Re: 812 AQMS - PM species stacked bar diagrams for 16 locations

Jim DeMocker to: Stephanie Sanzone 04/09/2010 11:54 AM

Cc: "Henry Roman", "Jim Neumann", "Leland Deck"

Stephanie--

One additional point of clarification: the 16 bar graphs reflect the earlier PM data. We are still in the process of completing the adjustments to the primary PM results for non-EGUs, some area sources, and fugitive dust; so the elements of these 16 bar graphs which are derived from model predictions (including MATS) would be expected to change, though the magnitude of the impending changes remain unclear to us at this point. Any final results for these types of comparisons which we decide to include in the revised final draft 812 report after May 5 will reflect the adjusted, final primary PM data.

Thanks, Jim D

Jim DeMocker Stephanie– The additional stacked bar concentr... 04/09/2010 11:45:39 AM

From:	Jim DeMocker/DC/USEPA/US
To:	Stephanie Sanzone/DC/USEPA/US@EPA
Cc:	"Henry Roman" <har@indecon.com>, "Jim Neumann" <Jneumann@indecon.com>, "Leland Deck" <LDeck@stratusconsulting.com>
Date:	04/09/2010 11:45 AM
Subject:	812 AQMS - PM species stacked bar diagrams for 16 locations

Stephanie—

The additional stacked bar concentration charts the 812 project team promised to provide the AQMS are attached. Each chart provides the results for one monitor, showing:

1. 2000/2002 levels with 6 bars:
    a. actual 2002 (FRM),
    b. 2002 reconstructed mass (RCFM),
    c. 2000 direct CMAQ *with-CAAA* ,
    d. 2000 MATS *with-CAAA* ,
    e. 2000 direct CMAQ *without-CAAA* ,
    f. 2000 MATS *without-CAAA*
2. 4 bars for 2010: CMAQ & MATS, with and without CAAA
3. 4 bars for 2020: CMAQ & MATS, with and without CAAA

The collection represents 13 new graphs along with the 3 sample locations shared before at the AQMS meeting. The 13 new locations include the 9 largest metro areas with speciated (STN) monitors, as well as 4 other fairly large cities to provide more geographic coverage (all 13 cities are in the biggest 20 metro areas with STN monitors).

The overall performance looks reasonable to the project team, but not perfect. Some cities with numerous monitors (regular FRM as well as STN) do not do as well (i.e., comparing the MATS estimates with either the FRM or RCFM bars). Los Angeles may be the most important case where MATS does not match the FRM or RCFM very well, although Manhatten also has a

visible gap between estimated and actual data. The location from the Central Valley in California (Tulare Co) also shows a suboptimal result, although probably for different reasons.

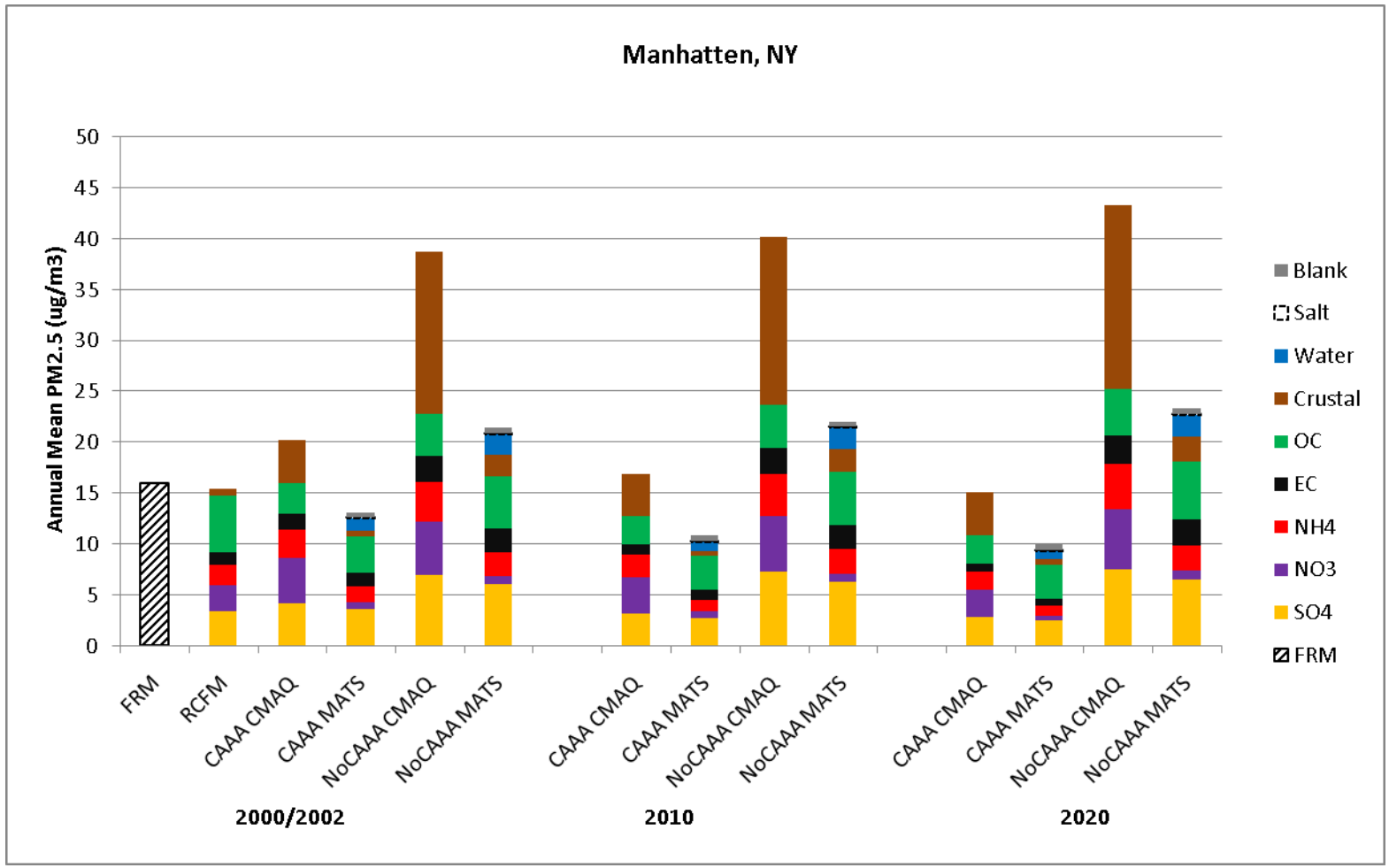
It's important to bear in mind that MATS is making a spatially weighted average using information from all neighboring monitors, and is predicting the level in the center of the grid cell. Particularly in cases where the chosen STN monitor used for the RCFM is not in the middle of the grid cell, the MATS estimate is influenced significantly by the other nearby monitors.

