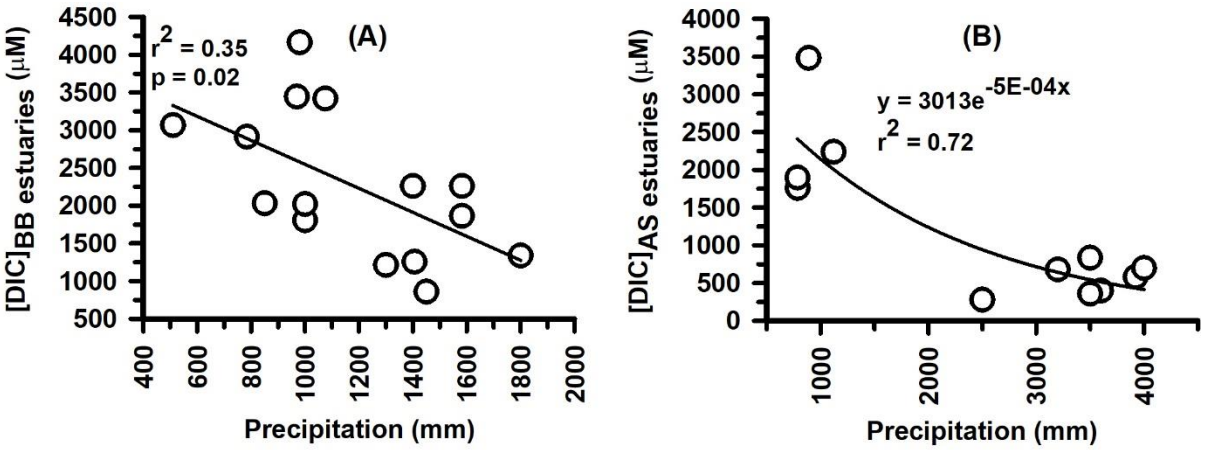


Fig.S1: The DIC – precipitation relationship in the (A) BB estuaries, and (B) AS estuaries during the wet season.

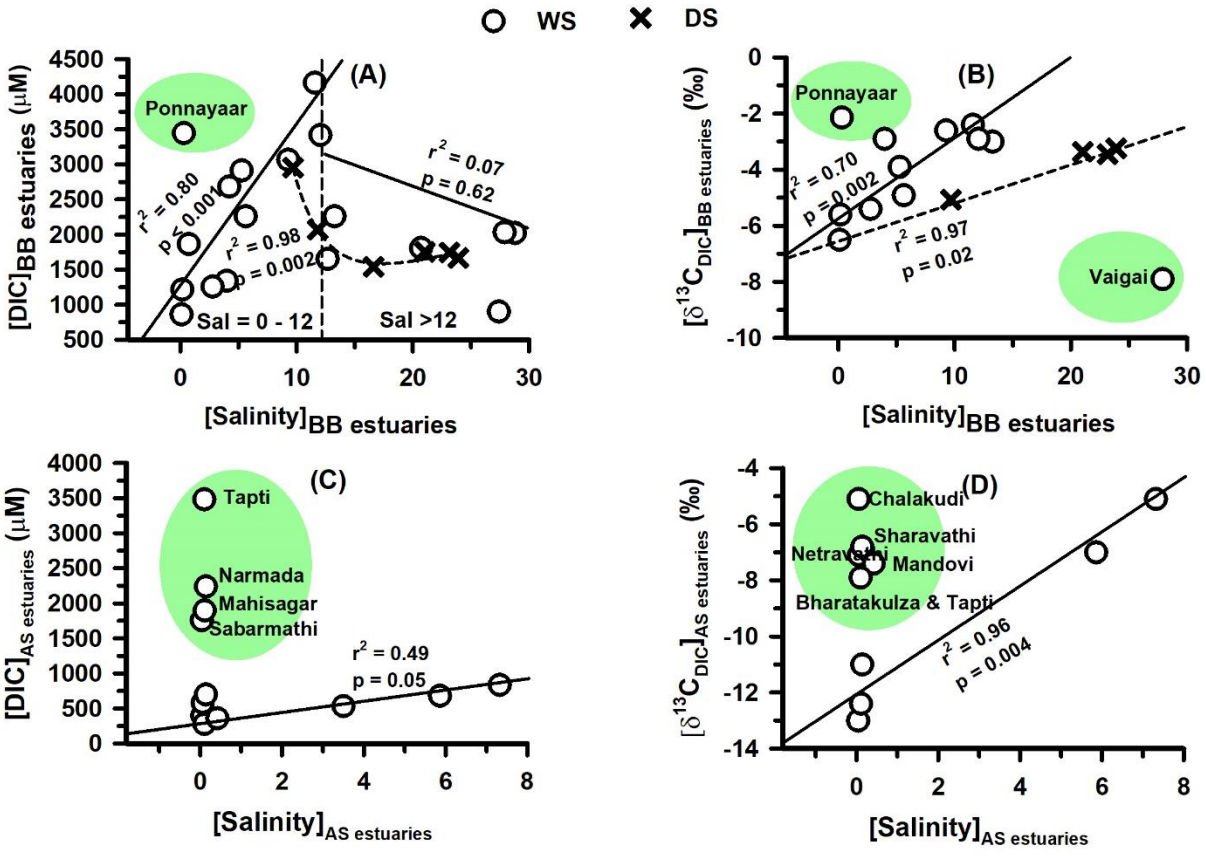


Fig. S2: (A) DIC – salinity in the BB estuaries, (B) $\delta^{13}C_{DIC}$ – salinity in the BB estuaries, (C) DIC – salinity in the AS estuaries, (B) $\delta^{13}C_{DIC}$ – salinity in the AS estuaries. The marked estuaries were excluded for the data analysis. WS = wet season; DS = dry season.

