

Organic Aerosols an AEROCOM project

TM4 ECPL model

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TM4 ECPL model description

- ▶ *Explicit chemical mechanism (Glyoxal studies - Myriokefalitakis et al., ACP 2008) (59 gases + about 20 aerosol species +? Radicals)*
- ▶ *Marine Aerosol → OA (Vignati et al AE 2009) + SOA (Myriokefalitakis et al 2010)*
- ▶ *Isorropia II equilibrium model for inorganic aerosols (Fountoukis and Nenes, ACP 2007)*
- ▶ *Aqueous phase chemistry of glycolaldehyde, glyoxal & methylglyoxal*
- ▶ *Ageing of SOA (by OH as Tsigaridis & Kanakidou ACP 2003, $K_{OH} = 1E-12$)*
- ▶ *Ageing of OA (by O₃ as Tsigaridis & Kanakidou, ACP 2003)*
- ▶ *Impact of heterogeneous chemistry*

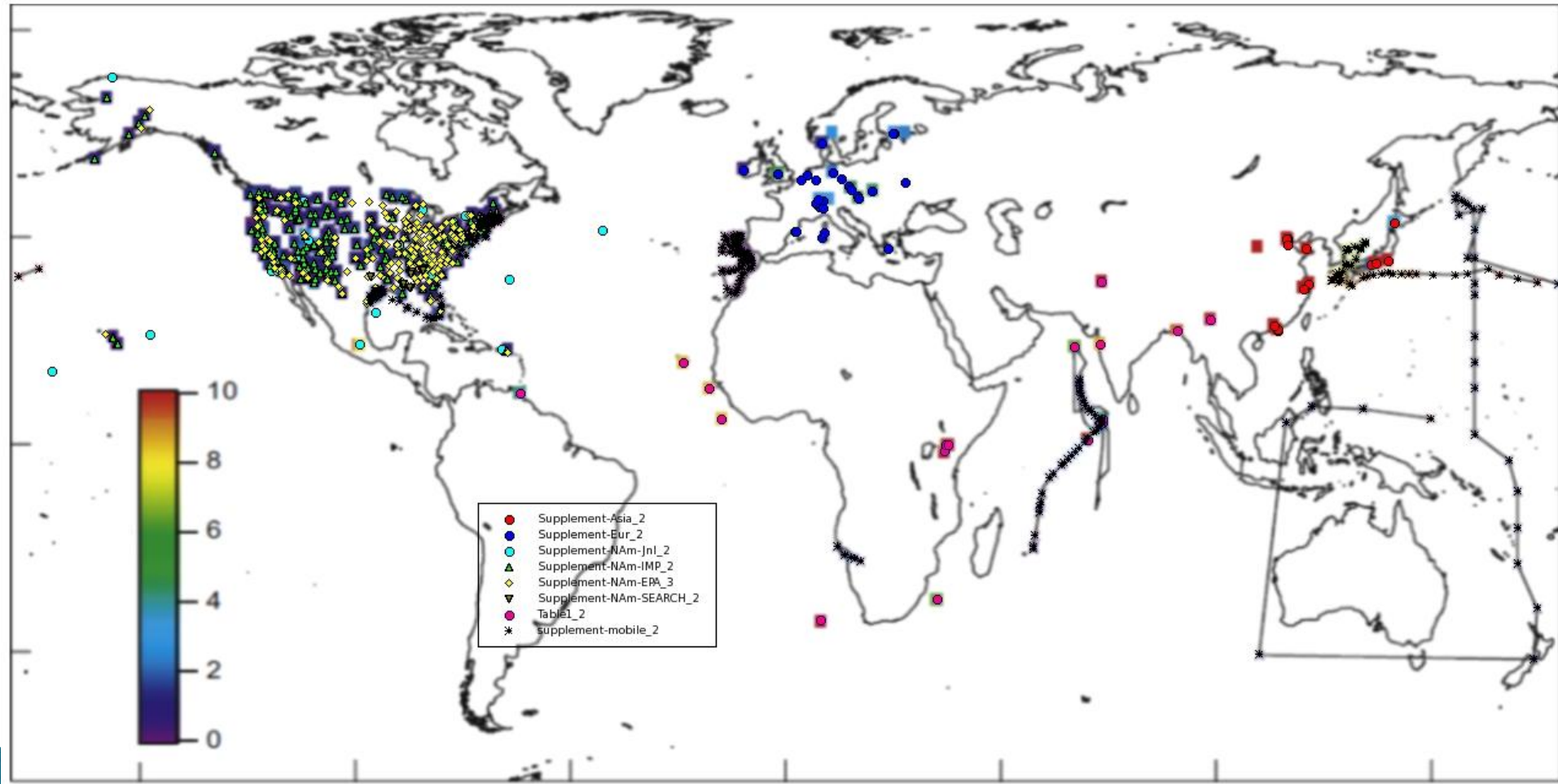
Emission scheme used for simulations (1 / 2)

<i>Species</i>	<i>Tg yr⁻¹</i>	<i>Source</i>
<i>NO_x</i>	<i>53</i>	<i>POET 2000</i>
<i>NH₃</i>	<i>52</i>	<i>EDGAR v2.0</i>
<i>SO₂</i>	<i>90</i>	<i>EDGAR v2.0</i>
<i>SO₄</i>	<i>2</i>	<i>EDGAR v2.0</i>
<i>DMS</i>	<i>19</i>	<i>Spiro. et al. (1992)</i>
<i>CO</i>	<i>1111</i>	<i>POET 2000</i>
<i>HCHO</i>	<i>4</i>	<i>POET 2000</i>
<i>CH₃OH</i>	<i>243</i>	<i>POET 2000</i>
<i>HCOOH</i>	<i>34</i>	<i>EDGAR v2.0</i>
<i>C₂H₆</i>	<i>12</i>	<i>POET 2000</i>
<i>C₂H₄</i>	<i>17</i>	<i>POET 2000</i>
<i>C₂H₂</i>	<i>7</i>	<i>EDGAR v2.0</i>
<i>CH₃COOH</i>	<i>18</i>	<i>POET 2000</i>

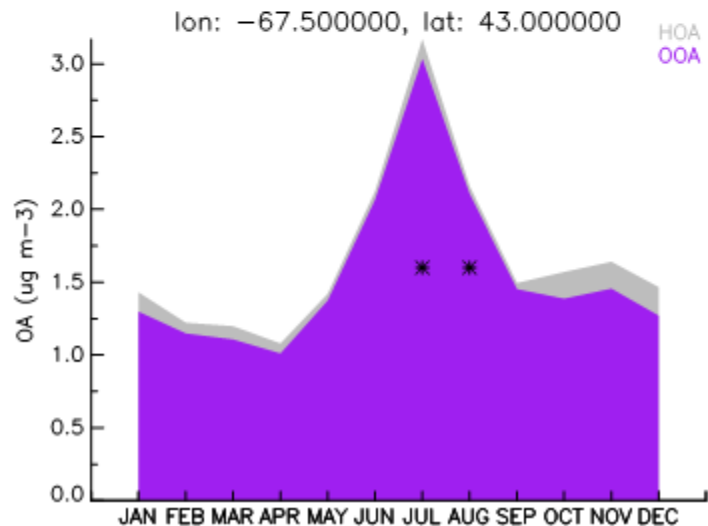
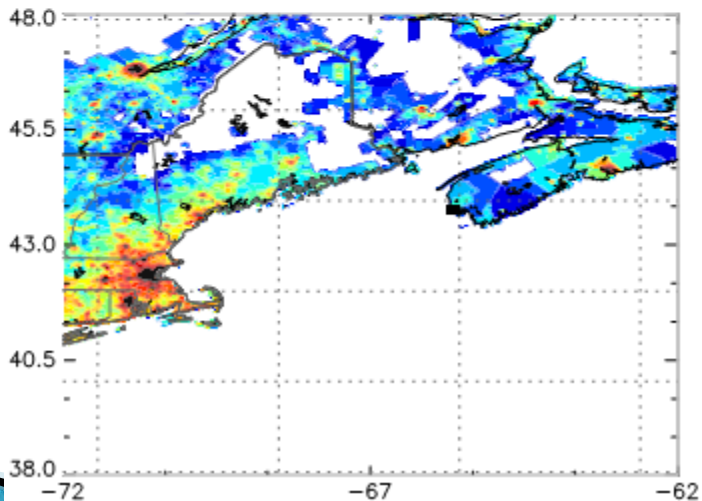
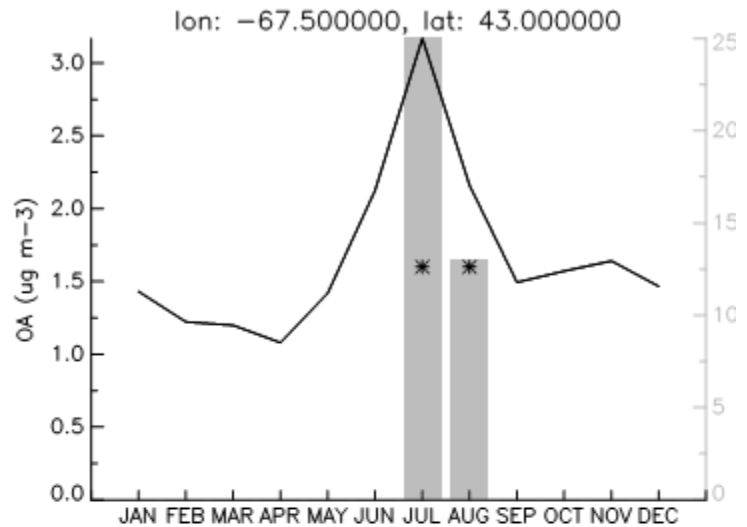
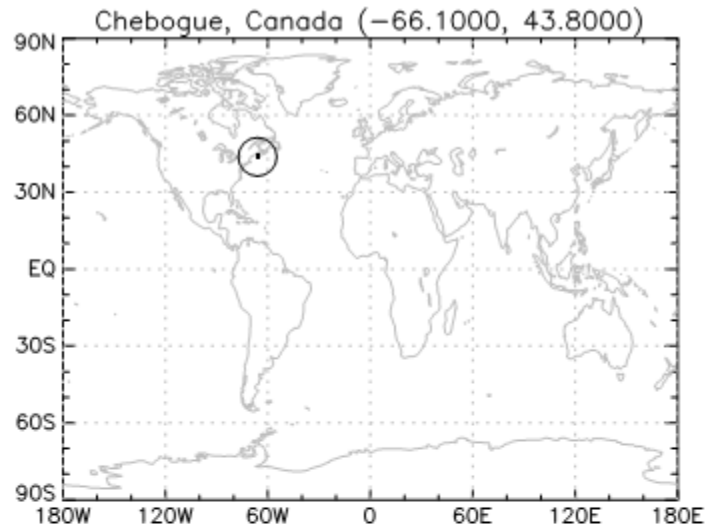
Emission scheme used for simulations (2 / 2)

