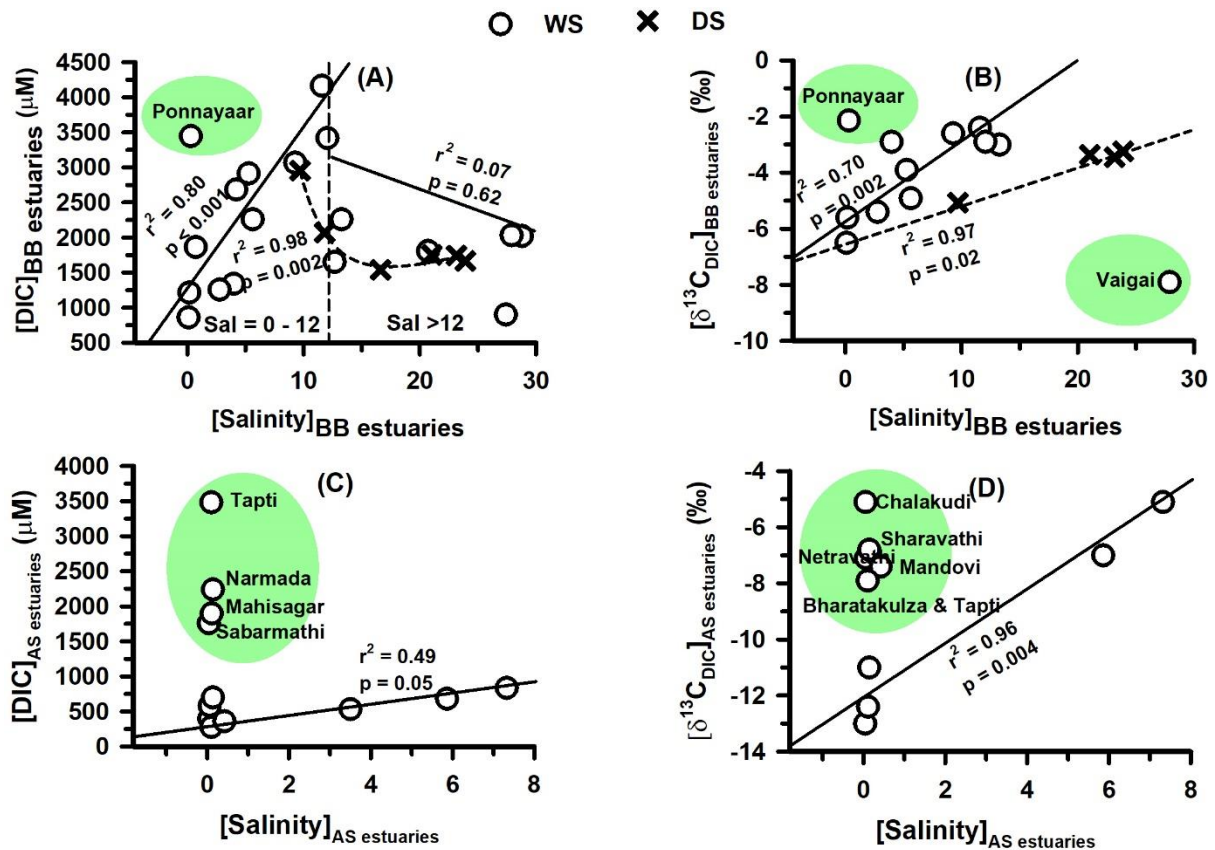


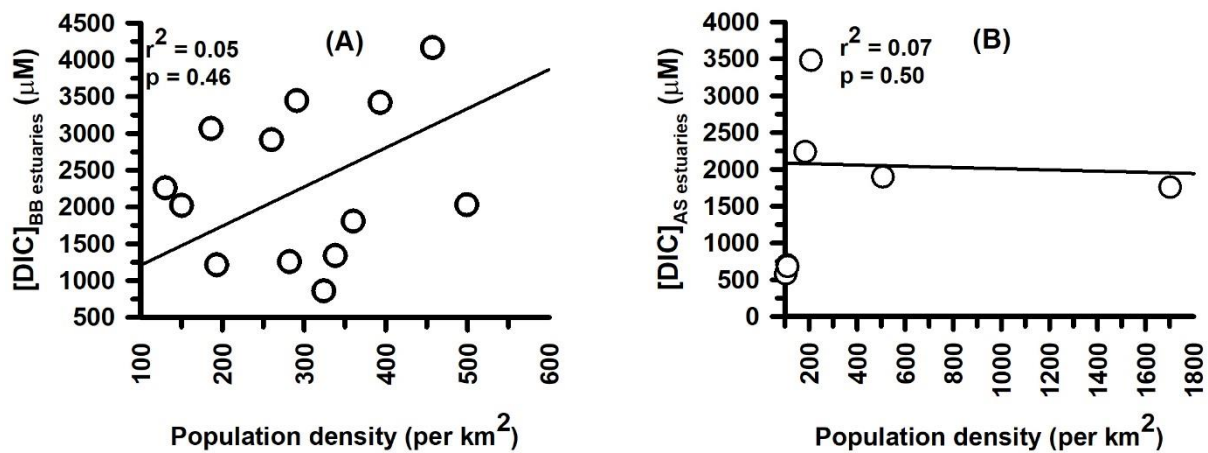
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Fig.S1: The DIC – precipitation relationship in the (A) BB estuaries, and (B) AS estuaries during the wet season.



