Supplementary material for "Continuing ^{137}Cs release to the sea from the Fukushima Dai-ichi Nuclear Power Plant through 2012" by J. Kanda (bg-2012-692)

Estimate of harbour volume

In a press release document of TEPCO which is cited in the manuscript (TEPCO, 2011), following values are given in a tabulated form

Concentration of radioactive material (Bq/L)

	A: Main harbour	B: U1-4 intake canal	Whole harbour (A+B)
Iodine-131	10	42	15
Cesium-134	180	616	255
Cesium-137	180	667	264

It is noted that the main harbour (A) includes the Unit 5-6 intake canal and corresponds to an area surrounded by blue line in a map (the map redrawn as Figure 1a in the paper).   It is also noted that the values for column A were obtained at the unloading dock (ULD) and the values for column B were derived as "volume-weighted average within the Unit 1-4 intake canal" during the period from 4 to 8 July 2011.   The values of the column for the whole harbour (A+B) are "concentrations at ULD assuming all the seawater of B is diffused in to the main harbour (A)".   By my back calculation, the values of the A+B column should have used a relative volume of 82.8 for the main harbour (A), and a relative volume of 17.2 for the Unit 1-4 intake canal (B), respectively, assuming the volume of the whole harbour to be 100.

The document then gives following values.

Amount of radioactive material within the harbour

Iodine-131	3.5×10^{10} Bq
Cesium-134	5.8×10^{11} Bq
Cesium-137	6.0×10^{11} Bq

By dividing these values by concentrations given in the A+B column above, one could obtain a value for the volume of the harbour.   As the underlined sentence in the above paragraph is rather confusing, the obtained volume could be either a value for the whole harbour (A+B) or a value for the main harbour (A).   With values of the area and the water-depth of the harbour (see text in the

manuscript), I assumed the obtained volume is for the whole harbour (A+B).   The volume of the main harbour would be then 1.88×10^6 m^3.

Reference

TEPCO (Tokyo Electric Power Company): Press release document on 11 July 2011 (in Japanese), http://www.tepco.co.jp/cc/press/betu11_j/images/110711k.pdf, 2011.