# IMPROVE Steering Committee Update

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MARAMA Monitoring Committee Workshop, Nov. 20-21, 2019

Swarthmore, PA

Total = 160 Sites

- New Sites
1. DINO, 10/29/2018
2. TOOL, 11/9/2018
3. SOGP, 10/1/2019
- VIIS back online since 12/2018
- Full suite of modules at ATLA1 and PITT1 as of summer 2019

# Analysis and Delivery Status

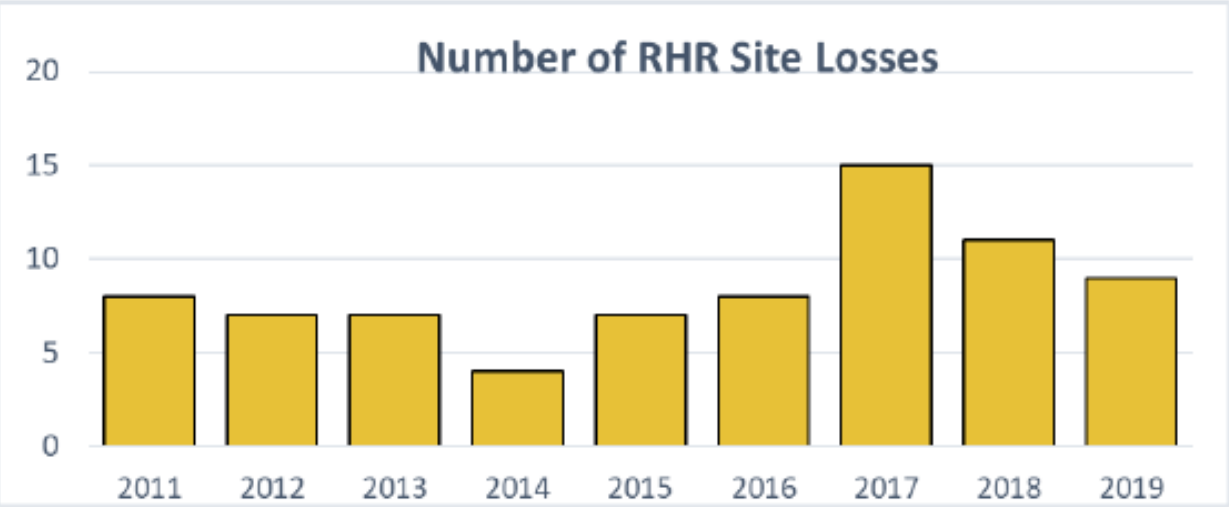
## All 2018 data have been delivered to AQS and FED.

| 2019 | Ions | Carbon | Elements | HIPS | Validation | Delivery (AQS & FED) |
|---|---|---|---|---|---|---|
| January | ✓ | ✓ | ✓ | ✓ | 🕒 | ✗ |
| February | ✓ | ✓ | ✓ | ✓ | 🕒 | ✗ |
| March | ✓ | ✗ | ✓ | ✓ | ✗ | ✗ |
| April | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ |
| May | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ |
| June | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| July | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| August | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| September | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |

# Regional Haze Rule (RHR) Completeness Criteria

RHR requires for all modules:

- < 11 consecutive missed samples
- > 50% recovery in each quarter
- > 75% annual recovery




2011-2018: Final number of losses after completion of full validation.

2019: Number of losses year-to-date.

