	669.3	3.9	1,513.2
2004	-31.9	17.6	609.4	-18.1	23.2	225.8	20.1	-12.9	697.8	3.9	1,534.9
2005	-31.9	17.6	606.4	-18.1	23.2	239.2	20.1	-12.9	619.7	3.9	1,467.3

Note: Figures after 1990 for regions outside of the tropics are estimations. Negative values indicate net carbon uptake.

Source: Compiled by Earth Policy Institute from R. A. Houghton, "Carbon Flux to the Atmosphere from Land-Use Changes: 1850-2005," in Carbon Dioxide Information Analysis Center, *TRENDS: A Compendium of Data on Global Change* (Oak Ridge, TN: Oak Ridge National Laboratory, 2008 and 2010), at cdiac.ornl.gov/trends/trends.htm.

This is part of a supporting dataset for Lester R. Brown, **Full Planet, Empty Plates: The New Geopolitics of Food Scarcity** (New York: W.W. Norton & Company, 2012). For more information, see Earth Policy Institute on-line at www.earth-policy.org.

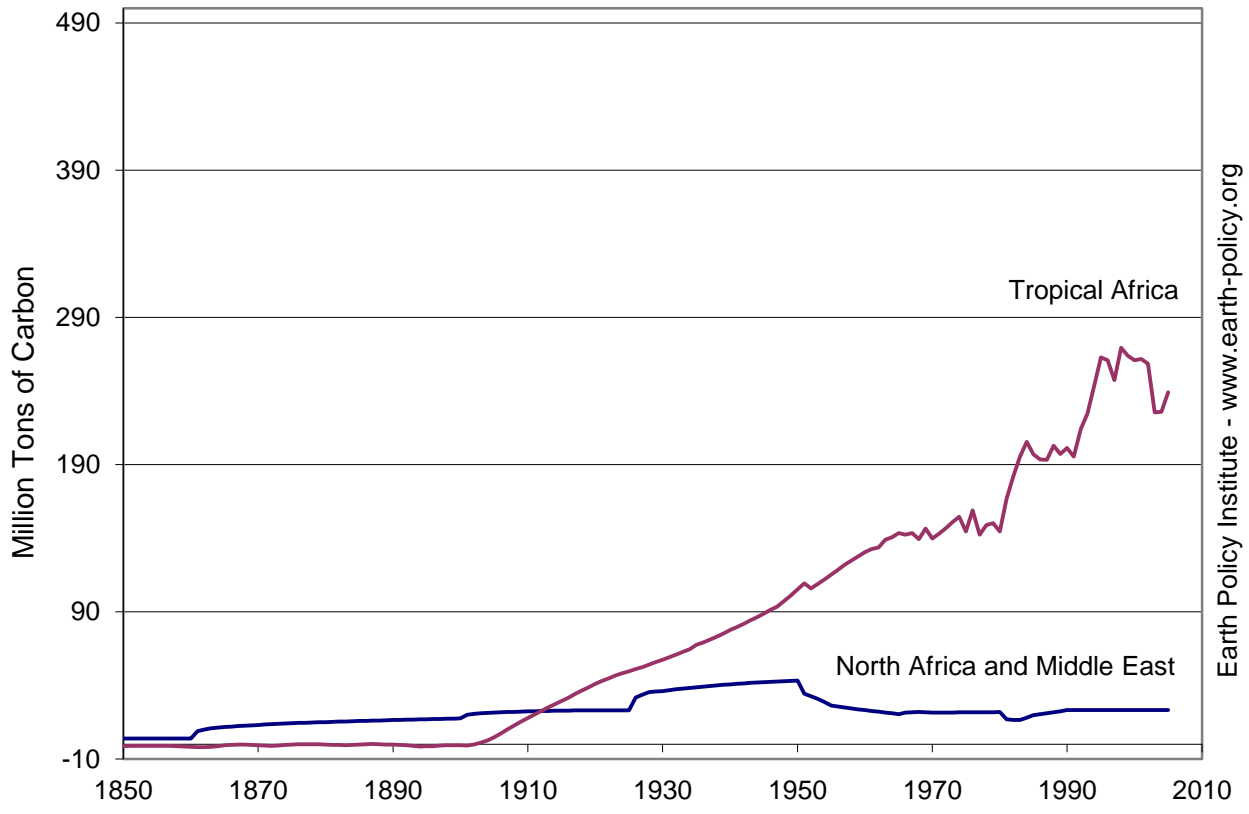
Net Carbon Emissions from Land Use Change Worldwide, 1850-2005