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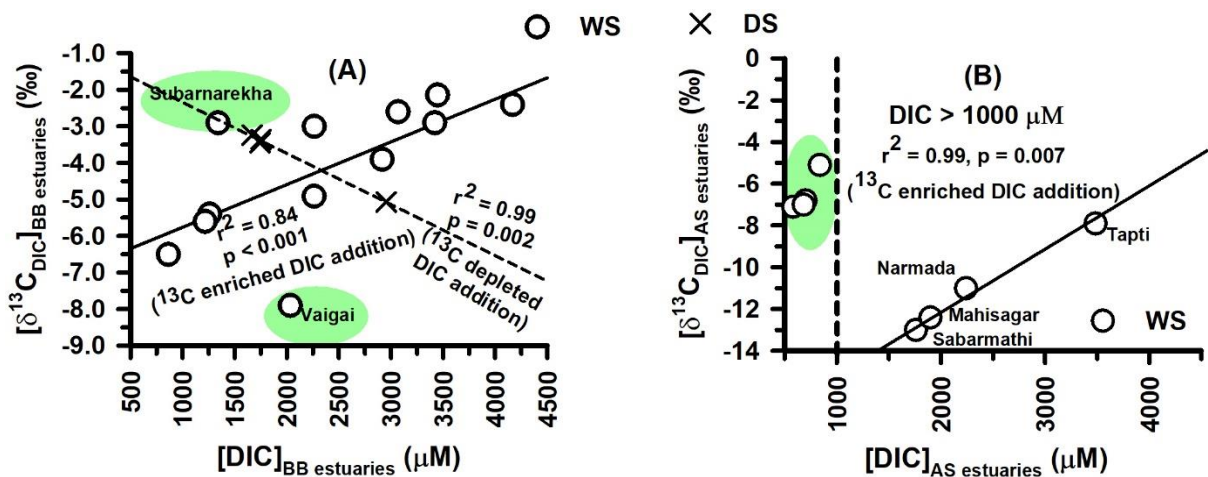
Fig. S2: (A) DIC – salinity in the BB estuaries, (B) $\delta^{13}\text{C}_{\text{DIC}}$ – salinity in the BB estuaries, (C) DIC – salinity in the AS estuaries, (B) $\delta^{13}\text{C}_{\text{DIC}}$ – salinity in the AS estuaries. The marked estuaries were excluded for the data analysis. WS = wet season;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



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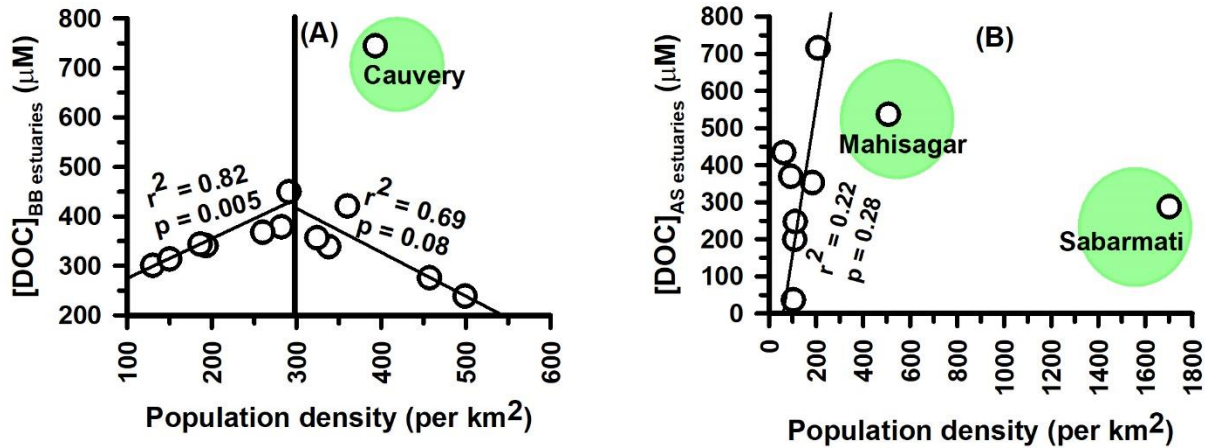
12 Fig. S3: The DIC – population density relationship for the (A) BB estuaries, (B) AS estuaries
 13 during the wet season.

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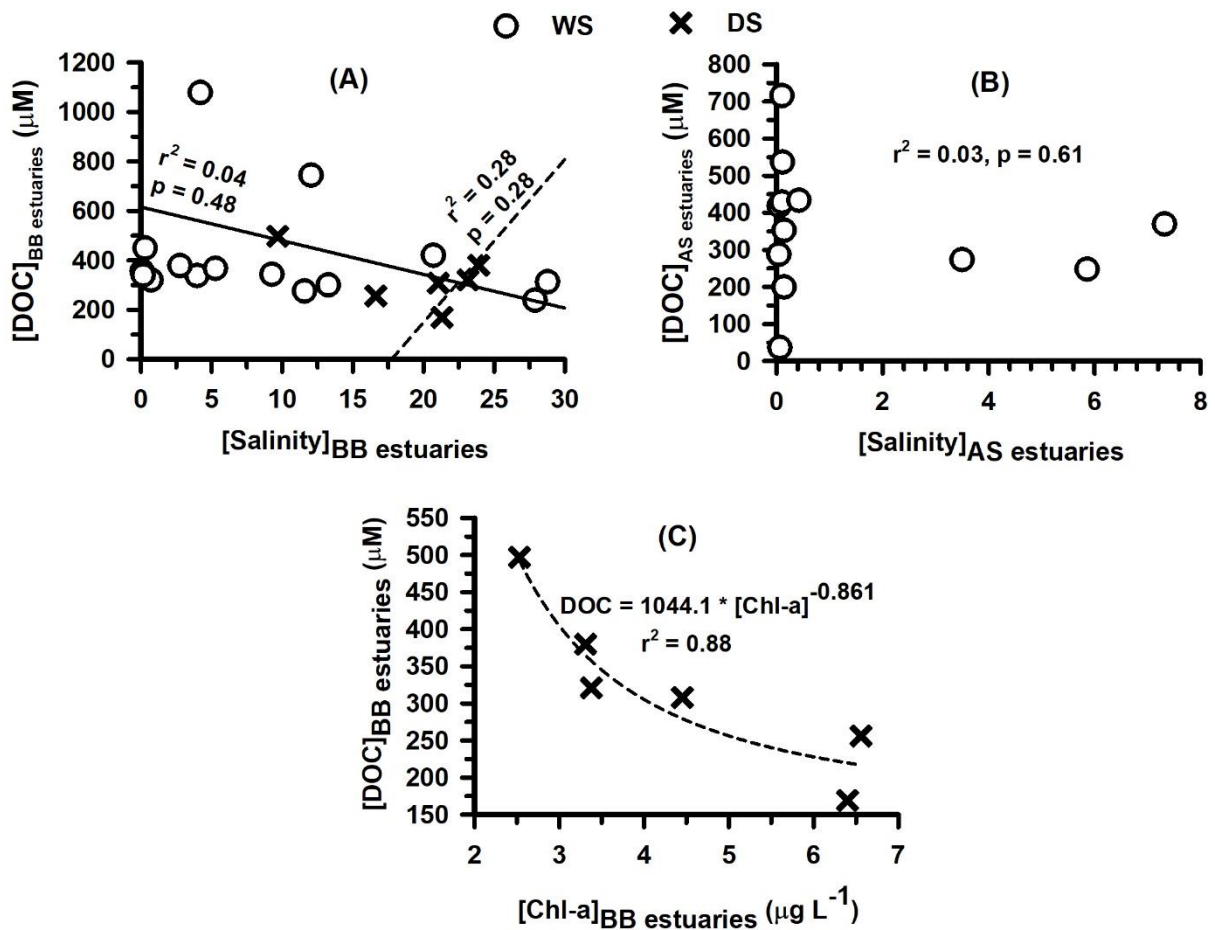
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16 Fig. S4: The $\delta^{13}C_{DIC}$ – DIC in the (A) BB estuaries (B) AS estuaries. The marked estuaries
 17 were excluded for the data analysis. WS = wet season; DS = dry season.



