

References

REFERENCES

- Al-Hashmi, K., Claereboudt, A., Michel, R., Al-Azri, A., Piontovski, R. and Sergey, A. 2010. Seasonal changes of chlorophyll a and environmental characteristics in the Sea of Oman, *The Open Oceanography Journal*, 4, pp. 107-114.
- Antoine, D., Andre, J. M. and Morel, A. 1996. Oceanic primary production: Estimation at global scale from satellite (coastal zone color scanner) chlorophyll. *Global Biogeochemical Cycles*, 10, pp. 57-69.
- Ardizzone, J., Atlas, R. and Hoffman, R.N. 2009. New Multiplatform Ocean Surface Wind Product Available. *Eos, Transactions American Geophysical Union*, 90 (27), pp. 231, doi:doi:10.1029/2009EO270003.
- Atlas, R., Ardizzone, J. and Hoffman, R.N. 2008. Application of satellite surface wind data to ocean wind analysis. *Proceedings of the SPIE*, pp. 70870B.
- Atlas, R., Hoffman, R.N., Ardizzone, J., Leidner, S.M., Jusem, J.C., Smith, D.K. and Gombos, D. 2011. A cross-calibrated, multiplatform ocean surface wind velocity product for meteorological and oceanographic applications. *Bulletin of the American Meteorological Society* 92(2), pp. 157–174.
- Baars, M., Schalk, P. and Veldhuis, M. 1998. Seasonal fluctuations in plankton biomass and productivity in the ecosystems of the Somali Current, Gulf of Aden and Southern Red Sea, in: Sherman, K., Okemwa, E. and Ntiba, M. (eds), *Large Marine Ecosystems of the Indian Ocean: Assessment, Sustainability and Management*. Blackwell Science, Cambridge, U.S. pp. 143-174.
- Babanin, A. V., Ganopolski, A. and Phillips, W. R. 2009. Wave-induced upper-ocean mixing in a climate model of intermediate complexity, *Ocean Model*, 29 (3), pp. 189–197.
- Babu, C. A., Philip, A. S. and Hareeshkumar, P.V. 2007. Characteristics of SST over the Arabian Sea and Bay of Bengal, *International Journal of Oceans and Oceanography*, 2(1) pp. 17–23.
- Bakun, A., Roy, C. and Luch-Cota, S. 1998. Coastal Upwelling and other processes regulating ecosystem productivity and fish production in the Western Indian Ocean, in:

Sherman, K. Okemwa, E. and Ntiba, M.(eds), Large Marine Ecosystems of the Indian Ocean: Assessment, Sustainability and Management. Blackwell Science, Cambridge, U.S. pp. 103-142.

Banase, K. 1987. Seasonality of phytoplankton chlorophyll in the central and northern Arabian Sea, *Deep Sea Res.*, 34, pp. 713–723.

Banase, K., Sumitra, V. and Madhupratap, M. 1996. On the possible causes of the seasonal phytoplankton blooms along the south-west coast of India. *Indian Journal of Marine Science*, 25, pp. 283-289.

Barnett, T. P., Pierce, D. W., Achutarao, K. M., Gleckler, P. J., Santer, B. D., Gregory, J. M. and Washington, W. M. 2005. Penetration of human-induced warming into the world's oceans, *Science*, 309, pp. 284–287.

Behrenfeld, M. J., O'Malley, R. T., Siegel, D. A., McClain, C. R., Sarmiento, J. L., Feldman, G. C., Milligan, A. J., Falkowski, P. G., Letelier, R. M. and Boss, E. S. 2006. Climate-driven trends in contemporary ocean productivity, *Nature*, 444 (7120), pp. 752–755.

Belkin, I. M. 2009. Rapid warming of Large Marine Ecosystems, *Progress in Oceanography*, 81, pp. 207–213.

Bhattathiri, A., Pant, A., Sawant, S., Gauns, M., Matondkar, P. and Mohanraju, R. 1996. Phytoplankton production and chlorophyll distribution in the eastern and central Arabian Sea in 1994-95, *Current Science*, 71, pp. 857-862.

Bindoff, N.L., Willebrand, J., Artale, V., Cazenave, A., Gregory, J., Gulev, S., Hanawa, K., LeQuere, C., Levitus, S., Nojiri, Y., Shum, C.K., Talley, L.D. and Unnikrishnan, A.S. 2007. The physical science basis. Contribution of Working Group first to the fourth assessment report of the intergovernmental panel on climate change. eds. by: Solomon, S.; Qin, D.; Manning, M.; Marquis, M.; Averyt, K.; Tignor, M.M.B.; Miller, H.L.; Chen, Z. Cambridge University Press; Cambridge; UK, pp. 385-432.

Web: Blueprint for the Future We Want, 2017, UNESCO. <http://www.unesco.org/new/en/natural-sciences/ioc-oceans/focus-areas/rio-20-ocean/blueprint-for-the-future-we-want/marine-biodiversity/facts-and-figures-on-marine-biodiversity>.

- Boris, W., Edward, B. B., Nicola, B., Emmett Duffy, J., Carl, F., Benjamin S. H., Jeremy, B., Jackson, C., Heike, K. L., Fiorenza, M., Stephen, R. P., Enric, S., Kimberley, A. S., John J. S. and Watson, R. 2007. Impacts of Biodiversity Loss on Ocean Ecosystem Services, *Science*, 314 (5800), pp. 787-790.
- Boyce, D. G., Lewis, M. R. and Worm, B. 2010. Global phytoplankton decline over the past century, *Nature*, 466, 7306, pp. 591-596.
- Brander, K. 2010. Impacts of climate change on fisheries, *Journal of Marine Systems*, 79, pp. 89–402.
- Brandt, P., Dengler, M., Rubino, A., Quadfasse, D. and Schott, F. 2003. Intraseasonal variability in the southwestern Arabian Sea and its relation to the seasonal circulation. *Deep-Sea Research II*, 50, pp. 2129–2141.
- Bricaud, A., Babin, M., Morel, A. and Claustre, H. 1995. Variability in the chlorophyll-specific absorption coefficients of natural phytoplankton: Analysis and parameterization, *Journal of Geophysics Research*, 100(C7), 13, pp. 321-332.
- Brink, K., Arnone, R., Coble, P., Flagg, C., Jones, B., Kindle, J., Lee, C., Phinney, D., Wood, M., Yentsch, C. and Young, D. 1998. Monsoons boost biological productivity in Arabian Sea. *EOS* 79, pp. 165-169.
- Brock, J. C., Mc Clain, C. R., Luther, M. E. and Hay, W.W. 1991. The phytoplankton bloom in the northwestern Arabian Sea during the southwest monsoon of 1979, *Journal of Geophysical Research*, 96 (642), pp. 623-630.
- Brock, J. C. and McClain, C. R. 1992. Interannual variability in phytoplankton blooms observed in the northwestern Arabian Sea during the southwest monsoon, *Journal of Geophysical Research*, 97, pp. 733–750.
- Broecker, W. S. 1982. Ocean chemistry during glacial time; *Geochemist. Cosmo chin Acts*, 46, pp. 1689.
- Brown, S., Nicholls, R., Woodroffe, C., Hanson, S., Hinkel, J. and Kebede, A. S. 2013. Sea-Level Rise Impacts and Responses: A Global Perspective. *Coastal Hazards*. Netherlands: Springer, pp. 117–149.