<i>Species</i>	<i>Tg yr⁻¹</i>	<i>Source</i>
<i>CH₃CHO</i>	<i>8</i>	<i>POET 2000</i>
<i>C₃H₈</i>	<i>12</i>	<i>POET 2000</i>
<i>CH₃C(O)CH₃</i>	<i>27</i>	<i>POET 2000</i>
<i>C₃H₆</i>	<i>7</i>	<i>POET 2000</i>
<i>C₄H₁₀</i>	<i>75</i>	<i>POET 2000</i>
<i>CH₃C(O)CH₂CH₃</i>	<i>14</i>	<i>POET 2000</i>
<i>Isoprene</i>	<i>506</i>	<i>POET 2000</i>
<i>Benzene</i>	<i>7</i>	<i>POET 2000</i>
<i>Toluene</i>	<i>14</i>	<i>POET 2000</i>
<i>Xylene</i>	<i>12</i>	<i>POET 2000</i>
<i>Monoterpenes (as 50% <i>α</i>-Pinene + 50% <i>β</i>-Pinene)</i>	<i>238</i>	<i>POET 2000</i>
<i>Primary Organic Carbon</i>	<i>44.4</i>	<i>Ito and Penner (2005)</i>
<i>Black Carbon</i>	<i>7.5</i>	<i>Ito and Penner (2005)</i>

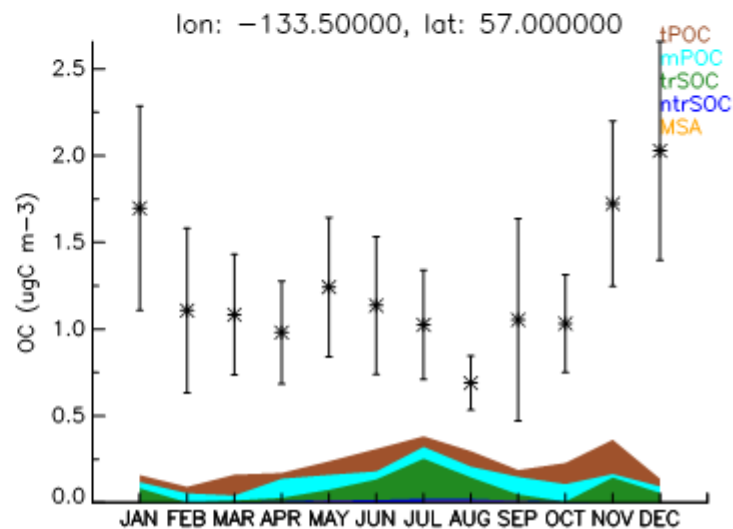
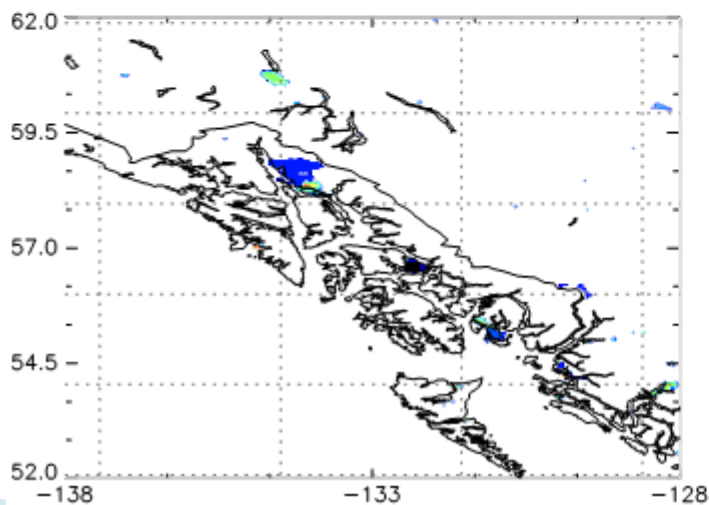
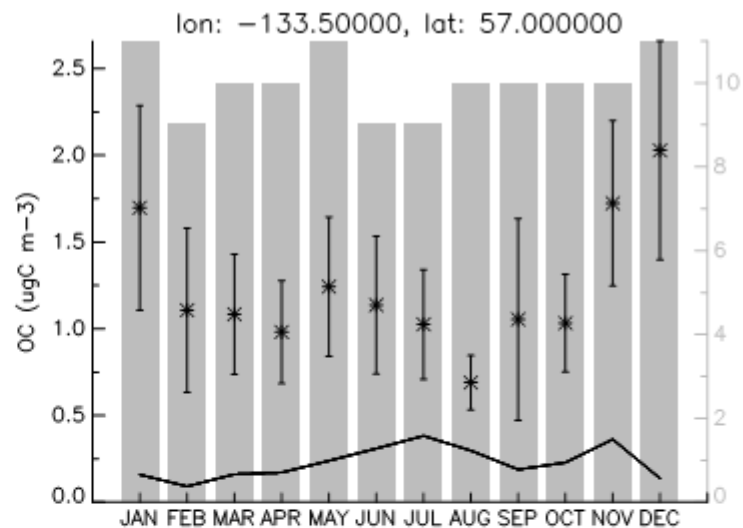
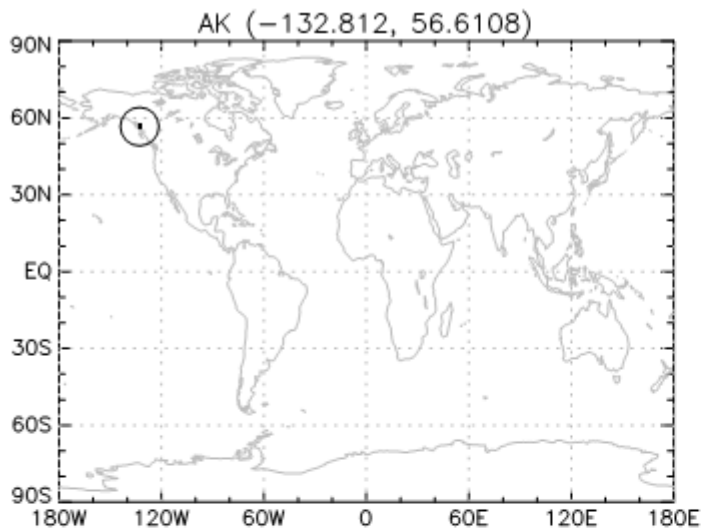
Measurement sites used up to now



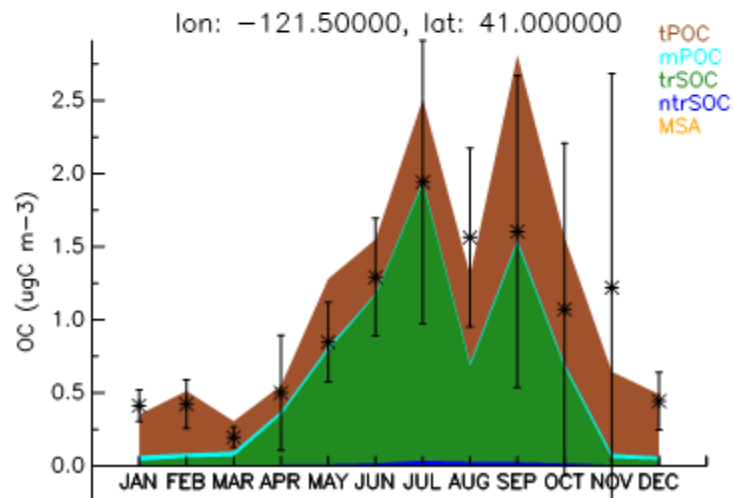
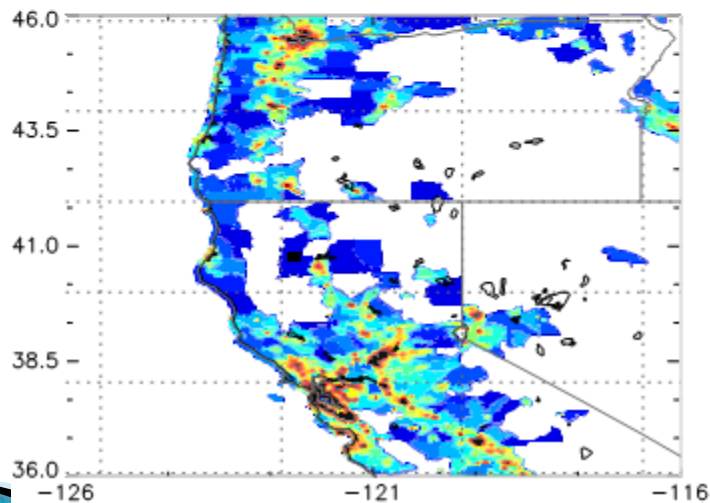
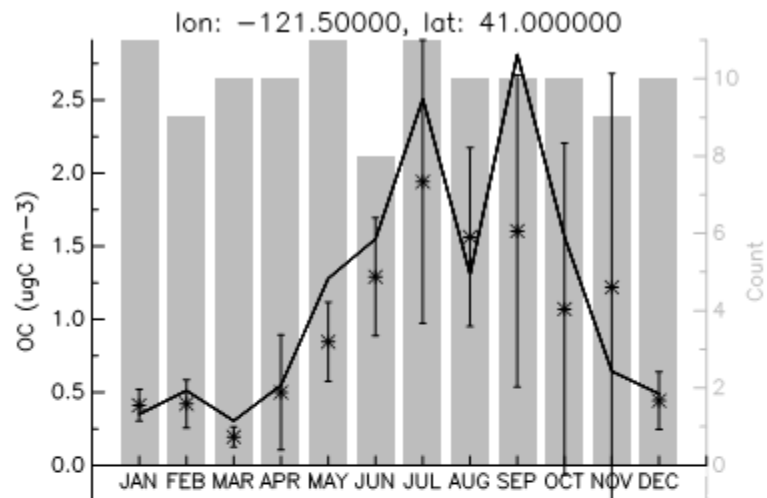
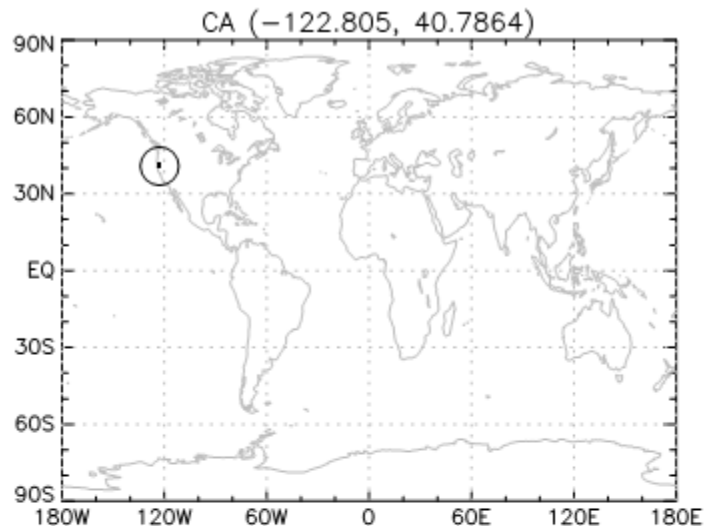
Remote stations vs TM4 ECPL model



