SUPPLEMENTARY.

Primary production

Spectral irradiance at the ocean surface was estimated with the model of Gregg & Carder (1990) combined with a correction for cloud cover, and the spectral light field was subsequently propagated into the water column with an ocean bio-optical model. PP at each depth was calculated as a function of the concentration of chlorophyll-a and light through light-photosynthesis relationships, based on parameters that vary with biogeographic province and season (Longhurst, 1998). Finally, PP was integrated over day length and depth, down to the 0.1% depth isolume.

References

Gregg, W., & Carder, K. (1990). A simple solar irradiance model for cloudless maritime atmospheres. *Limnol. Oceanogr.*, *35*, 1657-1675.

Longhurst, A. (1998). *Ecological geography of the sea*. Academic Press, San Diego, USA.

Figure S1: Large Marine Ecosystems of the world. 1. East Bering Sea 2. Gulf of Alaska 3. California Current 4. Gulf of California 5. Gulf of Mexico 6. Southeast U.S. Continental Shelf 7. Northeast U.S. Continental Shelf 8. Scotian Shelf 9. Newfoundland-Labrador Shelf 10. Insular Pacific-Hawaiian 11. Pacific Central-American Coastal 12. Caribbean Sea 13. Humboldt Current 14. Patagonian Shelf 15. South Brazil Shelf 16. East Brazil Shelf 17. North Brazil Shelf 18. West Greenland Shelf 19. East Greenland Shelf 20. Barents Sea 21. Norwegian Shelf 22. North Sea 23. Baltic Sea 24. Celtic-Biscay Shelf 25. Iberian Coastal 26. Mediterranean Sea 27. Canary Current 28. Guinea Current 29. Benguela Current 30. Agulhas Current 31. Somali Coastal Current 32. Arabian Sea 33. Red Sea 34. Bay of Bengal 35. Gulf of Thailand 36. South China Sea 37. Sulu-Celebes Sea 38. Indonesian Sea 39. North Australian Shelf 40. Northeast Australian Shelf 41. East-Central Australian Shelf 42. Southeast Australian Shelf 43. Southwest Australian Shelf 44. West-Central Australian Shelf 45. Northwest Australian Shelf 46. New Zealand Shelf 47. East China Sea 48. Yellow Sea 49. Kuroshio Current 50. Sea of Japan 51. Oyashio Current 52. Sea of Okhotsk 53. West Bering Sea 54. Chukchi Sea 55. Beaufort Sea 56. East Siberian Sea 57. Laptev Sea 58. Kara Sea 59. Iceland Shelf 60. Faroe Plateau 61. Antarctica 62. Black Sea 63. Hudson Bay 64. Arctic Ocean

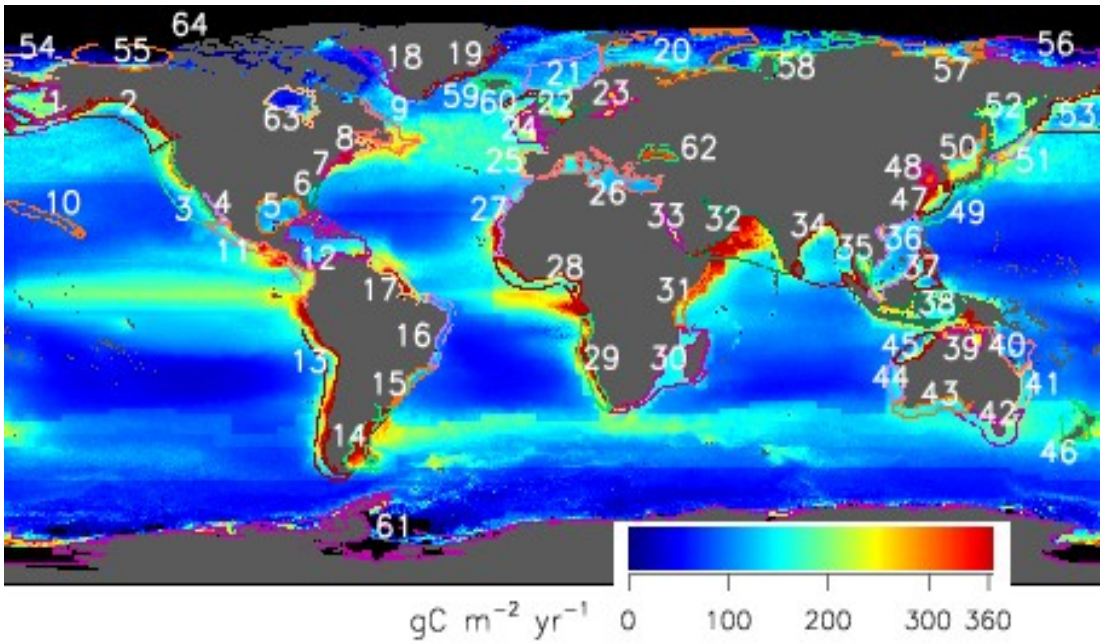

Figure S2: Mean annual catch in each Large Marine Ecosystems (LME) as a function of global marine primary production (PP) over 5-year block periods. Solid dashed lines indicate quantile τ = 10%, 50%, and 90%