- Burkill, P.H. 1999. ARABESQUE: UK JGOFS process studies in the Arabian Sea. *Deep Sea Research II*, 46, pp. 529–863.
- Caron, D. A. and Dennett, M. R. 1999. Phytoplankton growth and mortality during the 1995 northeast monsoon and spring intermonsoon in the arabian sea. *Deep Sea Research II*, 46, pp. 1665–1690.
- Chao, S. Y., Kao, T. W. and Al-Hajri, K. R. 1992. A numerical investigation of circulation in the Arabian Gulf. *Journal of Geophysical Research*, 7, pp. 11219-11236.
- Chaturvedi, N. and Narain, A. 2003. Chlorophyll distribution pattern in the Arabian Sea: seasonal and regional variability as observed from SeaWiFS data. *International Journal of Remote Sensing*, 24, pp. 511- 518.
- Chaturvedi, N., Shah, M., Ajai and Jasrai, Y. 2013. Is there impact of climate change on biological productivity in the Indian Ocean, *Indian Journal of Geo Marine Science*, 42 (1), pp. 50-57.
- Chauhan, P., Mohan, M., Sarangi, R. K., Kumari, B., Nayak, S. and Matondkar, S. G. P. 2002. Surface chlorophyll estimation in the Arabian Sea using IRS-P4 OCM Ocean Color Monitor (OCM) satellite data, *International Journal of Remote Sensing*, 23(8), pp. 1663–1676.
- Chavez, F. P., Ryan, J., Lluch-Cota, S. E. and Niquen, C. M. (2003) From anchovies to sardines and back: Multidecadal change in the Pacific Ocean, *Science*, 299, pp. 217 – 221.
- Chavez, F. P., Pennington, J. T., Castro, C. G., Ryan, J. P., Michisaki, R. P., Schlining, B., Walz, P., Buck, K. R., McFadyen, A. and Collins, C. A. 2002. Biological and chemical consequences of the 1997 – 1998 El Nino in central California waters, *Progress in Oceanography*, 54, pp. 205 – 232.
- Chisholm, H. 1911. Arabian Sea. *Encyclopedia* (11th ed.) Cambridge University Press.
- Chisholm, S. W. and Morel, F. M. M. 1991. What controls phytoplankton production in nutrient-rich areas of the open sea?, *Limnology of Oceanography*, 36, pp. 1507–1970.
- Church, J.A. 2001. How fast are sea levels rising?, *Science*, 294, pp. 802–803.

- Codispoti, L.A, 1991. Primary Productivity and Carbon and Nitrogen cycling in the Arabian Sea, US-JGOFS: Arabian Sea Process Study, U.S. Joint Global Ocean Flux Study, Woods Hole Oceanographic Institutions, Woods Hole U.S. Planning Report, 13.
- Colborn, J.G. 1975. Thermal Structure of the Indian Ocean, IIOE Monograph 2, An East west Press.
- Coles, S. L. 2003. Coral species diversity and environmental factors in the Arabian Gulf and the Gulf of Oman: a comparison to the Indo-Pacific Region. *Atoll Research Bulletin*. 507, pp. 1–19, doi.org/10.5479/si.00775630.507.1
- Cushing D. H. 1990. Plankton production and year-class strength in fish populations: an update of the match/mismatch hypothesis, *Advances in Marine Biology*, 26, pp. 249–293.
- Denman, K. 1973. A time-dependent model of the upper ocean, *Journal of Physical Oceanography*, 3, pp. 173–184.
- Desai, B.N. and Bhargava, R.M.S. 1998. Biologic production and fishery potential of the Exclusive Economic Zone of India, *Large Marine Ecosystems of the Indian Ocean: Assessment, Sustainability and Management*. Blackwell Science, Cambridge, U.S., pp. 297-309.
- Devi, G. K., Ganasri, B. P. and Dwarakish, G. S. 2015. Applications of Remote Sensing in Satellite Oceanography: A Review; *Aquatic Procedia*, 4, pp. 579 – 584.
- Diaz, R.J. and Rosenberg, R. 2008. Spreading dead zones and consequences for marine ecosystems. *Science*, 321, pp. 926–929.
- Dickey, T., Marra, J., Sigurdson, D.E., Weller, R.A., Kinkade, C. S., Zedler, S.E., Wiggert, J.D. and Langdon, C. 1998. Seasonal variability of bio-optical and physical properties in the western Arabian Sea: October 1994–October 1995. *Deep Sea Research II*, 45(10–11), pp. 2001-2005.
- Dickson, A. G., Sabine, C. L. and Christian, J. R. 2007. Guide to best practices for ocean CO₂ measurements, PICES Special Publication 3, IOCCP Report No. 8, North Pacific Marine Science Organization, Sidney, BC, Canada, pp.191.

- Dickson, M. L., Orchardo, J., Barber, R.T., Marra, J., McCarthy, J.J. and Sambrotto, R.N. 2001. Production and respiration rates in the Arabian Sea during the 1995 Northeast and Southwest Monsoons. *Deep-Sea Research II*, 48, pp. 1199–1230.
- Dixit, A. M., Kumar, P., Kumar, L., Pathak, K. D. and Patel, M. I. 2010. Economic Valuation of Coral Reef Systems in Gulf of Kachchh, Final Report. World Bank aided Integrated Coastal Zone Management (ICZM) Project. Gujarat Ecology Commission, pp. 158.
- Donelan, M. A., Drennan, W. M. and Katsaros, K. B. 1997. The Air–Sea Momentum Flux in Conditions of Wind Sea and Swell, *Journal of physical Oceanography*, 27, pp. 2087-2099.
- Doney, S. C. 2006. The dangers of ocean acidification. *Scientific American*, 294(3), pp. 58-65.
- Doney, S.C. 2006. Plankton in a warmer world. *Nature*, 447, pp. 695–696.
- Dwivedi, R. M., Raman, M., Babu, K. N., Singh, S. K., Vyas, N. K. and Matondkar, S. G. P. 2008. Formation of algal bloom in the northern Arabian Sea deep waters during January–March: a study using pooled In situ and satellite data, *International Journal of Remote Sensing*, 29, pp. 4537-4551.
- Dwivedi, R. M., Raman, M., Matondkar, S. G. P. and Nayak, S. 2006. Influence of northeasterly trade winds on intensity of winter bloom in the Northern Arabian Sea, *Current Science*, 90 (10), pp. 1397-1406.
- Dwivedi, R.M.; Chauhan, R.; Solanki, H.U.; Raman, M.; Matondkar, S.G.P.; Madhu, V.R.; Meenakumari, B., 2012. Study of ecological consequence of the bloom (*Noctiluca miliaris*) in off shore waters of the Northern Arabian Sea. *Indian Journal of Geo-Marine Sciences*, vol.41(4), 304-313 URI: <http://drs.nio.org/drs/handle/2264/4180>
- Dwivedi, S. N. and Choubey, A. K. 1998. Indian Ocean Large Marine Ecosystems: Need for national and regional framework for conservation and sustainable development, in: Sherman, K., Okemwa, E. and Ntiba, M. (eds), *Large Marine Ecosystems of the Indian Ocean: Assessment, Sustainability and Management*. Blackwell Science, Cambridge, U.S. pp 327-333.
- Emanuel, K.,] 2005. Increasing destructiveness of tropical cyclones over the past 30 years. *Nature*, 436, pp. 686–688.

Eppley R W. 1972. Temperature and phytoplankton growth in the sea. Fisheries Bulletin-NOAA, 70, pp. 1063-85

Evan, A. T., Kossin, J. P. Chung C. E. and Ramanathan, V. 2011. Arabian Sea tropical cyclones intensified by emissions of black carbon and other aerosols, *Nature*, 94, pp. 479.

Falkowksi, P. G., Katz, M. E., Knoll, A. H., Quigg, A., Raven, J. A., Schofield, O. and Taylor, F. J. R. 2004. The Evolution of Modern Eukaryotic Phytoplankton, *Science*, 305 (5682), pp. 354-360.

Field, C. B., Behrenfeld, M., Randerson, J. T. and Falkowski, P. 1998. Primary production of the biosphere: integrating terrestrial and oceanic components, *Science*, 281 (5374), 237-40.