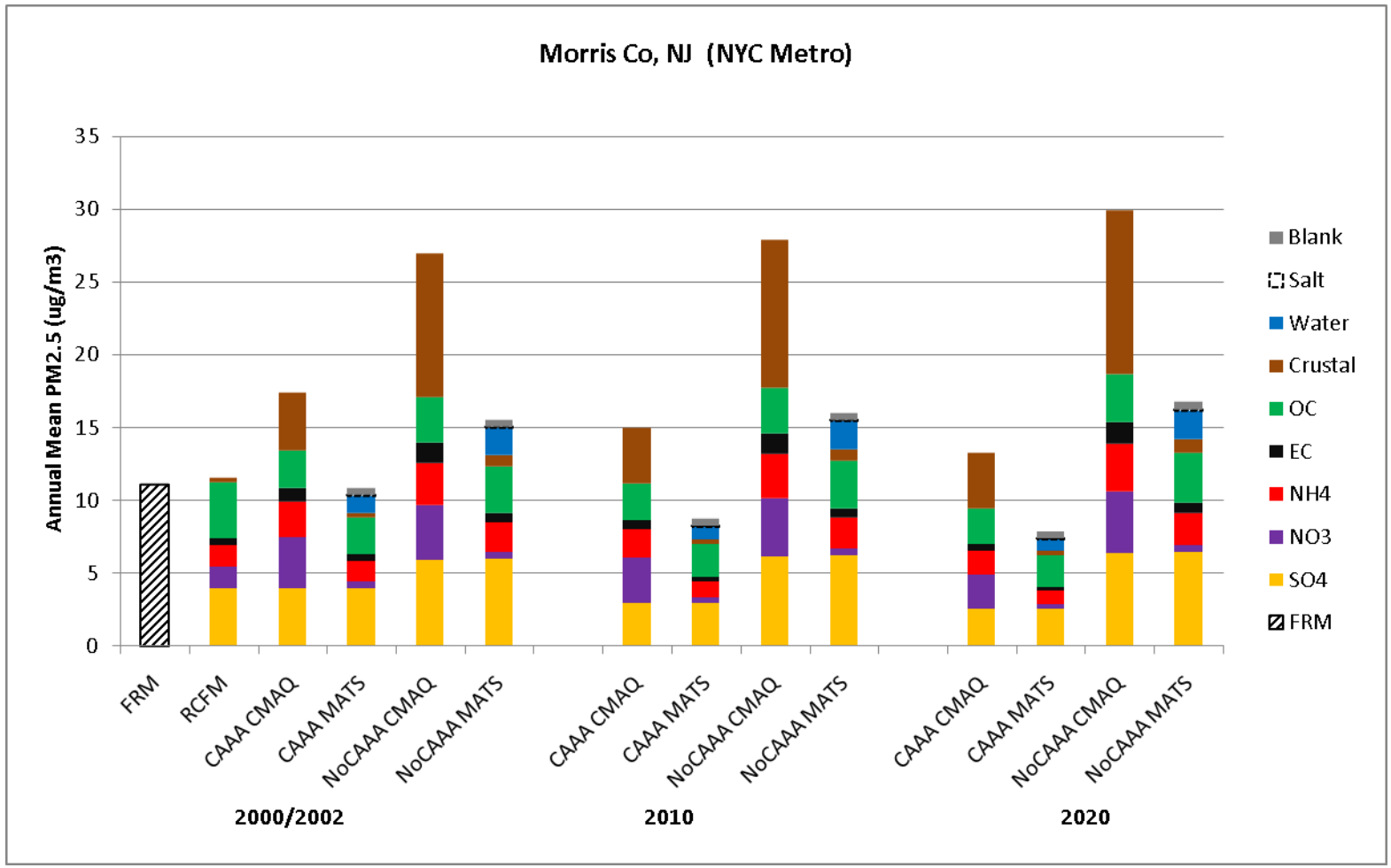
For those locations where matching is suboptimal, it appears MATS is underestimating PM levels, suggesting a possible conservative bias to our results. This overall conservatism of our MATS-adjusted results, however, depends to some extent on whether the sample of locations analyzed provides a reasonably representative sample.

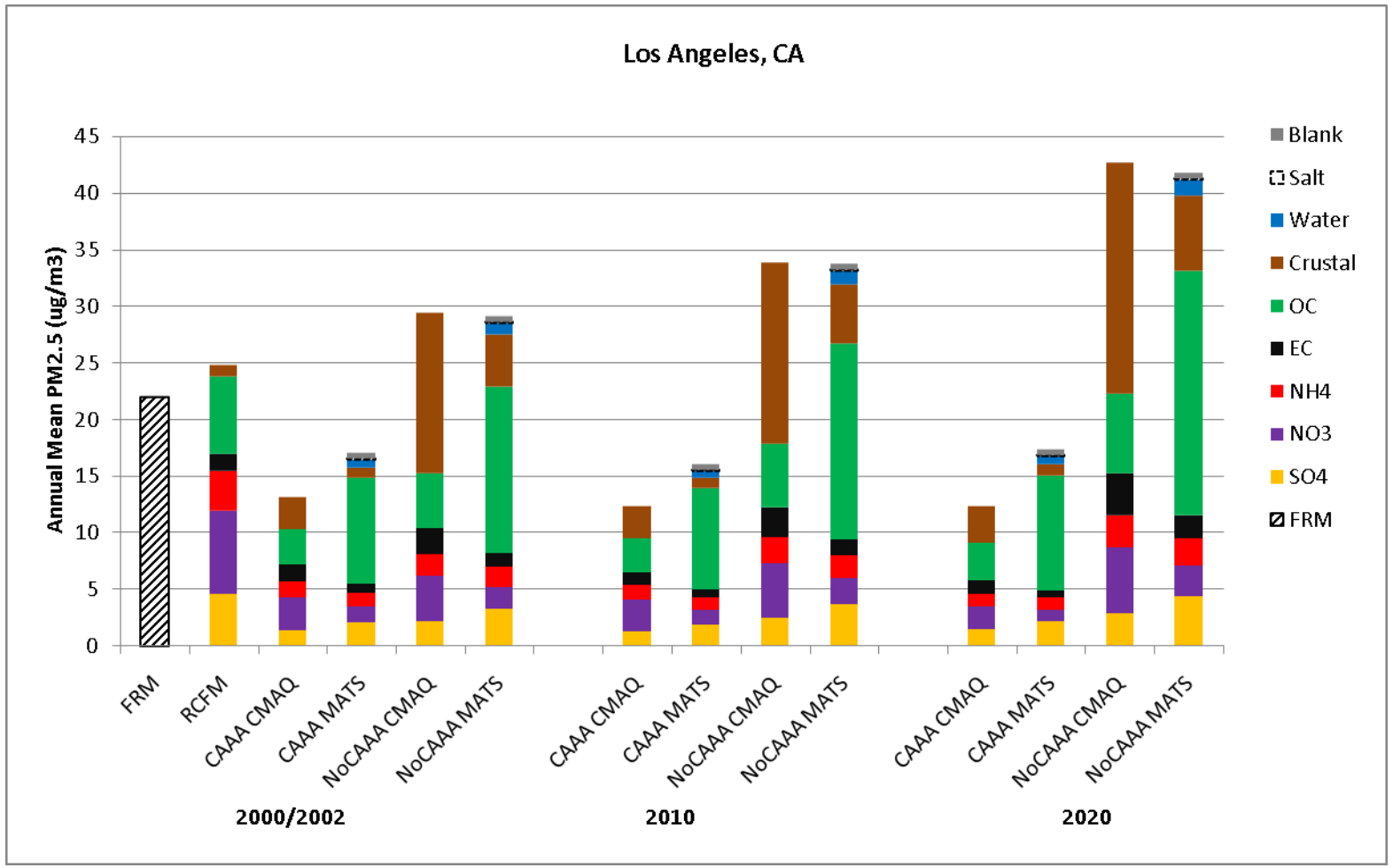
I hope this additional information is still useful to the AQMS, and I would be happy to provide further explanation or additional information if needed. I expect these results will be further evaluated by the team, and any useful analytical results and insights will be considered for inclusion in the revised final draft integrated report to be developed following the May 4-5 Council meeting.