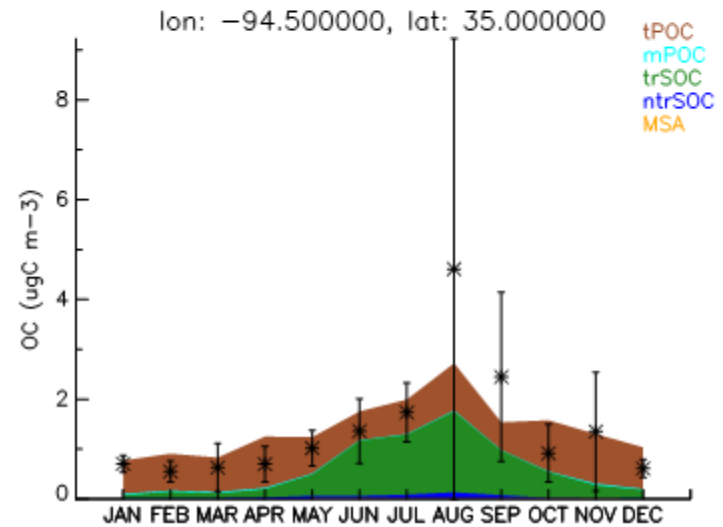
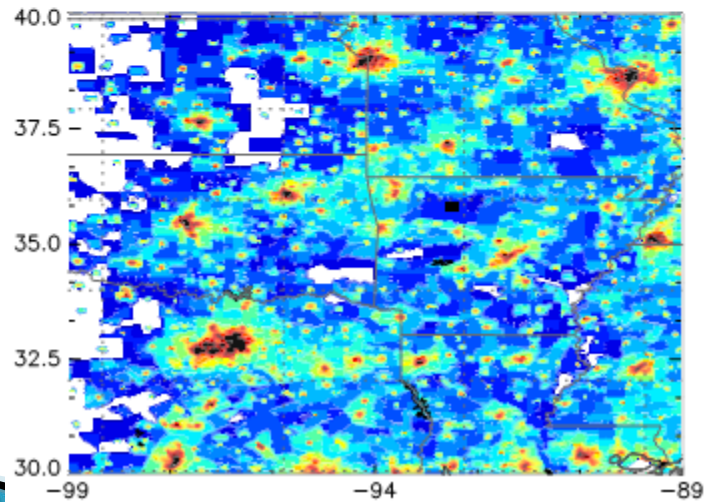
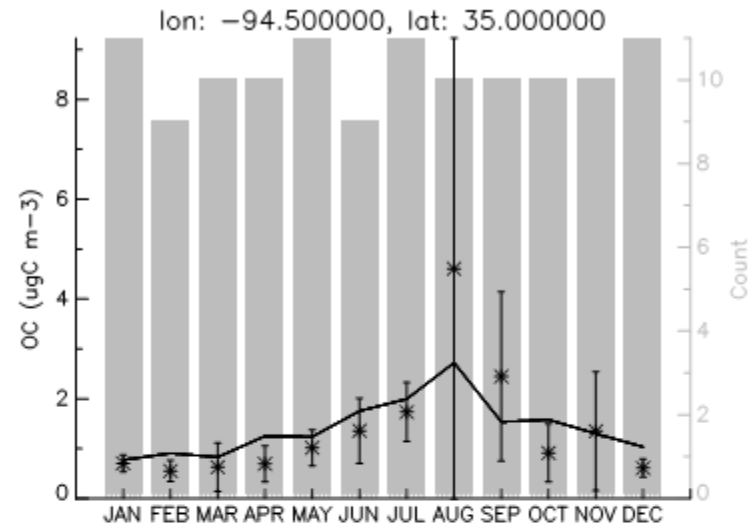
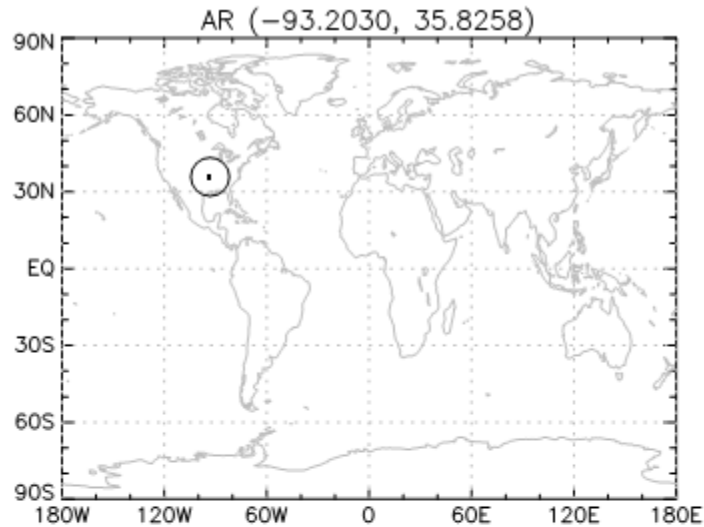
Remote stations vs TM4 ECPL model