Fischer, A. S., Weller, R. A., Rudnick, D. L., Eriksen, C. C., Lee, C. M., Brink, K. H., Fox, C. A. and Leben, R. R. 2002. Mesoscale eddies, coastal upwelling, and the upper-ocean heat budget in the Arabian sea, *Deep-Sea Research II*, 49, pp. 2231–2264.

Folland, C. K., Rayner, N. A., Brown, S. J., Smith, T. M., Shen, S. S. P., Parker, D. E., Macadam, I., Jones, P. D., Jones, R. N., Nicholls, N. and Sexton, D. M. H. 2001. Global temperature change and its uncertainties, *Geophysical Research Letter*, 28, pp. 2621–2624.

Fouda, M.M., Hermosa, G. and Al-Harhi, S. 1998. Status of fish biodiversity in the Sultanate of Oman. *Italian Journal of Zoology*, 65(1), pp. 23-47.

Gardner, W. D., Gundersen, J. S., Richardson, M. J. and Walsh, I. D. 1999. The role of seasonal and diel changes in mixed-layer depth on carbon and chlorophyll distributions in the Arabian Sea, *Deep-Sea Research II*, 46, pp. 1833-1858.

Glejin, J., Sanil Kumar, V., Balakrishnan Nair, T. M. and Singh, J. 2013. Influence of winds on temporally varying short and long period gravity waves in the near shore regions of the eastern Arabian Sea, *Ocean Science*, 9, pp. 343–353.

Goes I. J., Prasad G. T. and Helga H. R. 2005. Warming of the Eurasian landmass is making the Arabian Sea more productive, *Science*, 308, pp. 545-547.

Gohin, F., Luis Lampert, L., Guillaud, J. F., Herbland, L. and Nézan, E. 2003. Satellite and in Situ Observations of a Late Winter Phytoplankton Bloom, in the Northern Bay of Biscay, *Continental Shelf Research*, 23, pp. 1117-1141.

- Goswami, B.N., Venugopal, V., Sengupta, D., Madhusoodhanan, M.S. and Xavier, P.K. 2006. Increasing trend of extreme rains over India in a warming environment. *Science*, 314, pp. 1442–1445.
- Gregg, W. W., Conkright, M. E., Ginoux, P., O'Reilly, J. E. and Casey, N. W. 2003. Ocean primary production and climate: Global decadal changes, *Geophysical Research. Letter*, 30, pp. 1809.
- Gunderson, J. S., Gardner, W. D., Richardson, M. J. and Walsh, I. D. 1998. Effects of monsoons on the seasonal and spatial distributions of POC and chlorophyll in the Arabian Sea. *Deep-Sea Research II*, 45, pp. 2103– 2132.
- Habebrehman, H., Prabhakaran, M. P., Jacob, J., Sabu, P., Jayalakshmi, K. J., Achuthankutty, C. and Ravichandran, T. 2008. Variability in biological responses influenced by upwelling events in the eastern Arabian Sea, *Journal of Marine System*, 74, pp. 545-560.
- Halpern, B. S., Walbridge, S., Selkoe, K. A., Kappel, C. V., Micheli, F., D'Agrosa, C., Bruno, J. F., Casey, K. S., Ebert, C., Fox, H. E., Fujita, R., Heinemann, D., Lenihan, H. S., Madin, E. M. P., Perry, M. T., Selig, E. R., Spalding, M., Steneck, R. and Watson, R. 2008. A global map of human impact on marine ecosystems, *Science*, 319 (5865), pp. 948– 952.
- Hansen, J. E. and Lebedeff, S. 1987. Global trends of measured surface air temperature, *Journal of Geophysical Research*, 92 (11), pp. 13345–13372.
- Hansen, J. 1997. Public understanding of global climate change, *Carl Sagan's Universe*, edited by Terzian, Y. and Bilson, E. Cambridge University Press, New York, pp. 247–253.
- Hansen, J., Ruedy, R., Sato, M. and Lo, K. 2010. Global surface temperature change. *Reviews of Geophysics*, 48 (RG4004), pp.1-29, doi:10.1029/2010RG000345.
- Hastenrath, S. and Lamb, P. J. 1979. *Climatic Atlas of the Indian Ocean, Part 1, Surface Climate and Atmospheric Circulation*. Wisconsin University Press, Madison, 97, pp. 1-19.
- Heinze, C., Meyer, S., Goris, N., Anderson, L., Steinfeldt, R., Chang, N., Le Quéré, C. and Bakker, D. C. E. 2015. The ocean carbon sink – impacts, vulnerabilities and challenges, *Earth System Dynamics*, 6, pp. 327–358.

Henson, S. A., Sarmiento, J. L., Dunne, J. P., Bopp, L., Lima, I., Doney, S. C., John, J. and Beaulieu, C. 2009. Is global warming already changing ocean productivity?, *Biogeosciences Discussion*, 6, pp. 10311–10354.

Houghton, J. T., MeiaFilho, L. G., Callander, B. A., Marris, N., Katenberg, A. and Maskell, K. 1996. *Climate Change 1995: The Science of Climate Change*, Cambridge University Press, pp. 572.

Hoegh-Guldberg, O. and Bruno, J.F. 2010. The impact of climate change on the world's marine ecosystems, *Science*, 328 (5985), pp.1523-28, doi: 10.1126/science.1189930.

Hu, C., Lee, Z., & Franz, B., 2012. Chlorophyll a algorithms for oligotrophic oceans: A novel approach based on three-band reflectance difference. *Journal of Geophysical Research*, 117(C1). doi: 10.1029/2011jc007395

Solomon, S.; Qin, D.; Manning, M.; Chen, Z.; Marquis, M.; Avery, K.B.; Tignor M.; Miller, H.L., eds. 2007a. *Climate change 2007: The physical science basis. Contribution of Working Group I to the Fourth assessment report of the Intergovernmental Panel on Climate Change-IPCC*. Cambridge, United Kingdom and New York, NY: Cambridge University Press. pp.996.

International Ocean-Colour Coordinating Group (IOCCG)- Report 3. 2000. *Remote Sensing of Ocean Color in Coastal and Other Optically Complex*, edited by Sathyendranath, S. and Dartmouth, N. S. Canada.

Ittekkot, V., Haake, B., Bartsch, M., Nair, R.R. and Ramaswamy, V. 1992. Organic carbon accumulation rates in the Holocene and glacial Arabian sea: implications for O₂-consumption in the deep-sea and atmospheric CO₂ variations. *Climate Dynamics*, 7, 167-172.

Iverson, R. L. 1990. Control of marine fish production. *Limnology of Oceanography*, 35, pp. 1593–1604.

Jackson, J. B.C. 2010. The future of the oceans past. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365, pp. 3765–78.

Jayakumar, D. A., Naqvi, S. W. A., Narvekar, P. V. and George, M. D. 2001. Methane in coastal and offshore waters of the Arabian Sea, *Marine Chemistry*, 74, pp. 1–13.

Jenott, L. 2004. The Voyage around the Erythraean Sea
<http://depts.washington.edu/silkroad/texts/periplus/periplus.html>

JGOFS Core Measurement Protocols: Reports of the Core Measurements Working Groups, JGOFS Report No. 6, Scientific Committee on Oceanic Research, Bergen, pp. 40.

Ji, R., Davis, C.S., Chen, C.S., Townsend, D.W., Mountain, D.G., Beardsley, R.C. 2007 Influence of ocean freshening on shelf phytoplankton dynamics, *Geophysical Research Letter*, 34, pp. L24607.

Jiang, Y., Luo, Y., Zhao, Z. and Tao, S. 2010. Changes in wind speed over China during 1956–2004, *Theoretical and Applied Climatology*, 99, pp. 421–430.

Jones, P. D. and Wigley, T. M. L. 2007. Estimation of global temperature trends: What's important and what isn't. *Climate Change*, 100, pp. 59-69.

