## **Radiocarbon in the Northern Indian Ocean**

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The natural distribution of radiocarbon has been perturbed by nuclear weapon testing in the late fifties and early sixties which resulted in the injection of considerable amount of <sup>14</sup>C in the environment. This bomb <sup>14</sup>C has provided an additional tool to assess more precisely the time scales of various processes associated with carbon exchange among the various Earth surface reservoirs. Radiocarbon measurements were made in the northern Indian Ocean to determine air-sea exchange rate of CO<sub>2</sub>, circulation time scales in the Arabian Sea and Bay of Bengal and <sup>14</sup>C reservoir ages.

The estimated  $\Delta R$  correction values for the northern Arabian Sea is  $163 \pm 30$  yr,  $11 \pm 35$  yr for the eastern Bay of Bengal (Andaman Sea) and  $32 \pm 20$  yr for the southern Bay of Bengal. (Dutta et al., 2001). 1-D vertical advection-diffusion model calculations using <sup>14</sup>C measurements indicate that there is very rapid (w>>200 m/yr) vertical mixing in the deep waters (>1500m) of the Andaman basin consistent with the distribution of chemical and physical properties (Dutta et al., 2007). Based on the average <sup>14</sup>C derived CO<sub>2</sub> exchange rates as determined from the bomb produced <sup>14</sup>C inventories and reported annual surface seawater pCO<sub>2</sub> values, the net flux of CO<sub>2</sub> from the Indian Ocean during late 1990s has been estimated to be ~164TgC.yr<sup>-1</sup> (Bhushan et al., 2000). The Bay of Bengal acts as sink of CO<sub>2</sub> with net uptake rate of atmospheric CO<sub>2</sub> by the entire basin has been estimated to ~9TgC.yr<sup>-1</sup>.

Keywords; Northern Indian Ocean, Bomb Radiocarbon,  $\Delta R$  Correction Value, Air-sea  $CO_2$  Exchange Rates

## References

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