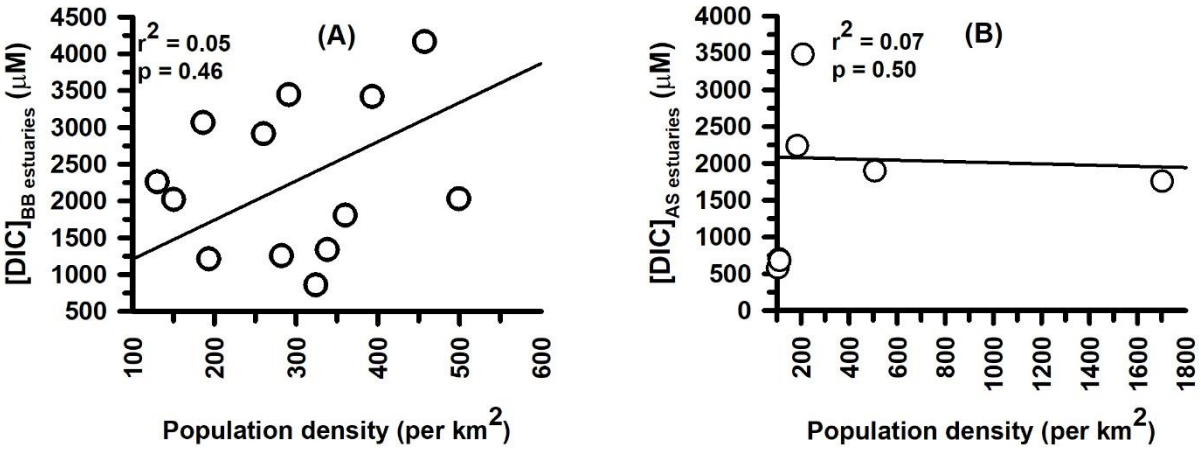


Fig. S3: The DIC – population density relationship for the (A) BB estuaries, (B) AS estuaries during the wet season.

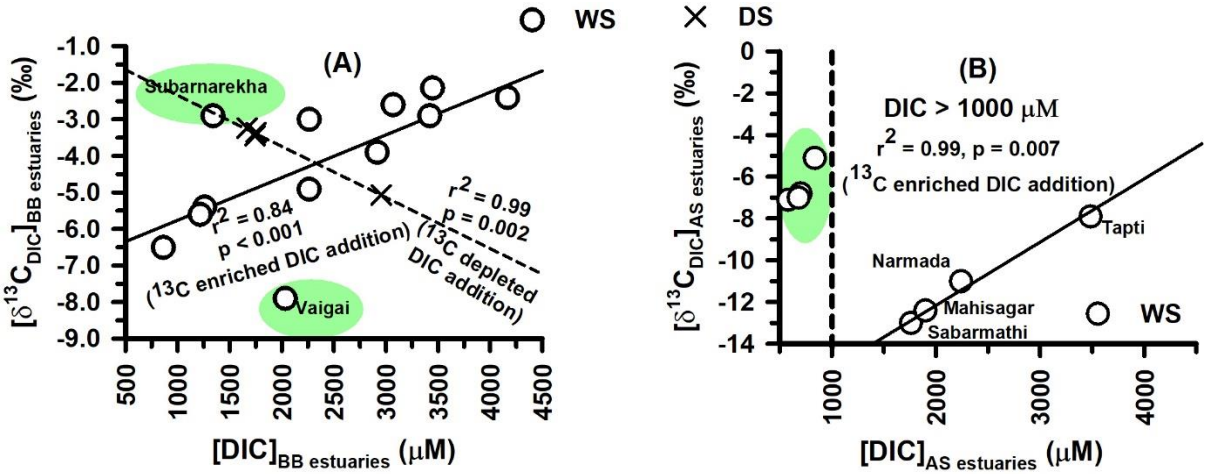


Fig. S4: The $\delta^{13}C_{DIC}$ – DIC in the (A) BB estuaries (B) AS estuaries. The marked estuaries were excluded for the data analysis. WS = wet season; DS = dry season.

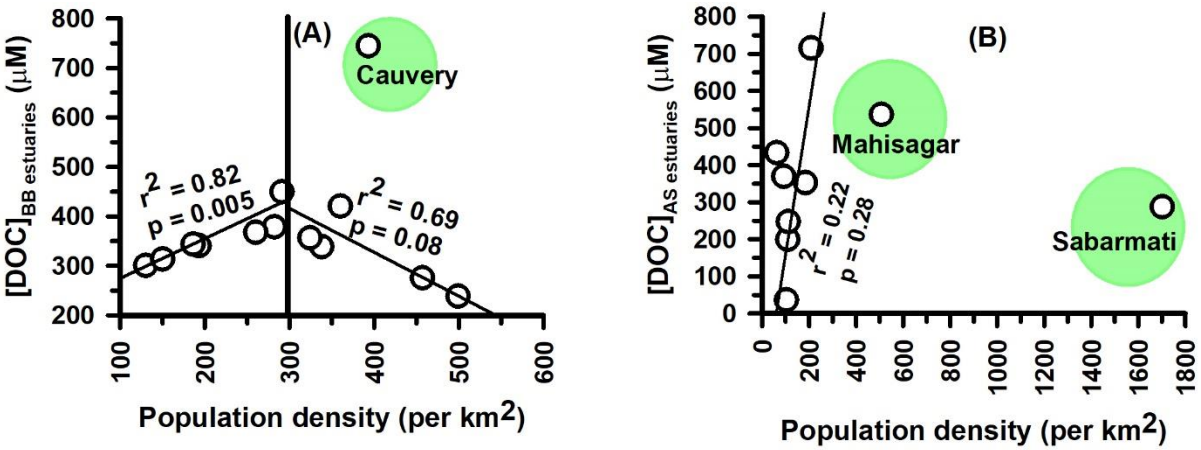


Fig.S5: The DOC – population density relationship in the (A) BB estuaries, (B) AS estuaries during the wet season. The marked estuaries were excluded for the data analysis.