Kabanova, Y. G. 1968. Primary production of the northern part of the Indian Ocean, *Oceanology*, 8(2), pp. 214-225.

Kahru, M., Gille, S. T., Murtugudde, R., Strutton, P. G., Manzano-Sarabia, M., Wang, H. and Mitchell, B. G. 2010. Global correlations between winds and ocean chlorophyll, *Journal of Geophysical Research*, 115, pp. C12040.

Kamat, 2017. The Arabian Sea. http://www.kamat.com/indica/geography/arabian_sea.htm

Karl, B. and McClain, C. R. 1986. Winter Blooms of phytoplankton in the Arabian Sea as observed by the Coastal Zone Color Scanner, *Marine Ecology*, 34, pp. 201-211.

Karl, B. 1987. Seasonality of phytoplankton chlorophyll in the central and northern Arabian Sea. *Deep-Sea Research*, 34, 713–723.

Kawai, Y. and Wada, A. 2007. Diurnal Sea Surface Temperature Variation and its impact on the atmosphere and ocean: a review, *Journal of Oceanography*, 63, pp. 721-744.

Kawamiya, M. and Oschlies, A. 2003. An eddy-permitting, coupled ecosystem-circulation model of the arabian sea, *Journal of Marine System*, 38, pp. 221–257.

Keeling, R. F., Kortzinger, A. and Gruber, N. 2010. Ocean deoxygenation in a warming world. *Annual Review of Marine Science*, 2, pp. 199–229.

Kendall, M.G. 1975. Rank Correlation Methods, 4th edition, Charles Griffin, London.

Khan, T. M. A., Khan, F. A. and Jilani, R. 2008. Sea surface temperature variability along Pakistan coast and its relation to El Nino Southern oscillation, *Journal of Basic and Applied Sciences*, 4(2), pp. 67-72.

Kogeler, J. and Rey, F.1999. Ocean Colour and the Spatial and Seasonal Distribution of Phytoplankton in the Barents Sea, *International Journal of Remote Sensing*, 20, pp. 1303-1318.

Kothawale, D. R., Munot, A. A. andBorgaonkar, H. P. 2007. Temperature variability over the Indian Ocean and its relationship with Indian summer monsoon rainfall, *Theoretical and Applied Climatology*, 20, pp. 1303-1318.

Kumar, P., Roshin, R. P.,Narvekar, J., Kumar, P. K. D. and Vivekanandan, E. 2009. Response of the Arabian Sea to global warming and associated regional climate shift, *Marine Environmental Research*, 68, pp. 217–222.

Kumar, S. P., Madhupratap, M., Dileep Kumar, M., Muraleedharan, P. M., De Suza, S. N., Surekha, S.,Mangesh, G. and Sarma, V. V. S. S. 2001. High biological productivity in the interior Arabian Sea during summer monsoon driven by Ekman pumping and lateral advection,*Current Science*, 81, pp. 1633–1638.

Kumar, S. P., Narvekar, J., Ajoy Kumar, C., Shaji, P., Anand, P., Sabu, G., Rijomon, J., Josia, K.A., Jayaraj, A. and Radhika, N. 2004. Intrusion of the Bay of Bengal water into the Arabian Sea during winter monsoon and associated chemical and biological response. *Geophysical Research Letter*, 31, L15304, doi. org/:10.1029/2004GL020247

Kumar, S. P. and Prasad, G. T. 1999. Formation and spreading of Arabian Sea high-salinity water mass, *Journal of Geophysical Research*, 104, pp. 1455–1464.

Kumar, S.P., Madhupratap, M., Dileep Kumar, M., Gauns, M., Muraleedharan, P.M., Sarma, V.V.S.S. and de Souza, S.N. 2000. Physical control of primary productivity on a seasonal scale in the central and eastern Arabian Sea, *Proceedings of the Indian Accad. (Earth and Planetary Science)*, 109, pp. 433–441.

Kumar, V. S. and Kumar, K.A. 2010. Waves and currents in tide dominated location off Dahej, Gulf of Khambhat, India, *Marine Geodesy*, 33(2), pp. 218-231.

Kumar, V. S. and Sajiv, C. 2010. Variations in long term wind speed during different decades in Arabian Sea and Bay of Bengal, *Journal of Earth System Science*, 119, pp. 639–653.

Kumar, V. S., Pathak, K. C., Pednekar, P. and Gowthaman, R. 2006. Coastal processes along the Indian coastline, *Current Science*, 91, pp. 530–536

Kuz'menko, L. V. 1977. Distribution of phytoplankton in the Arabian Sea, *Marine Biology*, 17(1), pp. 70-74.

Laurent, B., Chris, B., 2015. The Ocean: a Carbon Pump;: <http://www.ocean-climate.org/wp-content/uploads/2015/03/ocean-carbon-pump>.

Levitus, S. 1982. Climatological atlas of the world ocean, NOAA Professional paper 13, U.S. Government Printing Office, Washington, xv, pp. 173.

Lewandowska, A. M., Boyce, D. G., Hofmann, M., Matthiessen, B., Sommer, U. and Worm, B. 2014. Effects of sea surface warming on marine plankton, *Ecology Letters*, 17(5), pp. 614–623.

Li, T., Zhang, Y., Chang, C. P. and Wang, B. 2001. On the relationship between Indian Ocean surface temperature and Asian summer monsoon, *Geophysical Research Letter*, 28, pp. 2843– 2846.

Liss, P. and Merlivat, L. 1986. Air-sea gas exchange rates: Introduction and synthesis, *The Role of Air-Sea Exchange in Geochemical Cycling*, Springer Netherlands, Dordrecht, pp. 113–127.

Luis, J. A. and Kawamura, H. 2004. Air-Sea Interaction, Coastal Circulation and Primary Production in the Eastern Arabian Sea: A Review, *Journal of Oceanography*, 60, pp. 205-218.

Madhu, N.V. 2004. Seasonal studies on primary production and associated environmental parameters in the Indian EEZ. Ph. D. Thesis, Cochin University of Science and Technology, pp. 234.

Madhupratap, M., Kumar, S. P., Bhattathiri, P. M. A., Kumar, M. D., Raghukumar, S., Nair, K. K. C. and Ramaiah, N. 1996. Mechanism of the biological response to winter cooling in the Northeastern Arabian Sea, *Nature*, 386, pp. 549–552.

- Mann, H.B. 1945. Non-parametric tests against trend, *Econometrica* 13:163-171.
- Matthias, T. and Godfrey, J. S. 2003. *Regional Oceanography: An Introduction*, 2nd Edition, Chapter 11, Daya Publishing House, Delhi
- McClain, E.P., Pichel, W.G. and Walton, C.C. 1985. Comparative performance of AVHRR-based multichannel sea surface temperatures. *J. Geophys. Res.* 90 (C6), pp. 11587-11601.
- McClain, C. R. 2009. A Decade of Satellite Ocean Color Observations. *Annual Review of Marine Science*, 1, pp. 19-42.
- McCreary, J. P., Kundu, P. K. and Molinari, R. L. 1993. A numerical investigation of dynamics, thermodynamics and mixed-layer processes in the Indian Ocean. *Progress in Oceanography*, 31, pp. 181–224.
- McVicar, T. R., Roderick, M. L., Donohue, R. J., Li, L. T., Van Niel, T. G., Thomas, A., Grieser, J. R., Jhajharia, D., Himri, Y. and Mahowald, N. M. 2012. Global review and synthesis of trends in observed terrestrial near-surface wind speeds: implications for evaporation. *Journal of Hydrology*, 416, pp. 182–205.
- Meehl, G. A., Washington, W. M., Collins, W. D., Arblaster, J. M., Hu, A., Buja, L. E., Strand, W. G. and Teng, H. 2005. How much more global warming and sea level rise?, *Science*, 307, pp. 1769–1772.
- Montaigne, F. 2007. The global fish crisis. *National Geographic*, 211(4), pp. 32–99.
- Morel, A., Huot, Y., Gentili, B., Werdell, P. J., Hooker, S. B. and Franz, B. A. 2007, Examining the consistency of products derived from various ocean color sensors in open ocean (case 1) waters in the perspective of a multi-sensor approach, *Remote Sensing of Environment*, 111, pp. 69–88.
- Morgan, J. R., Verlaan, P. A., Aleem, A. A., 2017. Arabian Sea, <https://www.britannica.com/place/Arabian-Sea>
- Morrison, J. M, Codispoti, L. A., Smith, S. L., Wishner, K., Flagg, C., Gardner, W. D., Gaurin, S., Naqvi, S.W.A., Manghnani, V., Prosperie, L. and Gundersen, J.S. 1999. The Oxygen minimum zone in the Arabia Sea during 1995, *Deep Sea Research Part II: Topical Studies in Oceanography*, 46(8-9), pp. 1903-1931.

