

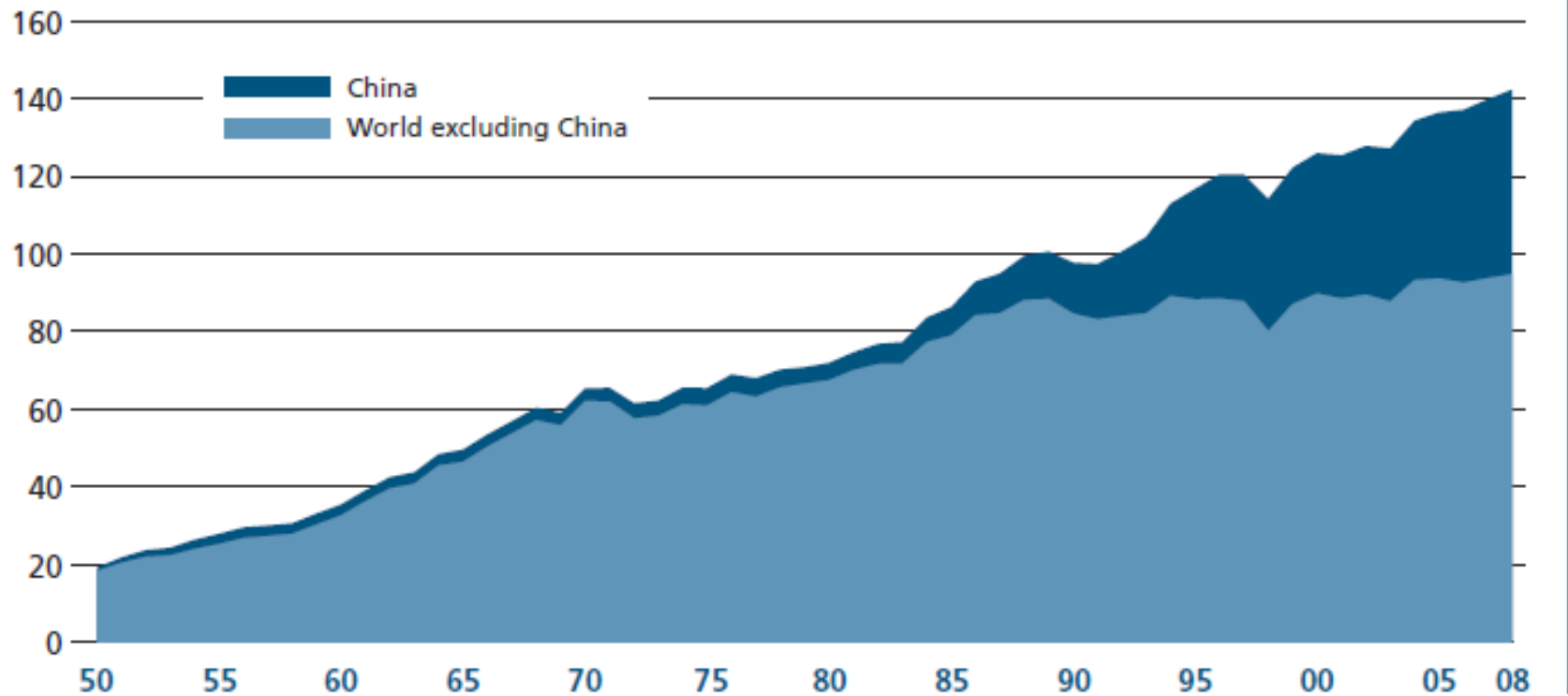
World fisheries and aquaculture production and utilization

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|-------------------------|--------------|--------------|--------------|--------------|--------------|
| | <i>(Million tonnes)</i> | | | | | |
| PRODUCTION | | | | | | |
| INLAND | | | | | | |
| Capture | 8.6 | 9.4 | 9.8 | 10.0 | 10.2 | 10.1 |
| Aquaculture | 25.2 | 26.8 | 28.7 | 30.7 | 32.9 | 35.0 |
| Total inland | 33.8 | 36.2 | 38.5 | 40.6 | 43.1 | 45.1 |
| MARINE | | | | | | |
| Capture | 83.8 | 82.7 | 80.0 | 79.9 | 79.5 | 79.9 |
| Aquaculture | 16.7 | 17.5 | 18.6 | 19.2 | 19.7 | 20.1 |
| Total marine | 100.5 | 100.1 | 98.6 | 99.2 | 99.2 | 100.0 |
| TOTAL CAPTURE | 92.4 | 92.1 | 89.7 | 89.9 | 89.7 | 90.0 |
| TOTAL AQUACULTURE | 41.9 | 44.3 | 47.4 | 49.9 | 52.5 | 55.1 |
| TOTAL WORLD FISHERIES | 134.3 | 136.4 | 137.1 | 139.8 | 142.3 | 145.1 |
| UTILIZATION | | | | | | |
| Human consumption | 104.4 | 107.3 | 110.7 | 112.7 | 115.1 | 117.8 |
| Non-food uses | 29.8 | 29.1 | 26.3 | 27.1 | 27.2 | 27.3 |
| Population (<i>billions</i>) | 6.4 | 6.5 | 6.6 | 6.7 | 6.8 | 6.8 |
| Per capita food fish supply (<i>kg</i>) | 16.2 | 16.5 | 16.8 | 16.9 | 17.1 | 17.2 |

Note: Excluding aquatic plants. Data for 2009 are provisional estimates.