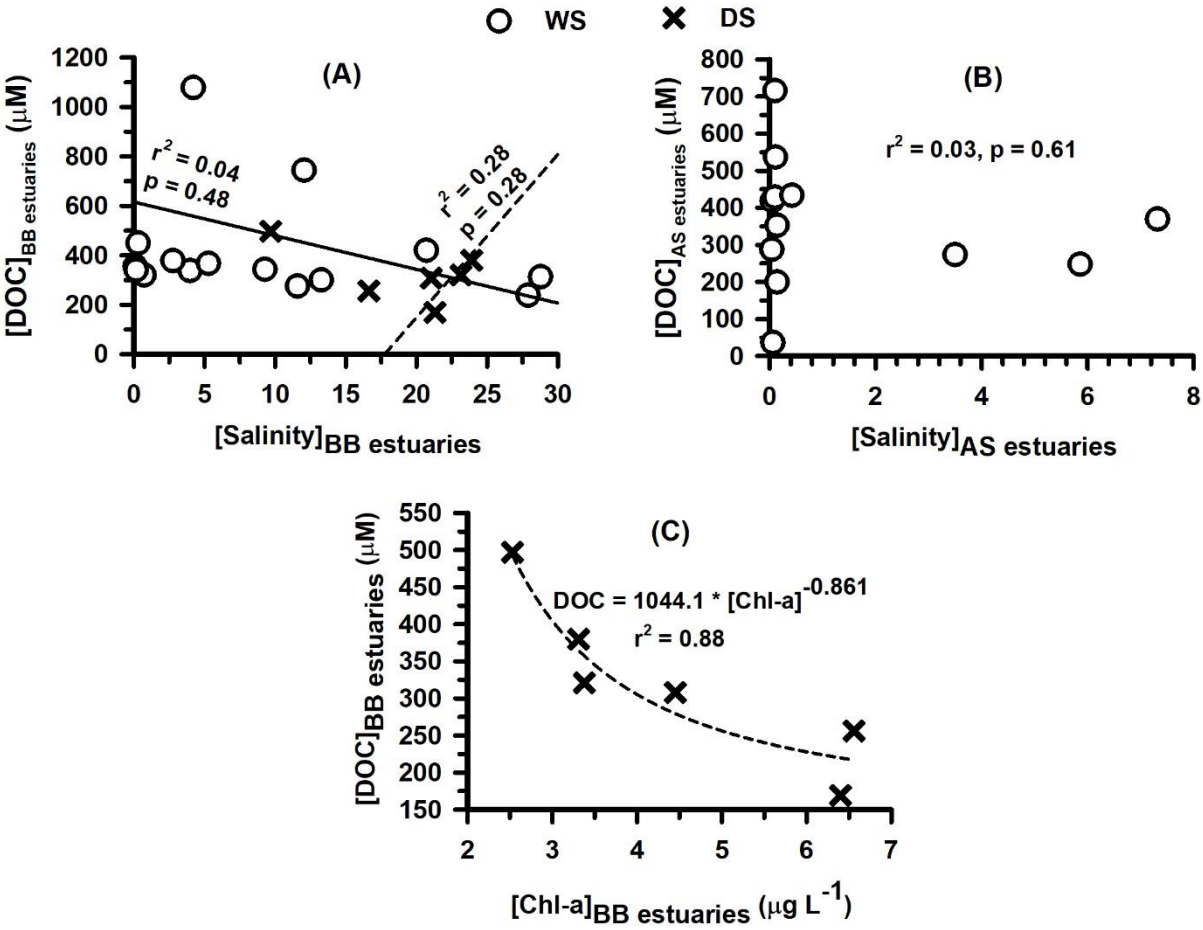


Fig.S6: (A) DOC – salinity relationship in BB estuaries, (B) DOC – salinity relationship in AS estuaries, (C) DOC – Chl – a relationship in the BB estuaries during the dry season. WS = wet season; DS = dry season.