- Murtugudde, R. G., Wang, L., Hackert, E., Beauchamp, J., Christian, J. and Busalacchi, A. 2004. Remote sensing of the Indo-Pacific region: Ocean colour, sea level, winds and sea surface temperatures, *International Journal of Remote Sensing*, 25, pp. 1423–1435.
- Murtugudde, R., Signorini, S., Christian, J., Busalacchi, A., McClain, C. and Picaut, J. 1999. Ocean color variability of the tropical Indo-Pacific basin observed by SeaWiFS during 1997–1998. *Journal of Geophysical Research*, 104(18), pp. 351-366.
- Muzaini, S. A. and Jacob, P.G., 1996. Marine plants of the Arabian Gulf. *Environment International*, 22(3), pp. 369-376.
- Nair, K. K. C., Madhuprathap, M., Gopalakrishnan, T. C. and Haridas, P. 1999. The Arabian Sea: Physical Environment, Zooplankton and Myctophid abundance, *Indian Journal of Marine Science*, 28, pp. 138-145.
- Nandkeolyar, N., Raman, M., Sandhya Kiran, G. and Ajai. 2013. Comparative Analysis of Sea Surface Temperature Pattern in the Eastern and Western Gulfs of Arabian Sea and the Red Sea, *International Journal of Oceanography*, Article ID 501602, pp.1-16.
- Naqvi, S. W. A. , Moffett, J. W., Gauns, M. U., Narvekar, P. V., Pratihary, A. K., Naik, H., Shenoy, D. M., Jayakumar, D. A., Goepfert, T. J., Patra, P. K., Al-Azri, A. and Ahmed, S. I. 2010. The Arabian Sea as a high-nutrient, low-chlorophyll region during the late Southwest Monsoon, *Journal of Biogeosciences*, 7, pp.2091–2100.
- Naqvi, S. W. A., Jayakumar, D. A., Narvekar, P. V., Naik, H., Sarma, V. V. S. S., D'Souza, W., Joseph, S. and George, M. D. 2000. Increased marine production of N₂O due to intensifying anoxia on the Indian continental shelf, *Nature*, 408, pp. 346–349.
- Naqvi, S. W. A., Naik, H. and Narvekar, P. V. 2003. The Arabian Sea, In: *Biogeochemistry of Marine Systems*, Blackwell, Oxford, pp. 156–206.
- NASA Goddard Space Flight Center, Ocean Biology Processing Group, 2010. Sea-viewing Wide Field-of-view Sensor (SeaWiFS) Ocean Color Data, NASA OB.DAAC,
- Neumann, B., Vafeidis, A. Zimmermann T., and Nicholls, R. J. 2015. Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding - A Global Assessment. <https://doi.org/10.1371/journal.pone.0118571>).

New World Encyclopedia, 2016. Arabian Sea.
http://www.newworldencyclopedia.org/entry/Arabian_Sea

Nezlin Nikolay P., Sutula Martha A., Stumpf Richard P. and Sengupta A. 2012. Phytoplankton blooms detected by SeaWiFS along the central and southern California coast. *Journal of geophysical research*, vol. 117, c07004, doi:10.1029/2011jc007773, 2012

Nightingale, P. D., Malin, G., Law, C. S., Watson, A. J., Liss, P. S., Liddicoat, M. I., Boutin, J., Upstill-Goddard, R. C., 2000. In situ evaluation of air-sea gas exchange parameterizations using novel conservative and volatile tracers, *Global Biogeochem. Cy.*, 14, pp. 373–387, doi:10.1029/1999GB900091.

Oerlemans, J., 1994. Quantifying global warming from the retreat of glaciers. *Science*, 264, pp. 243–245.

O'Reilly, J. E., Maritorena S., Mitchell B. G., Siegel D. A. Carder, K. L. Sara A. G., Kahru, M., McClain, C. 1998. Ocean color chlorophyll algorithms for SeaWiFS. *Journal of geophysical research*, 103, 24, pp. 937-924..<https://doi.org/10.1029/>,

Parnesan, C., 2006. Ecological and evolutionary responses to recent climate change. *Annual Review of Ecology, Evolution, and Systematics*, 37, pp. 637–669.

PERSGA/GEF, 2002. The Red Sea and Gulf of Aden Regional Network of Marine Protected Areas. Regional Master Plan. PERSGA Technical Series No.1. PERSGA, Jeddah.

Pet-Soede, L., Wafar, M.V.M., Venkataraman, K., Rajan, P.T. and Wilhelmsson, D., 2000. The status of the coral reefs of India following the bleaching event of 1998, in: Souter, D., Obura, D. and Lindén, O. (eds), *CORDIO Status Report 2000*. Sida/SAREC, Stockholm University, Stockholm, Sweden.

Pilcher, N. J., 1999. The hawksbill turtle *Eretmochelysimbricata* in the Arabian Gulf *Chelonian Conserv. Biol.*, 3 (2), pp. 312-317

Pilcher, N. J., 2013. A portable restraining box for sea turtles; *Mar. Turt. Newsl.*, 136, pp. 3-4

Pilcher, N. J., S. Wilson, S.H. Alhazeem, M.R. Shokri; Status of coral reefs in the Arabian/Persian Gulf and Arabian Sea Region (Middle East); C. Wilkinson (Ed.), *Status of Coral Reefs of the World: 2000*, Australian Institute of Marine Science, Australia, pp. 55-64

Pilcher, N. J., Wilson, S., Alhazeem, S. H. and Shokri, M. R., 2000. Status of coral reefs in the Arabian/Persian Gulf and Arabian Sea region (Middle East), p 55-64 in: Wilkinson, C. (ed), Status of Coral Reefs of the World: 2000. Australian Institute of Marine Science, Townsville, Australia.

Pilcher, N.J., L. Perry, M. Antonopoulou, M.A. Abdel-Moati, T.Z. Al Abdessalaam, M. Albeldawi, M. Al Ansi, S.F. Al-Mohannadi, R. Baldwin, A. Chikhi, H.S. Das, A. Hamza, O.J. Kerr, A. Al Kiyumi, A. Mobaraki, H.S. Al Suwaidi, A.S. Al Suweidi, M. Sawaf, C. Tourenq, J. Williams, A. Willson, 2014. Short-term behavioural responses to thermal stress by hawksbill turtles in the Arabian region; J. Exp. Mar. Biol. Ecol., 457, pp. 190-198

Pillai, V. N., Pillai, V. K., Gopinathan, C. P., Nandakumar, A., 2000. Seasonal variations in the physico-chemical and biological characteristics of the eastern Arabian Sea. J. Mar. Biol. Ass. India, 42(1& 2), pp. 1-11

Piontkovski, S. A., Claereboudt, M. R., 2012. Interannual changes of the Arabian Sea productivity; <http://dx.doi.org/10.1080/17451000.2011.615325>

Platt, T., Sathyendranath, S., 1988. Oceanic primary production: Estimation by remote sensing at local and regional scales, Science, 241, pp. 613–1620

Plymouth Marine Sciences Partnership, 2009. Why are the oceans important, http://cmore.soest.hawaii.edu/oceanacidification/documents/PML_TechnicalSheet_high_CO2_world.pdf

Polovina, J. J., Howell, E. A., Abecassis, M., 2008. Ocean's least productive waters are expanding. Geophys. Res. Lett. 35, L03618, doi:10.1029/2007GL031745.