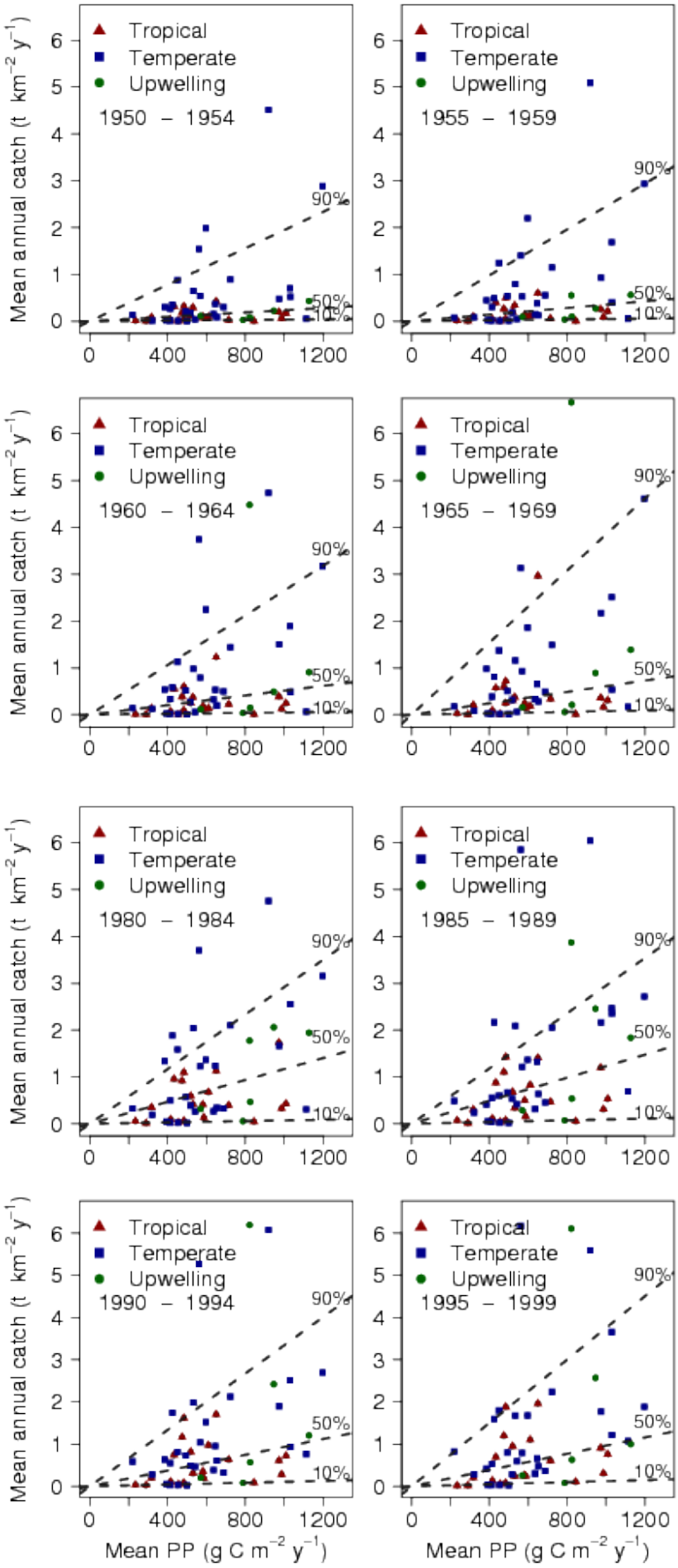

Figure S3: Relationship between the mean annual catch in each Large Marine Ecosystem (LME) during 1950-2004 and the mean annual catch in each LME during 2000-2004. *r* is the Pearson's correlation coefficient for the different relationship.