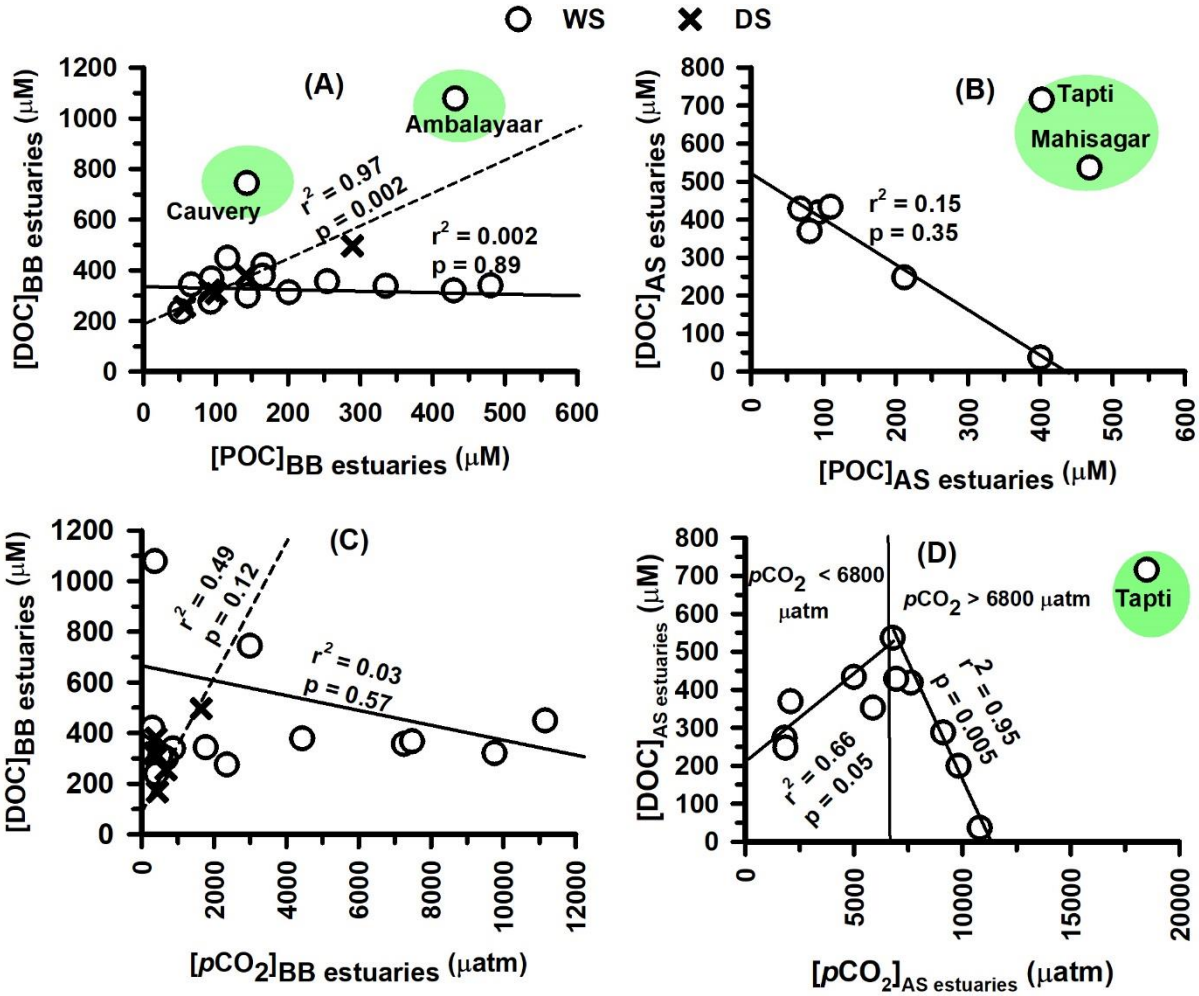


Fig.S7: (A) DOC – POC relationship in the BB estuaries, (C) DOC – POC relationship in the AS estuaries, (D) DOC – pCO_2 relationship in the BB estuaries, and (E) DOC – pCO_2 relationship in the AS estuaries. The marked estuaries were excluded for the data analysis. WS = wet season; DS = dry season.

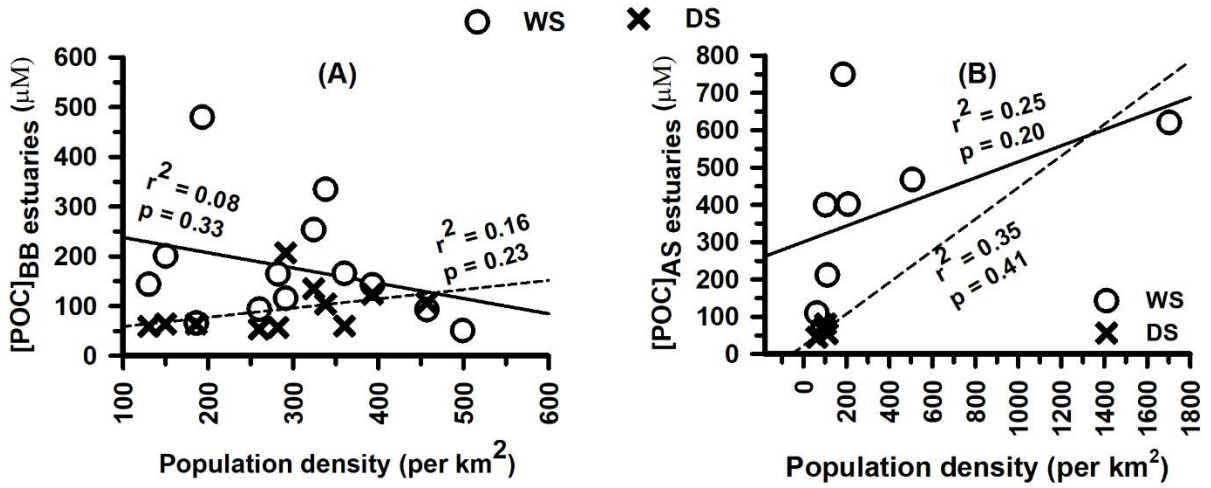


Fig. S8: The POC – population relationship in the (A) BB, (B) AS estuaries. WS = wet season; DS = dry season.