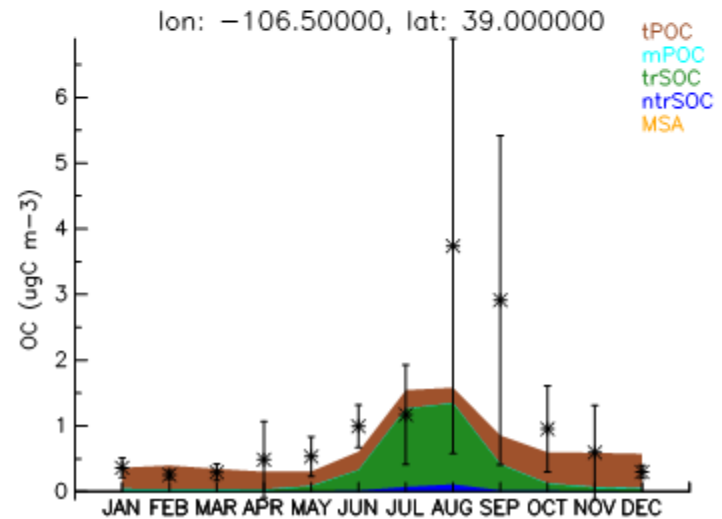
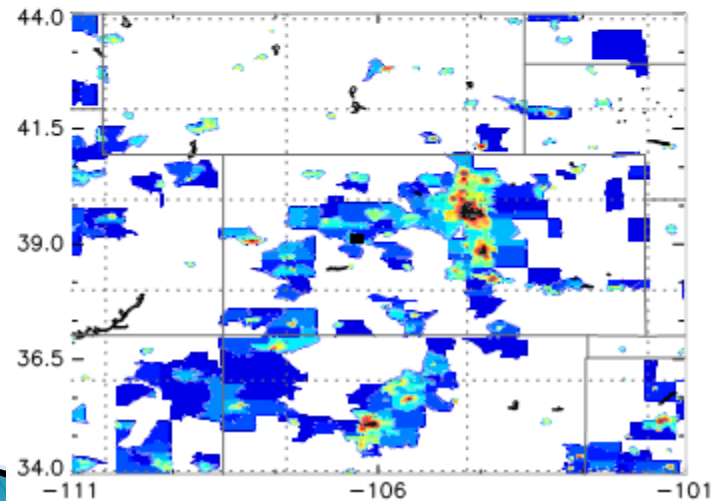
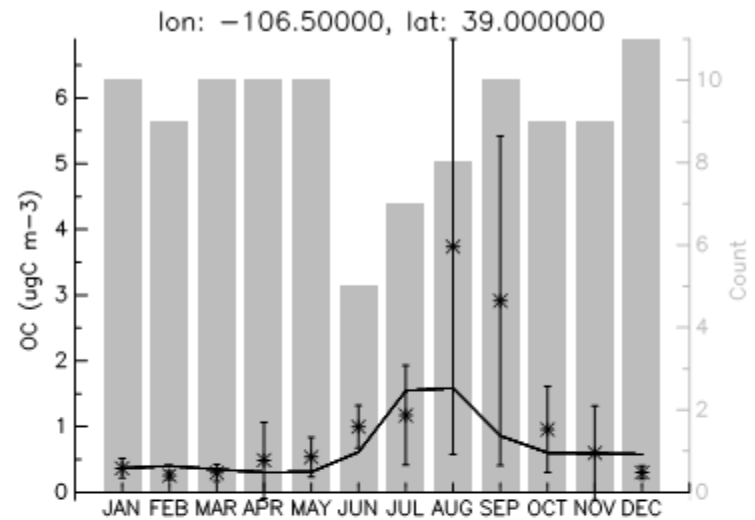
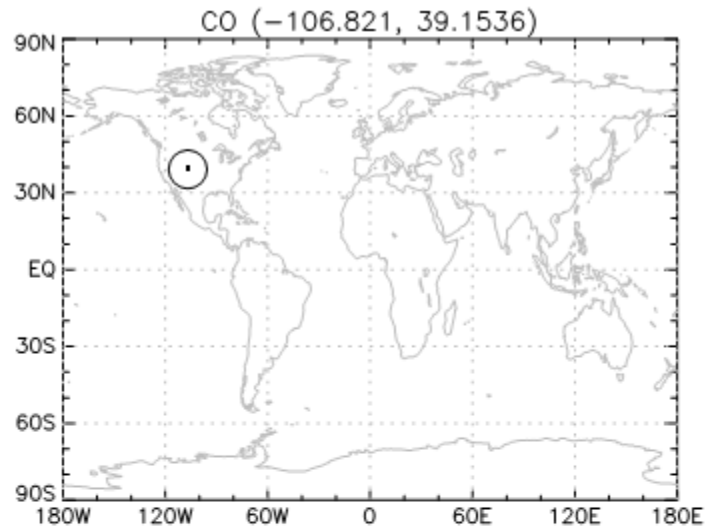
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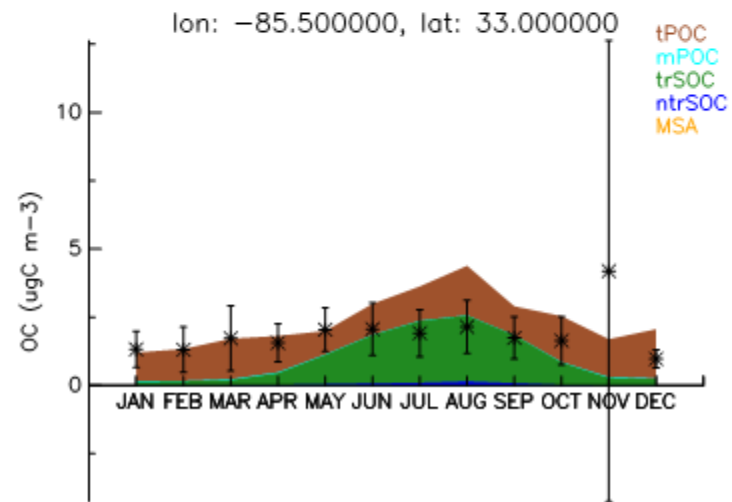
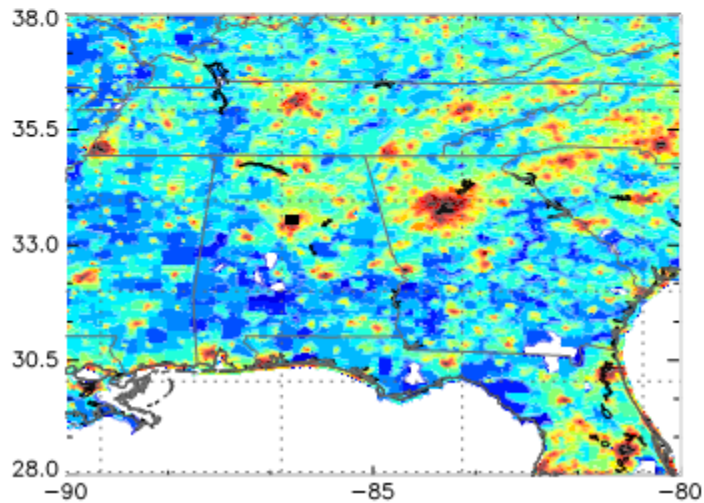
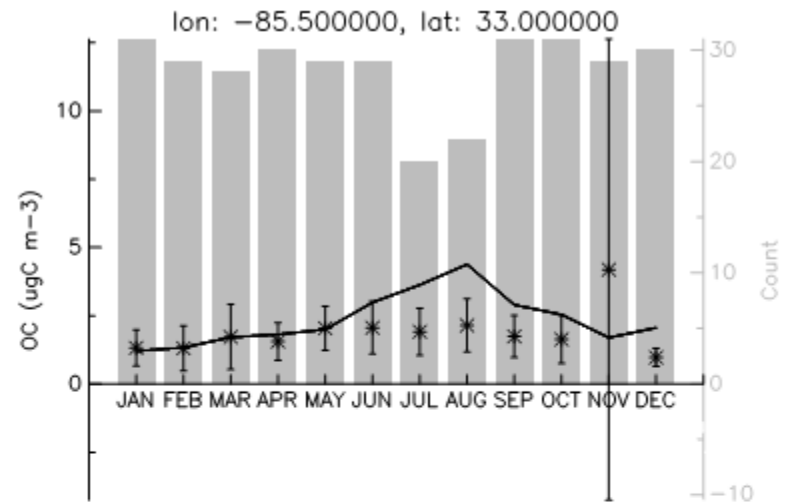
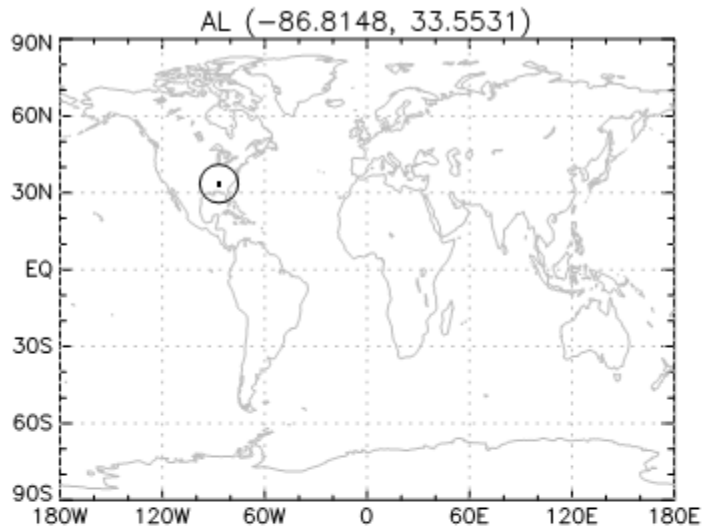
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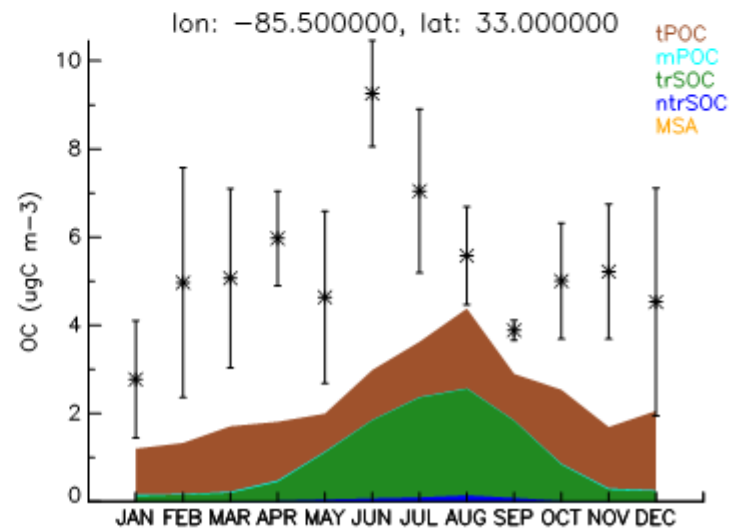
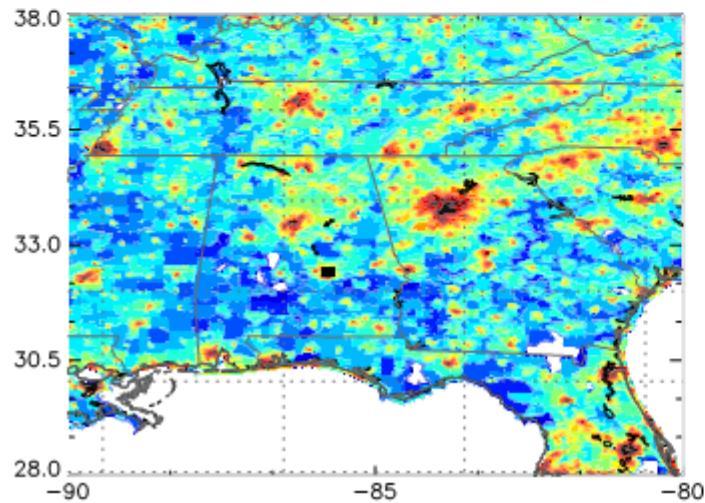
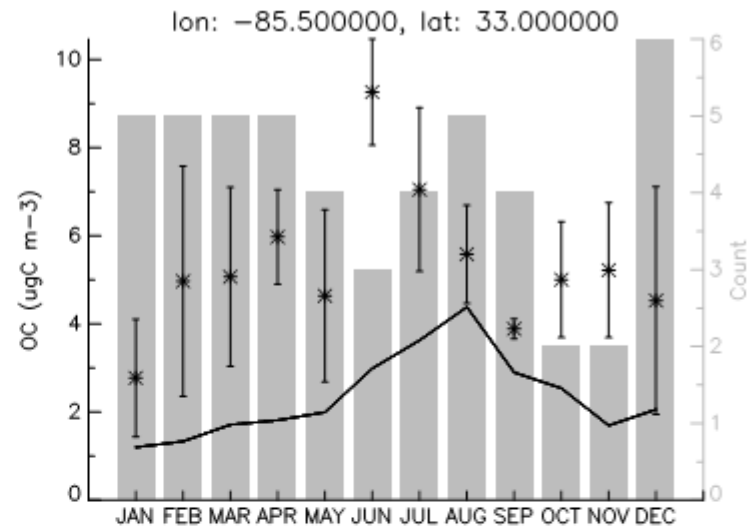
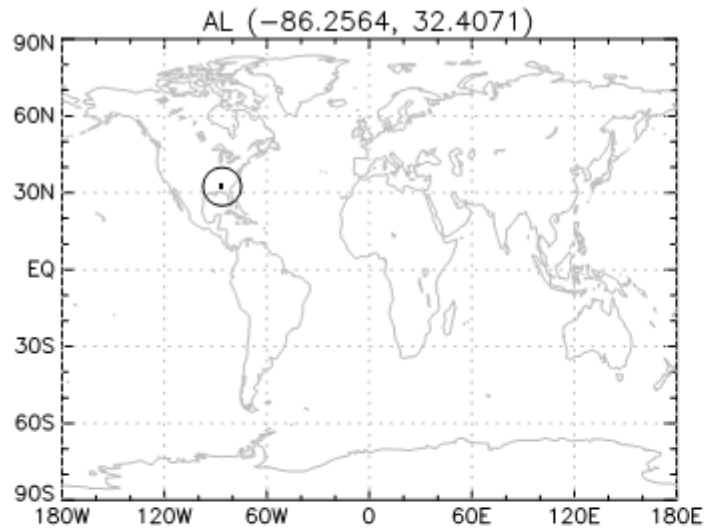
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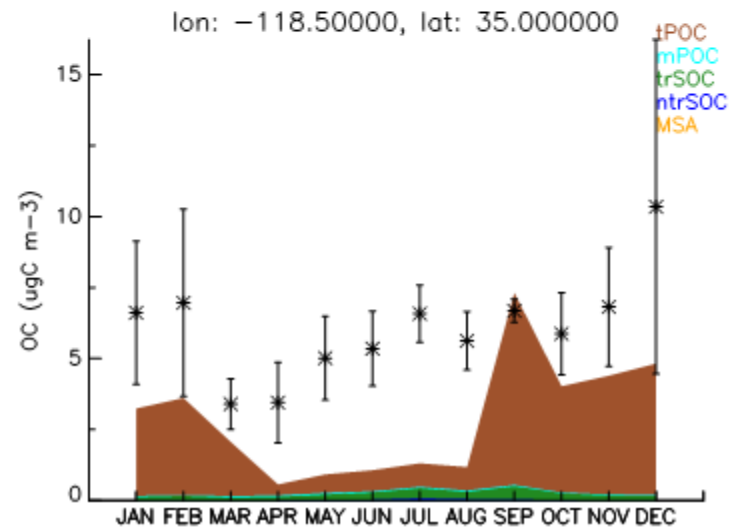
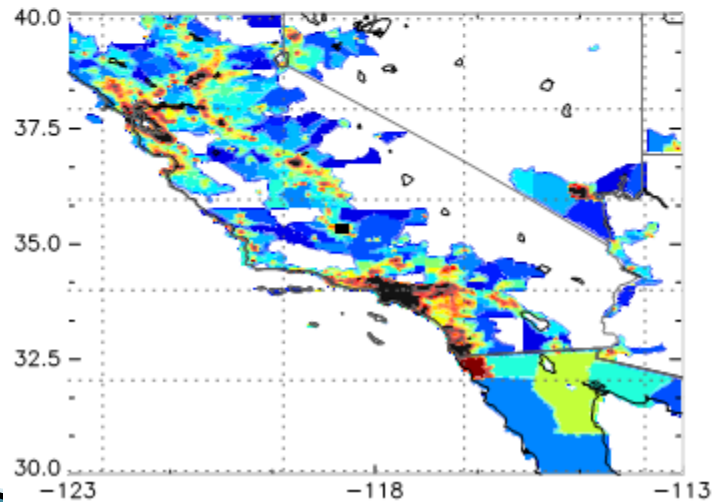
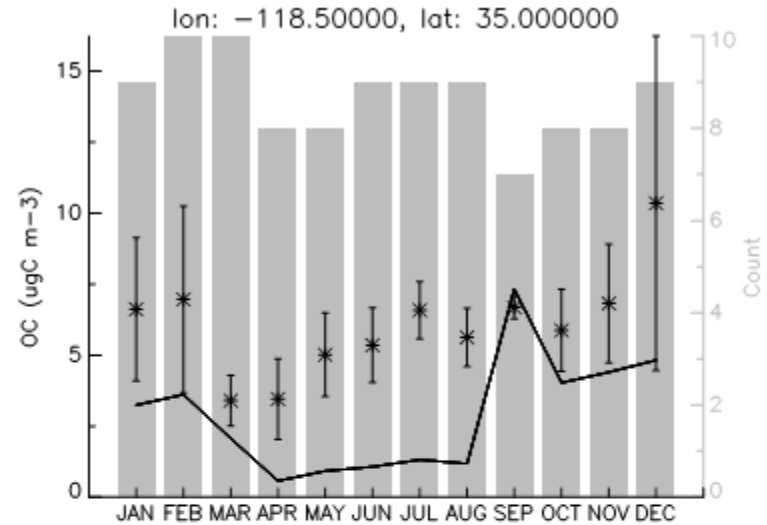
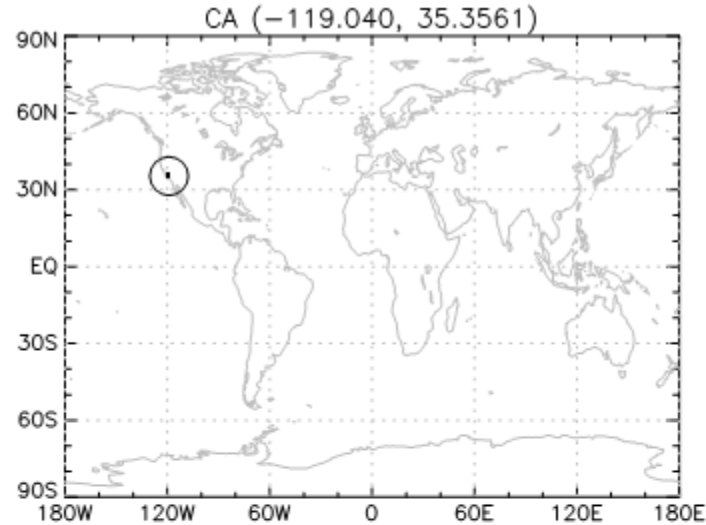
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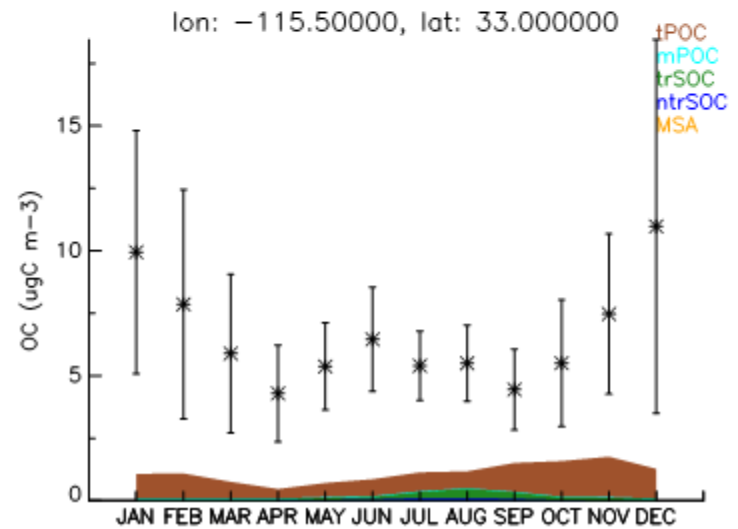
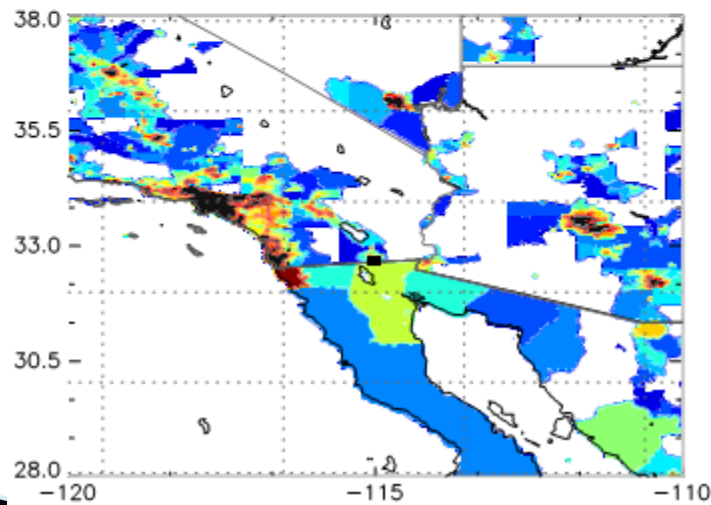
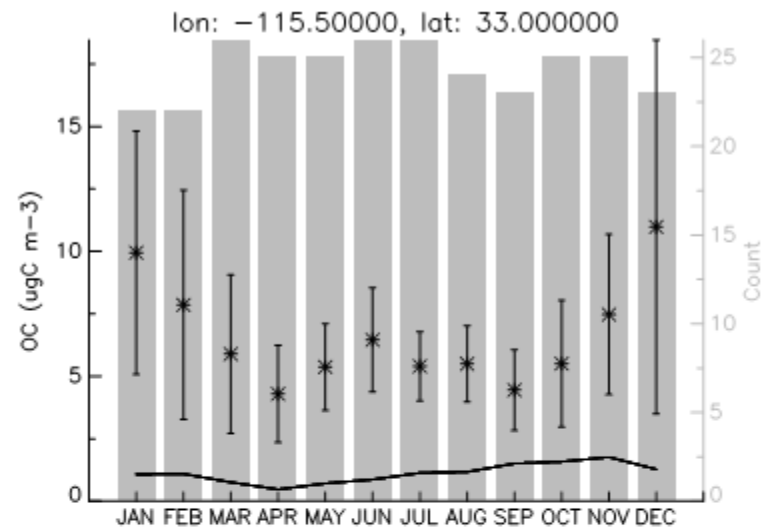
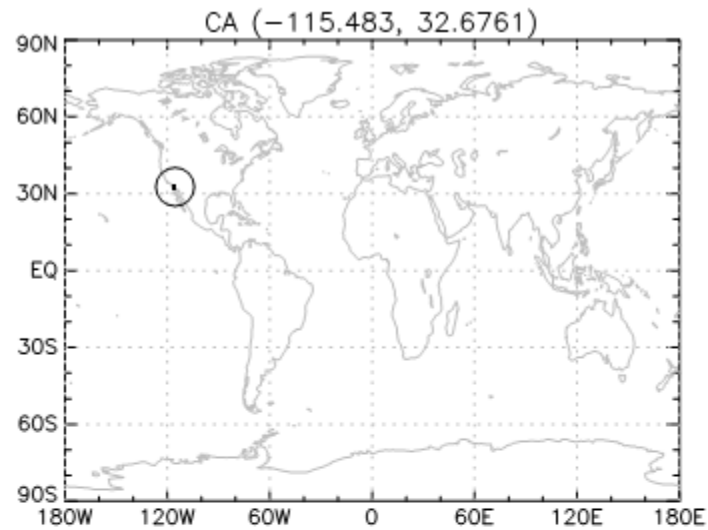
Urban stations vs TM4 ECPL model