World capture fisheries and aquaculture production

Million tonnes

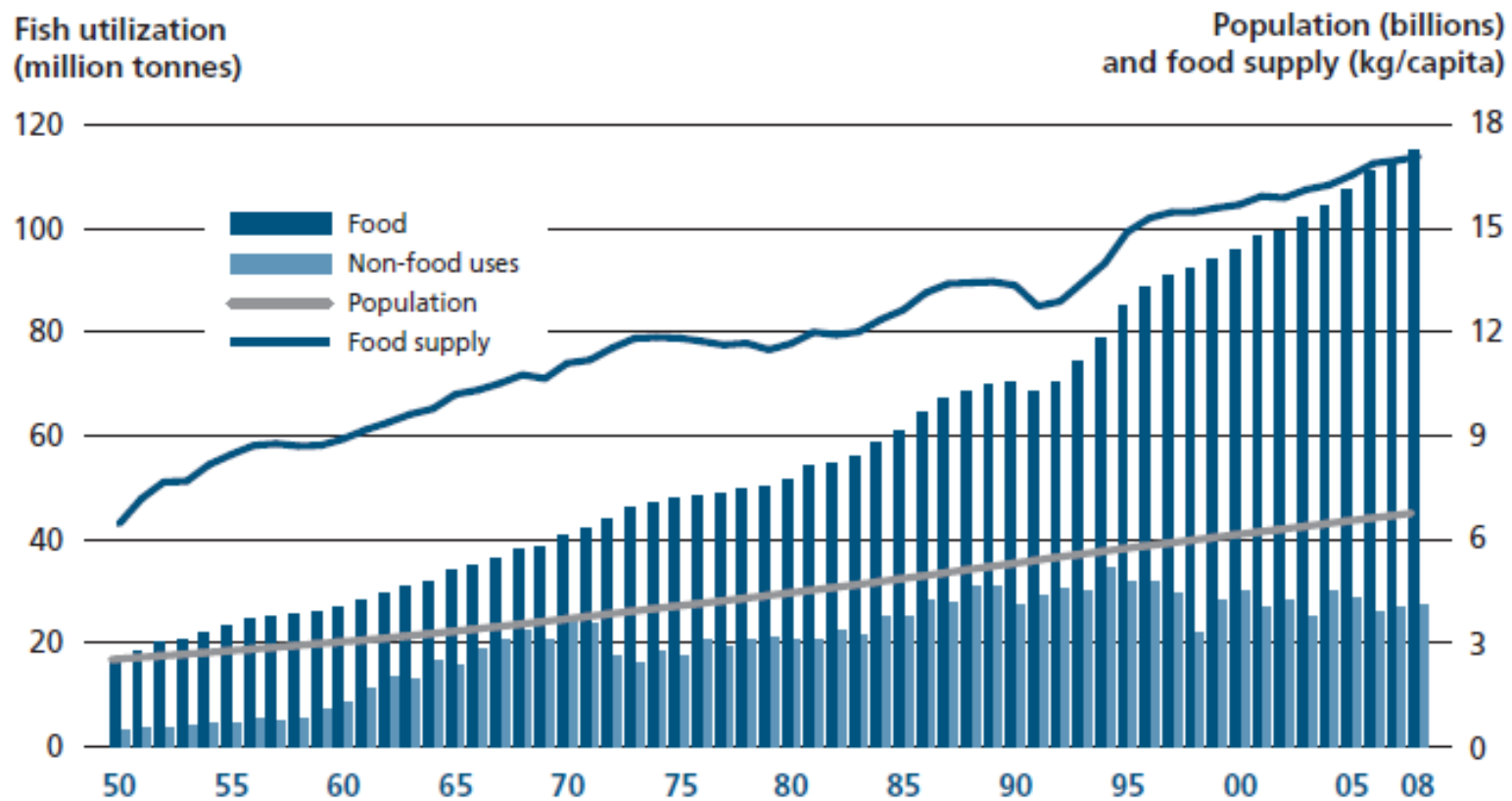


World fisheries and aquaculture production and utilization, excluding China

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|-------------------------|-------------|-------------|-------------|-------------|-------------|
| | <i>(Million tonnes)</i> | | | | | |
| PRODUCTION | | | | | | |
| INLAND | | | | | | |
| Capture | 6.5 | 7.2 | 7.6 | 7.7 | 8.0 | 7.9 |
| Aquaculture | 8.9 | 9.5 | 10.2 | 11.0 | 12.2 | 12.9 |
| Total inland | 15.4 | 16.7 | 17.7 | 18.7 | 20.1 | 20.8 |
| MARINE | | | | | | |
| Capture | 71.4 | 70.3 | 67.5 | 67.5 | 67.0 | 67.2 |
| Aquaculture | 6.5 | 6.7 | 7.3 | 7.5 | 7.6 | 8.1 |
| Total marine | 77.9 | 77.0 | 74.8 | 75.0 | 74.6 | 75.3 |
| TOTAL CAPTURE | 77.9 | 77.5 | 75.1 | 75.2 | 74.9 | 75.1 |
| TOTAL AQUACULTURE | 15.3 | 16.2 | 17.5 | 18.5 | 19.8 | 21.0 |
| TOTAL FISHERIES PRODUCTION | 93.2 | 93.7 | 92.6 | 93.7 | 94.8 | 96.1 |
| UTILIZATION | | | | | | |
| Human consumption | 68.8 | 70.4 | 72.4 | 73.5 | 74.3 | 75.5 |
| Non-food uses | 24.5 | 23.2 | 20.2 | 20.2 | 20.5 | 20.5 |
| Population (<i>billions</i>) | 5.2 | 5.2 | 5.3 | 5.4 | 5.4 | 5.5 |
| Per capita food fish supply (<i>kg</i>) | 13.4 | 13.5 | 13.7 | 13.7 | 13.7 | 13.7 |

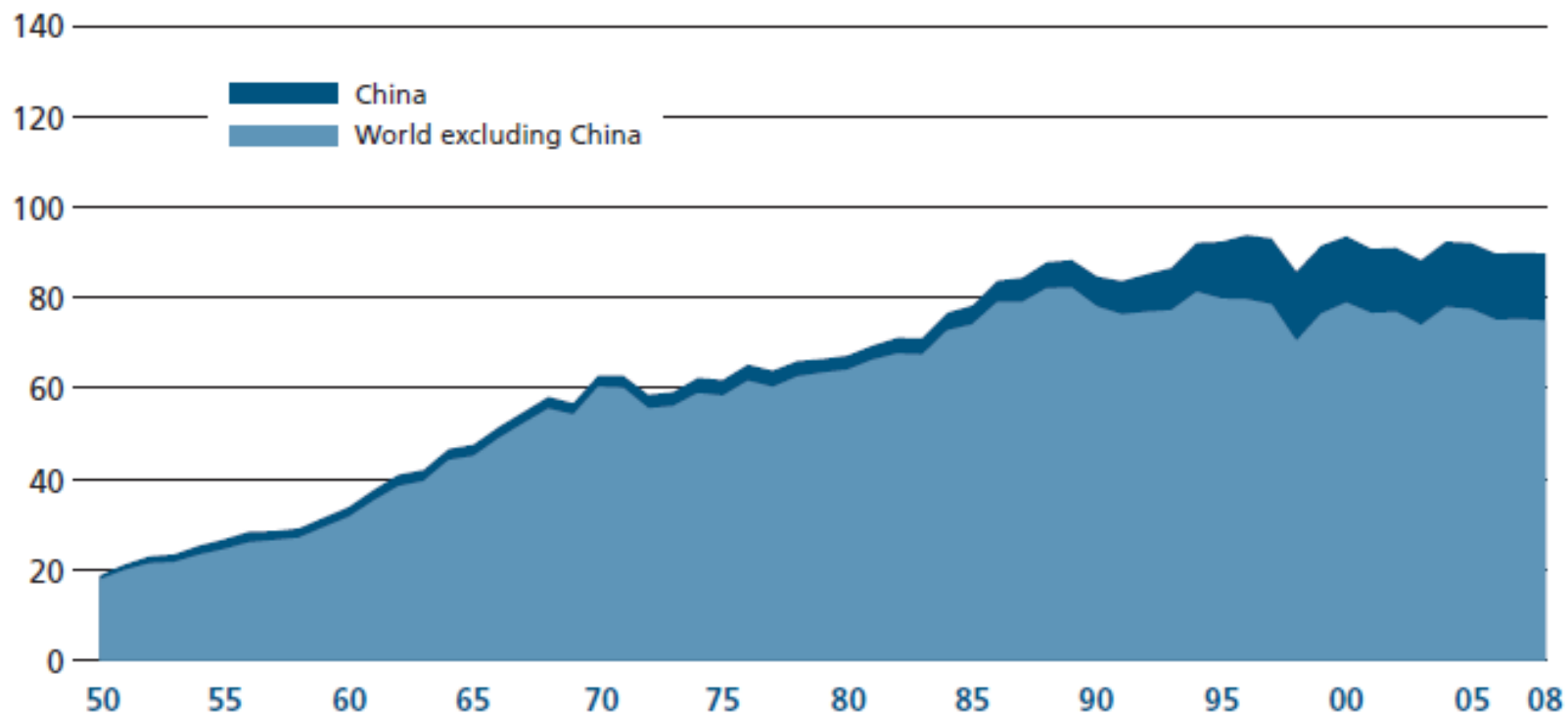
Note: Excluding aquatic plants. Data for 2009 are provisional estimates.