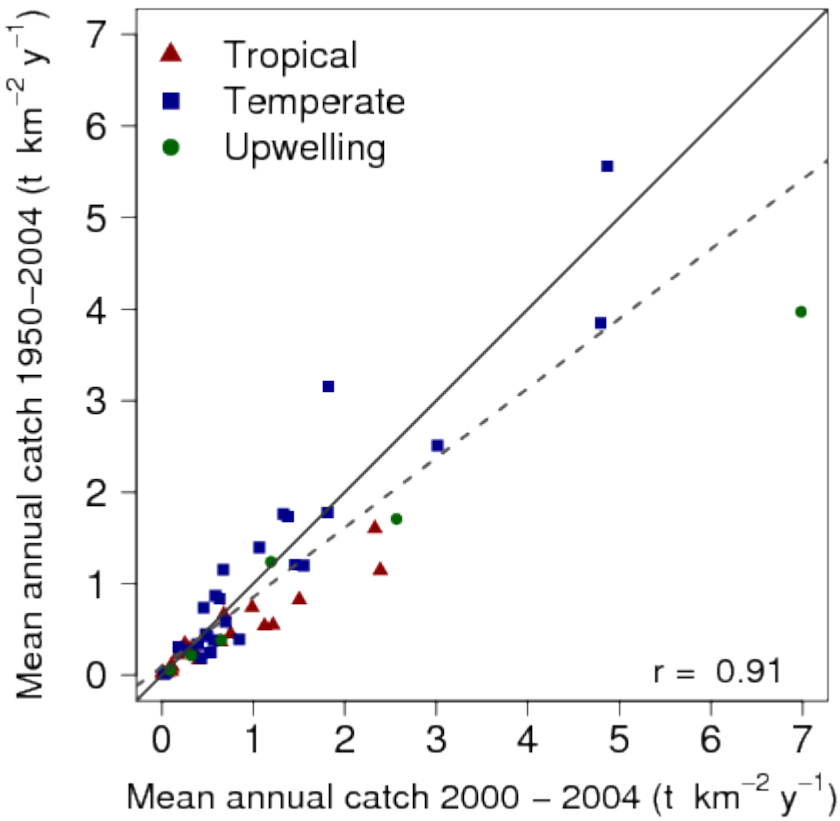

Figure S4: Relationship between the mean annual catch in the each Large Marine Ecosystems (LME) over 5-year block periods and the mean annual catch during 2000-2004. *r* is the Pearson's correlation coefficient for the different relationship.

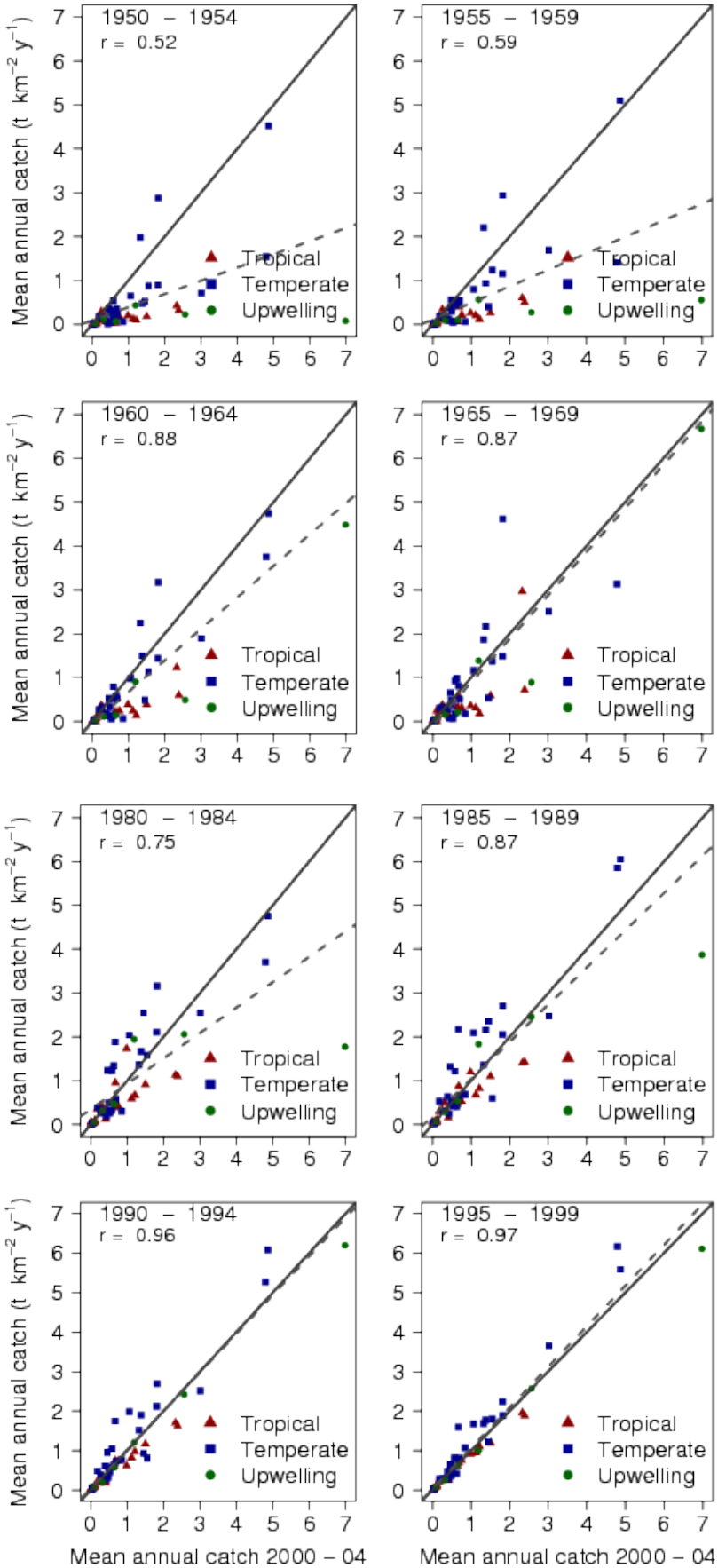

Figure S5: Mean annual primary production required (PPR) to sustain catches in each Large Marine Ecosystems (LME) as a function of global marine primary production (PP) over 5-year block periods. Solid dashed lines indicate quantile regressions models with quantile τ = 10%, 50%, and 90%