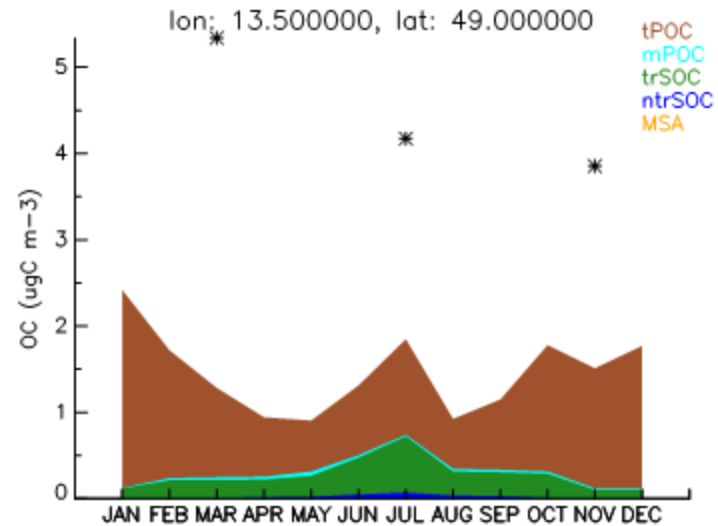
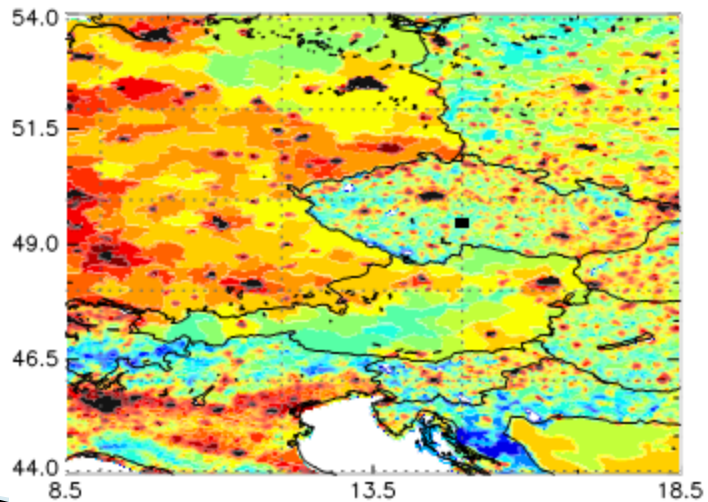
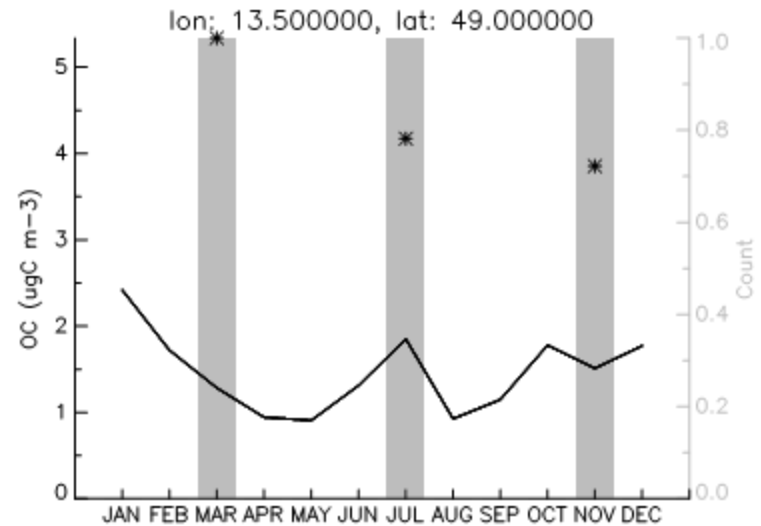
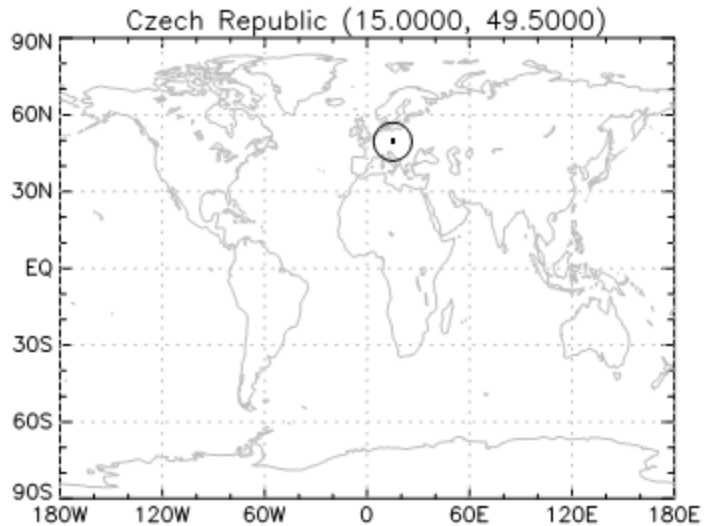
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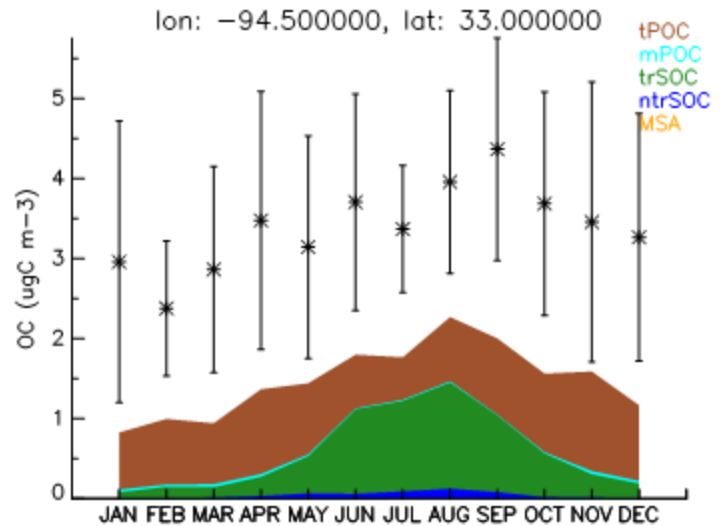
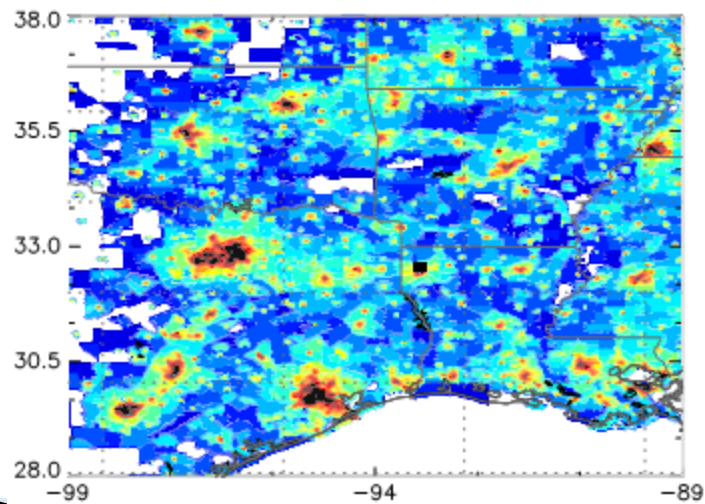
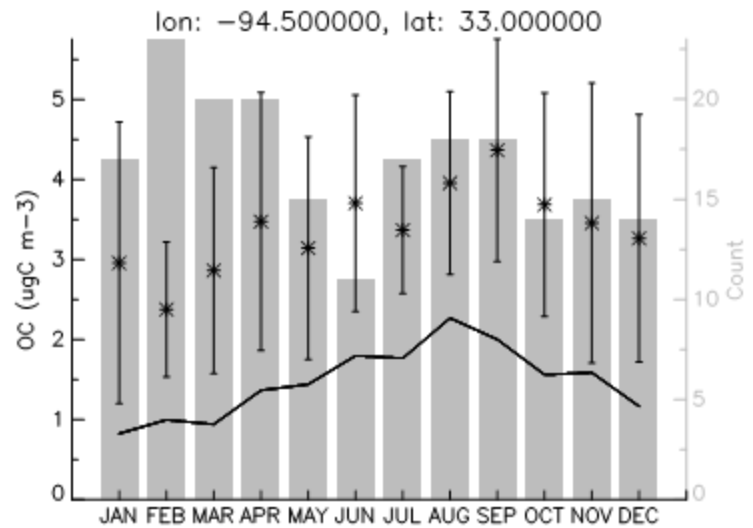
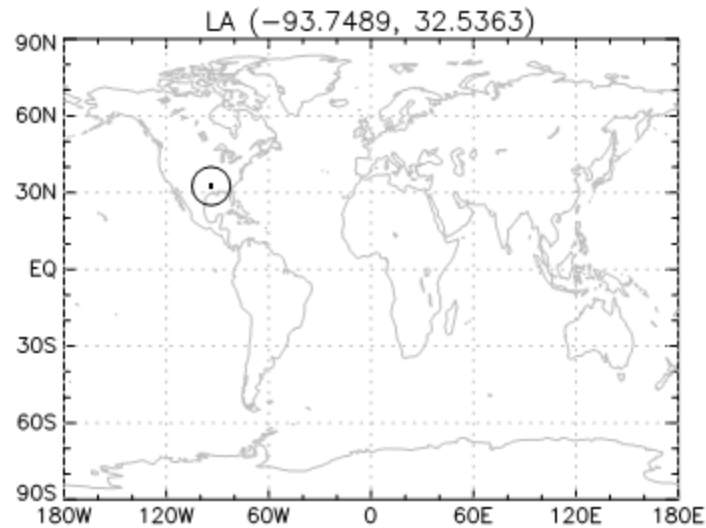
Urban stations vs TM4 ECPL model