Site status report distributed every quarter; if you aren't on the list, let us know

# Site losses in 2019

Government shutdown in January resulted in 9+ consecutive lost samples (NS) at most sites

1. BOAP1 (FWS): 12 consecutive PO samples in Q1
2. BYIS1 (SKorea): 13 consecutive NS samples
3. FLAT1 (Tribe): 31 samples lost this year (mostly NS samples)
4. FLTO1 (FS): 12 consecutive samples lost in Q1 (mostly NS samples)
5. FOPE1 (Tribe): 19 samples lost in Q1 (mostly NS samples)
6. IKBA1 (FS): 20 samples lost in Q1 (mostly NS samples)
7. MING1 (FWS): 12 consecutive NS samples in Q1
8. THRO1 (NPS): 12 consecutive NS+EP samples in Q1
9. BLIS1 (FS): >10 consecutive PO, electricity shut due to code violations

# MTL Automated Weighing Chamber

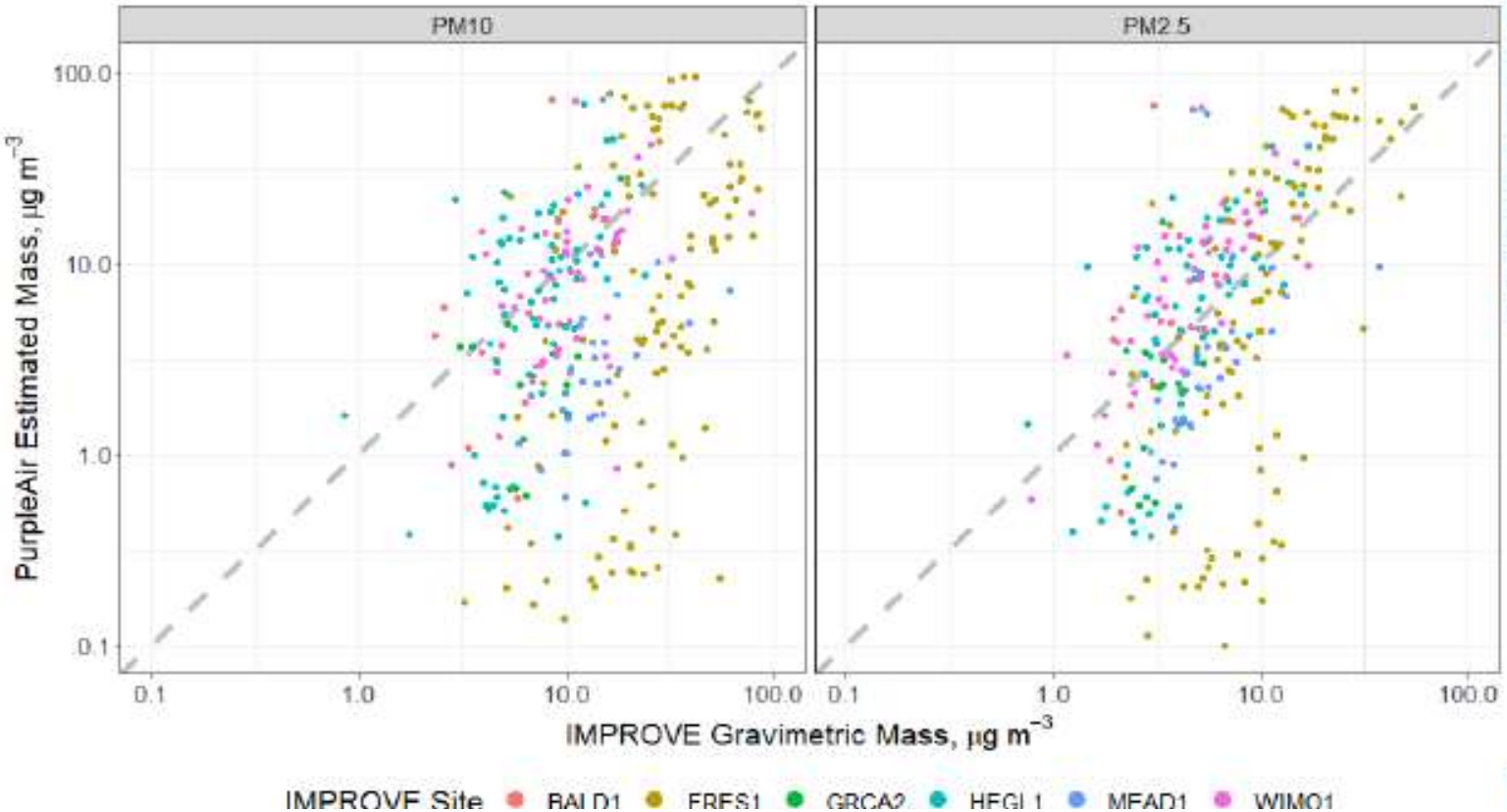
Operational starting October 5, 2018

- Relative humidity set to 39% (± 0.4% with door closed)
- Temperature set to 21.5 °C
- 2-4 hour equilibration time (operationally limited)

Long term testing ongoing:

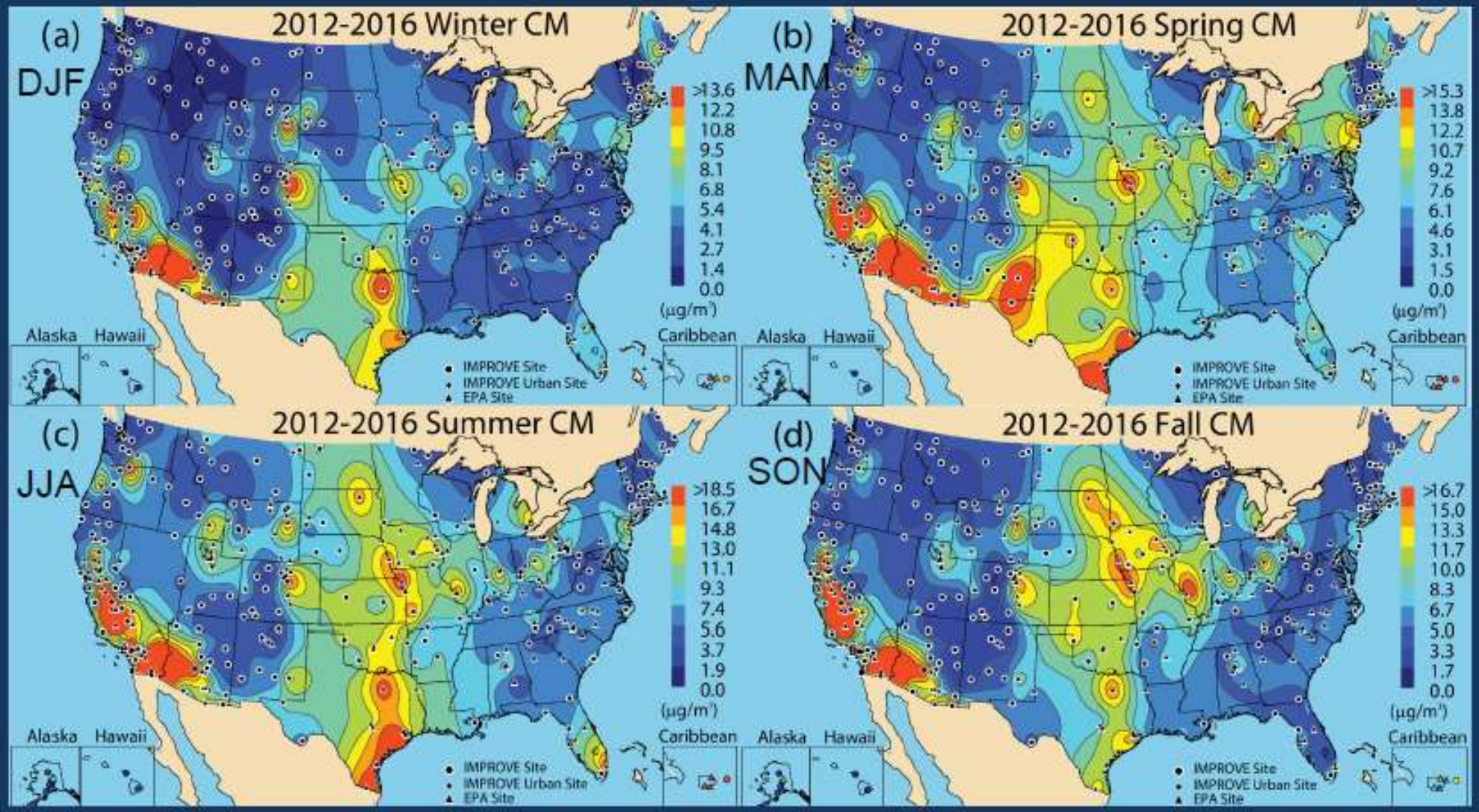
- Longer equilibration time
- Manual balance vs. chamber system
- Mass gain on blanks

