

Organized response to a wildfire smoke exposure

A multidisciplinary study to assess potential effects on a rural community

Chris Migliaccio, Ph.D., Pharm.D.

Fire Season 2017: Seeley Lake, MT

○ Rice Ridge Fire

- >160,000 acres

○ Liberty Fire

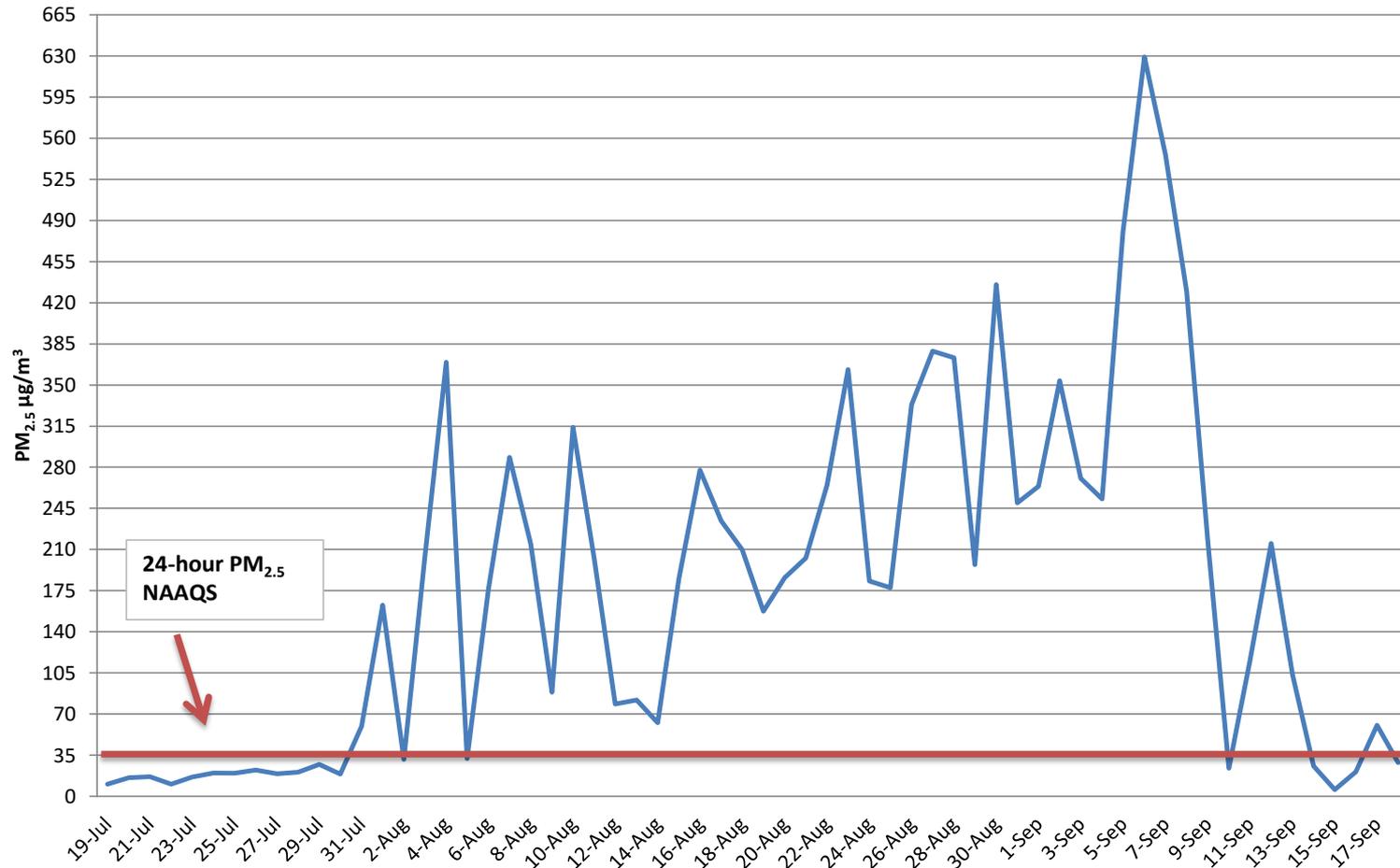
- >29,000 acres

○ Significant weather inversions

Seeley Lake statistics

- Over 190,000 acres burned
- July 31st-September 18th
- Median 24-hr average: 203.4 $\mu\text{g}/\text{m}^3$
- 9 days of $>1000 \mu\text{g}/\text{m}^3$
- 35/50 days were “very unhealthy” or “hazardous”