Urban stations vs TM4 ECPL model

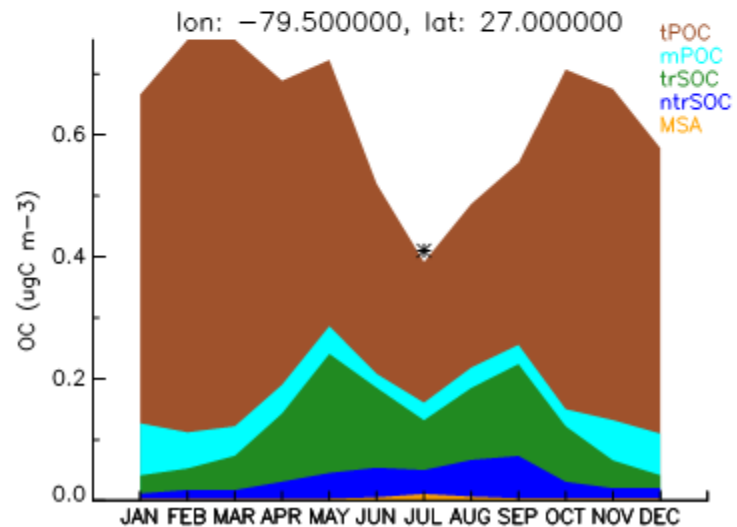
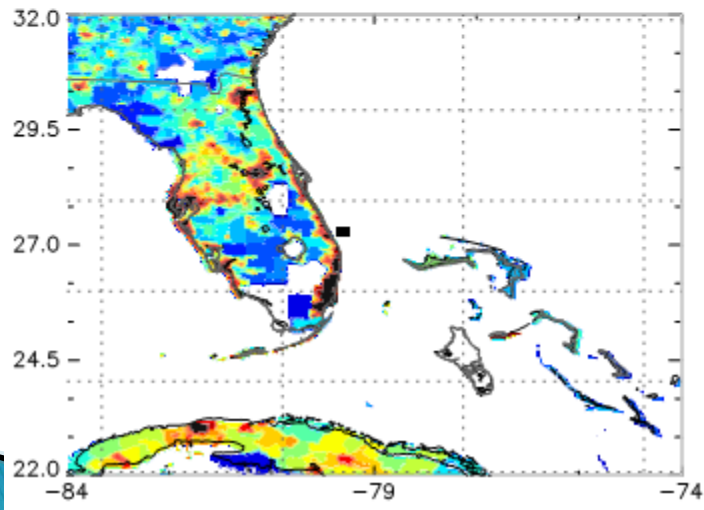
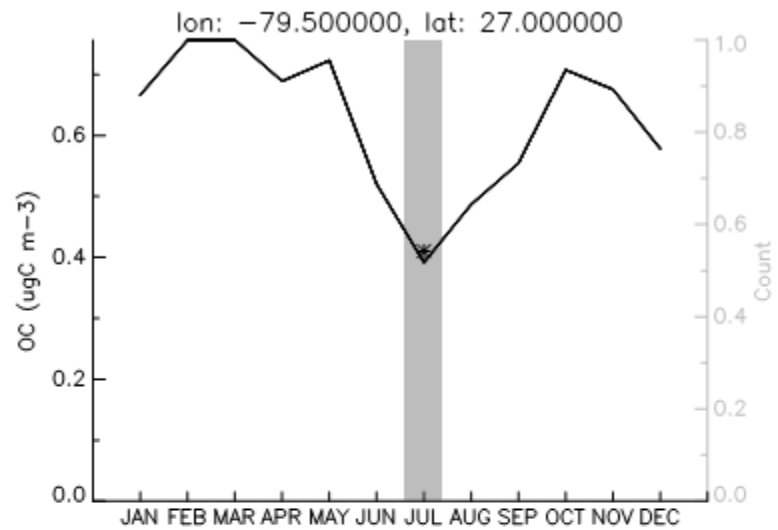
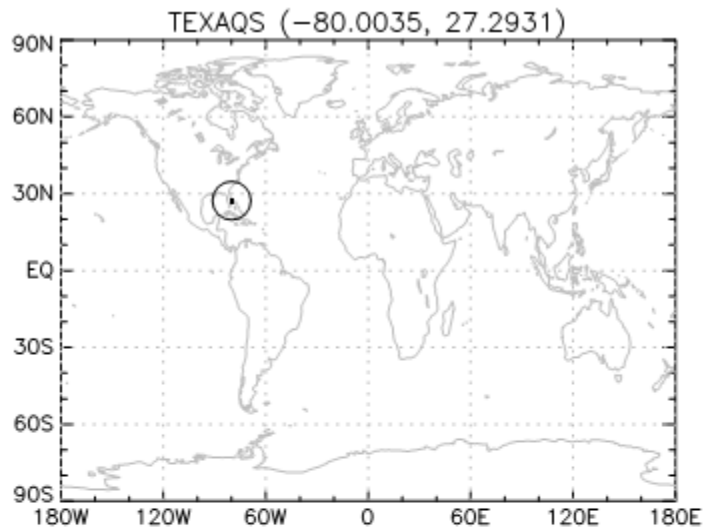