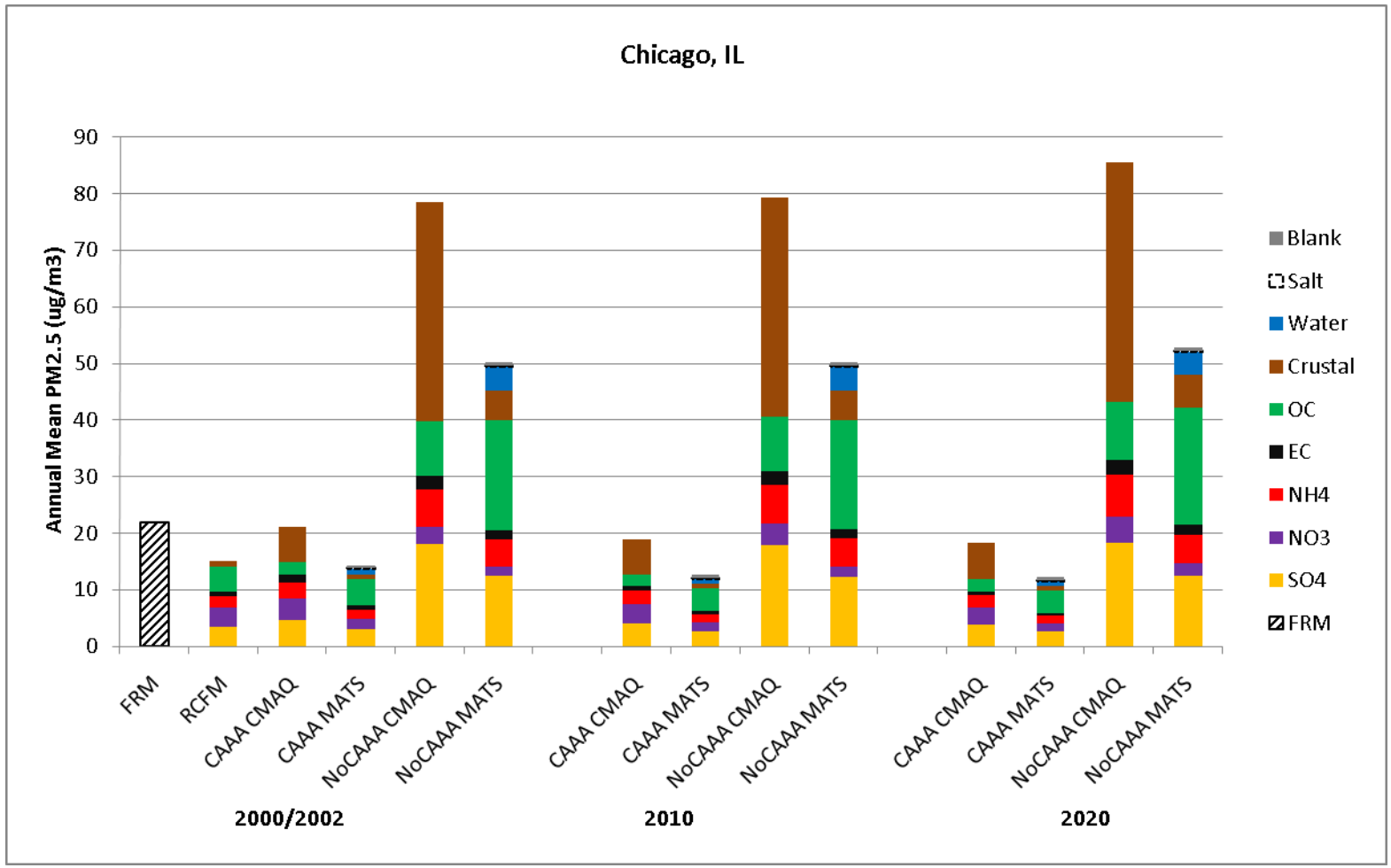
Thanks, Jim D

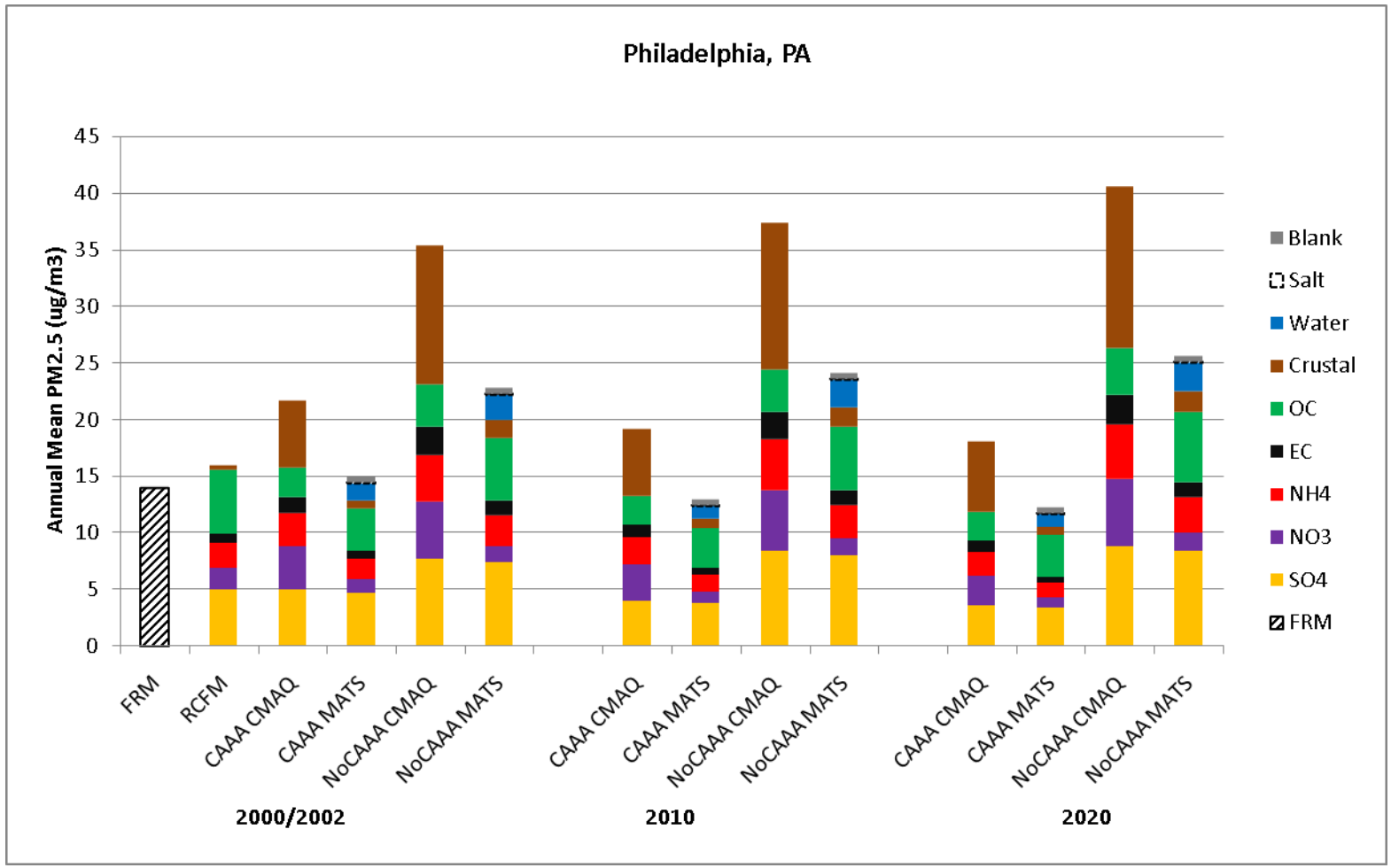
[attachment "100408 - 812 Pro II - 16 stacked bar graphs comparing CMAQ-MATS.pdf" deleted by Jim DeMocker/DC/USEPA/US]