Seeley Lake 2017 Wildfire Season Average 24-hour PM_{2.5} Concentrations*†



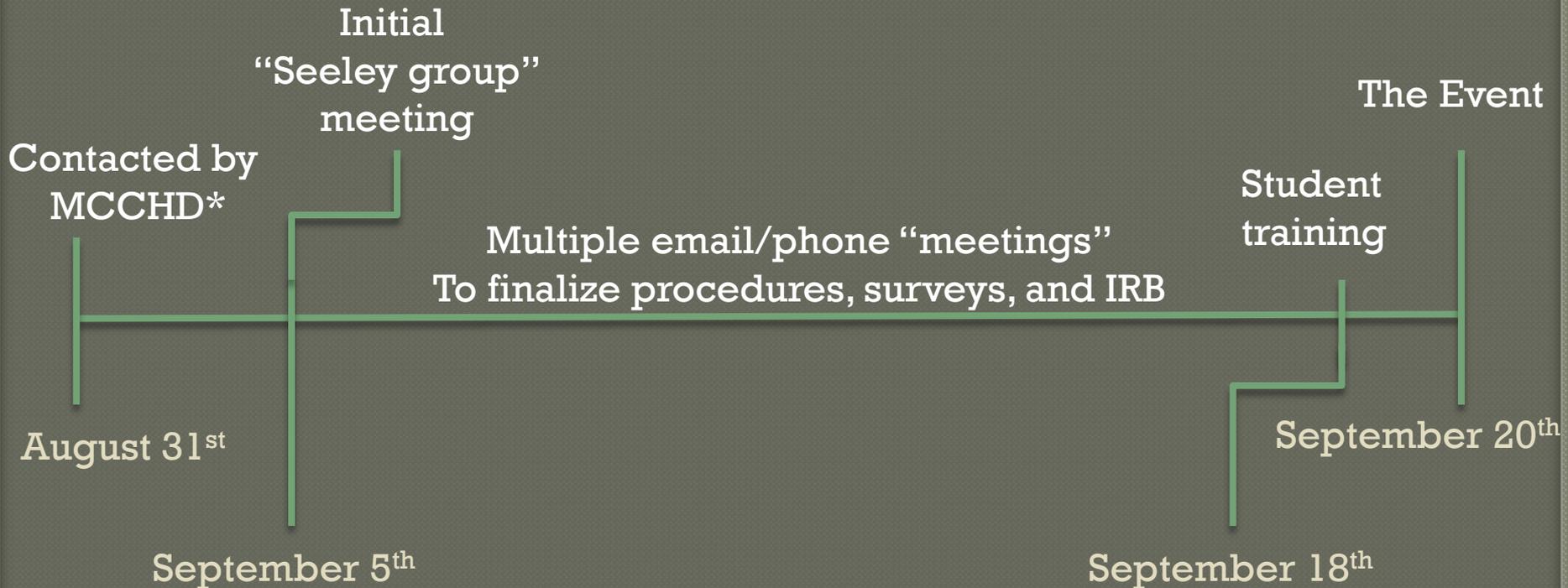
*These data have not been through the QA process †Some of these data are underestimates due to monitoring equipment limitations.

Seeley post-fires: October 2017



J. Fischer 2017

Sequence of events



*MCCHD: Missoula City-County Health Department

“Seeley Study Group”

- Biomedical researchers
- School of Public Health faculty
- Local clinicians
- Staff scientists
- Clinical faculty from School of Pharmacy
- IPHARM program
 - Health professions students

IPHARM

- **Im**Proving **H**ealth of **R**ural **M**ontanans
- Established in the School of Pharmacy in 2002
- Travel throughout the state performing health screenings and educations
- Students and professionals from pharmacy, nursing, physical therapy, social work, medical
- No identifiable data collected

IRB approval

- ◉ Needed to be expedited
- ◉ Due to short timeframe, focused on non-invasive measures
- ◉ Respiratory assessment
- ◉ Surveys
- ◉ BP, HR, SpO₂

Event design

- ◉ Utilized the IPHARM model and experience
- ◉ Check-in and screening
- ◉ Surveys and “health stations”
- ◉ Participant compensation – steak sandwiches (MCCHD)

Study Design

- Pre-screening questions (ie spirometry)
- Surveys
 - Demographics
 - MCCHD information – evacuation
 - Depression scale (CESD)
 - Mental health (POMS)
 - Adult and Child health
- Health screening
- Original goal of 50 participants

Conclusions

- ◎ Establishment of a unique cohort
 - Enrolled 95 residents
 - Pulmonary function assessments
 - Survey data
 - Demographics
- ◎ Model for future responses
 - Wildfires every summer

Future

- Applied for time-sensitive R21 (NIEHS)
- Amend IRB to include blood and buccal samples
- Return multiple times in the next couple years – added tests, participants
- Identified a control community
- Prepare for next season

Acknowledgements

- University of Montana

- School of Public and Community Health
- Skaggs School of Pharmacy
- MSU School of Nursing - UM
- Program in Social Work

- NIGMS CoBRE Grant 1P30GM103338

- GWEP HRSA Grant U1QHP28733

Acknowledgements

● School of Pharmacy

- Chris Migliaccio, Ph.D., Pharm.D., AE-C
- Donna Beall, Pharm.D., BCPS, CPP
- Rory Johnson, Pharm.D. AE-C
- Rachael Zins, Pharm.D., AE-C
- Michelle Salois
- Marshall Renna
- Ruby Gale
- Kelly Hasquet
- Andrew Gluckert
- Jacob Lilletvedt

● UM Social Work program

- Jordan Gilbert

● UM CEHS – IPP Core

- Mary Buford

● School of Public and Community Health

- Curtis Noonan, Ph.D.
- Tony Ward, Ph.D.
- Erin Semmens, Ph.D.
- Emily Weiler

● MSU School of Nursing

- Madelyn
- Haley DeVries

● Missoula City-County Health Dept.

- Sarah Coefield
- Ben Schmidt

● Community

- Paul Smith, D.O.