World fish utilization and supply

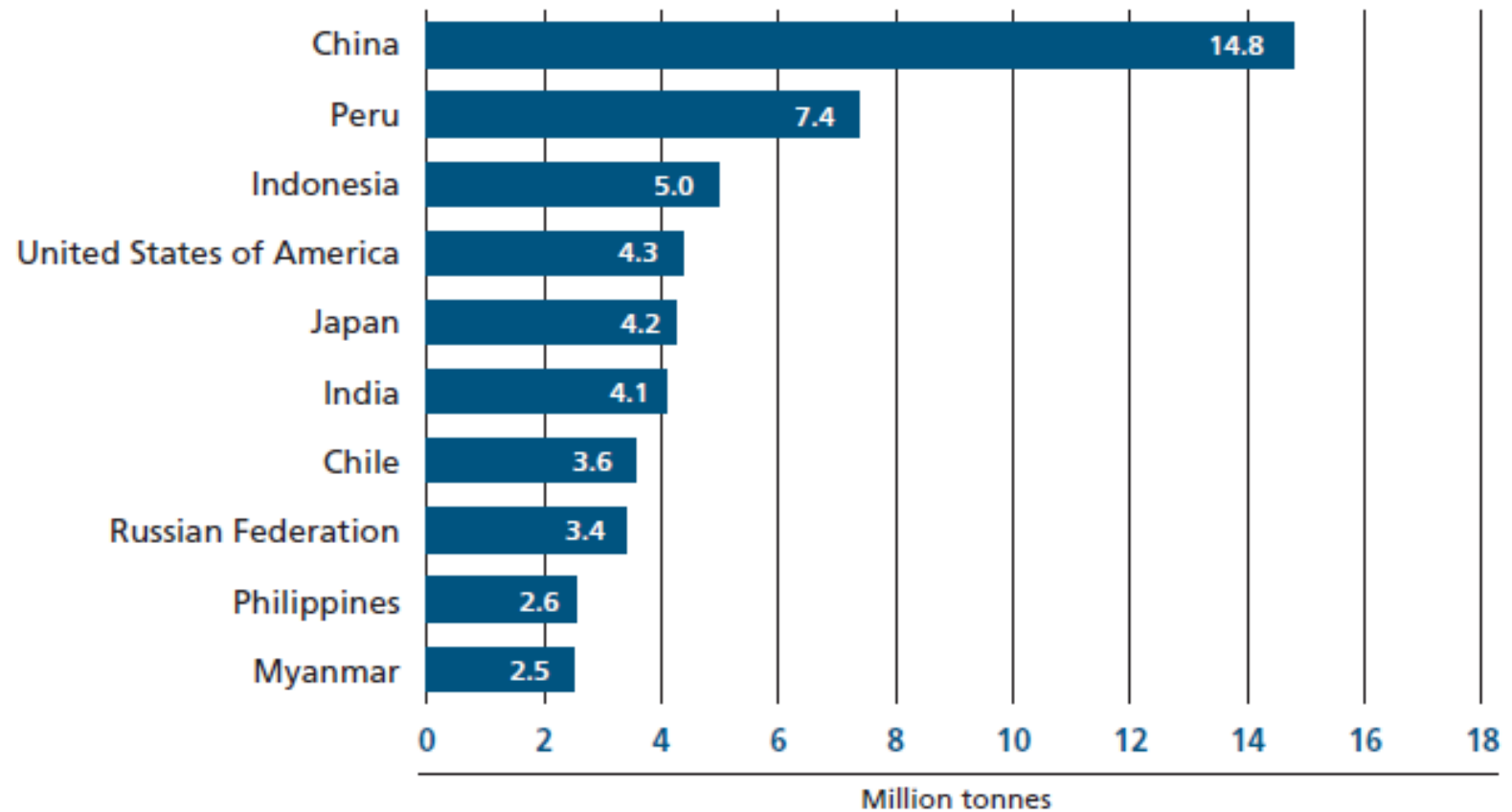


World capture fisheries production

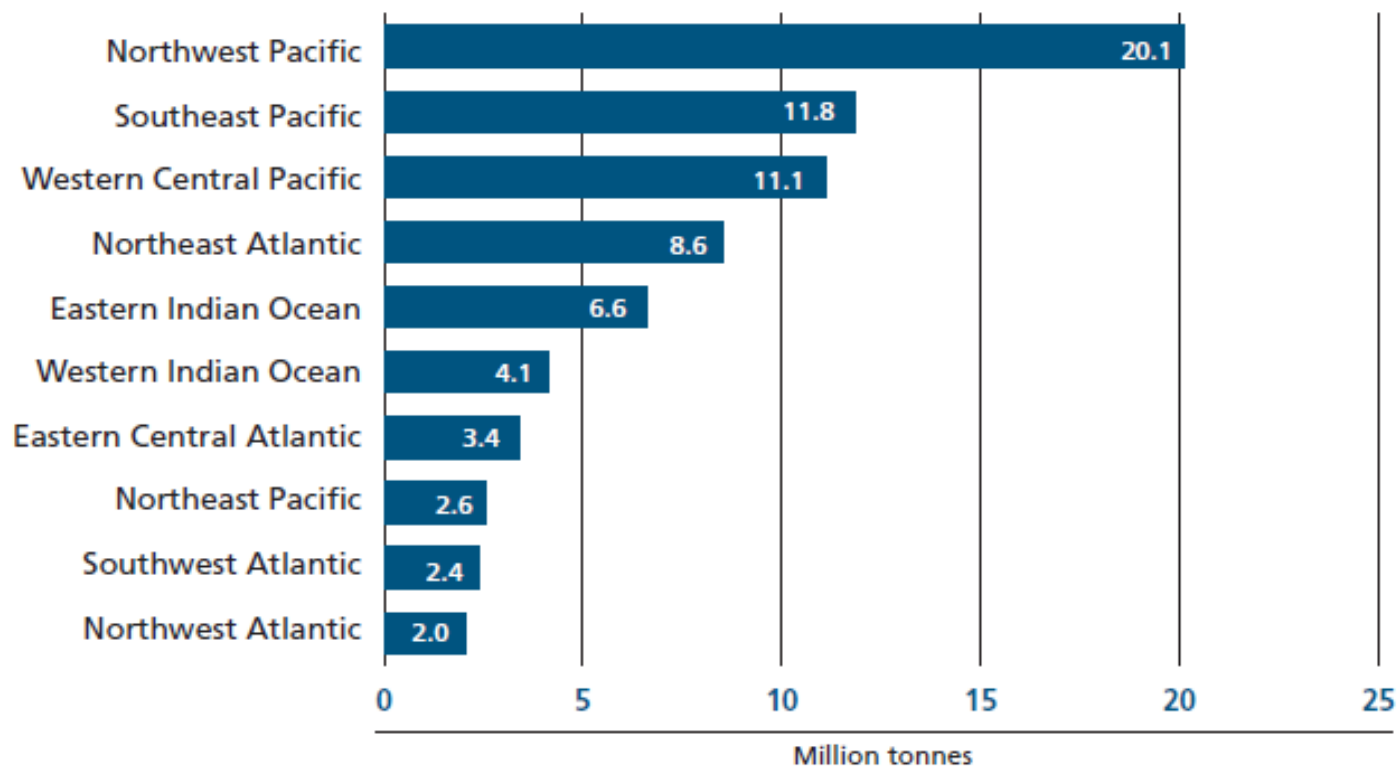
Million tonnes



Marine and inland capture fisheries: top ten producer countries in 2008

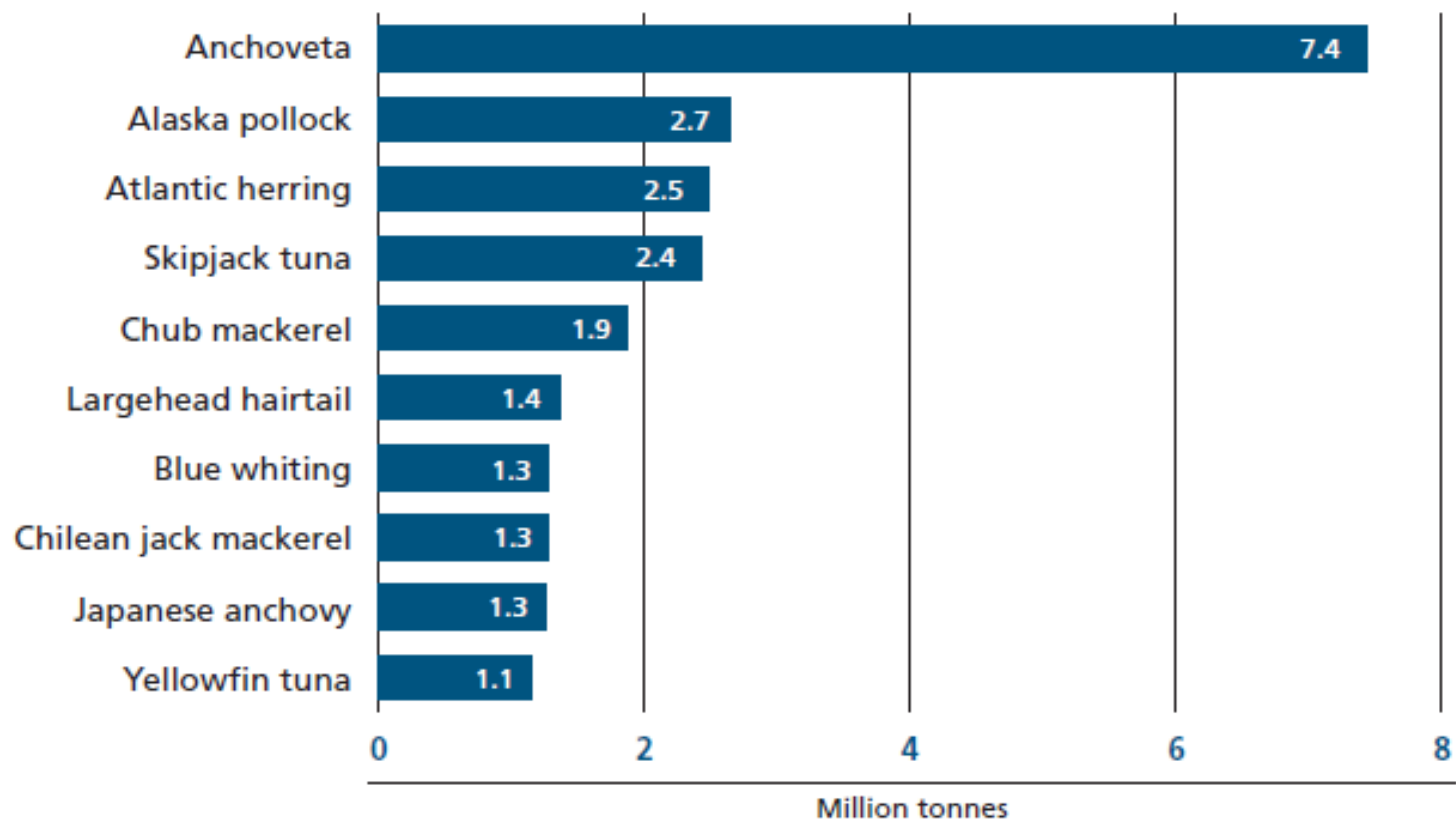


Capture fisheries production: principal marine fishing areas in 2008



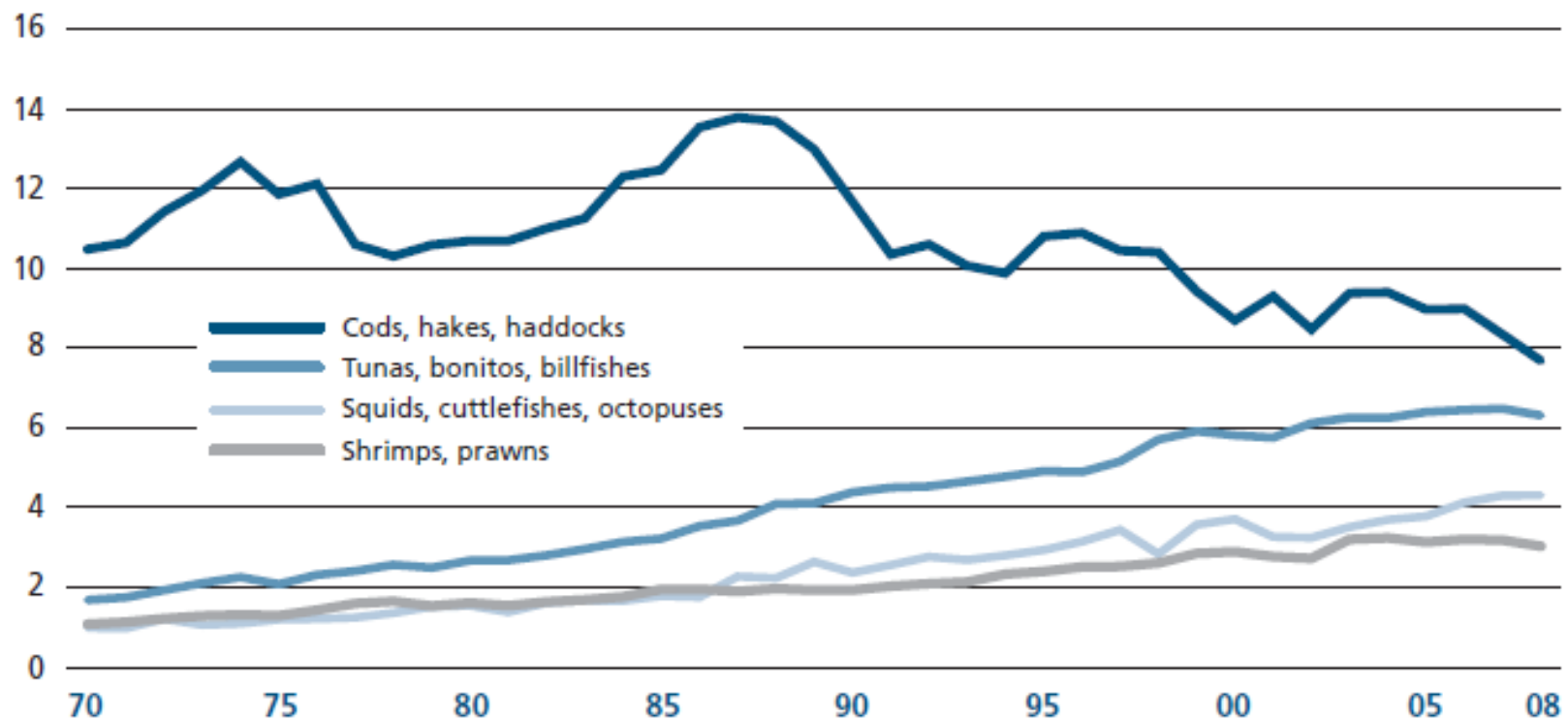
Note: Fishing areas listed are those with a production of at least 2 million tonnes.

Marine capture fisheries production: top ten species in 2008



Catch trends by valuable marine species groups

Million tonnes