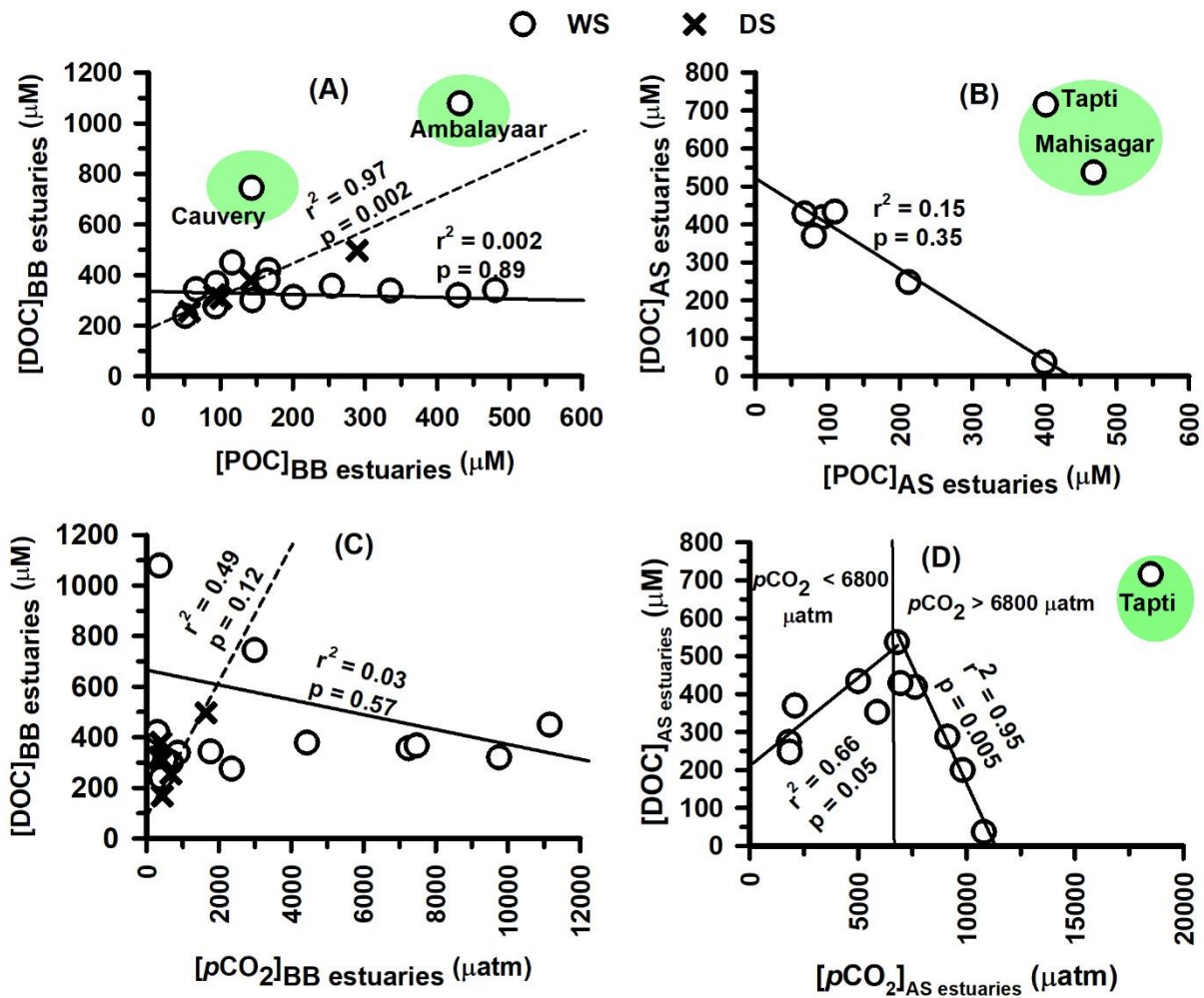
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19 Fig.S5: The DOC – population density relationship in the (A) BB estuaries, (B) AS estuaries
 20 during the wet season. The marked estuaries were excluded for the data analysis.