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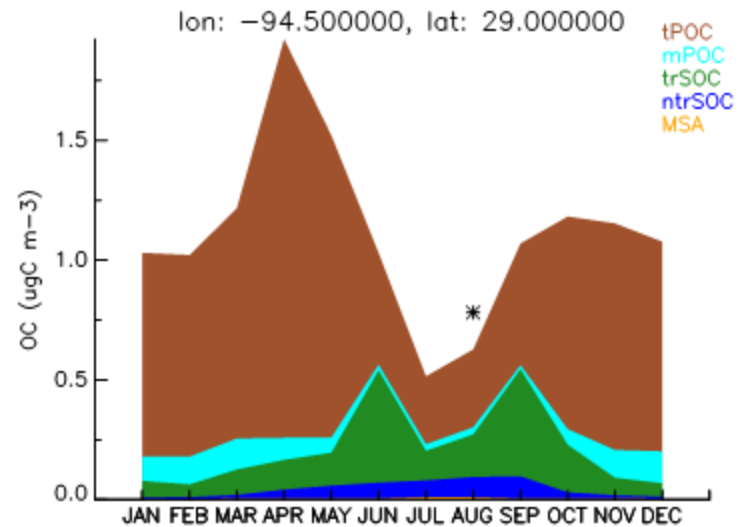
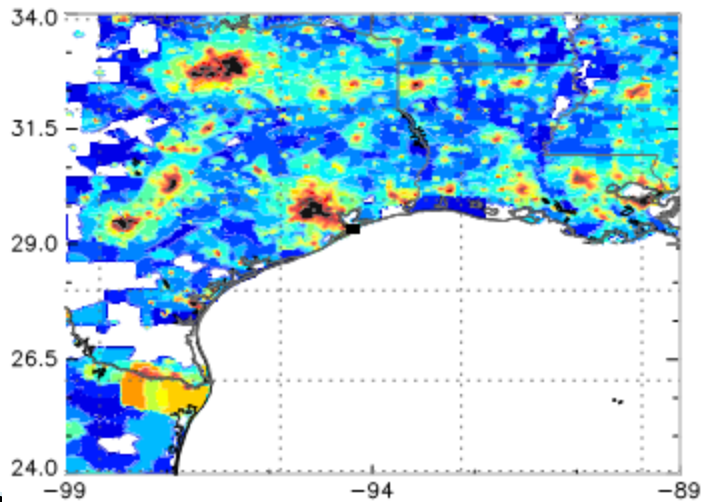
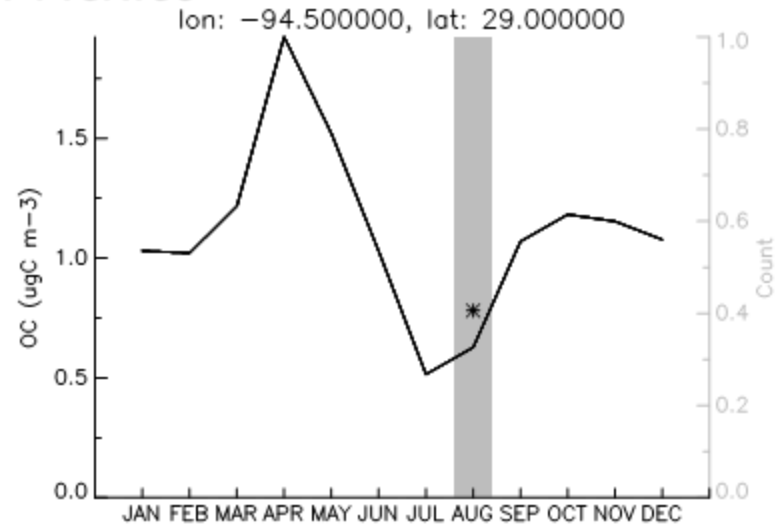
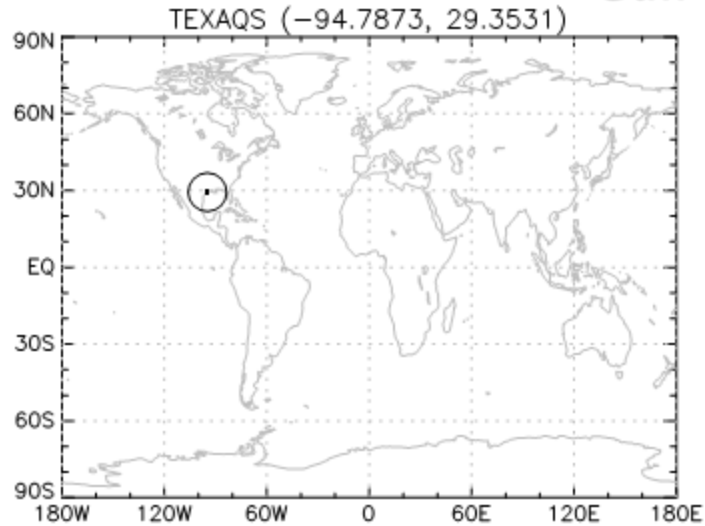
Marine measurements vs TM4 ECPL model

Gulf of Mexico



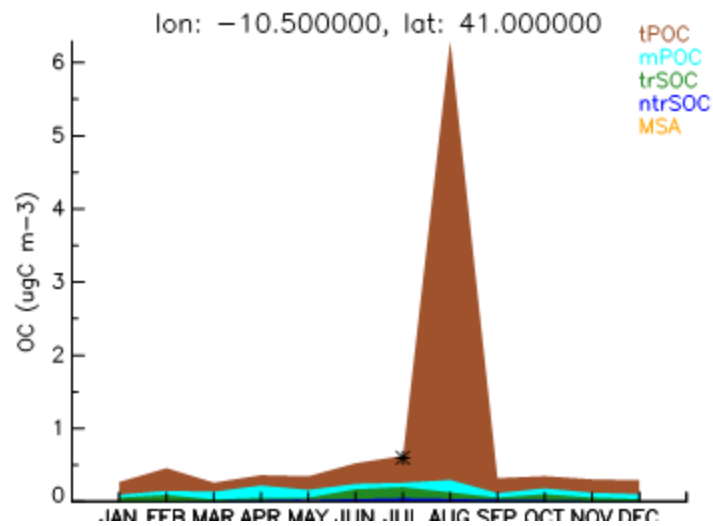
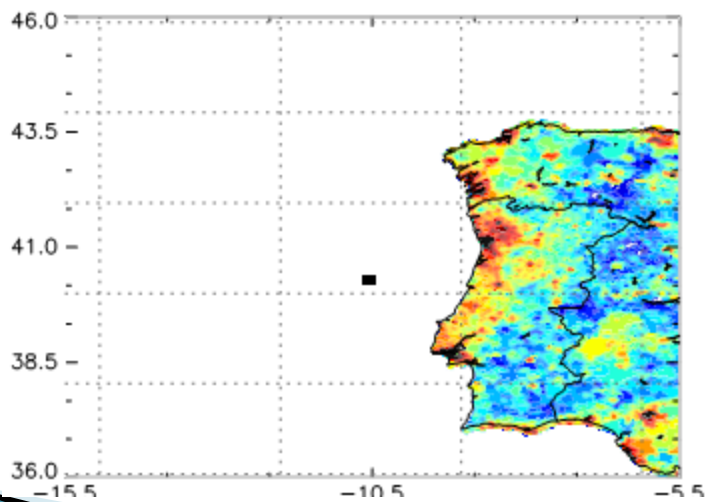
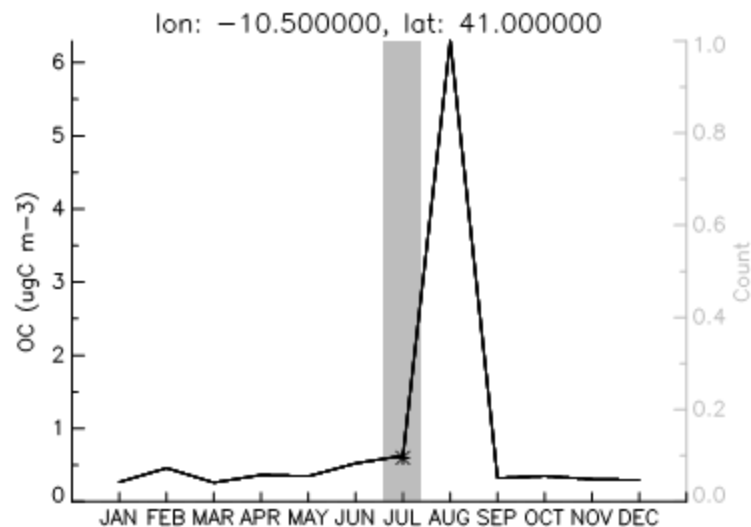
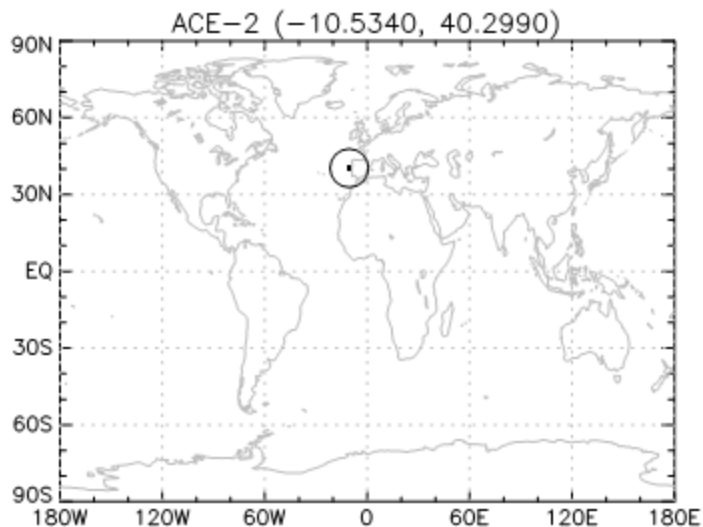
Marine measurements vs TM4 ECPL model