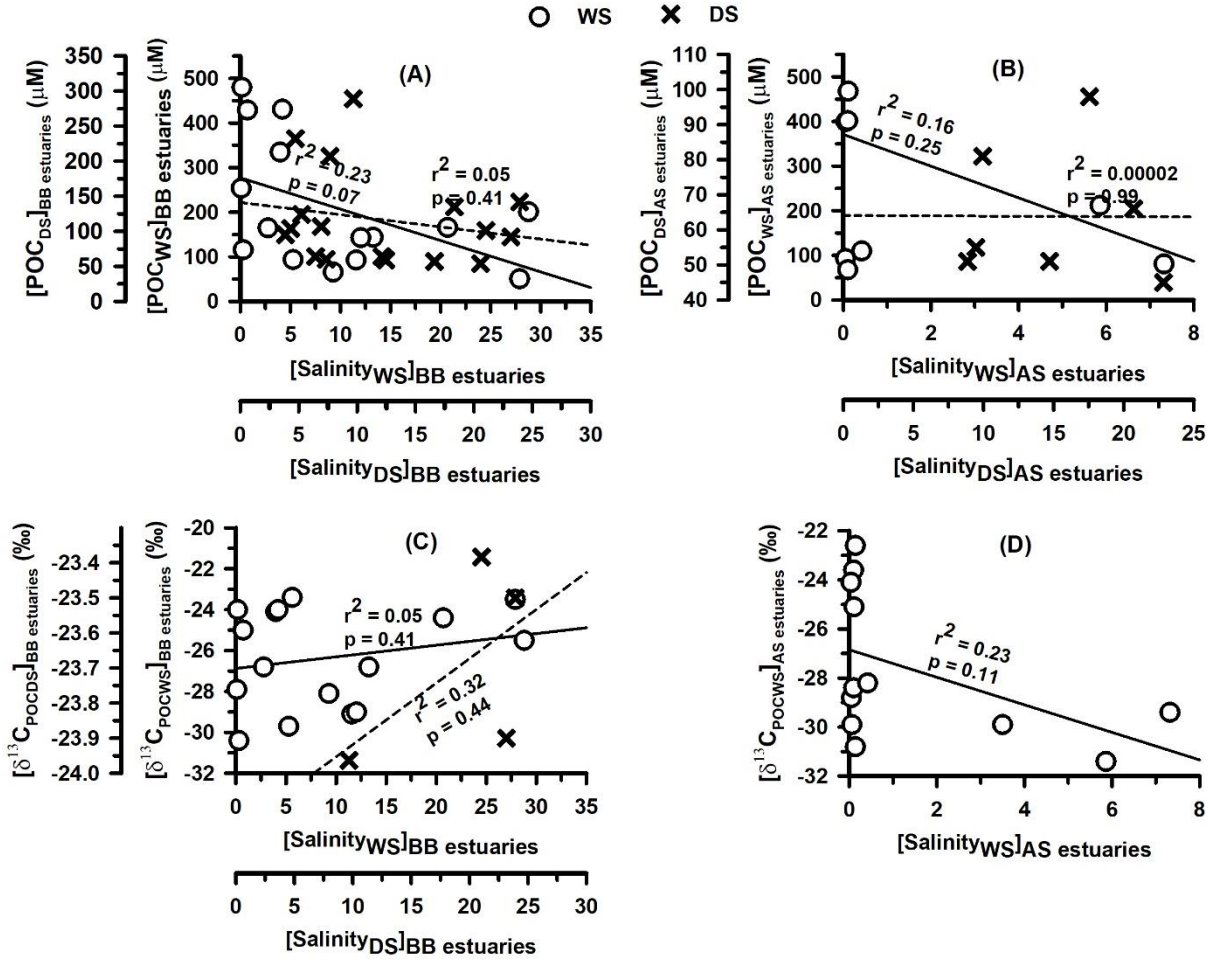
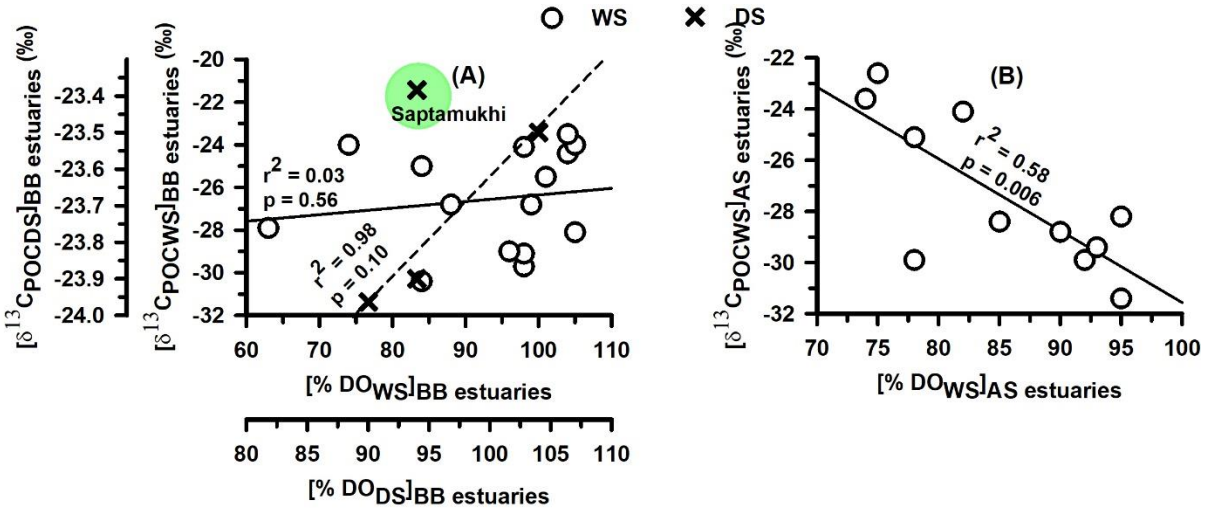


Fig. S9: (A) POC – salinity in the BB estuaries, (B) POC – salinity in the AS estuaries, (C) $\delta^{13}C_{POC}$ – salinity in the BB estuaries, (D) $\delta^{13}C_{POC}$ – salinity in the AS estuaries. WS = wet season; DS = dry season.



38

39 Fig.S10: $\delta^{13}C_{POC}$ – %DO relationships in the (A) BB, and (B) AS estuaries. The marked
40 estuaries were excluded for the data analysis. WS = wet season; DS = dry season.

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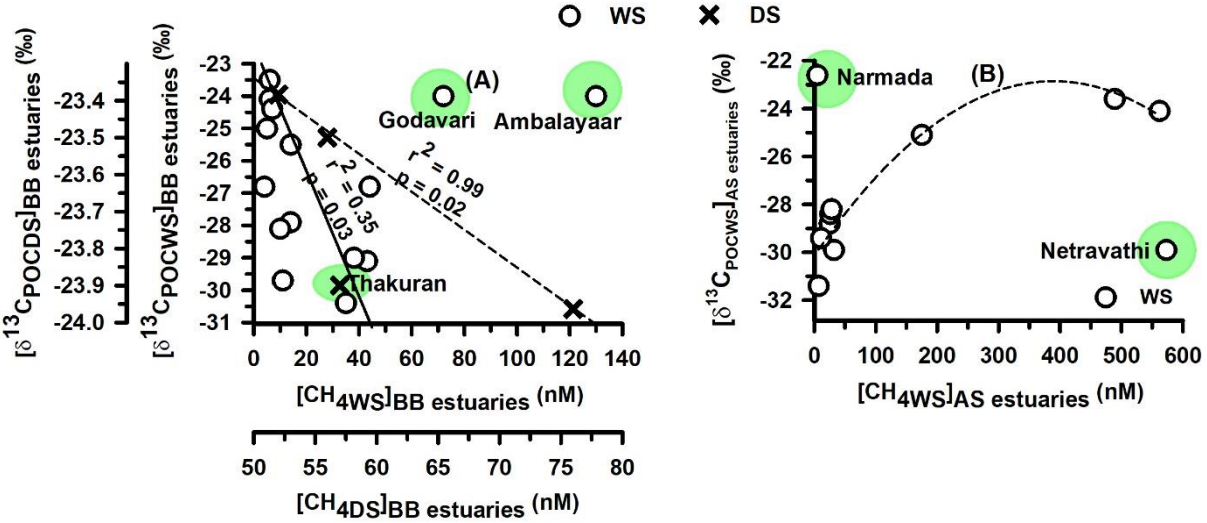

42

43 Fig.S11: $\delta^{13}C_{POC}$ – CH_4 relationships in the (A) BB, and (B) AS estuaries. The marked estuaries
44 were excluded for the data analysis. WS = wet season; DS = dry season.