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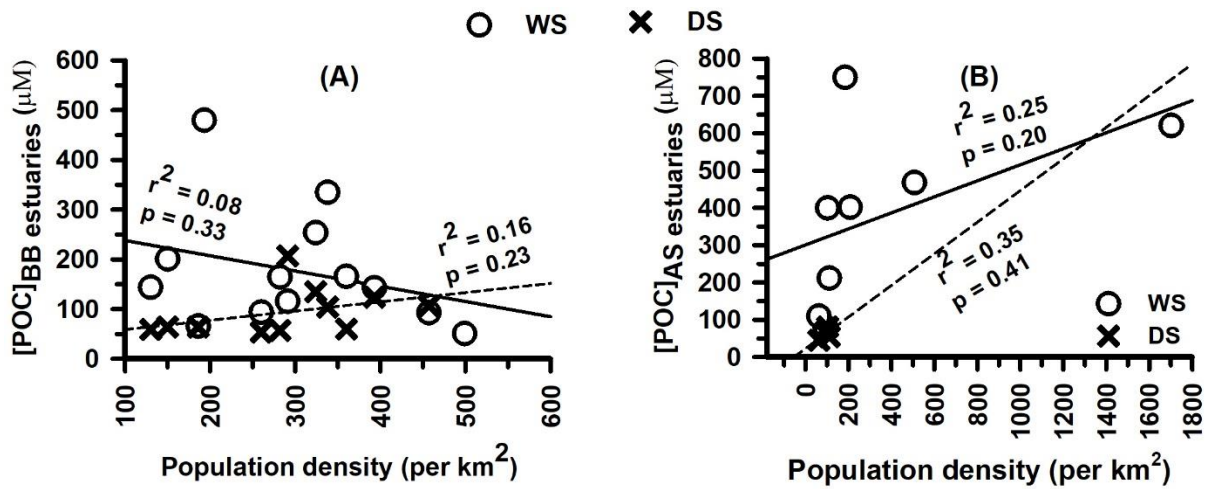
22 Fig.S6: (A) DOC – salinity relationship in BB estuaries, (B) DOC – salinity relationship in AS
 23 estuaries, (C) DOC – Chl – a relationship in the BB estuaries during the dry season. WS = wet
 24 season; DS = dry season.



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26 Fig.S7: (A) DOC – POC relationship in the BB estuaries, (C) DOC – POC relationship in the
 27 AS estuaries, (D) DOC – $p\text{CO}_2$ relationship in the BB estuaries, and (E) DOC – $p\text{CO}_2$
 28 relationship in the AS estuaries. The marked estuaries were excluded for the data analysis. WS
 29 = wet season; DS = dry season.

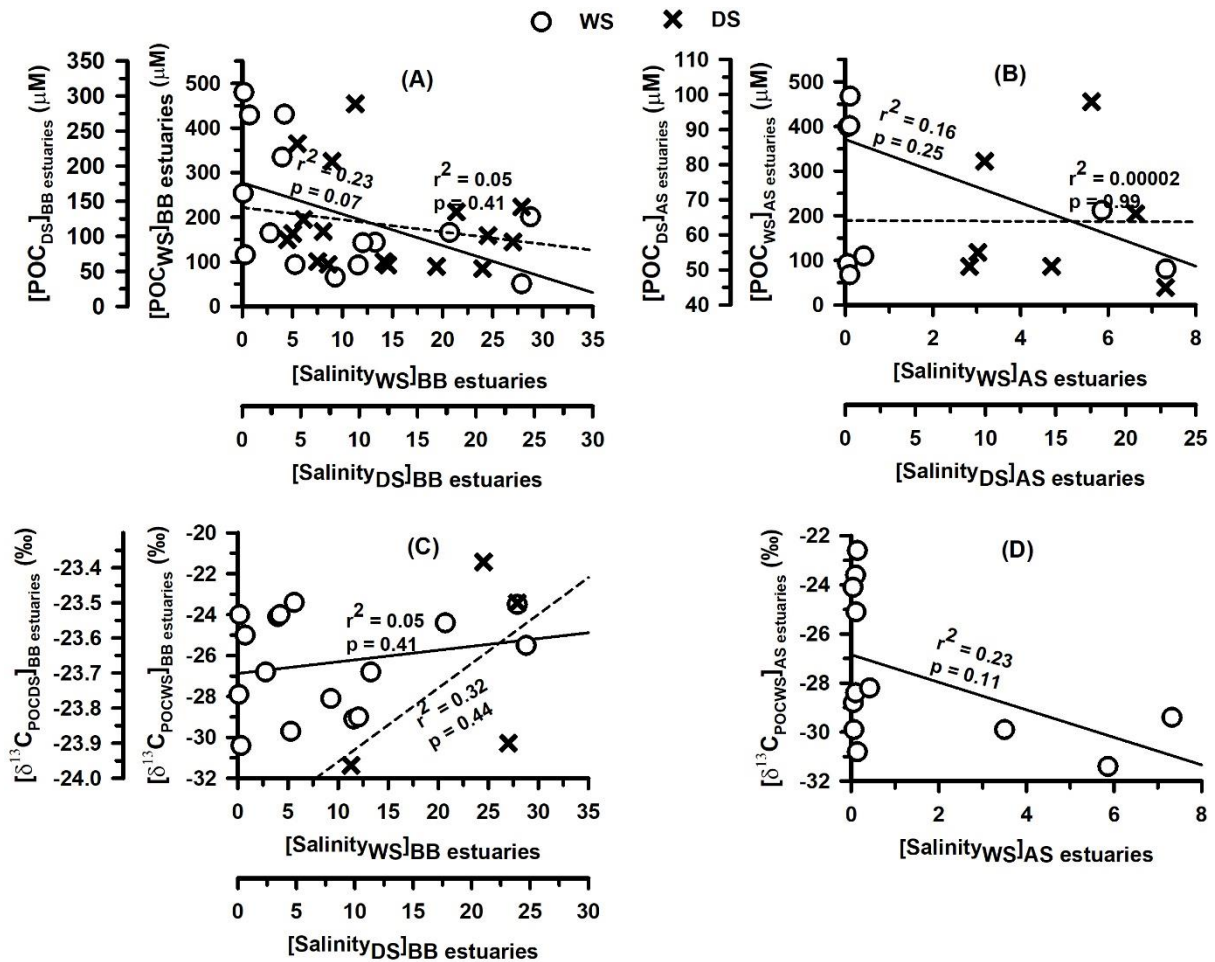
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32 Fig. S8: The POC – population relationship in the (A) BB, (B) AS estuaries. WS = wet season;