Gulf of Mexico



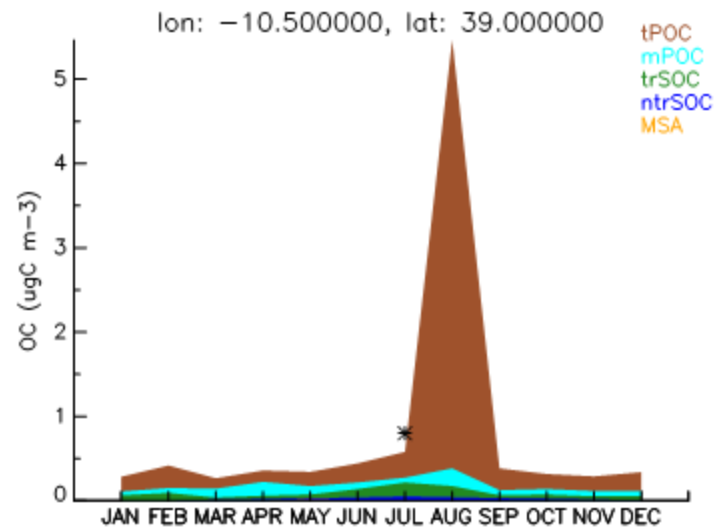
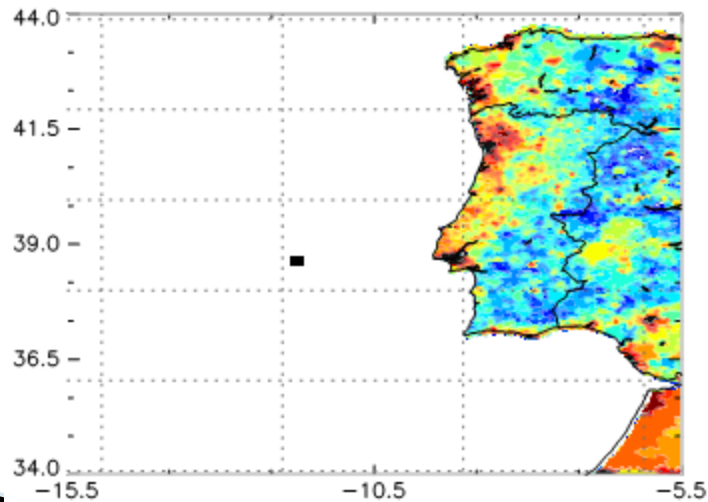
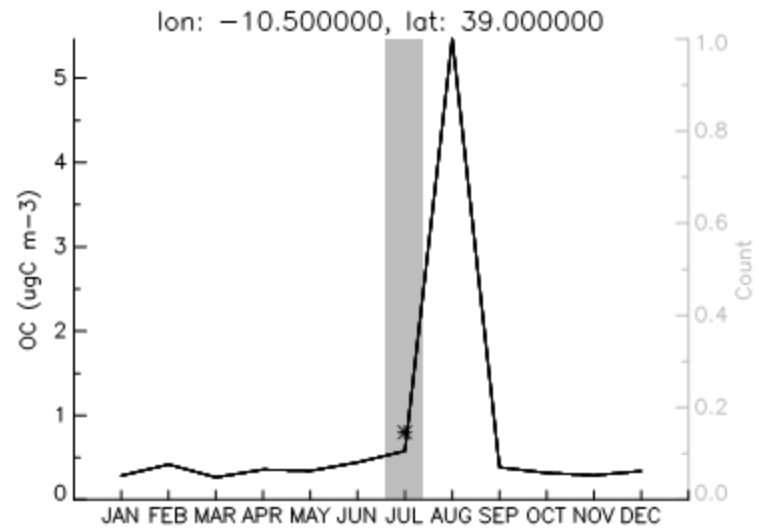
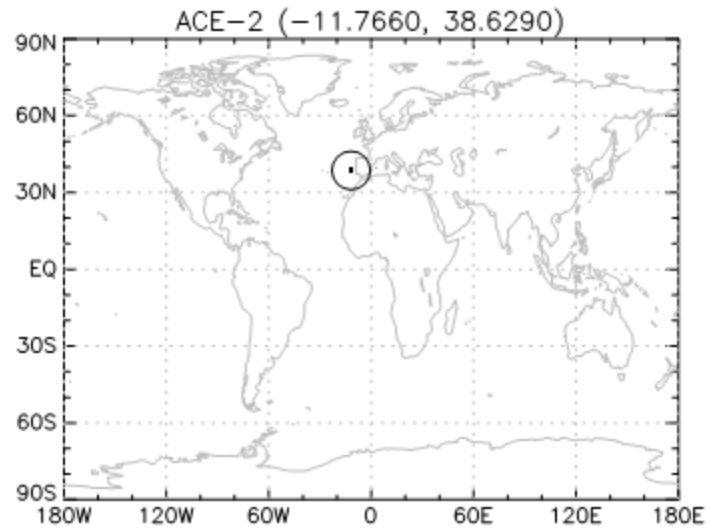
Marine measurements vs TM4 ECPL model

Asia



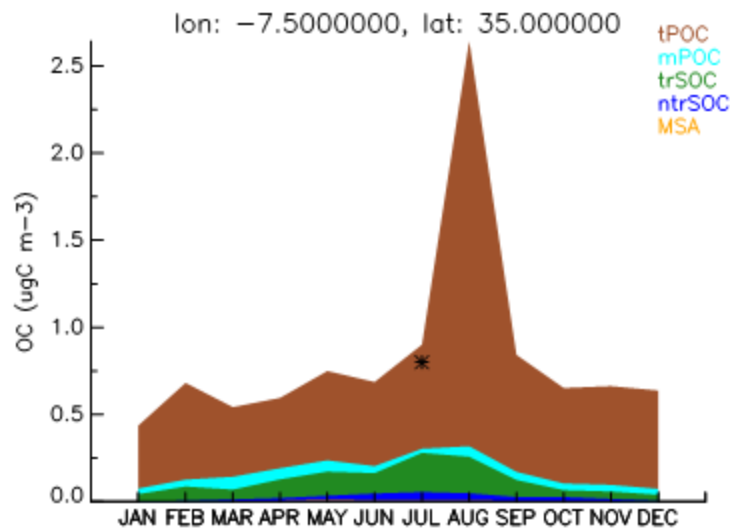
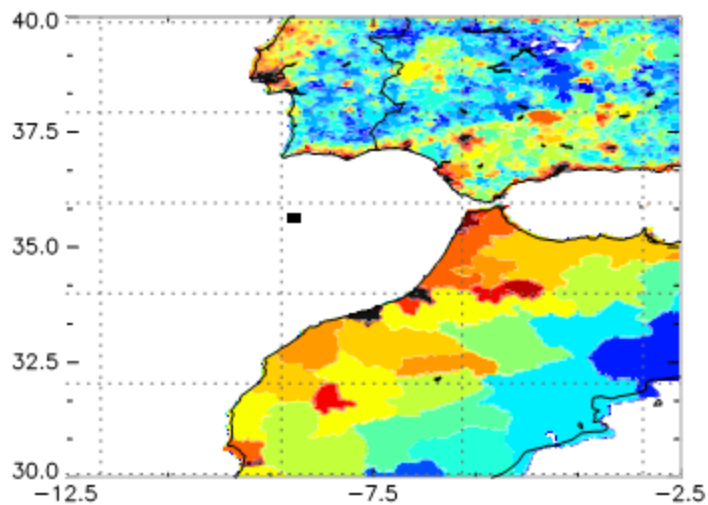
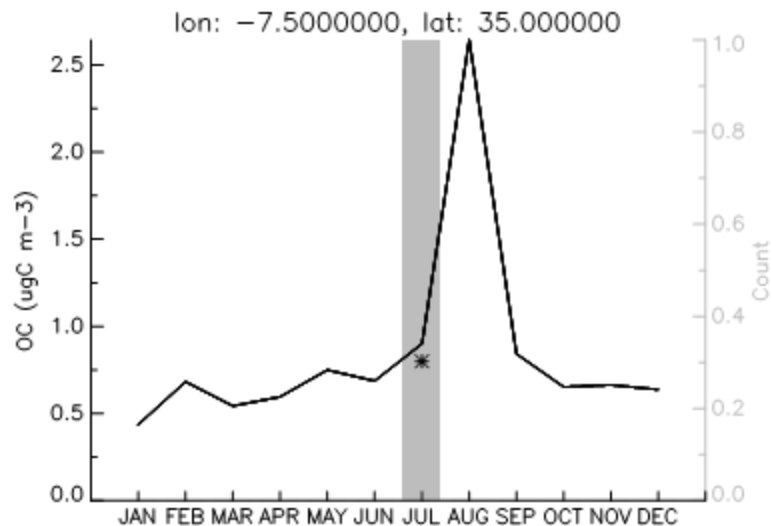
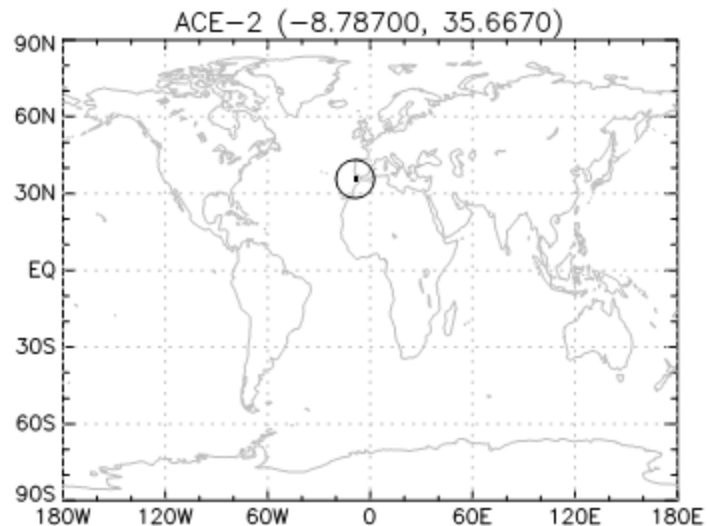
Marine measurements vs TM4 ECPL model

Asia



Marine measurements vs TM4 ECPL model

Asia



On going projects / Future work

- ▶ GFEDv2 fire emissions in TM4 ECPL (*up to year 2008*) –*finished*
- ▶ CIRCE database of anthropogenic emissions in TM4 ECPL (*up to year 2005 & scenario for 2010*) –*evaluating*
- ▶ Re-evaluation of the model with the new emissions –*summer 2010*
- ▶ Extension of the OA measurements database for better evaluation of the models – *on going*
- ▶ Include more models to the evaluation – *summer 2010*

Have a nice summer!

And a nice stay in Crete!!!