Prakash, S., Ramesh, R., 2007. Is the Arabian Sea getting more productive? Current Science, 92, pp. 667-71.

Prasad, T.G, Ikeda, M., 2002. A numerical study of the seasonal variability of the Arabian Sea high-salinity water. Journal of Geophysical Research, 107, pp. 3197.

Kumar, P., Madhupratap, S. M., Kumar, D. M., Gauns, M., Muraleedharan, P. M., Sarma, V. V. S. S., De Souza, S. N., 2001. Physical control of primary productivity on a seasonal scale in central and eastern Arabian Sea; Proc. Indian Acad. Sci. (Earth Planet. Sci.), 109 (4), pp. 433-441

- Kumar, P.S., Roshin, R. P., Narvekar, J., Kumar, P. K. D, Vivekanandan, E., 2009. Response of the Arabian Sea to global warming and associated regional climate shift, *Marine Environmental Research*, 68, pp. 217-222
- Premkumar, K., Ravichandran, M., Kalsi, S. R., Sengupta, D., Gadgil, S., 2000. First results from a new observation system over the Indian Seas, *Current Science*, 78, pp. 323–330
- Qasim, S. Z., 1977. Biological productivity of the Indian Ocean. *Indian Journal of Marine Sciences*, 6, pp. 122–137.
- Qasim, S. Z., 1982. Oceanography of the northern Arabian Sea. *Deep-Sea Res.*, 29, pp. 1041–1068.
- Rabbani, M.M., Rehman, A. and Harms, C.E. 1990. Mass mortality of fishes caused by dinoflagellate bloom in Gwadar Bay, Southwestern Pakistan, in: *Toxic Marine Phytoplankton*. (Eds.): E. Graneli., B. Sundström., L. Edler., and D.M. Anderson., Elsevier, New York, U.S. pp. 209-214.
- Rao, K., Goswami, B.N., 1987. Intra annual variation of Sea surface temperature over Arabian Sea and the Indian Ocean: A new perspective. *Monthly weather review*, 116, pp. 558-568.
- Rao, R. R., Molinari, R. L., Festa, J. F., 1989. Evolution of the climatological near surface thermal structure of the tropical Indian Ocean: Description of mean monthly mixed layer depth, sea surface temperature, surface current and surface meteorological fields, *Journal of Geophysical Research*, 94, pp. 10801-10815.
- Rao, R. R., Sivakumar, R., 2000. Seasonal variability of near-surface thermal structure and heat budget of the mixed layer of the tropical Indian Ocean from a new global ocean temperature climatology, *Journal of Geophysical Research*, 105, pp. 995– 1015.
- Ravichandran, M., Girishkumar, M. S., Riser, S., 2012. Observed variability of chlorophyll-a using Argo profiling floats in the southeastern Arabian Sea; *Deep-Sea Research I*, 65, pp. 15– 25.
- Rayner, N. A., Parker, D. E., Horton, E. B., Folland, C. K., Alexander, L. V., Rowell, D. P., Kent, E. C., Kaplan, A., 2003. Global analyses of sea surface temperature, sea ice, and night

marine air temperature since the late nineteenth century, *Journal of Geophysical Research*, 108 (D14), pp. 4407.

Regional Oceanography: An Introduction pdf version 11 December 2006.

Reid, P. C., Fischer, A.C., Lewis-Brown, E., Meredith, M.P., Sparrow, M., Andersson, A. J., Antia, A., Bates, N. R., Bathmann, U., Beaugrand, G., Brix, H., Dye, S., Edwards, M., Furevik, T., Gangstø, R., Hátún, H., Hopcroft, R. R., Kendall, M., Kasten, S., Keeling, R., Le Quéré, C., Mackenzie, F. T., Malin, G., Mauritzen, C., Olafsson, J., Paull, C., Rignot, E., Shimada, K., Vogt, M., Wallace, C., Wang, Z., Washington, R., 2009. Chapter 1. Impacts of the oceans on climate change, *Adv Mar Biol.*, 56, pp. 1-150. doi: 10.1016/S0065-2881(09)56001-4. PubMed PMID: 19895974.

Reynolds, M. R., 1993. Physical oceanography of the Gulf, Strait of Hormuz, and Gulf of Oman: results from the Mt. Mitchell expedition. *Marine Pollution Bulletin*, 27, pp. 35-39.

Reynolds, R. W., Smith, T. M., 1994. Improved global sea surface temperature analyses using optimum interpolation. *Journal of Climate* 7: 75-86.

Reynolds, R.W., 1988. A real-time global sea surface temperature analysis, *Journal of Climate*, 1, pp. 75-86.

Reynolds, R.W., Marsico, D.C., 1993. An improved real-time global sea surface temperature analysis, *Journal of Climate*, 6, pp. 114-119.

Ricciardulli, Lucrezia, & National Center for Atmospheric Research Staff (Eds). Last modified 27 Feb 2017. "The Climate Data Guide: CCMP: Cross-Calibrated Multi-Platform wind vector analysis." Retrieved from <https://climatedataguide.ucar.edu/climate-data/ccmp-cross-calibrated-multi-platform-wind-vector-analysis>.

Richardson, A. J., Schoeman, D. S., 2004. Climate impact on plankton ecosystems in the Northeast Atlantic, *Science*, 305 (5690), pp. 1609–1612.

Rio Ocean Declaration: Calling for strong and immediate action to meet the sustainable development goals for oceans, coasts, and small island developing States (SIDS) at Rio+20 and beyond; Co-Chairs' Statement of The Oceans Day at Rio+20; June 16, 2012. Rio Conventions Pavilion, United Nations Conference on Sustainable Development, Rio de Janeiro, Brazil

- Roman, M., Smith, S., Wishner, K., Zhang, X., Gowing, M., 2000. Mesozooplankton production and grazing in the Arabian Sea. *Deep-Sea Research II*, 47, pp. 1423–1450.
- Rubao, J, Edwards, M., Mackas, D. L., Runge, J. A., Thomas, A. C., 2010. Marine plankton phenology and life history in a changing climate: current research and future directions; *J Plankton Res*, 32(10), pp 1355–1368.
- Kumar, R., R., Kumar, Krishna, K., Ashrit, R. G., Patwardhan, S. K., Pant, G. B., 2002. Climate change in India: observations and model projections, Edited by Shukla, P. R., Sharma, S. K., VenkataRamana, P. *Climate Change and India: Issues, Concerns and Opportunities*. Tata McGraw-Hill Publishing Company Limited, New Delhi.
- Ryko, O., Kanda, M. 2009. The seventh International Conference on Urban climate, Yokohama, 29 June -03 July, 2009.
- Ryther, J. H., Yentsch, C. S., 1957. The estimation of phytoplankton production in the ocean from chlorophyll and light data. *Limnol. Oceanog.*, 2, pp. 281-286.
- Ryther, J. H., Hall, J. R., Pease, A. K., Bakun, A., Jones, M. M., 1966. Primary organic production in relation to the chemistry and hydrography of the western Indian Ocean, *Limnology and Oceanography*, 11, pp. 371–380
- Ryther, J. H., Menzel, D. W., 1965. On the production, composition, and Distribution of organic matter in the western Arabian Sea, *Deep Sea Res.*, 12, pp. 199-209.
- Saafani, M. A., Shenoi, S. C., 2007. Water Masses in the Gulf of Aden. *Journal of Oceanography*, 63, pp. 1-14
- Saha, K. R., Bavadekar, S. N., 1973. Water vapour budget and precipitation over the Arabian Sea during the northern summer monsoon; *Quarterly Journal of Royal Meteorological Society*, 99, pp. 272-278.
- Saifullah, S. M., 1997. Management of the Indus Delta mangroves, p 333-346 in: Haq, B.U., Haq, S.M. and Stel, J.M. (eds), *Coastal Zone Management Imperative for Maritime Developing Nations*. Kluwer Academic Publishers, Germany.