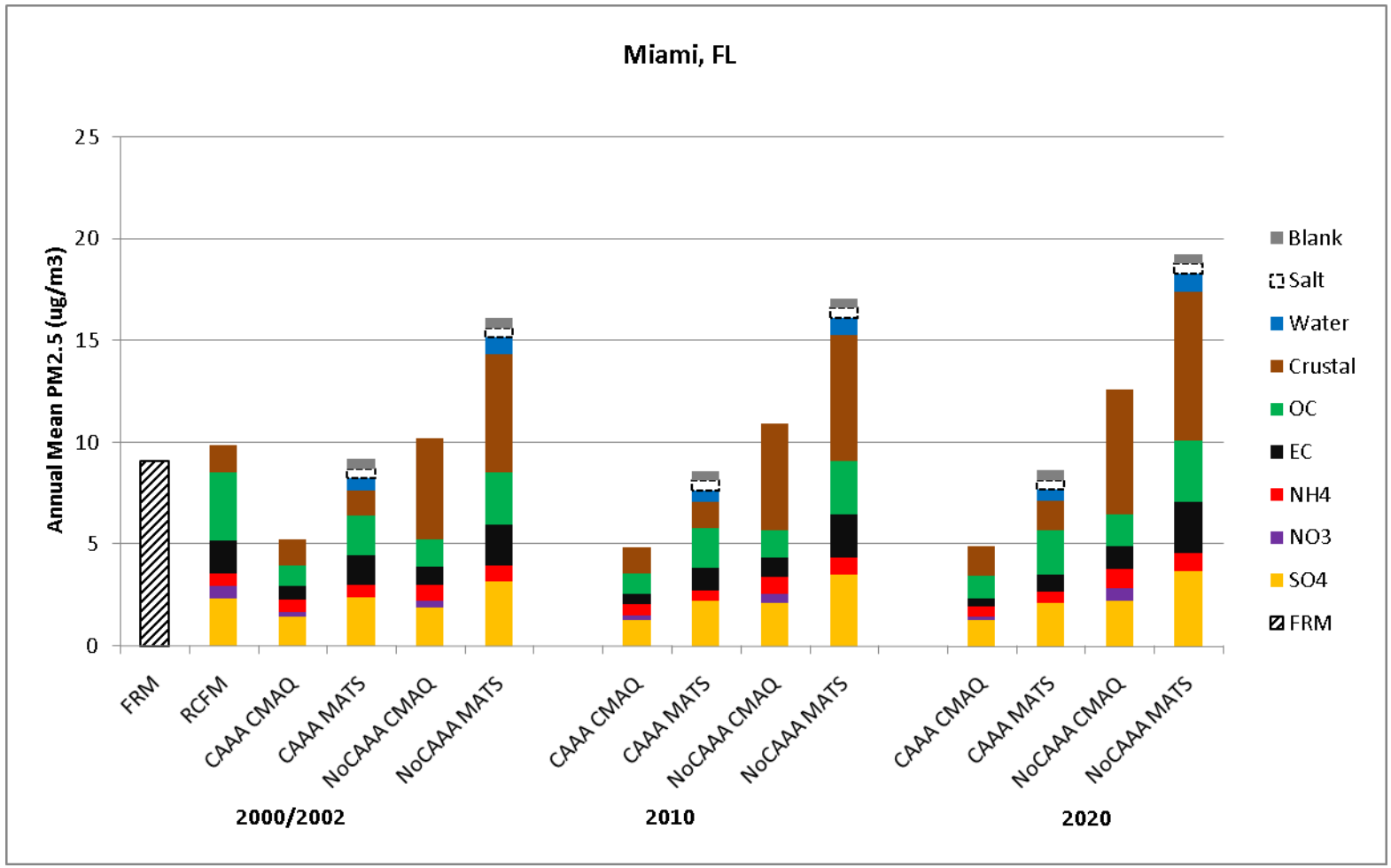

Manhatten, NY
Annual Mean PM2.5 (ug/m3)
50
45
40
35
30
25
20
15
10
5
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM

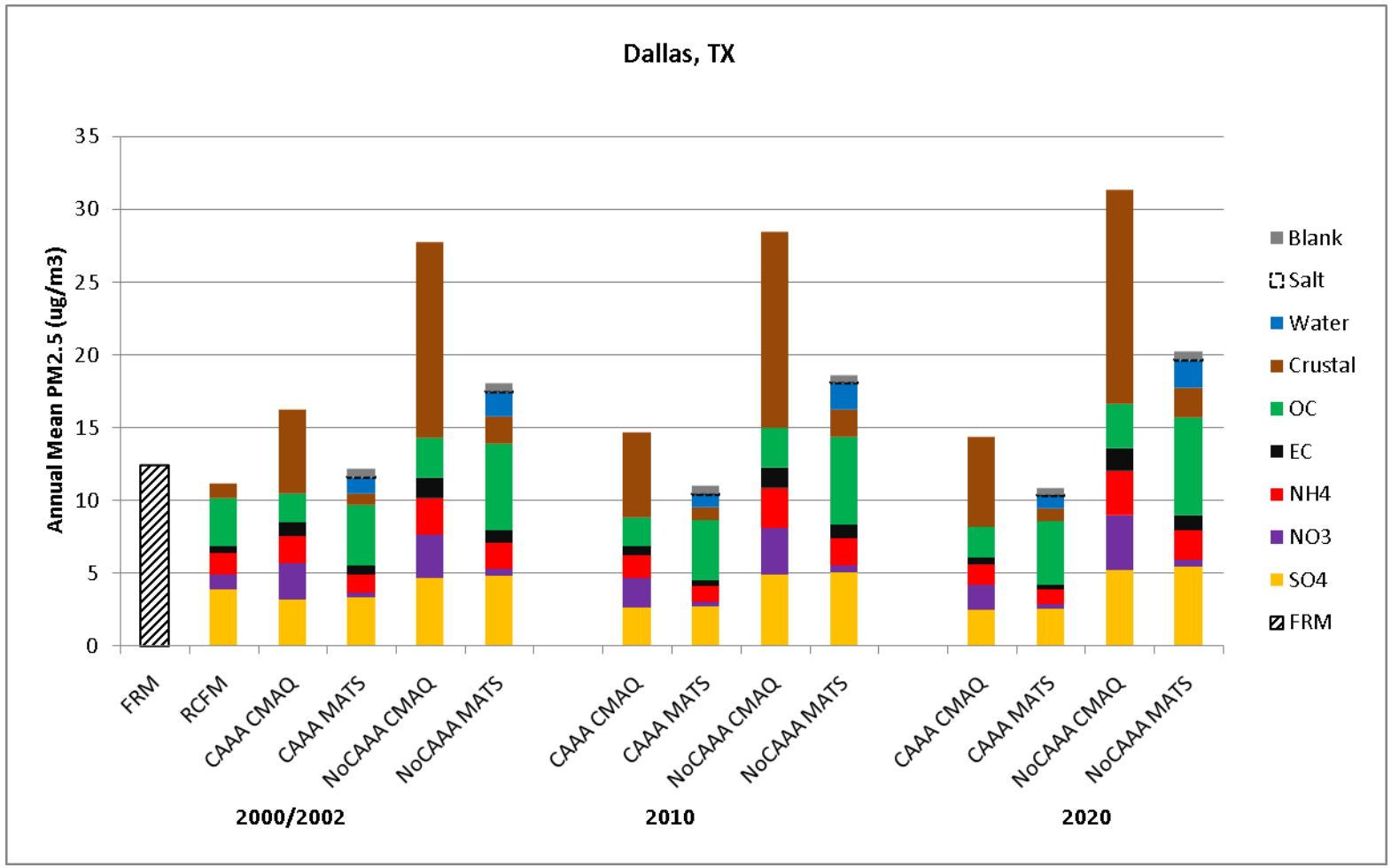

Morris Co, NJ (NYC Metro)
Annual Mean PM2.5 (ug/m3)
35
30
25
20
15
10
5
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM

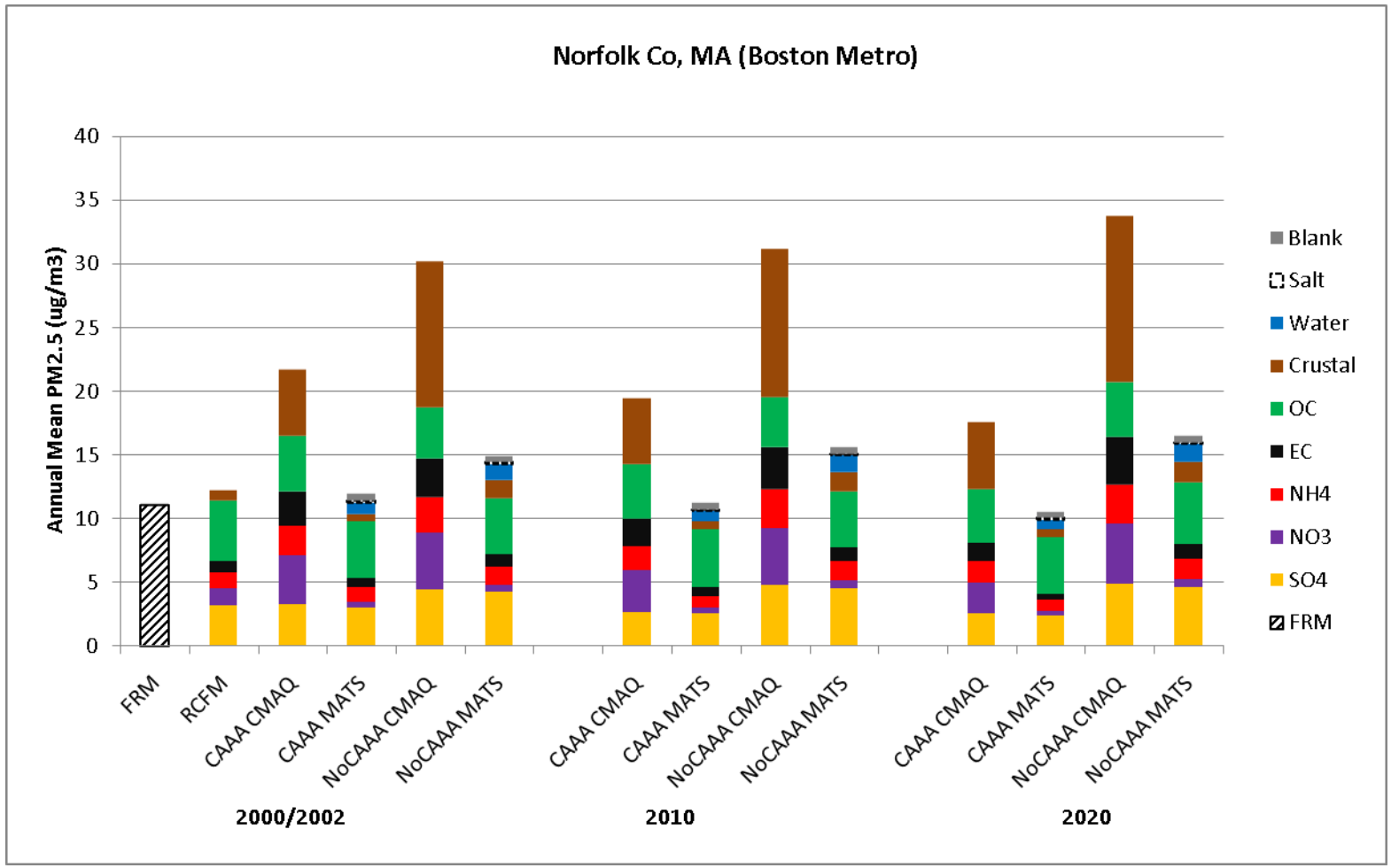

Los Angeles, CA
Annual Mean PM2.5 (ug/m3)
45
40
35
30
25
20
15
10
5
0
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020