Source: Houghton

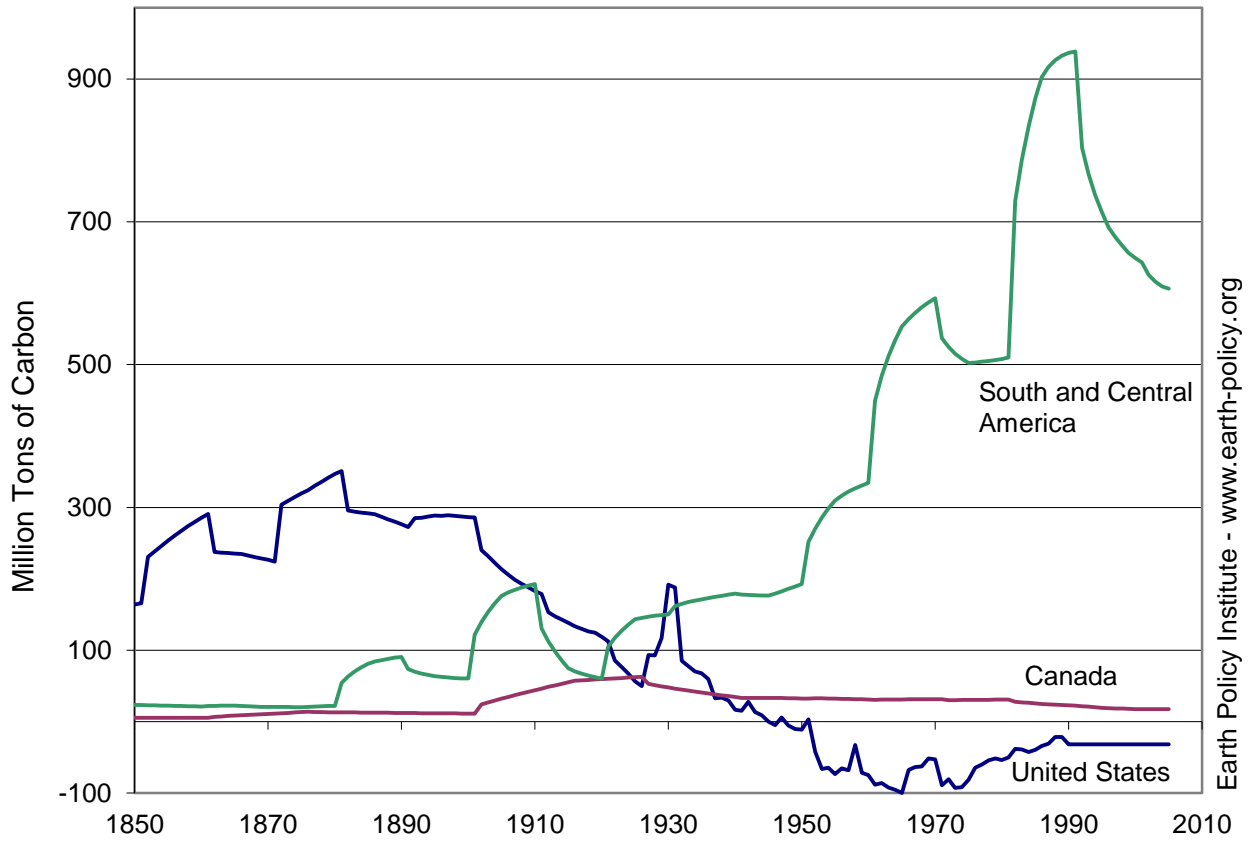
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Net Carbon Emissions from Land Use Change in Africa and the Middle East, 1850-2005