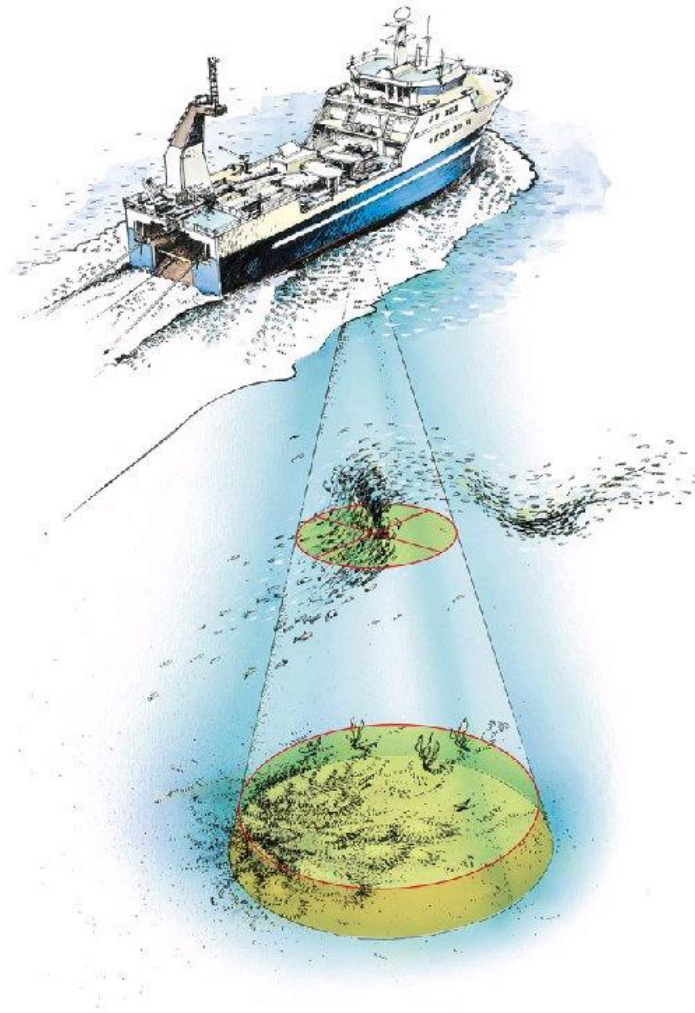


Top 15 aquaculture producers by quantity in 2008 and growth

| | Production | | | Average annual rate of growth | | |
|--------------------------|--------------------------|--------|--------|-------------------------------|-----------|-----------|
| | 1990 | 2000 | 2008 | 1990–2000 | 2000–2008 | 1990–2008 |
| | <i>(Thousand tonnes)</i> | | | <i>(Percentage)</i> | | |
| China | 6 482 | 21 522 | 32 736 | 12.7 | 5.4 | 9.4 |
| India | 1 017 | 1 943 | 3 479 | 6.7 | 7.6 | 7.1 |
| Viet Nam | 160 | 499 | 2 462 | 12.0 | 22.1 | 16.4 |
| Indonesia | 500 | 789 | 1 690 | 4.7 | 10.0 | 7.0 |
| Thailand | 292 | 738 | 1 374 | 9.7 | 8.1 | 9.0 |
| Bangladesh | 193 | 657 | 1 006 | 13.1 | 5.5 | 9.6 |
| Norway | 151 | 491 | 844 | 12.6 | 7.0 | 10.0 |
| Chile | 32 | 392 | 843 | 28.3 | 10.1 | 19.8 |
| Philippines | 380 | 394 | 741 | 0.4 | 8.2 | 3.8 |
| Japan | 804 | 763 | 732 | -0.5 | -0.5 | -0.5 |
| Egypt | 62 | 340 | 694 | 18.6 | 9.3 | 14.4 |
| Myanmar | 7 | 99 | 675 | 30.2 | 27.1 | 28.8 |
| United States of America | 315 | 456 | 500 | 3.8 | 1.2 | 2.6 |
| Republic of Korea | 377 | 293 | 474 | -2.5 | 6.2 | 1.3 |
| Taiwan Province of China | 333 | 244 | 324 | -3.1 | 3.6 | -0.2 |

Note: Data exclude aquatic plants.