# Purple Air Sensors

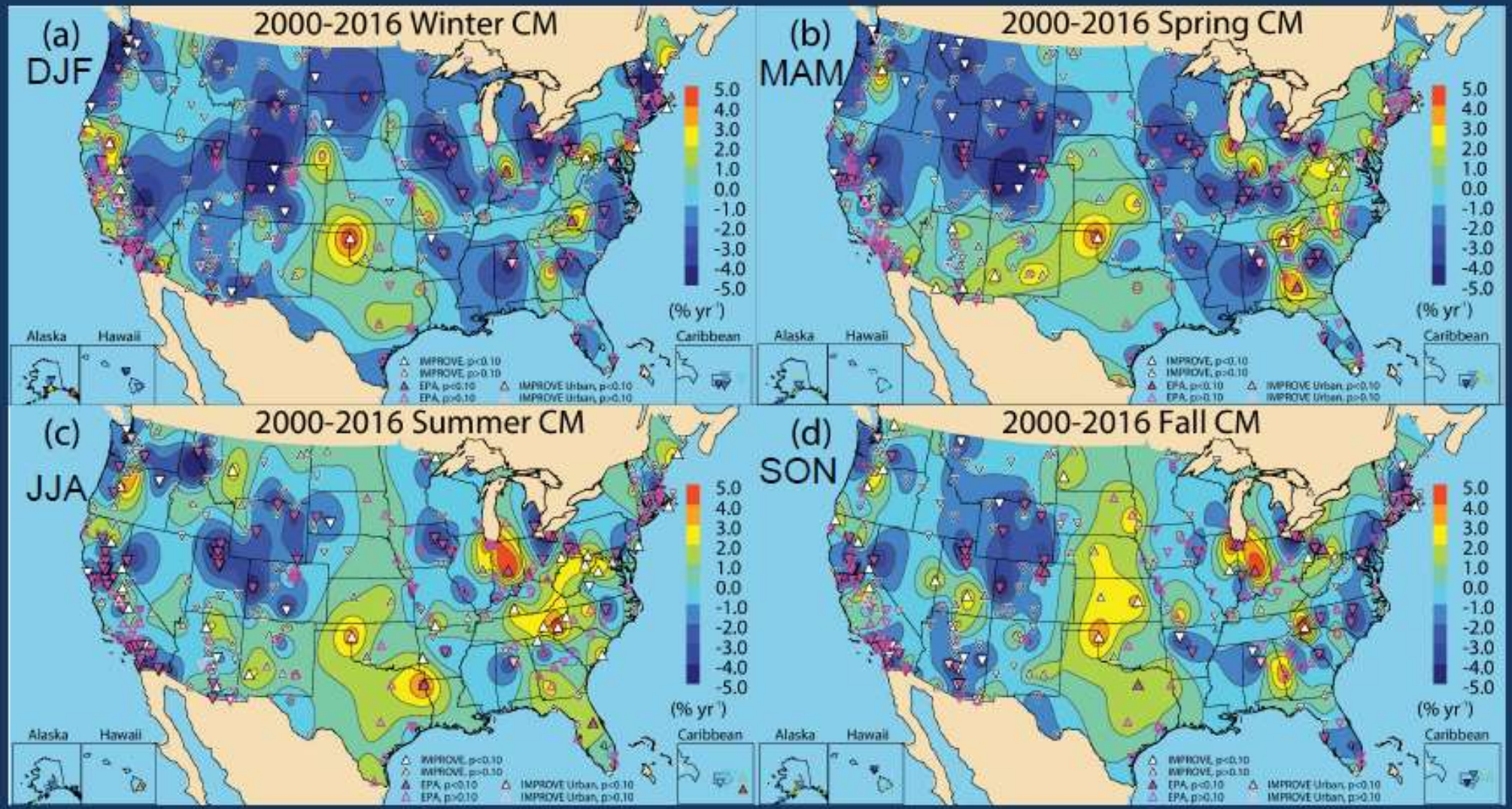



| Location | Data Output | Installed |
|---|---|---|
| Fresno, CO (FRES1) | Public | 05/14/2018 |
| Meadview, AZ (MEAD1)* | SD Card | 06/04/2018 |
| Grand Canyon, AZ (GRCA2) | SD Card | 06/05/2018 |
| Mount Baldy, AZ (BALD1*) | SD Card | 06/07/2018 |
| Wichita Mountain, OK (WIMO1) | Public | 07/26/2018 |
| Hercules-Glades, MO (HEGL1) | Public | 07/29/2018 |
| Mammoth Cave, KY (MACA1) | Controller | 05/07/2019 |
| Great Smoky Mountains, TN (GRSM1) | Controller | 05/10/2019 |
| University of CA – Davis | SD Card | 05/22/2019 |
| Shenandoah, VA (SHEN1) | Controller | 7/26/2019 |
| Theodore Rosevelt, ND (THRO1) | Controller | 8/22/2019 |

# Seasonal Mean CM concentrations (2012-2016) (μg $m^{-3}$)

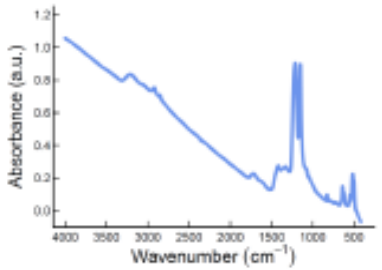


# 2000-2016 Seasonal Mean Trends in CM (% $yr^{-1}$)



# FT-IR for network use

Teflon filter




- FT-IR is a non-destructive, fast, low-cost method
- Reproduce existing data
  - OC and EC in CSN and IMPROVE are predicted with a few sites of TOR
  - Sulfate, ammonium, silicate, etc. predicted in IMPROVE and CSN
    - Data useful for QC of network data
- New data
  - OM, OM/OC and functional groups
  - Observe trends in OM, OM/OC and composition
- Single filter ops. - SPARTAN, MAIA, FRM, personal samplers (J. Volckens, CSU)
- Source characterization (not discussed today)
  - Characterize source samples (Mike Hayes, EPA)
  - Identify dust, smoke, marine and other sources in ambient samples

FTIR is a promising method for measuring compositional data in PM2.5 monitoring networks

# Budget Issues

- Total budget: EPA 5,285,590
  NPS 168,000
  USFS 131,000
  EPA CSN/FTIR 621,593
  Other 77,000
  6,283,183
- Total expenditures: 6,383,127
- Deficit: (109,944)

# Budget Issues

- Four options under consideration to address projected deficits of > $100,000 in the coming years

  - Option 1: Secure increased funding.
  - Option 2: Change the way measurements are made. Alternate C methods (Fabs/FTIR) or alternate sampler configuration (IMPROVE “light”).
  - Option 3: Reduce the number of sites.
  - Option 4: Reduce frequency of sampling

- Reconstituted IMPROVE Budget Working Group will convene by teleconference to develop recommendations for consideration by next Spring.

Full Steering Committee presentations available here:

http://vista.cira.colostate.edu/Improve/2019-steering-committee-agenda/