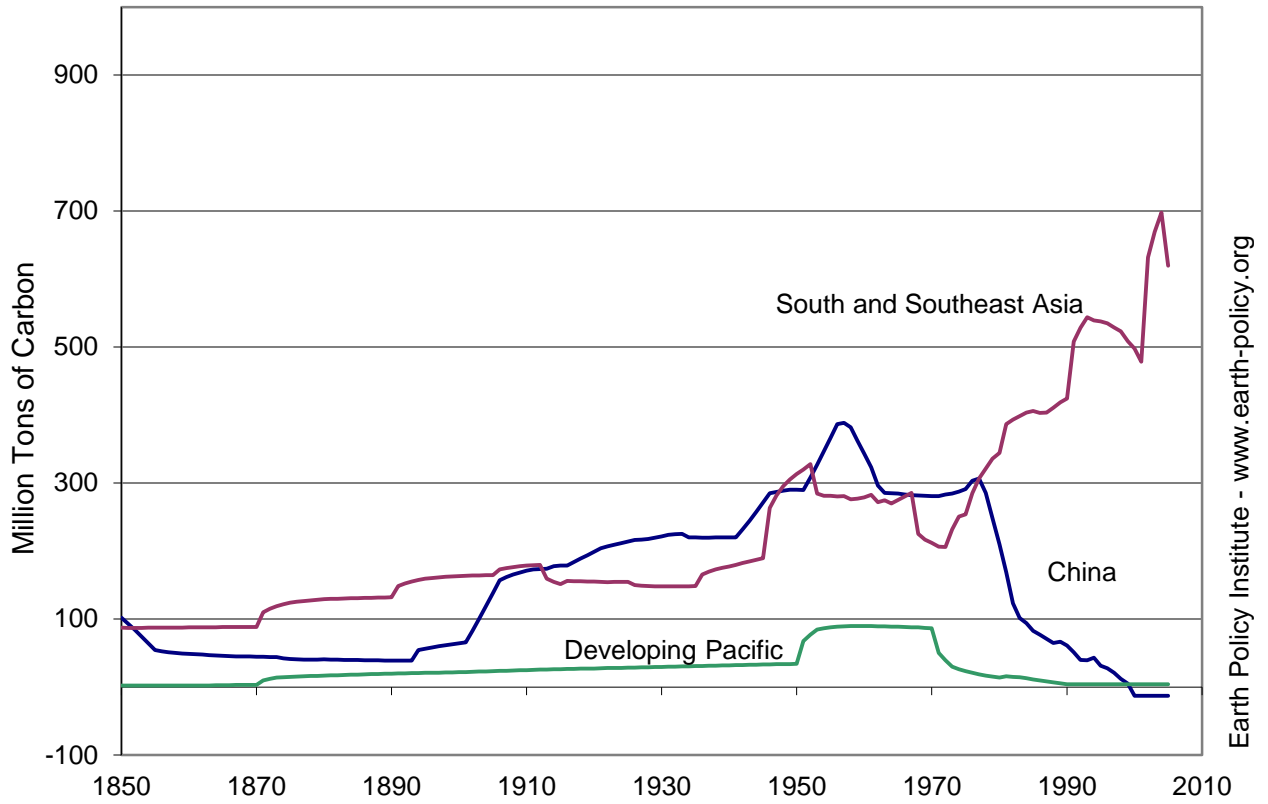
Source: Houghton

Net Carbon Emissions from Land Use Change in the Americas, 1850-2005



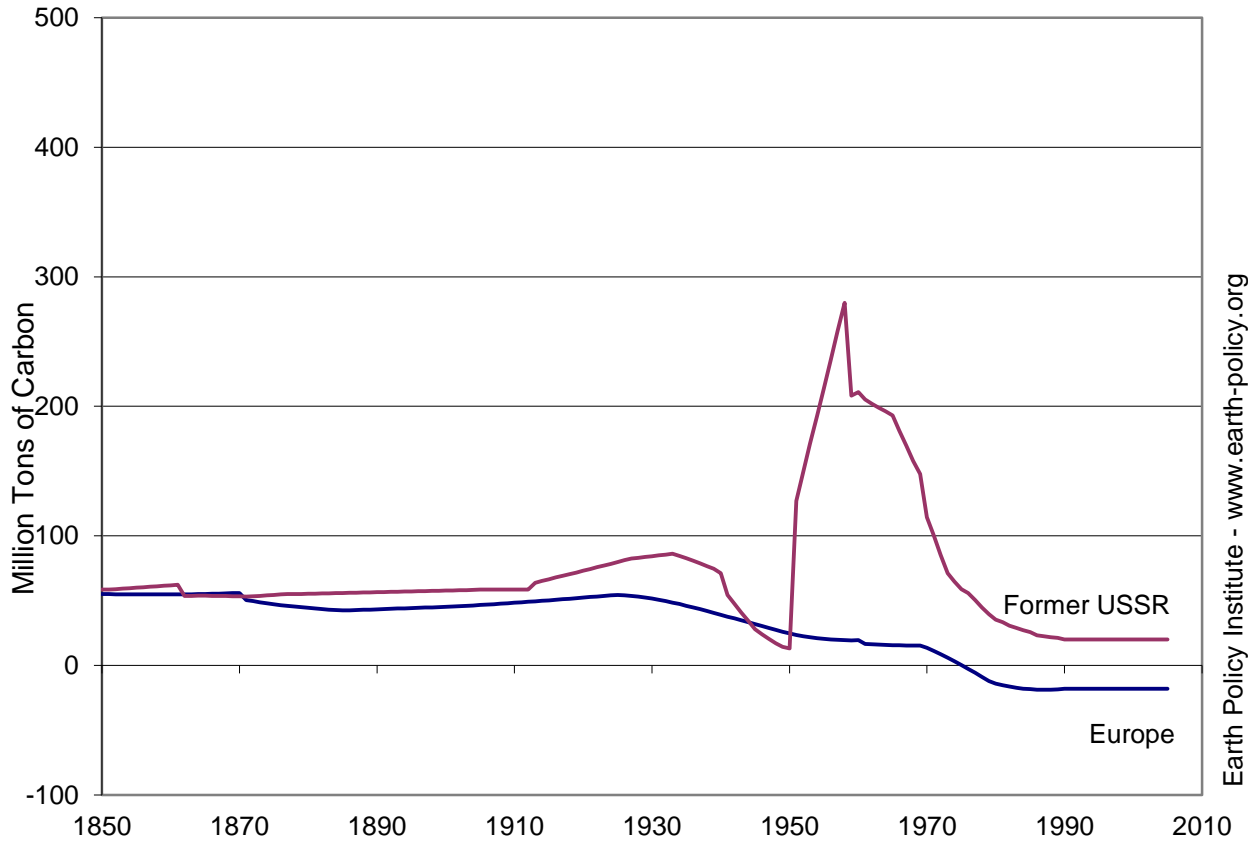
Source: Houghton

Net Carbon Emissions from Land Use Change in Asia and the Pacific, 1850-2005



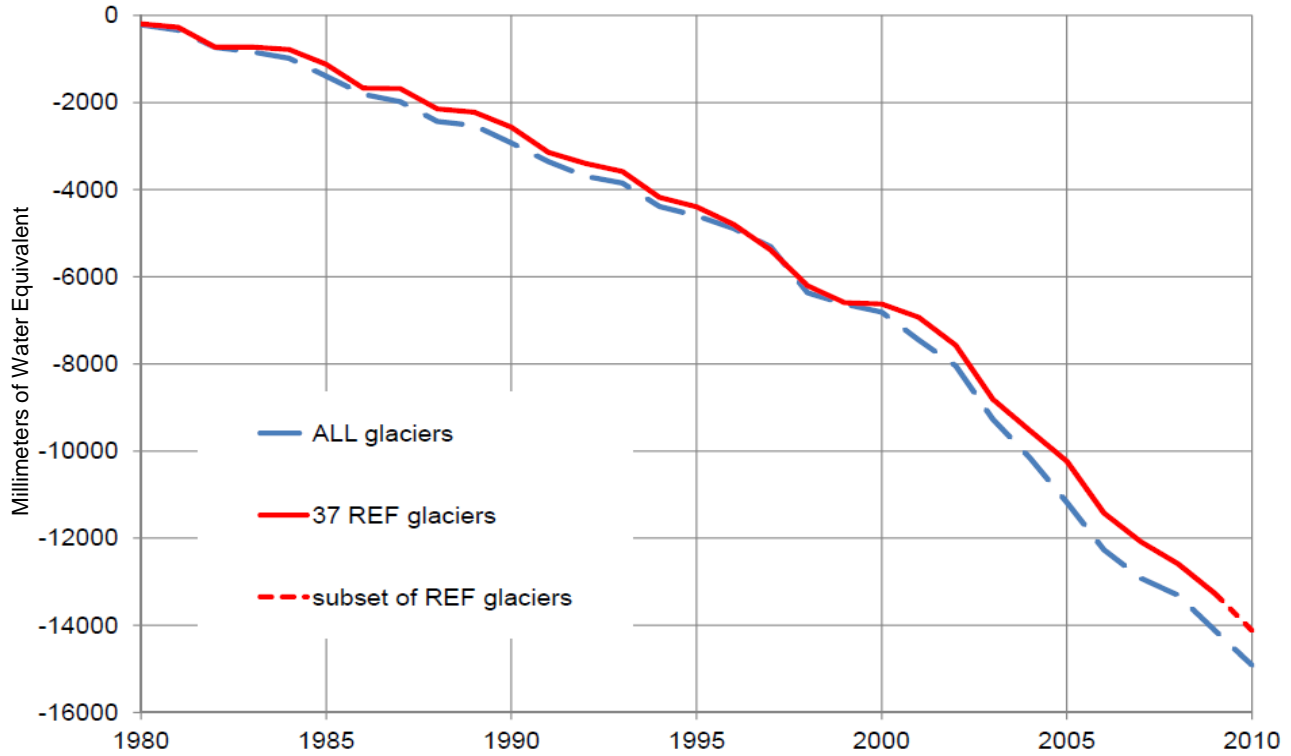
Source: Houghton

Net Carbon Emissions from Land Use Change in Europe and the Former Soviet Union, 1850-2005



Source: Houghton

Mean Cumulative Specific Mass Balance of Mountain Glaciers Worldwide, 1980-2010



Note: The net accumulation minus net melt in millimeters of water equivalent (mm w.e.) for 1980-2010. A negative mass balance indicates shrinking glacier size. "REF" refers to reference glaciers which have a continuous long-term observation series.

Source: World Glacier Monitoring Service (WGMS), University of Zurich, "Preliminary Glacier Mass Balance Data 2009/2010," at <http://www.geo.uzh.ch/microsite/wgms/mbb/sum10.html>, updated 28 March 2012.

This is part of a supporting dataset for Lester R. Brown, **Full Planet, Empty Plates: The New Geopolitics of Food Scarcity** (New York: W.W. Norton & Company, 2012). For more information, see Earth Policy Institute on-line at www.earth-policy.org.

Effects of 1 to 5 Meters of Sea Level Rise on Populations and Land Area around the World