33 DS = dry season.

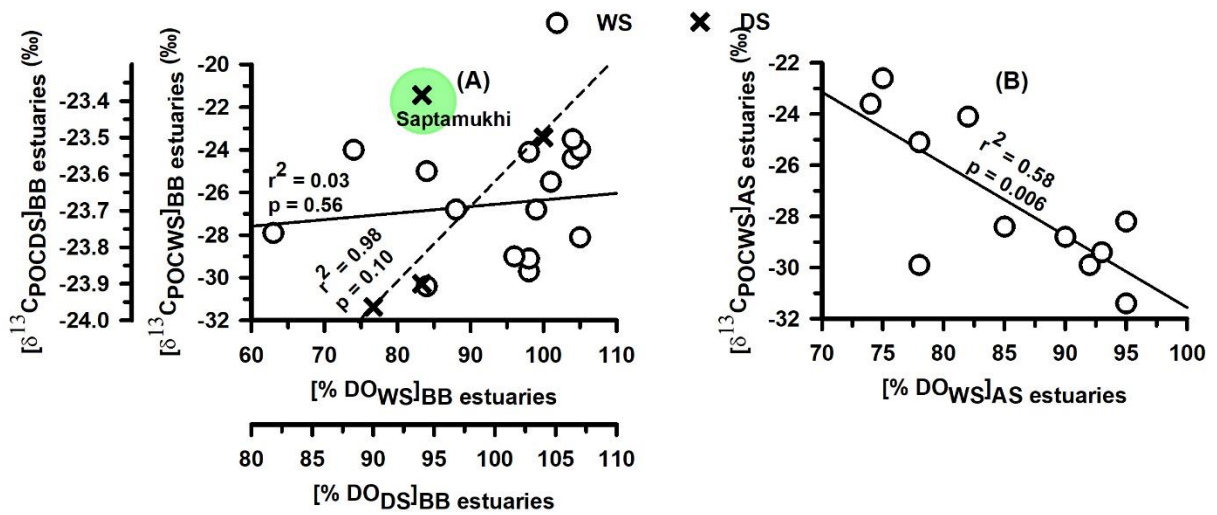


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35 Fig. S9: (A) POC – salinity in the BB estuaries, (B) POC – salinity in the AS estuaries, (C)

36 $\delta^{13}\text{C}_{\text{POC}}$ – salinity in the BB estuaries, (D) $\delta^{13}\text{C}_{\text{POC}}$ – salinity in the AS estuaries. WS = wet

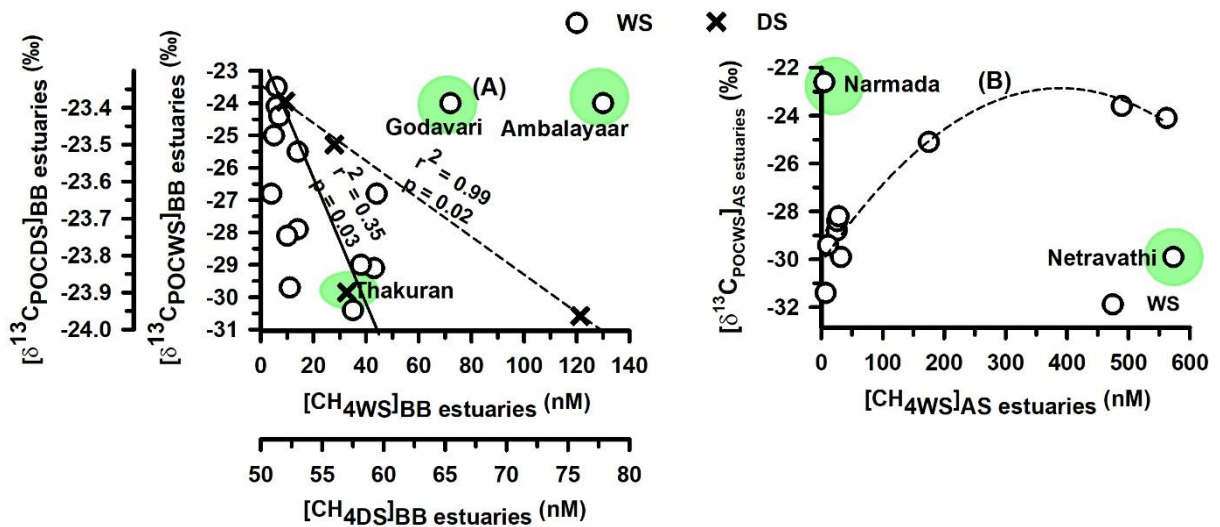
37 season; DS = dry season.