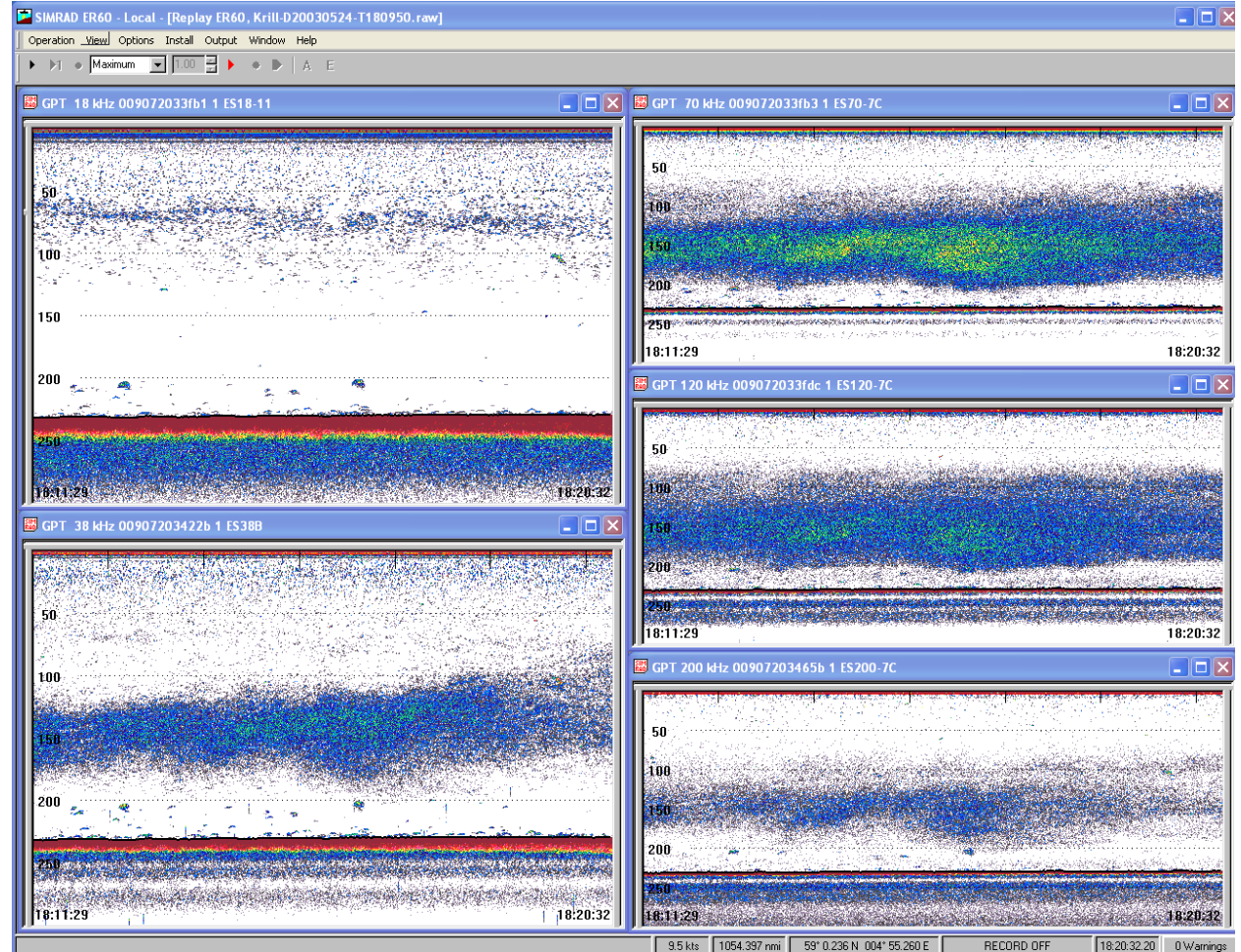
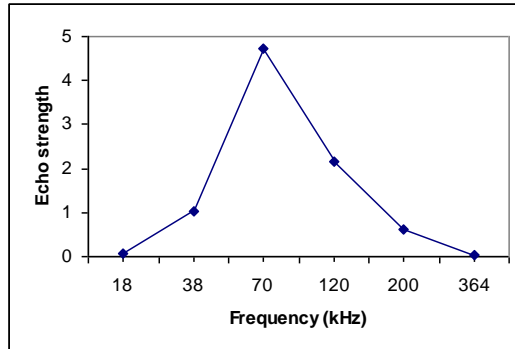
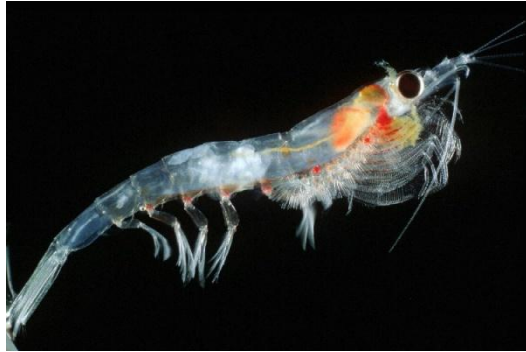
Classical echosounding