Region	Sea Level Rise	Population Directly Affected		Area Inundated		Urban Area Inundated		Agricultural Area Inundated	
	Meters	Millions	Percent	Square Kilometers	Percent	Square Kilometers	Percent	Square Kilometers	Percent
Latin America & Caribbean	1	2.9	0.6	64,632	0.3	3,080	0.6	16,104	0.3
	2	4.7	0.9	101,736	0.5	5,212	1.0	29,514	0.6
	3	7.2	1.5	149,183	0.8	8,090	1.6	47,003	1.0
	4	10.3	2.1	193,786	1.0	11,614	2.3	66,330	1.4
	5	13.5	2.7	234,117	1.2	15,294	3.0	85,959	1.8
Middle East and North Africa	1	8.3	3.2	24,654	0.3	3,679	1.9	4,086	1.2
	2	10.9	4.2	33,864	0.3	5,037	2.7	6,031	1.7
	3	13.7	5.3	43,727	0.4	6,529	3.4	8,007	2.3
	4	16.5	6.3	53,615	0.5	7,951	4.2	9,819	2.8
	5	19.4	7.5	63,120	0.6	9,384	4.9	11,451	3.2
Sub-Saharan Africa	1	2.1	0.5	18,641	0.1	430	0.4	1,646	0.0
	2	3.7	0.8	28,083	0.2	742	0.7	3,404	0.1
	3	4.3	0.9	42,645	0.3	1,268	1.2	6,595	0.2
	4	8.5	1.8	59,661	0.4	1,853	1.7	11,231	0.3
	5	11.0	2.4	77,253	0.5	2,449	2.2	16,145	0.4
East Asia	1	37.2	2.0	74,020	0.5	6,648	1.7	45,393	0.8
	2	60.2	3.2	119,370	0.8	11,127	2.9	78,347	1.4
	3	90.0	4.8	178,177	1.3	17,596	4.5	121,728	2.2
	4	126.2	6.7	248,970	1.8	25,725	6.6	174,076	3.2
	5	162.4	8.6	325,089	2.3	34,896	9.0	229,185	4.2
South Asia	1	5.9	0.5	12,362	0.3	809	0.3	3,442	0.1
	2	10.2	0.8	21,983	0.5	1,379	0.6	6,951	0.2
	3	17.8	1.4	35,696	0.9	2,311	1.0	13,501	0.5
	4	22.1	1.7	52,207	1.2	3,599	1.5	23,716	0.8
	5	39.5	3.0	69,225	1.7	5,117	2.1	35,190	1.2
World	1	56.3	1.3	194,309	0.3	14,646	1.0	70,671	0.4
	2	89.6	2.0	305,036	0.5	23,497	1.6	124,247	0.7
	3	133.0	3.0	449,428	0.7	35,794	2.5	196,834	1.1
	4	183.5	4.2	608,239	1.0	50,742	3.5	285,172	1.6
	5	245.9	5.6	768,804	1.2	67,140	4.7	377,930	2.1

Notes: These data are for 84 coastal developing countries; low-lying island nations, which are among those nations most affected by rising seas, are not included in this study. Population and GDP data are from 2000. The data presented here are conservative; they likely underestimate the magnitude of impacts because coastal populations have increased over the last decade and because the analysis does not take into account changes in storm surges as a result of sea level rise. Methodology of study from which these data are taken consisted of overlaying population and area data onto inundation zones with GIS software. Inundation zones were determined through analysis of coastline and elevation data and exclude low-lying areas that are not contiguous with the coast.

Source: Compiled by Earth Policy Institute from Susmita Dasgupta et al., *The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis* (Washington, DC: World Bank, February 2007).

This is part of a supporting dataset for Lester R. Brown, **Full Planet, Empty Plates: The New Geopolitics of Food Scarcity** (New York: W.W. Norton & Company, 2012). For more information, see Earth Policy Institute on-line at www.earth-policy.org.

Effects of 10 Meter Rise in Sea Level on Populations and Land Area around the World

Region	Population and Land Area in Low Elevation Coastal Zone				Share of Population and Land Area in Low Elevation Coastal Zone			
	Total	Urban	Total Land	Urban Land	Share of	Share of Urban	Share of Land	Share of Urban
	Million People		Thousand Square Kilometers		Percent		Percent	
Africa	56	31	191	15	7	12	1	7
Asia	466	238	881	113	13	18	3	12
Europe	50	40	490	56	7	8	2	7
Latin America	29	23	397	33	6	7	2	7
Australia and New Zealand	3	3	131	6	13	13	2	13
North America	24	21	553	52	8	8	3	6
Small Island States	6	4	58	5	13	13	16	13
World	634	360	2,700	279	10	13	2	8

Note: "Low Elevation Coastal Zone" is defined as the "contiguous area along the coast that is less than 10 meters above sea level."

Source: Compiled by Earth Policy Institute from Gordon McGranahan, Deborah Balk, and Bridget Anderson, "The Rising Tide: Assessing the Risks of Climate Change

This is part of a supporting dataset for Lester R. Brown, **Full Planet, Empty Plates: The New Geopolitics of Food Scarcity** (New York: W.W. Norton & Company, 2012). For more information, see Earth Policy Institute on-line at www.earth-policy.org.