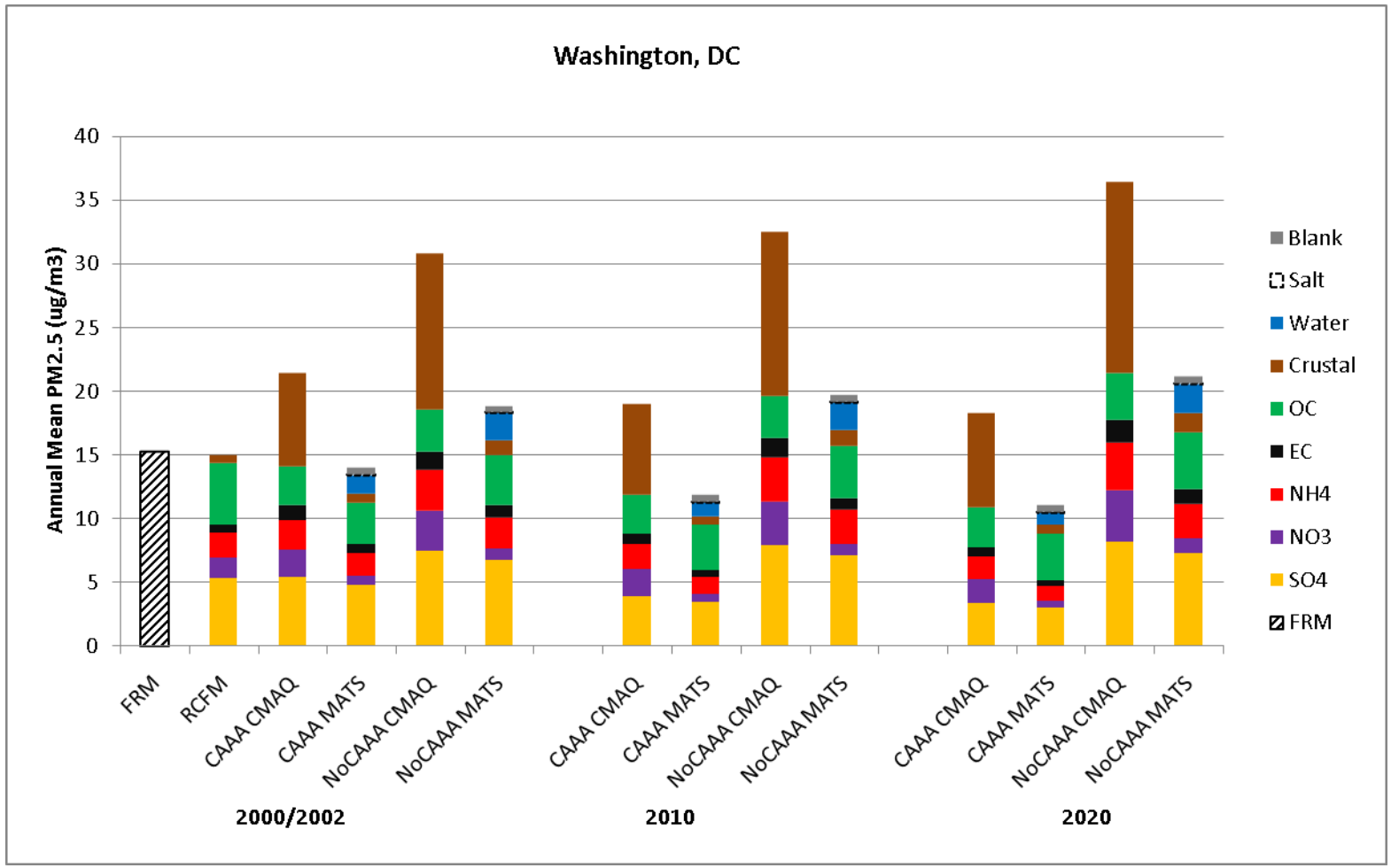

Chicago, IL
Annual Mean PM2.5 (ug/m3)
90
80
70
60
50
40
30
20
10
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM


Philadelphia, PA
Annual Mean PM2.5 (ug/m3)
45
40
35
30
25
20
15
10
5
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM


Miami, FL
Annual Mean PM2.5 (ug/m3)
25
20
15
10
5
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM


Dallas, TX
Annual Mean PM2.5 (ug/m3)
35
30
25
20
15
10
5
0
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020


Norfolk Co, MA (Boston Metro)
Annual Mean PM2.5 (ug/m3)
40
35
30
25
20
15
10
5
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM


Washington, DC
Annual Mean PM2.5 (ug/m3)
40
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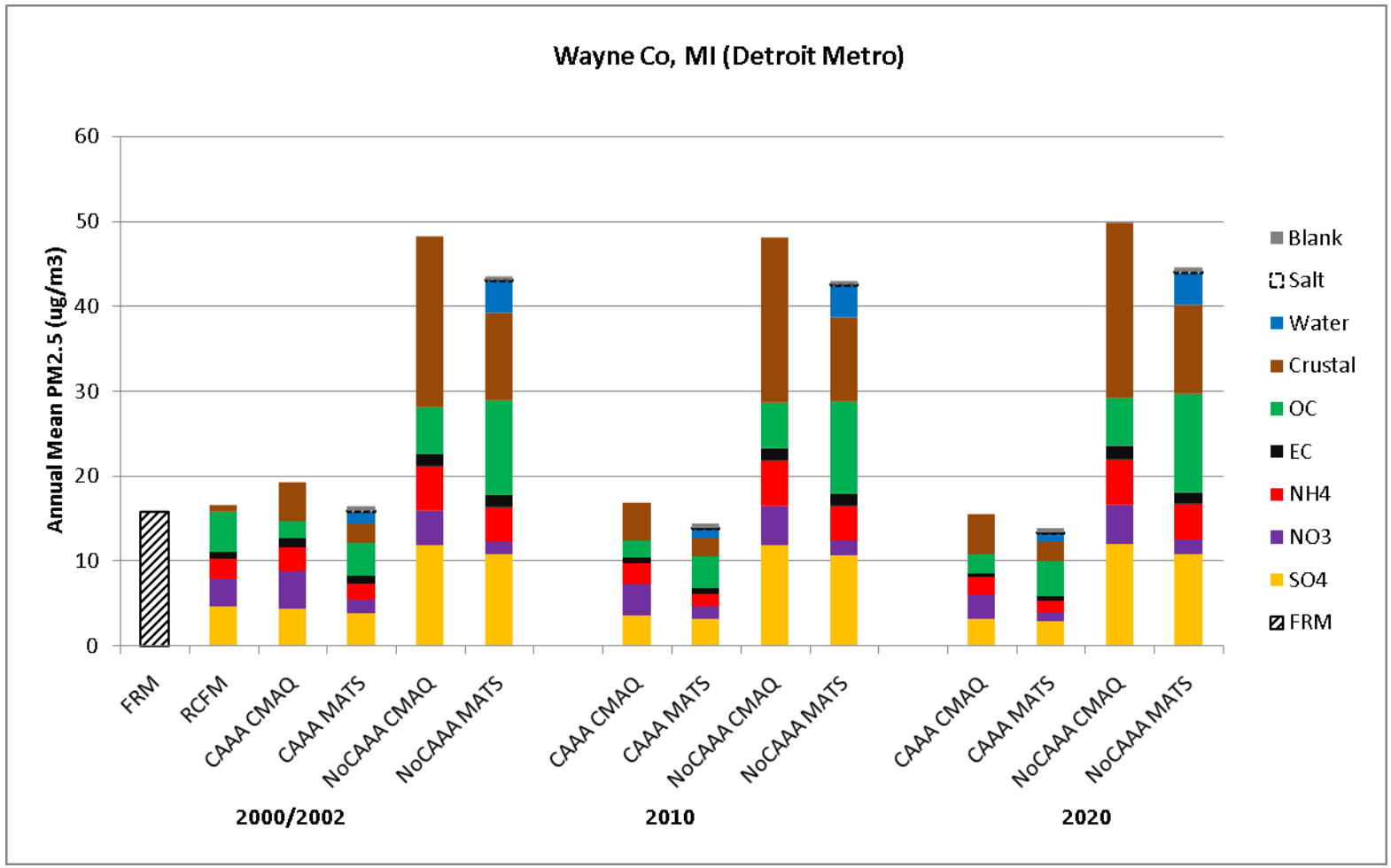
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM


Wayne Co, MI (Detroit Metro)
Annual Mean PM2.5 (ug/m3)
60
50
40
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FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
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2000/2002
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Salt
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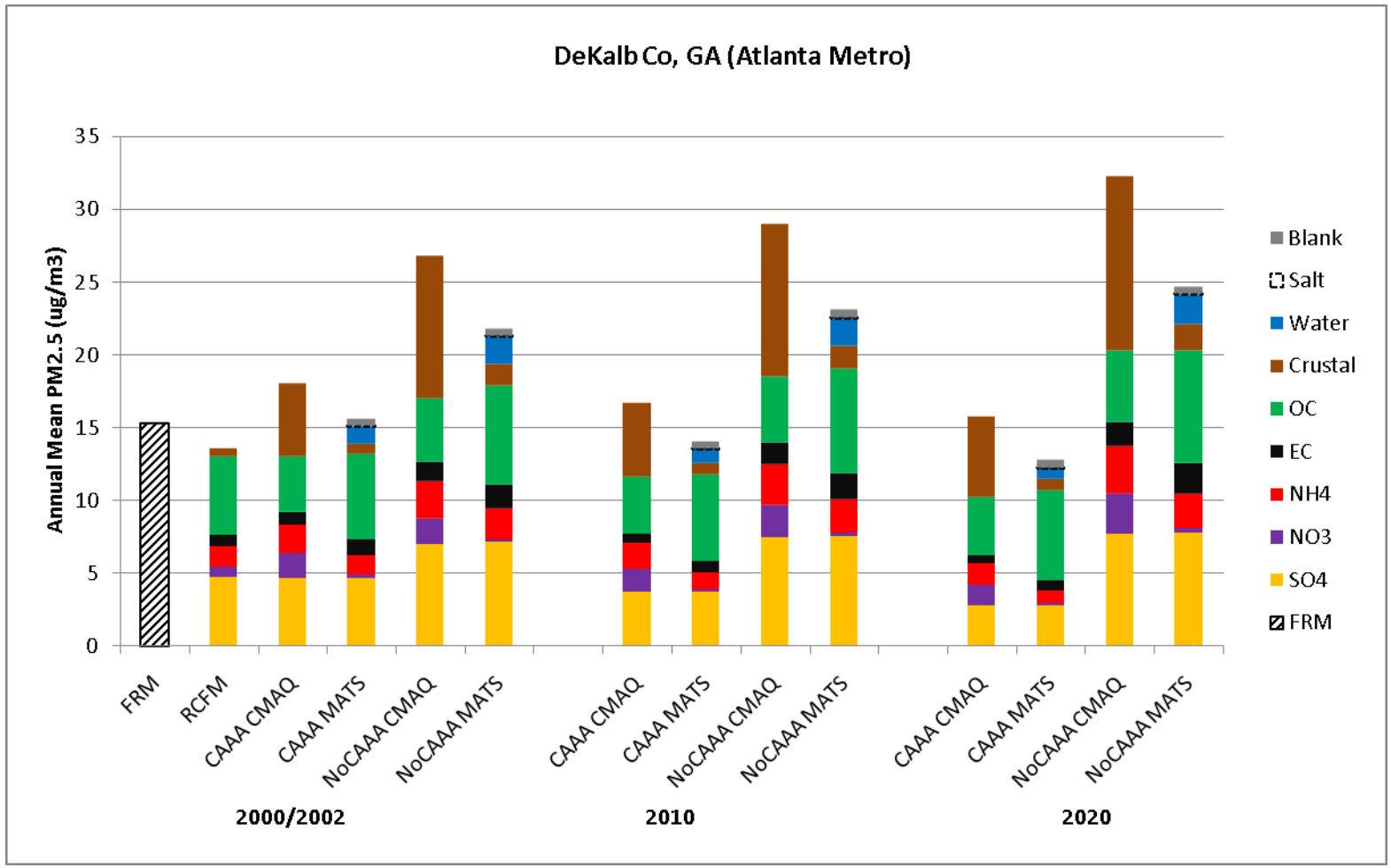
NH4
NO3
SO4
FRM


DeKalb Co, GA (Atlanta Metro)
Annual Mean PM2.5 (ug/m3)
35
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FRM
RCFM
CAAA CMAQ
CAAA MATS
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NoCAAA MATS
CAAA CMAQ
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NoCAAA CMAQ
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CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
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Salt
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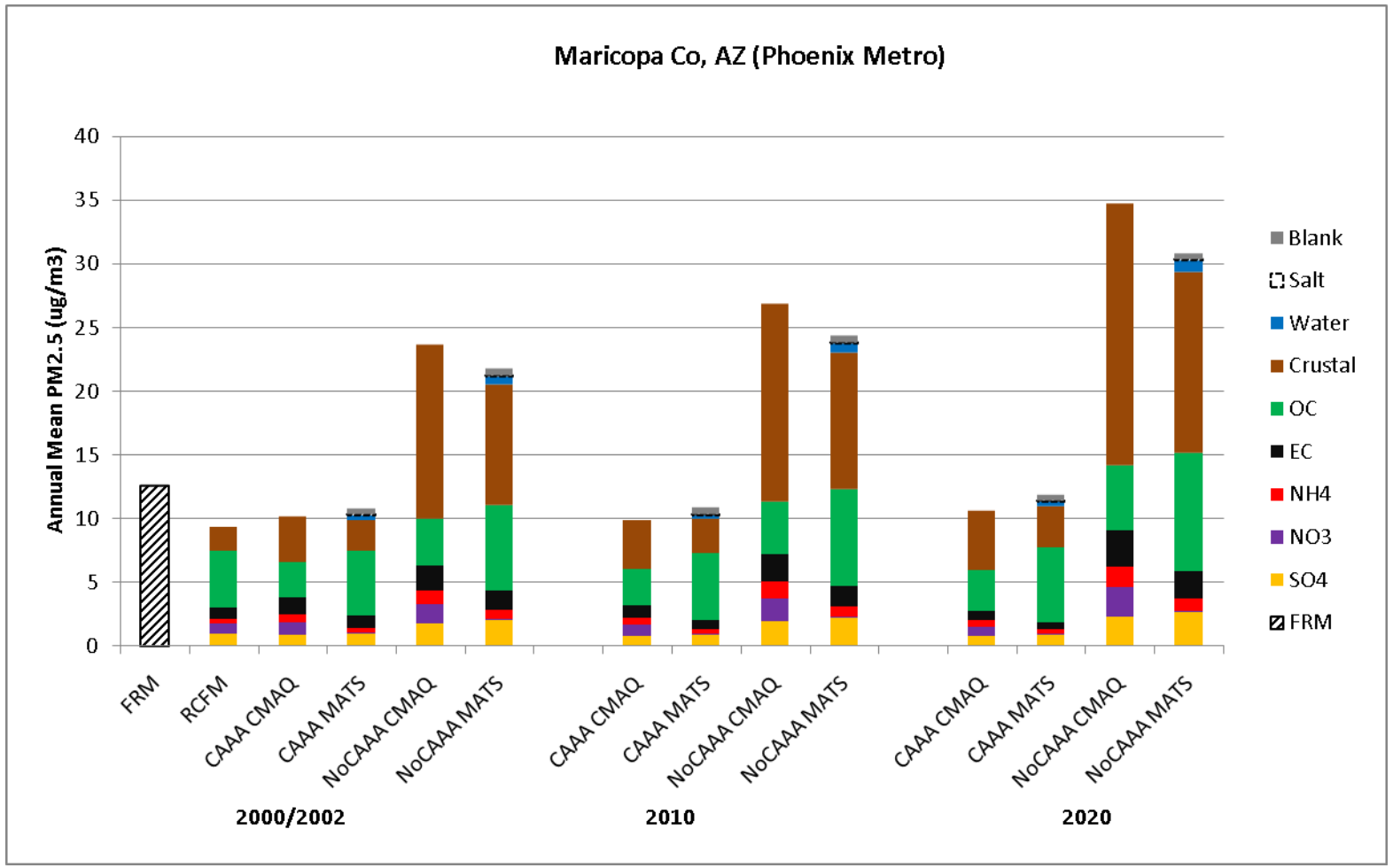
Crustal
OC
EC
NH4
NO3
SO4
FRM