Drop-keel with transducers



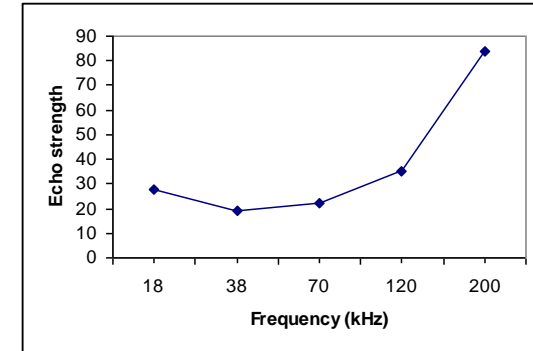
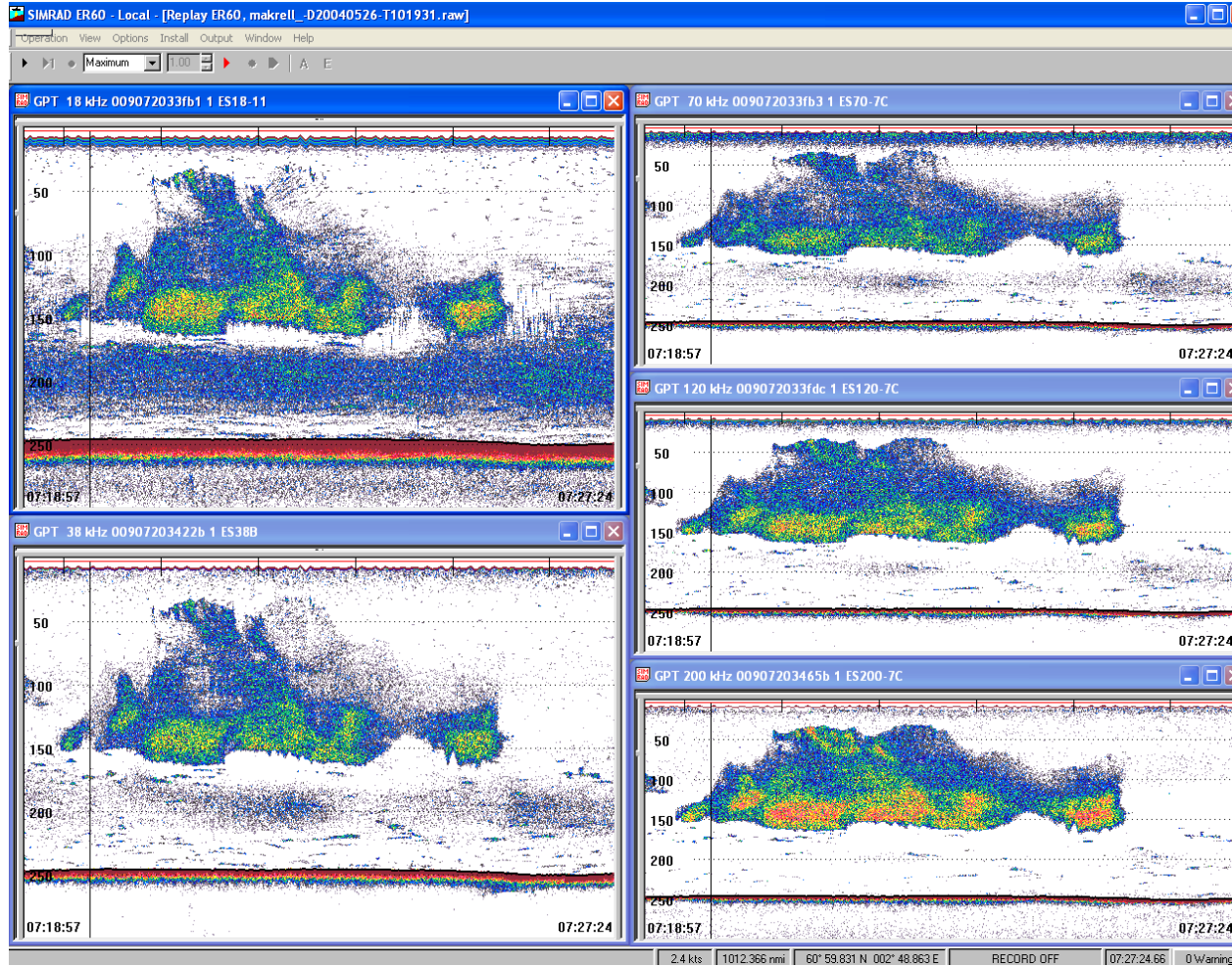
Krill (*Meganyctiphanes norvegica*)



Euphausiid – fluid like

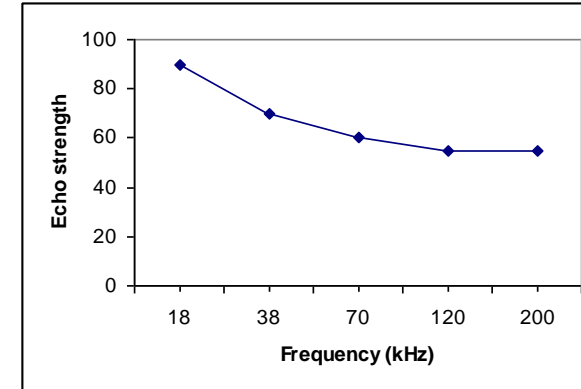
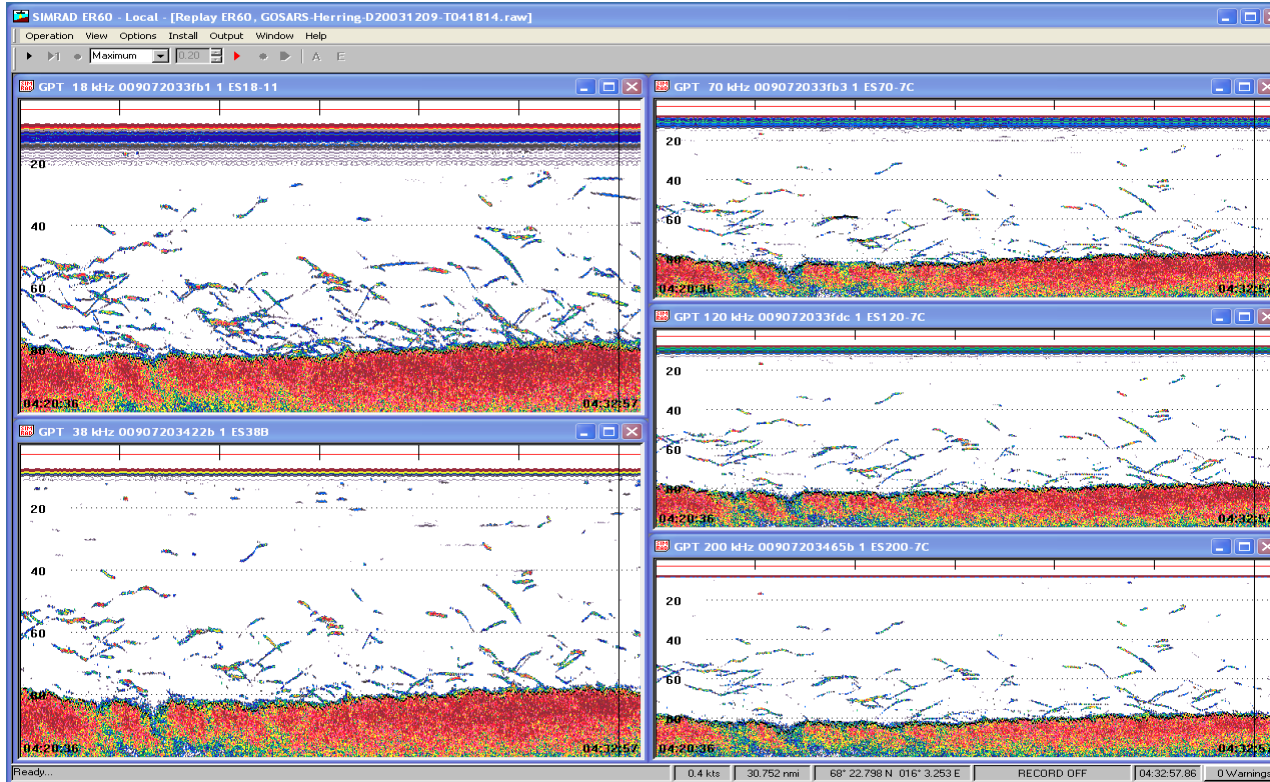
IMR, with permission