- Sajiv, P. C., Kumar, V. S., Glejin, J., Dora, G. U., and Vinayaraj, P., 2012. Interannual and seasonal variations in near shore wave characteristics off Honnavar, west coast of India, *Current Science*, 103, pp. 286–292
- Sarmiento, J. L., Orr, J. C., 1991, Three-dimensional simulations of the impact of Southern Ocean nutrient depletion on atmospheric CO₂ and ocean chemistry, *Journal of Limnology and Oceanography*, 36(8), pp. 1928-1959
- Sarmiento, J. L., Slater, R., Barber, R., Bopp, L., Doney, S. C., Hirst, A. C., Kleypas, J., Matear, R., Mikolajewicz, U., Monfray, P., Soldatov, V., Spall, S. A., Stouffer, R., 2004. Response of ocean ecosystems to climate warming, *Global Biogeochem. Cy.*, 18, GB002134
- Schlitzer, R., 2000. Applying the adjoint method for global biogeochemical modeling. *Inverse Methods in Global Biogeochemical Cycles* edited by Kasibhatla, P., Heimann, M., Hartley, D., Mahowald, N., Prinn, R., Rayner, P., AGU Geophysical Monograph Series, pp. 107–124.
- Schott, F. A., Xie, S. P., and McCreary Jr., J. P., 2009. Indian Ocean circulation and climate variability, *Rev. Geophys.*, 47, RG1002, doi:10.1029/2007RG000245
- Sen Gupta, R., Naqvi, S.W.A., 1984. Chemical oceanography of the Indian Ocean, north of the equator, *Deep Sea Research*, 31, pp. 671-706.
- Shah, Meghal, Chaturvedi, Neera, Pandya, Himanshu, Ajai, 2017. Climate change and biological productivity: Indian Ocean. *Indian Journal of Marine Science*, Vol.46(03), 480-484.
- Shanas, P. R., Kumar, V. Sanil; Trends in surface wind speed and significant wave height as revealed by ERA-Interim wind wave hindcast in the Central Bay of Bengal, *International Journal of Climatology*, 35(9) pp. 2654–2663
- Shankar, D., Vinayachandran, N. P., Unnikrishnan, A. S., 2002. The monsoon currents in the north Indian Ocean, *Progress in Oceanography*, 52, pp. 63-120.
- Sheppard, C. R. C, Loughland, R., 2002. Coral Mortality and recovery in response to increasing temperature I the southern Arabian Gulf; *Aquatic Ecosystem Health and Management*; 5 (4), pp. 395-402

Sheridan C. C., Landry M. R., 2004. A 9-year increasing trend in mesozooplankton biomass at the Hawaii Ocean Time-series Station ALOHA. *ICES J. Mar. Sci.*, 61, pp. 457–463.

Shukla, J., 1975. Effect of Arabian Sea surface temperature anomaly on Indian summer monsoon: A numerical experiment with GFDL model, *Journal of Atmospheric Sciences*, 32, pp. 503– 511.

Shenoi, S.S.C., 2010. Intra-seasonal variability of the coastal currents around India: a review of the evidences from new observations. *Indian Journal of Geo-Marine Sciences* 39, 489–496.

Shetye, S.R., 1999. Dynamics of circulation of the waters around India. In: Somayajulu, B.L.K. (Ed.), *Ocean Science: Trends and Future directions*. Indian National Science Academy, New Delhi, pp. 1–21.

Sigman, D. M., Hain, M. P., 2012. The Biological Productivity of the Ocean, *Nature Education Knowledge*, 3(10), pp. 21.

Singh, O. P., Ali Khan, T. M., Rahman, M. S., 2001. Has the frequency of intense tropical cyclones increased in the North Indian Ocean? *Current Sciences*, 60, pp. 575–580.

Smith, L. and Madhupratap, M., 2005. Mesozooplankton of the Arabian Sea: Patterns influenced by seasons, upwelling, and oxygen concentrations. *Progress in Oceanography*, 65(2-4), pp. 214-239

Smith, S. L., Codispoti, L. A., Morrison, J. M., Barber, R. T., 1998. The 1994–1995 Arabian Sea Expedition: an integrated, interdisciplinary investigation of the response of the northwestern Indian Ocean to monsoonal forcing. *Deep-Sea Research II*, 45, pp. 1905–1916

Smith, T. M., Reynolds, R. W., 2003. Extended Reconstruction of Global Sea Surface Temps Based on COADS 1854-1997. *Journal of Climate*, 16, pp. 1495–1510.

Smith, T.M., Reynolds, R. W., Peterson, T. C., Lawrimore, J., 2008. Improvements to NOAA's historical merged land-ocean surface temperature analysis (1880-2006). *Journal of Climate*, 21, pp. 2283-2296

Smith, T.M., Reynolds, R.W., 2004. Improved Extended Reconstruction of SST 1854-1997. *Journal of Climate*, 17, pp. 2466–2477.

Solanki, H. U., Dwivedi, R. M., Nayak, S. R., Jadeja, J. V, Thakar, D. B., Dave, H. B., Patel, M. I., 2001. Application of Ocean Color Monitor chlorophyll and AVHRR SST for fishery forecast, preliminary validation results off Gujarat coast, northwest coast of India. *Indian J. Mar. Sci.*, 30, pp. 132–138.

Solanki H.U., Dwivedi R. M., Nayak, S.R., Naik S.N., John M.E. Somvanshi V.S., 2004. Application of remotely sensed closely coupled biological and physical processes for marine fishery resources exploration. *International Journal of Remote Sensing*. ISSN 0143-1161 print/ ISSN 1366-5901 online. <http://www.tandf.co.uk/journals>, DOI: 10.1080/01431160310001595028

Somero, G., 2012. The physiology of global change: linking patterns to mechanisms. *Annu. Rev. Mar. Sci.*, 4, p. 39–61

Stelfox, C. E., Burkill, P. H., Edwards, E. S., Harris, R. P., Sleigh, M. A., 1999. The structure of zooplankton communities, in the 2 to 2000 μ m size range, in the Arabian Sea during and after the SW monsoon, 1994. *Deep-Sea Research II*; 46, pp. 815– 842.

Strickland, J. D. H., 1960. Measuring the production of marine phytoplankton. *Bull. Fisheries Res. Board Can.*, 122: pp. 1-172

Swallow, J .C., 1984. Some aspects of the physical oceanography of the Indian Ocean. *Deep Sea Res. I*, 31, pp. 639-650.

Swallow, J., 1991. Circulation in the northwestern Indian Ocean. In: Smith, et al. (Eds.). *US JGOFS Arabian Sea Process Study Planning Report 13*, pp. 37– 39.

Tang, D., Kawamura H., and Luis A.J., 2002, Short-term variability of phytoplankton blooms associated with a cold eddy in the northwestern Arabian Sea, *Rem. Sens. Environm.*, 81, pp. 82-89

Thomas, B. R., E. C. Kent, V. R. Swail, and D. I. Berry, 2008. Trends in ship wind speeds adjusted for observation method and height, *Int. J. Climatol.*, 28(6), 747–763

Thompson, B., Gnanaseelan, C., Parekh, A., Salvekar, P. S., 2008. North Indian Ocean warming and sea level rise in an OGCM. *Journal of Earth System Sciences*, 117 (2), pp. 169–178.