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39 Fig.S10: $\delta^{13}\text{C}_{\text{POC}}$ – %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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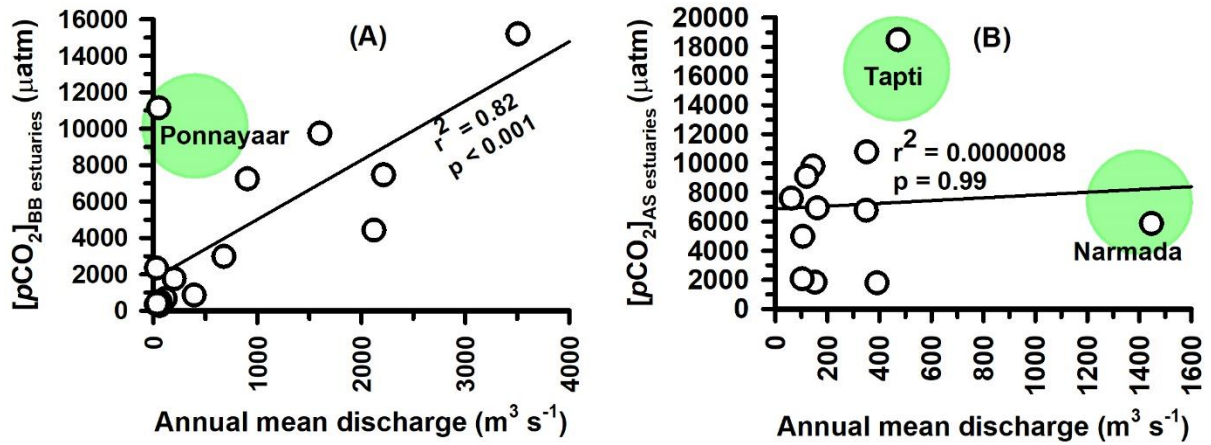
43 Fig.S11: $\delta^{13}\text{C}_{\text{POC}}$ – CH_4 relationships in the (A) BB, and (B) AS estuaries. The marked estuaries
44 were excluded for the data analysis. WS = wet season; DS = dry season.

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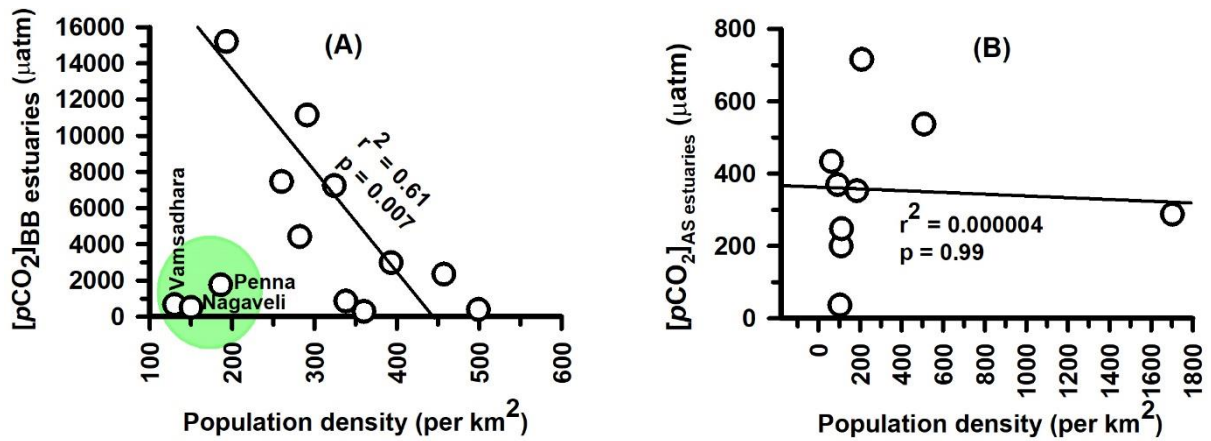
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50 Fig.S12: The $p\text{CO}_2$ – discharge relationship in the (A) BB, and (B) AS estuaries during the wet
 51 season. The marked estuaries were excluded for the data analysis.

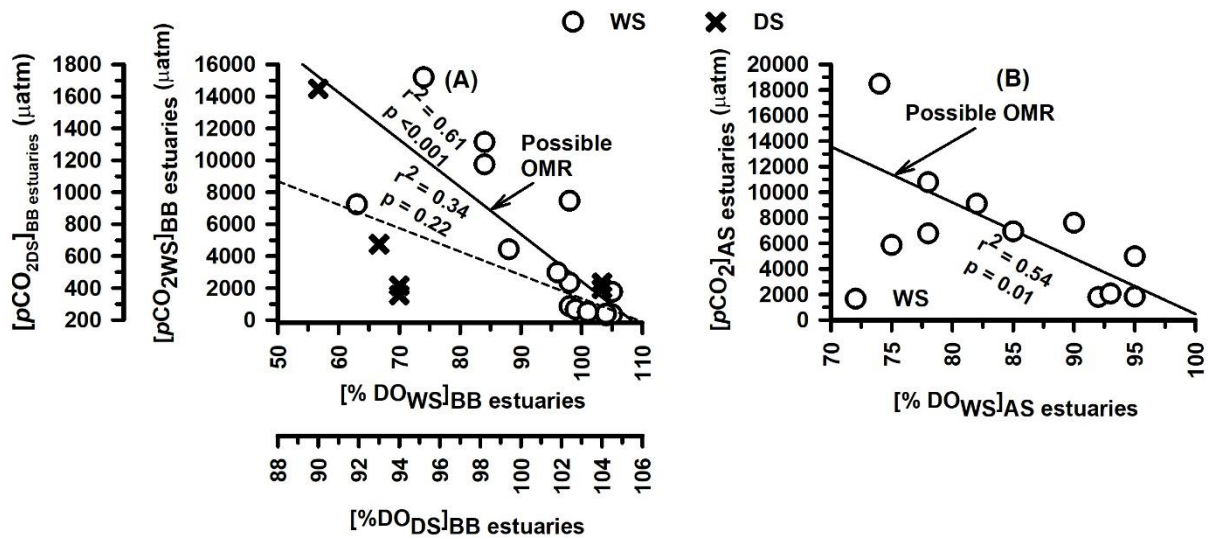
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54 Fig.S13: The $p\text{CO}_2$ – population density relationship in the (A) BB, and (B) AS estuaries during
 55 the wet season. The marked estuaries were excluded for the data analysis.