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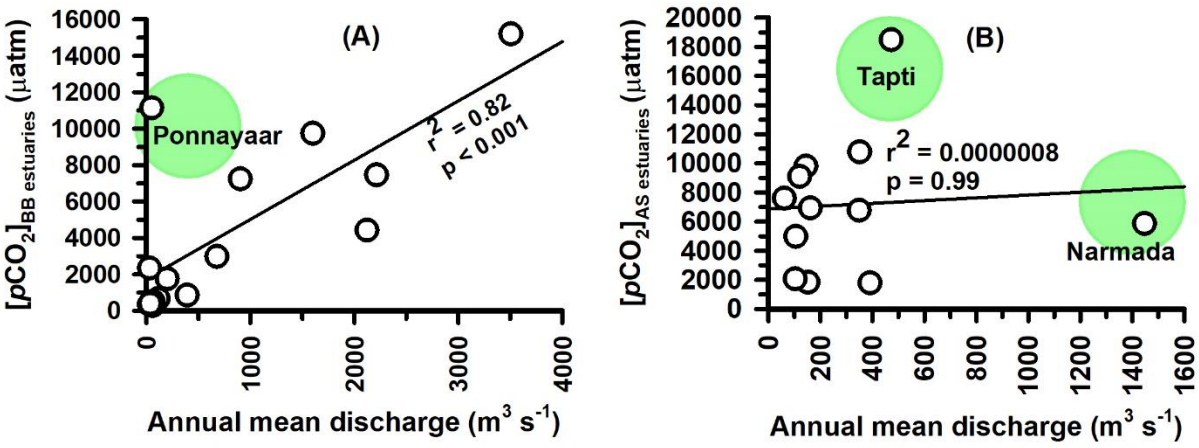


Fig.S12: The pCO_2 – discharge relationship in the (A) BB, and (B) AS estuaries during the wet season. The marked estuaries were excluded for the data analysis.

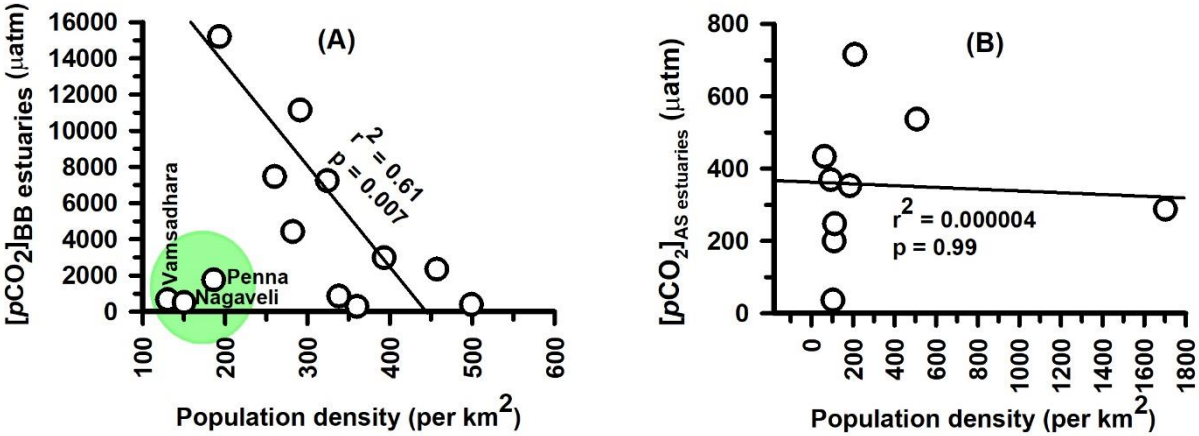
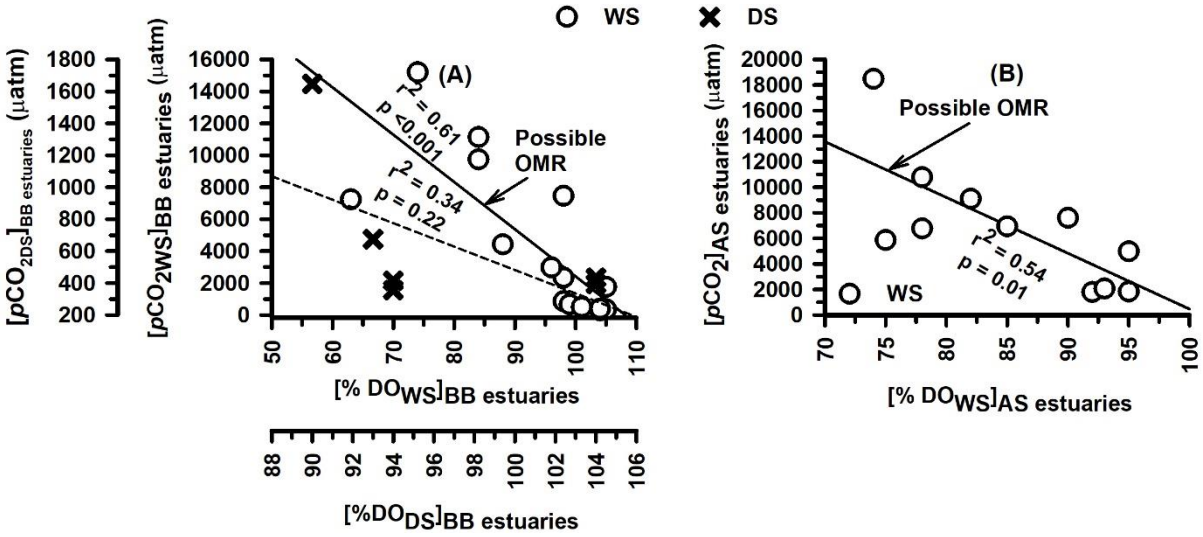


Fig.S13: The pCO_2 – population density relationship in the (A) BB, and (B) AS estuaries during the wet season. The marked estuaries were excluded for the data analysis.