Maricopa Co, AZ (Phoenix Metro)
Annual Mean PM2.5 (ug/m3)
40
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FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
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CAAA MATS
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NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
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2000/2002
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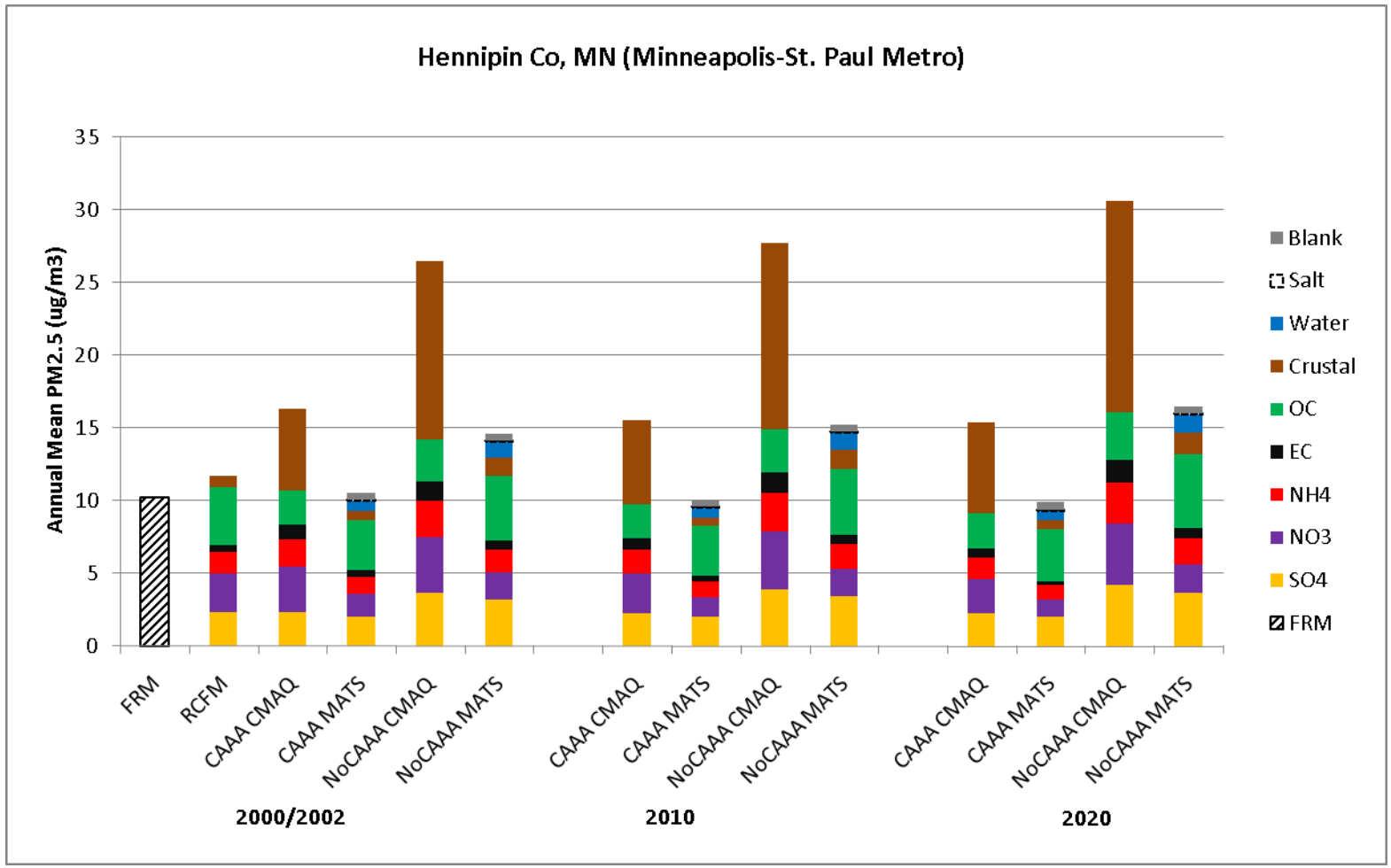
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM


Hennipin Co, MN (Minneapolis-St. Paul Metro)
Annual Mean PM2.5 (ug/m3)
35
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0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
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Salt
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Crustal
OC
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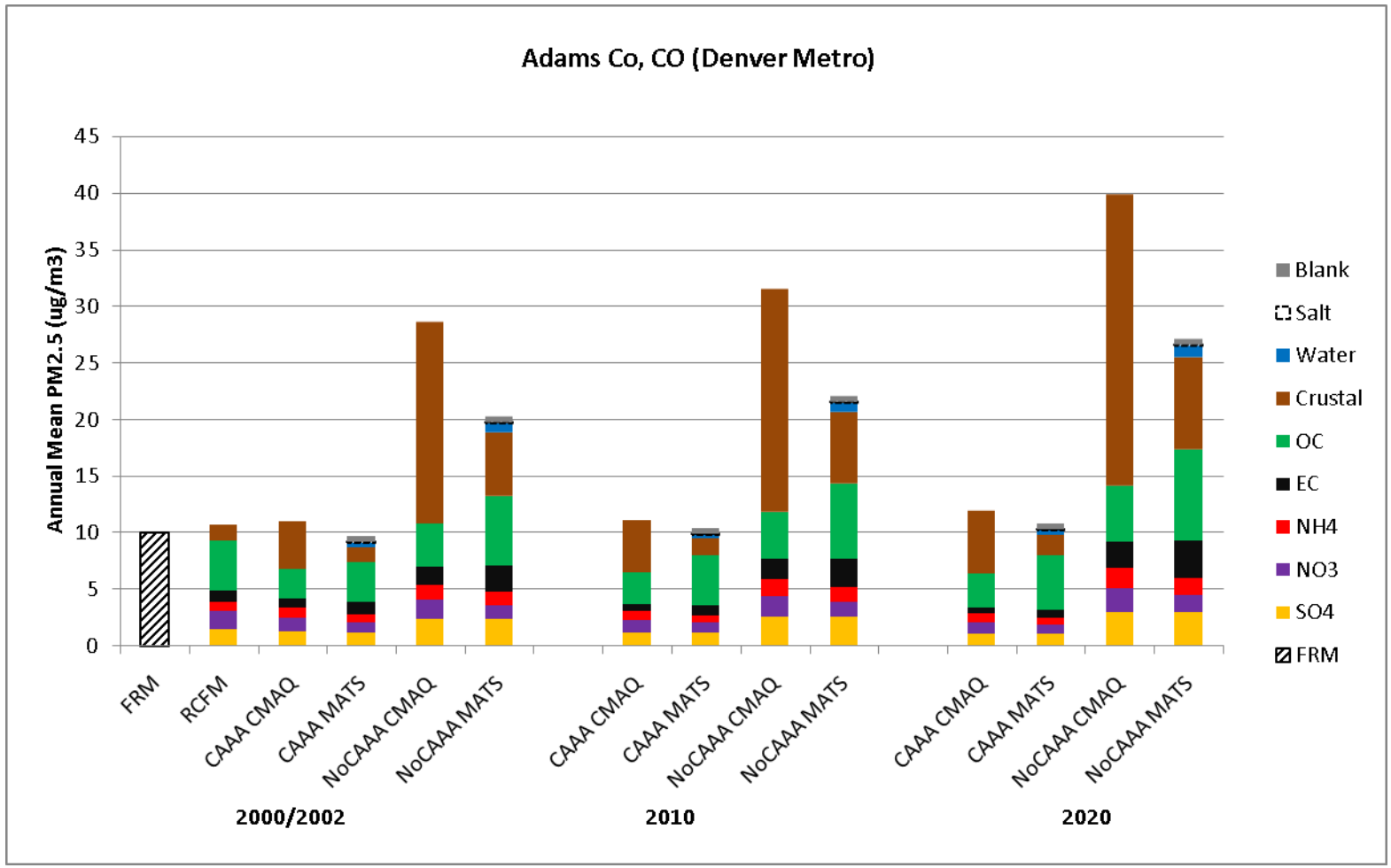
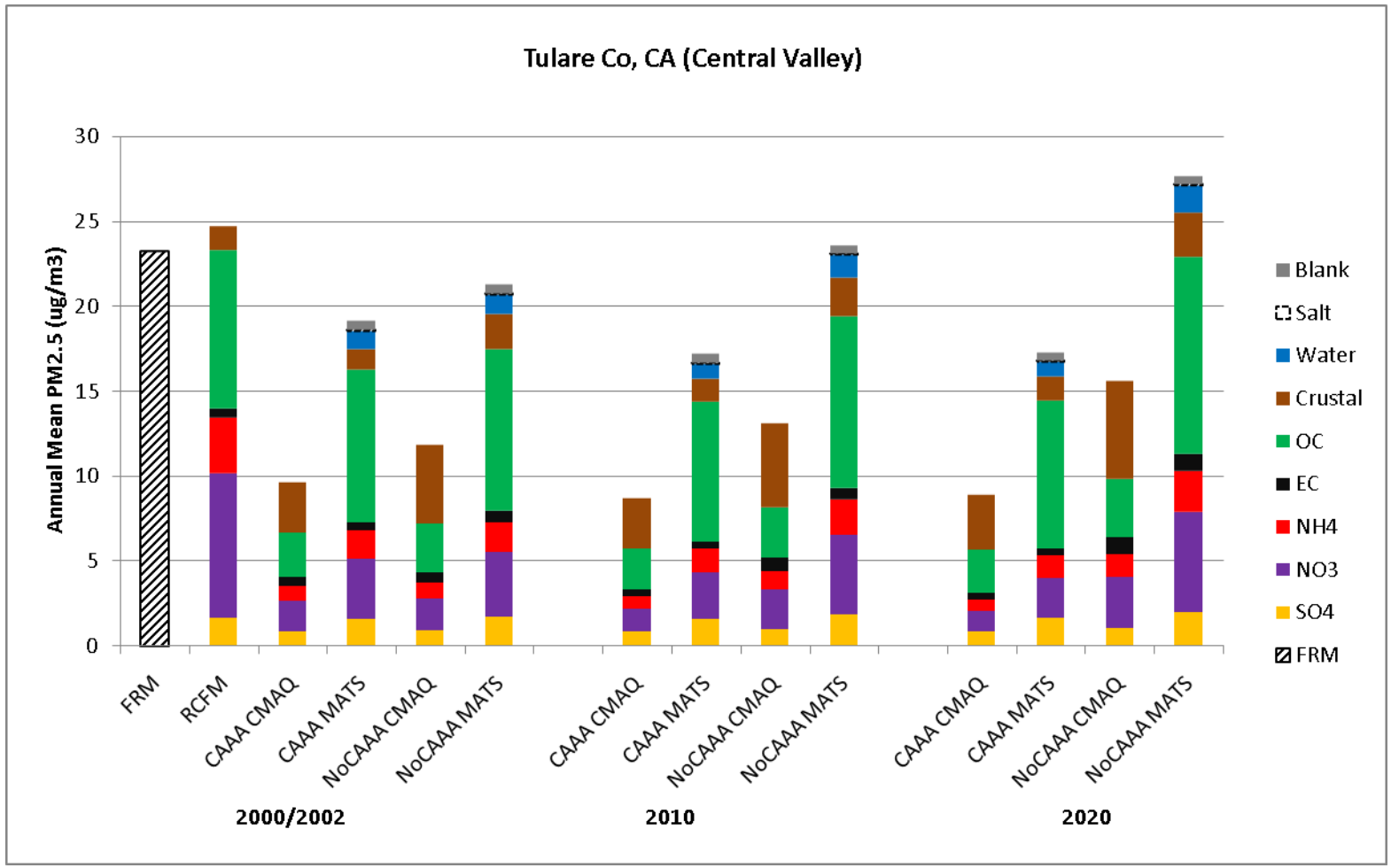
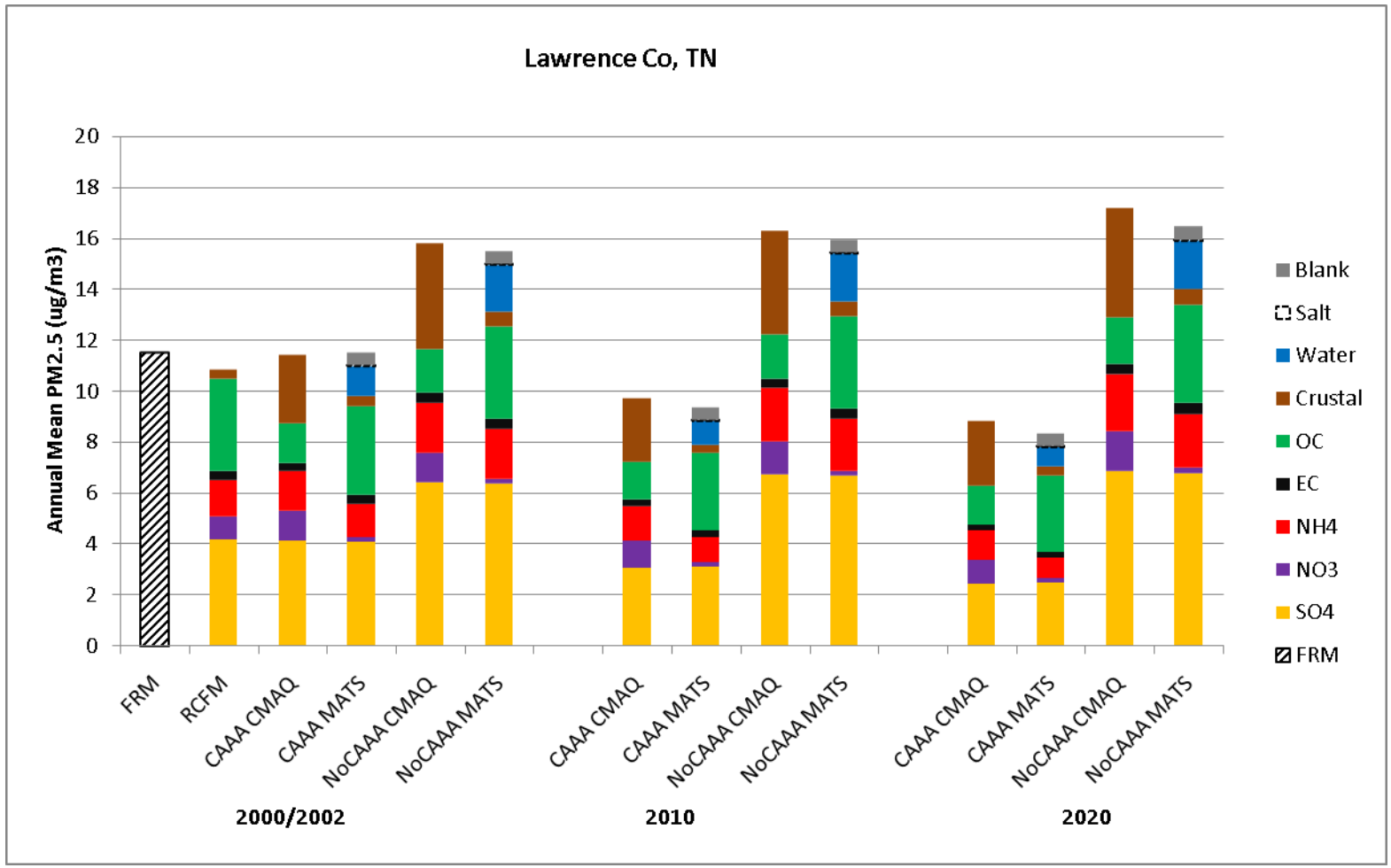
NH4
NO3
SO4
FRM


Adams Co, CO (Denver Metro)
Annual Mean PM2.5 (ug/m3)
45
40
35
30
25
20
15
10
5
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM


Tulare Co, CA (Central Valley)
Annual Mean PM2.5 (ug/m3)
30
25
20
15
10
5
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM


Lawrence Co, TN
Annual Mean PM2.5 (ug/m3)
20
18
16
14
12
10
8
6
4
2
0
FRM
RCFM
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
CAAA CMAQ
CAAA MATS
NoCAAA CMAQ
NoCAAA MATS
2000/2002
2010
2020
Blank
Salt
Water
Crustal
OC
EC
NH4
NO3
SO4
FRM