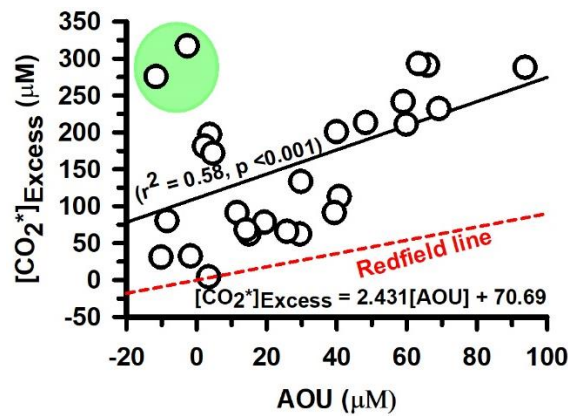
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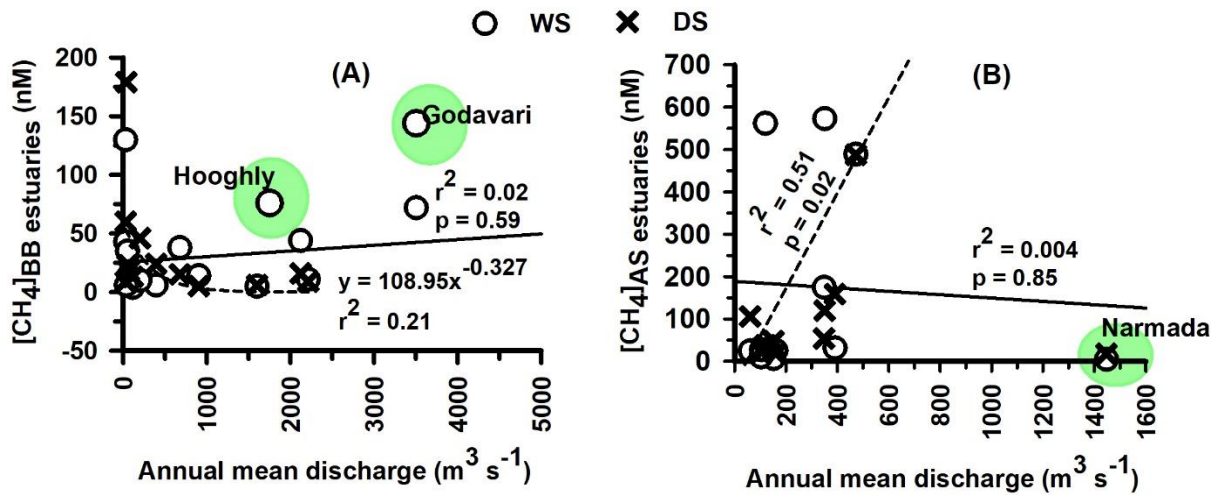
58 Fig.S14: The $p\text{CO}_2$ - %DO relationship for the (A) BB, and (B) AS estuaries. WS = wet season;
 59 DS = dry season; OMR = organic matter respiration

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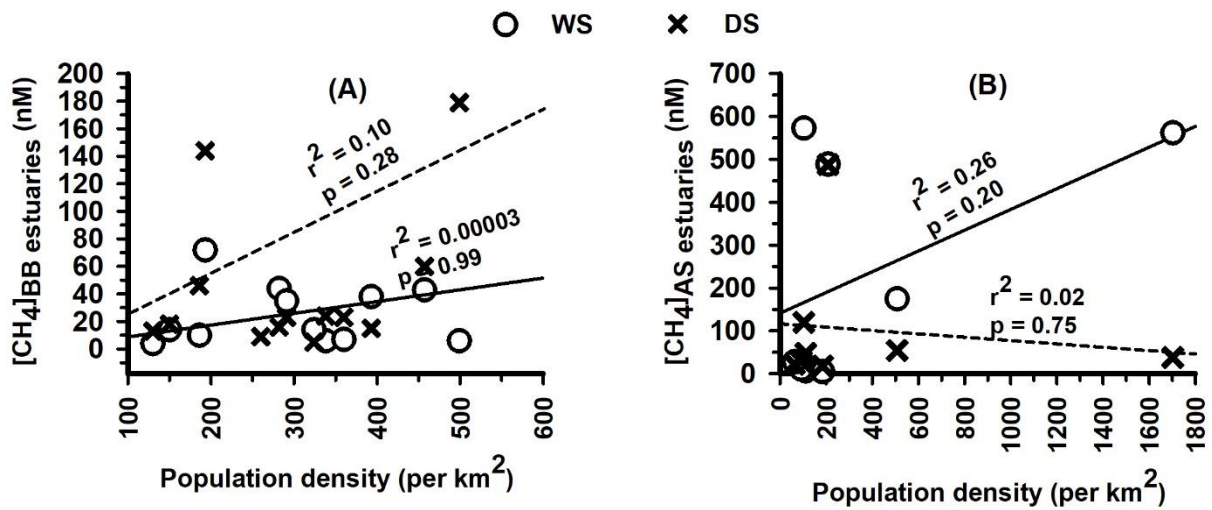
62 Fig.S15: The $[\text{CO}_2^*]_{\text{Excess}}$ – AOU relationship for the Indian major rivers during the wet season.
 63 The marked estuaries were excluded for the data analysis.



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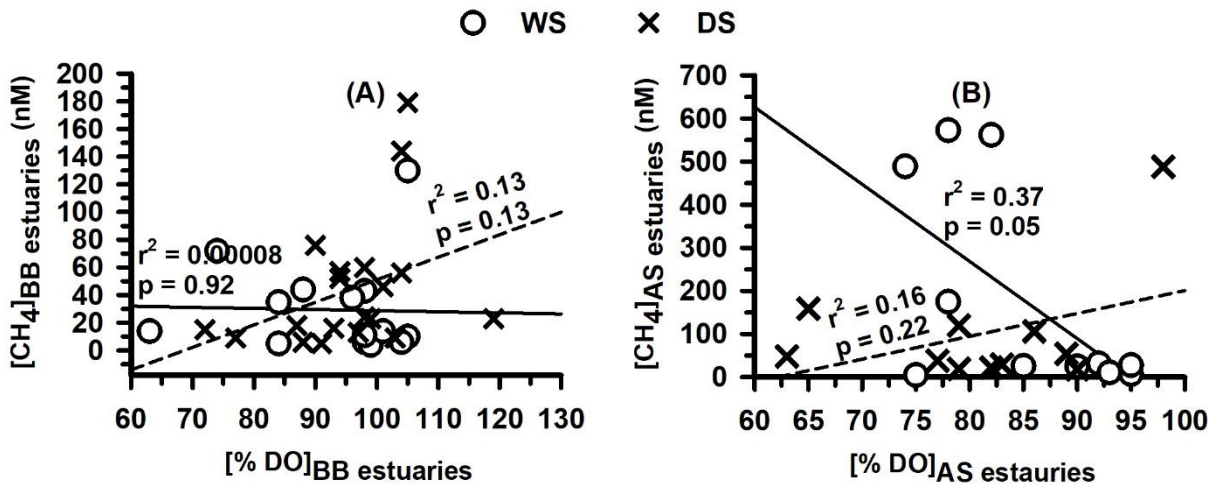
65 Fig.S16: The CH₄ – discharge relationships in the (A) BB, and (B) AS estuaries. The marked
 66 estuaries were excluded for the data analysis. WS = wet season; DS = dry season.