- Thompson, D. W. J., Wallace, J. M., Jones, P. D., and Kennedy, J. J., 2009. Identifying signatures of natural climate variability in time series of global mean surface temperature: Methodology and insights, *Journal of Climatology*, 22, pp. 6120–6141.
- Tokinaga, H., Xie, S. P., 2011. Wave- and Anemometer-Based Sea Surface Wind (WASWind) for climate change analysis, *Journal of Climatology*. 24, pp. 267–285.
- Tom Schils and Simon C. Wilson, 2006. Temperature threshold as a biogeographic barrier in northern Indian ocean macroalgae. *Journal of Phycology*, 42 (4), pp.749 – 756. <https://doi.org/10.1111/j.1529-8817.2006.00242.x>
- Tripathy, M, Raman, M., Dwivedi, R., Ajai, 2012. Frequency of Cyclonic Disturbances and Changing Productivity Patterns in the North Indian Ocean Region: A Study Using Sea Surface Temperature and Ocean Colour Data; *International Journal of Geosciences*, 3, pp. 490-506
- UNEP/GEF, 2002. Regionally based Assessment of Persistent Toxic substances: Indian Ocean Regional Report. UN Environment Programme (Chemicals), Geneva/Global Environment Facility, Washington.
- UNESCO, 1994. Protocols for the Joint Global Ocean Flux Study (JGOFS) Core Measurements, Scientific Committee on Oceanic Research. Manual and Guides 29, 170 p
- Vautard, R., J. Cattiaux, P. Yiou, et al. 2010. Northern Hemisphere atmospheric stilling partly attributed to an increase in surface roughness. *Nature Geoscience*, 3, pp. 756–761.
- Veldhuis, M. J. W., Kraay, G. W., Van Bleijswijk, J. D. L., Baars, M. A., 1997. Seasonal and spatial variability in phytoplankton biomass, productivity and growth in the northwestern Indian ocean: The southwest and northeast monsoon, 1992–1993. *Deep-Sea Res. I*, 44, pp. 425–449.
- Vinayachandran, P. N., 2004. Summer cooling of the Arabian Sea during contrasting monsoons. *Geophysical Research Letter*, 31, L-13306
- Vinayachandran, P. N., Shankar, D., Kurian, J., Durand, F., Shenoi, S. S. C., 2007. Arabian Sea mini warm pool and the monsoon onset vortex. *Current Science*, Volume, 93, 2.

- Volk, T., Hoffert, M. I., 1985. Ocean carbon pumps: Analysis of relative strengths and efficiencies in ocean-driven atmospheric CO₂ changes, *The carbon cycle and atmospheric CO₂: Natural variations Archean to present*, edited by: Sundquist, E. T. and Broecker, W. S., American Geophysical Union, Washington, D.C., pp. 99–110.
- Walther, G.R., Post, E., Convey, P., Menzel, A., Parmesan, C., Beebee, T. J., Fromentin, J. M., Hoegh-Guldberg, O., Bairlein, F., 2002. Ecological responses to recent climate change, *Nature*, 28, 416(6879), pp. 389-95.
- Wanninkhof, R. 1992. Relationship between wind speed and gas exchange over the ocean, *J. Geophys. Res.*, 97, pp. 7373–7382.
- Ware, D., Thomson, R., 2005. Bottom-up ecosystem trophic dynamics determine fish production in the northeast Pacific, *Science*, 308, pp. 1280 – 1284
- Webster, P. J., Holland, G. J., Curry, J. A., Chang, H. R., 2005. Changes in tropical cyclone number, duration, and intensity in a warming environment. *Science*, 309, pp. 1844– 1846.
- Webster, P. J., Magana, V. O., Palmer, T. N., Shukla, J., Tomas, R. A., Yanai, M., Yasunari, T., 1998. Monsoons: Processes, predictability and prospects for prediction. *Journal of Geophysical Research*, 103 (C7), pp. 14451-14510.
- Weering, T. C. E. V, Helder, W., Schalk, P, 1997. The Netherlands Indian Ocean expedition 1992–1993, first results and an introduction, *Deep-Sea Res. Pt. II*, 44, pp. 1177–1193
- Weiss, R. F., 1974. Carbon dioxide in water and seawater: the solubility of a non-ideal gas, *Mar. Chem.*, 2, pp. 203–215,
- Wellera, R. A., Fischera, A. S., Rudnick, D. L., Eriksen, C. C., Dickey, T. D., Marra, J., Fox, C., Leben, R., 2002. Moored observations of upper-ocean response to the monsoons in the Arabian Sea during 1994–1995; *Deep-Sea Research II*, 49, pp. 2195–2230
- Wentz, F. J., Ricciardulli, L., Hilburn, K., Mears, C., 2007. How much more rain will global warming bring?, *Science*, 317(5835), pp. 233–235.
- Wiggert, J. D., Hood, R. R., Banse, K., Kindle, J. C., 2005. Monsoon-driven biogeochemical processes in the Arabian Sea. – *Progress in Oceanography*, 65, pp. 176-213.

Wiggert, J. D., Jones, B. H., Dickey, T. D., Brink, K. H., Weller, R. A., Marra, J., Codispoti, L. A., 2000. The Northeast Monsoon's impact on mixing, phytoplankton biomass and nutrient cycling in the Arabian Sea. *Deep-Sea Research II*, 47, pp. 1353-1386.

Wiggert, J. D., Jones, B. H., Dickey, T. D., Brink, K. H., Weller, R. A., Marra, J., Codispoti, L. A., 2000. The NE Monsoon's impact on mixing, phytoplankton biomass and nutrient cycling in the Arabian Sea. *Deep-Sea Research II*, 47, pp. 1353–1385

Wilson, S., Fatemi, S. M. R., Shokri, M. R., Claereboudt, M., 2002. Status of coral reefs of the Persian/Arabian Gulf and Arabian Sea Region, p 53-62 in: Wilkinson, C.R. (ed), *Status of Coral Reefs of the World:2002*. Australian Institute of Marine Science, Townsville, Australia.

Worm B., Edward Barbier B., Nicola B., Emmett Duffy J., Carl F., Halpern B.S., Jeremy J. B. C. (2006). Impacts of Biodiversity Loss on Ocean Ecosystem Services. *Science*, Vol. 314, Issue 5800, pp. 787-790. DOI: 10.1126/science.1132294

Wyrtki, K., 1973. Physical oceanography of the Indian Ocean. p. 18–36. In *The Biology of the Indian Ocean*, Ecological Studies, 3, ed. by B. Zeitzschel and S. A. Gerlach, Springer-Verlag, London.

Yoder, J. A., McClain, C. R., Feldman, G. F., Esaias, W. E., 1993. Annual cycles of phytoplankton chlorophyll concentrations in the global ocean: a satellite view. *Global Biogeochemical Cycles*, 7, pp. 181-193.

Young, I. R., Zieger, S., Babanin, A. V., 2011. Global Trends in Wind Speed and Wave Height; *Science*, 332.

Zhang, X., Zwiers, F. W., Hegerl, G. C., Lambert, F. H., Gillett, N. P., Solomon, S., Stott, P. A., Nozawa, T., 2007. Detection of human influence on twentieth-century precipitation Trends. *Nature*, 448, pp. 461–465.

Weblinks:

- 1) <http://depts.washington.edu/silkroad/texts/periplus/periplus.html>
- 2) http://www.kamat.com/indica/geography/arabian_sea.htm
- 3) http://www.newworldencyclopedia.org/entry/Arabian_Sea
- 4) <https://earthobservatory.nasa.gov>
- 5) <https://earthobservatory.nasa.gov/Features/Phytoplankton/>

- 6) [https://www.britannica.com /place/Arabian-Sea](https://www.britannica.com/place/Arabian-Sea)
- 7) https://oceancolor.gsfc.nasa.gov/atbd/chlor_a/