Mackerel MF-response



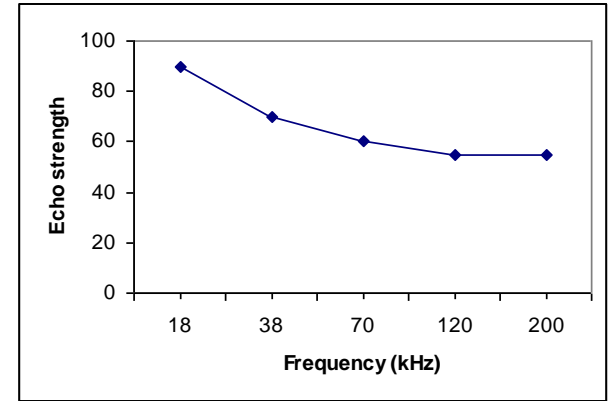
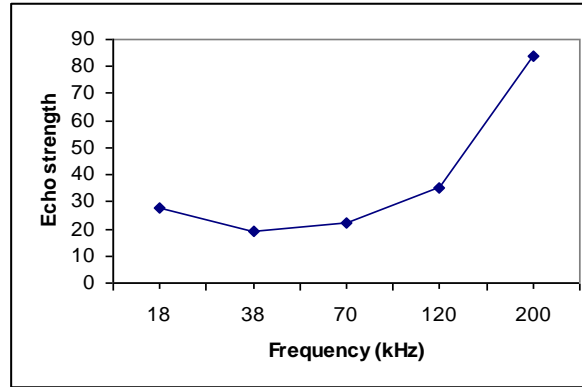
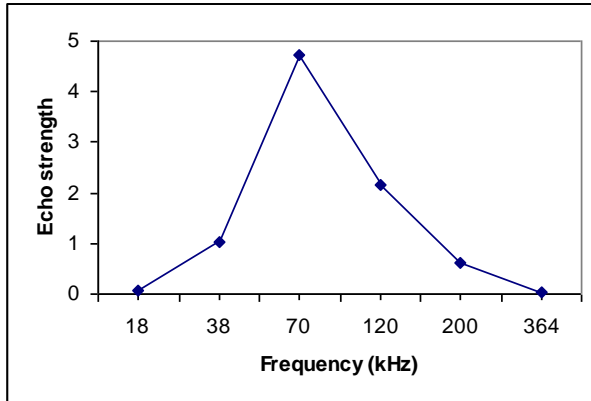
IMR, with permission

Herring MF-response



IMR, with permission

Acoustic signatures



Krill



Mackerel



Herring

- Increased resolution at longer range
 - Higher bandwidth -> Higher resolution
 - Longer pulse duration -> Longer range
- Increased frequency response information

New improved echo sounder!

Krill example

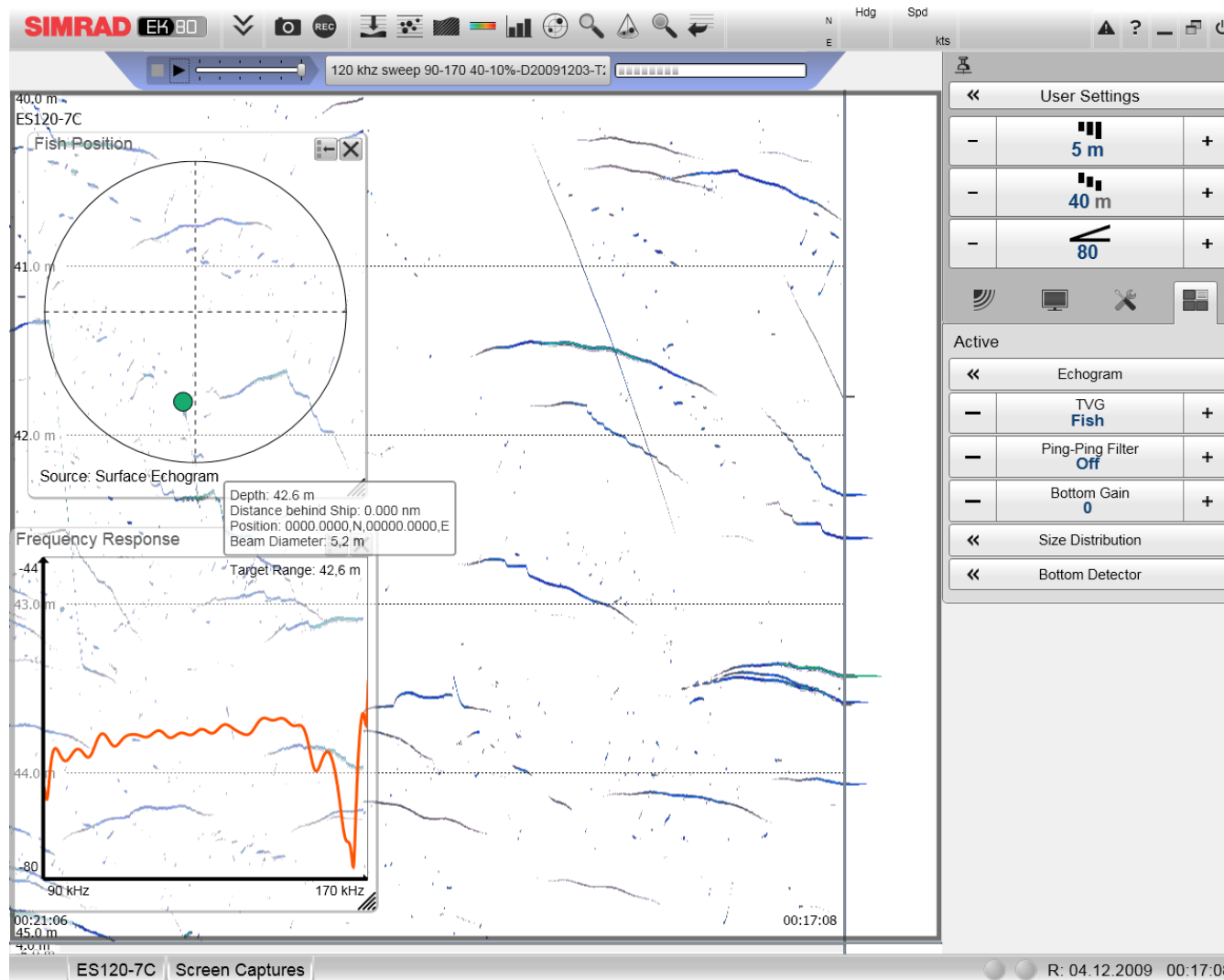


Figure 1 United Nations World Population Projections, 1950 - 2050

Source: World Population Prospects

