

H.M. Stapleton, N.G. Dodder, J.R. Kucklick, C.M. Reddy, M.M. Schantz, P.R. Becker, F. Gulland, B.J. Porter, and S.A. Wise, *Determination of HBCD, PBDEs and MeO-BDEs in California sea lions (Zalophus californianus) stranded between 1993 and 2003*, Marine Pollution Bulletin, 2006; v52; 522-531.

Blubber samples from male California sea lions (*Zalophus californianus*) stranded between 1993 and 2003 were analyzed for 27 polybrominated diphenyl ether (PBDE) congeners, three isomers of hexabromocyclododecane (HBCD) and 14 methoxylated polybrominated diphenyl ether (MeO-BDE) congeners. Total PBDEs ranged from 450 ng/g to 4740 ng/g wet mass and total HBCD ranged from <0.3 ng/g to 12 ng/g wet mass. The concentration of HBCD increased from 0.7 ng/g to 12.0 ng/g wet mass in sea lion blubber between 1993 and 2003. However, no significant temporal trend was observed for any of the other brominated compounds over this 10 year period. Only one of the 14 MeO-BDE congeners was detected in the blubber samples, 6-methoxy-2,20,4,40-tetrabromodiphenyl ether (6-MeO-BDE 47), and concentrations ranged from <0.2 ng/g to 12 ng/g wet mass. A bromo-, chloro-heterocyclic compound, 1,10-dimethyl-tetrabromo-dichloro-2,20-bipyrrole (DBP-Br<sub>4</sub>Cl<sub>2</sub>), previously reported in marine species along the Pacific coast, was also identified in the sea lion blubber. DBP-Br<sub>4</sub>Cl<sub>2</sub> ranged from 44 ng/g wet mass to 660 ng/g wet mass and was present at concentrations rivaling the dominant PBDE congener, BDE 47 (2,20,4,40-tetrabromodiphenyl ether). Concentrations of DBP-Br<sub>4</sub>Cl<sub>2</sub> were positively correlated with 6-MeO-BDE 47 ( $r = 0.7$ ;  $p < 0.05$ ). Both of these compounds have been identified in marine algae and sponges, and studies suggest they are both produced from natural sources. This study demonstrates that brominated compounds from both anthropogenic and biogenic sources can accumulate to similar levels in marine mammals. In addition, HBCD concentrations appear to be increasing in California sea lion populations, whereas PBDE concentrations, between 1993 and 2003, were highly variable.