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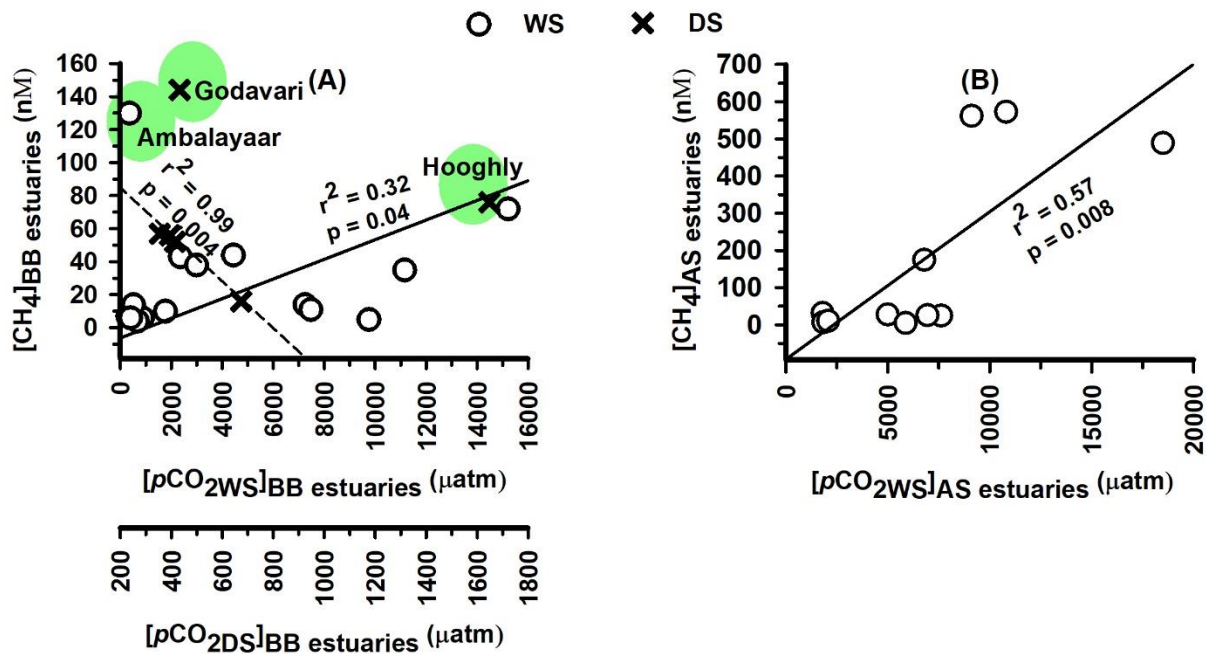
69 Fig.S17: The CH₄ – population density relationships in the (A) BB, and (B) AS estuaries. WS
 70 = wet season; DS = dry season.



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72 Fig.S18: The CH₄ – %DO relationships in the (A) BB, and (B) AS estuaries. WS = wet season;

73 DS = dry season.

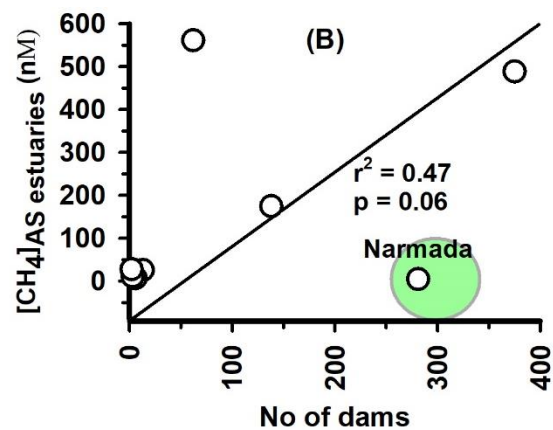
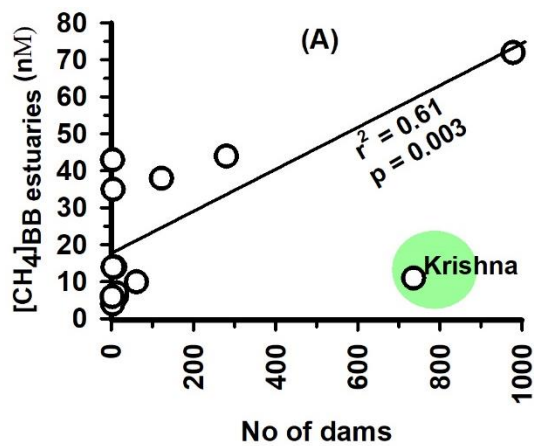


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75 Fig. S19: The pCO₂ – CH₄ relationship in the (A) BB, and (B) AS estuaries. The marked

76 estuaries were excluded for the data analysis. WS = wet season; DS = dry season.

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79 Fig. S20: The CH₄ – No of dams' relationship in the (A) BB, and (B) AS estuaries during the
80 wet season. The marked estuaries were excluded for the data analysis.

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