57

58 Fig.S14: The pCO_2 - %DO relationship for the (A) BB, and (B) AS estuaries. WS = wet season;
59 DS = dry season; OMR = organic matter respiration

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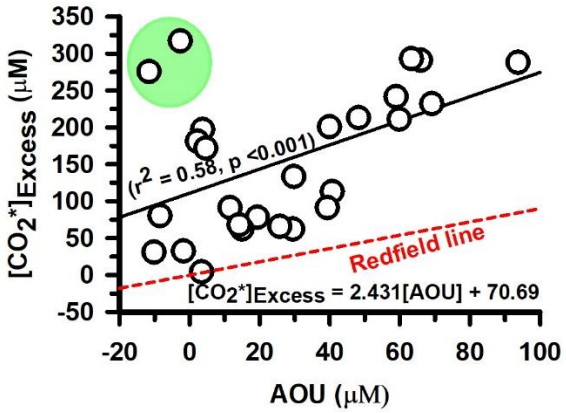


61

62 Fig.S15: The $[CO_2*]_{Excess}$ – AOU relationship for the Indian major rivers during the wet season.
63 The marked estuaries were excluded for the data analysis.

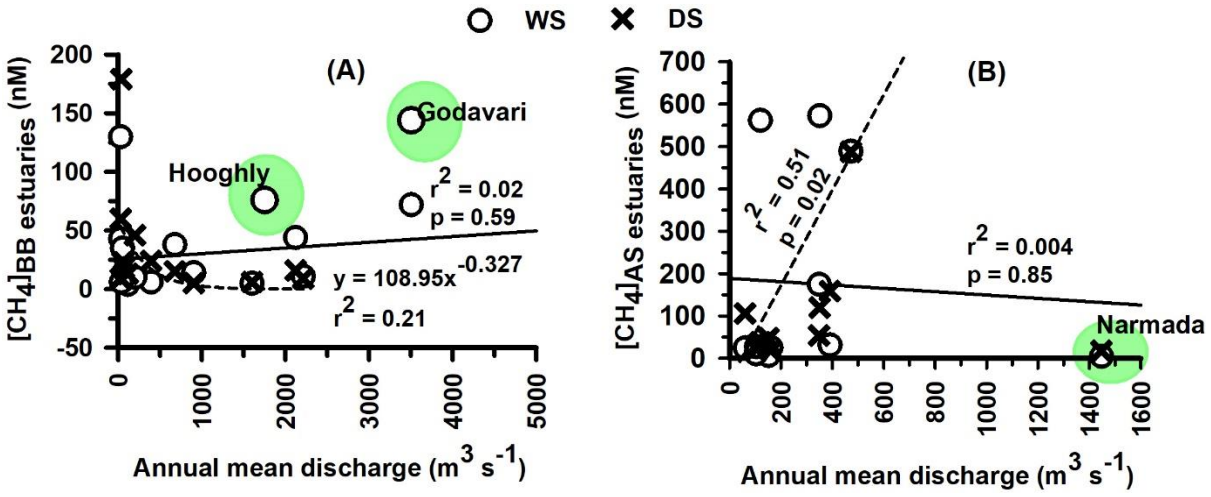


Fig.S16: The CH_4 – discharge relationships in the (A) BB, and (B) AS estuaries. The marked estuaries were excluded for the data analysis. WS = wet season; DS = dry season.

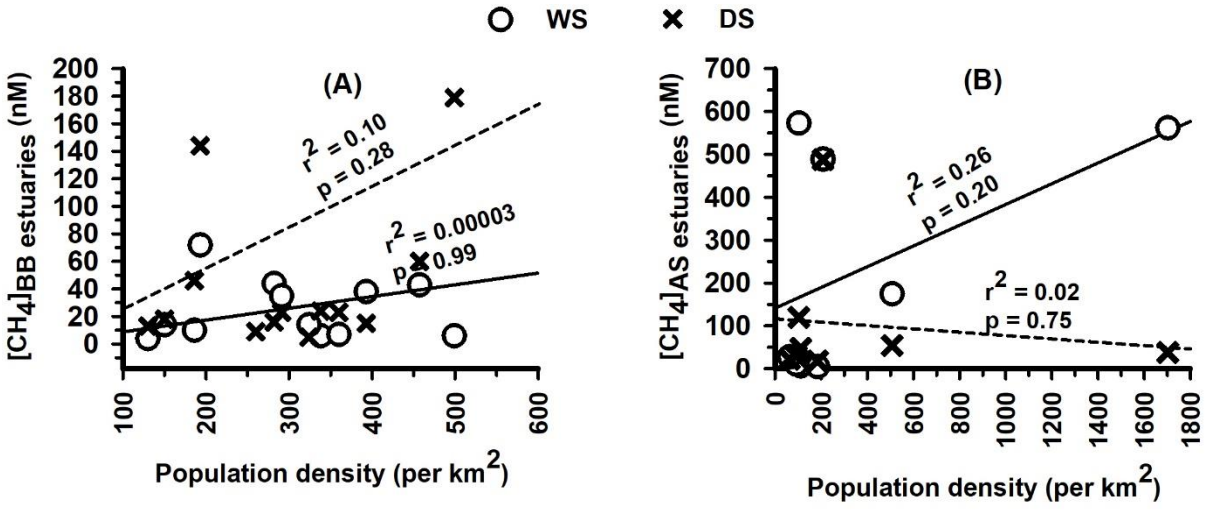
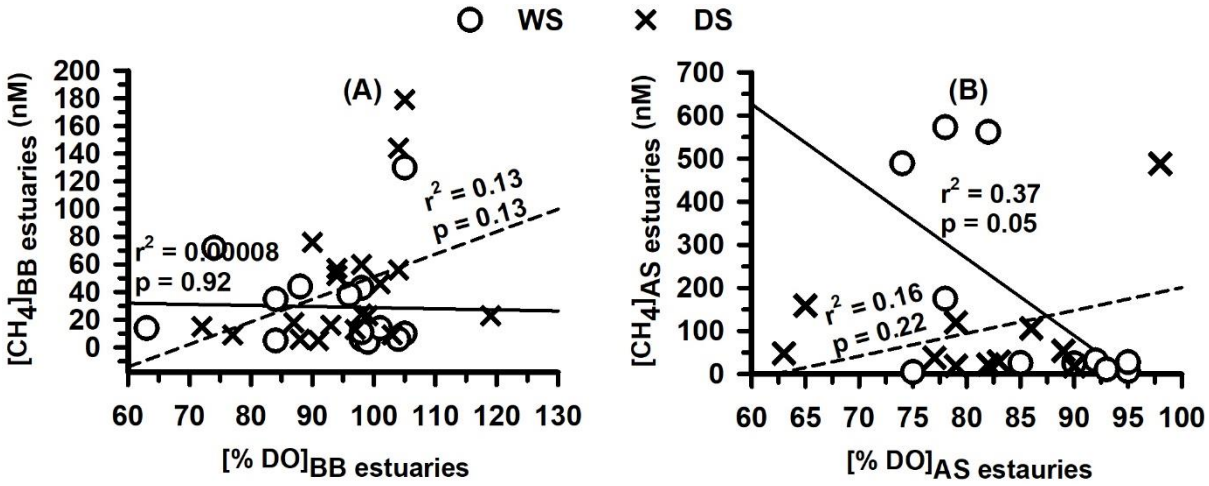


Fig.S17: The CH_4 – population density relationships in the (A) BB, and (B) AS estuaries. WS = wet season; DS = dry season.



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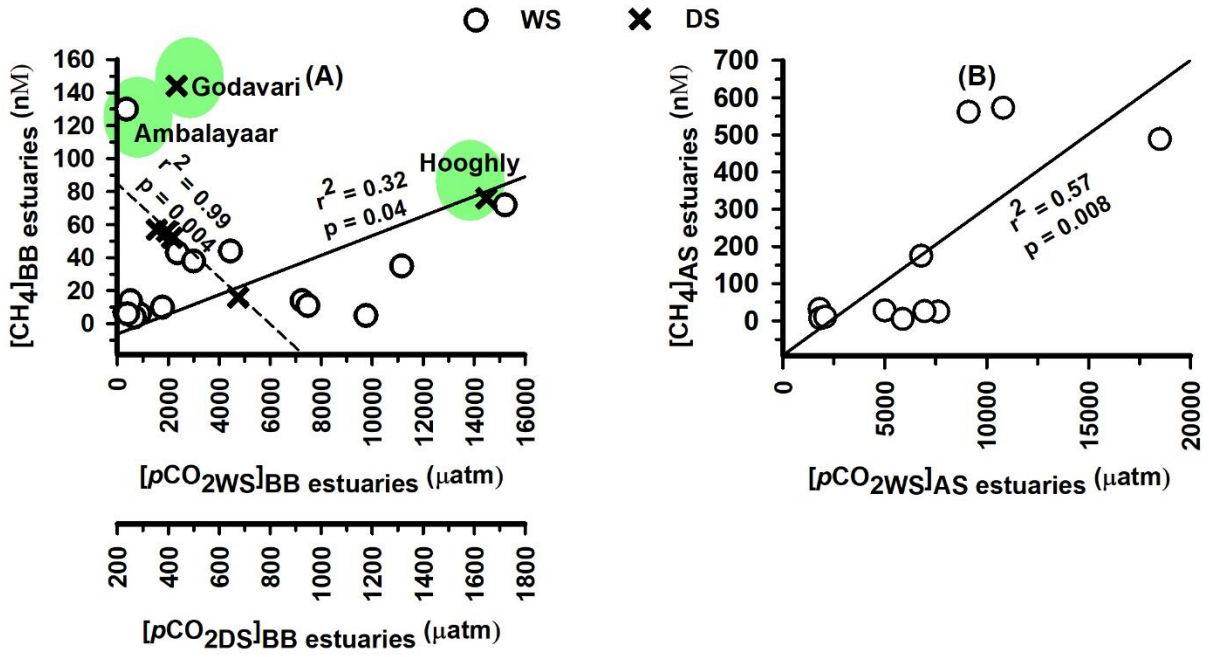
72 Fig.S18: The CH_4 – %DO relationships in the (A) BB, and (B) AS estuaries. WS = wet season;
73 DS = dry season.



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75 Fig. S19: The pCO_2 – CH_4 relationship in the (A) BB, and (B) AS estuaries. The marked
76 estuaries were excluded for the data analysis. WS = wet season; DS = dry season.

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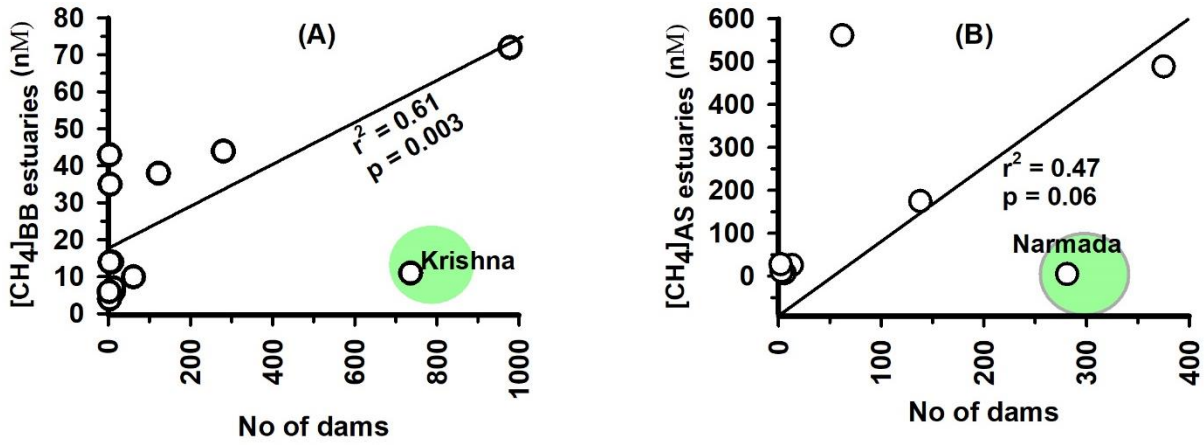

Fig. S20: The CH_4 – No of dams' relationship in the (A) BB, and (B) AS estuaries during the wet season. The marked estuaries were excluded for the data analysis.