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Welcome to the Fifth AmeriFlux Webinar

## Site Visit Lite

Hosted by the AmeriFlux Tech Team  
Berkeley, CA  
January 8, 2021; 10 am (PST)



# Webinar content

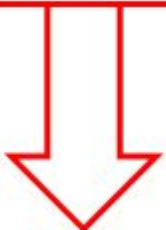


Introduction  
Tech Team and support  
Comprehensive Site Visits  
Site Visits 2.0 Framework  
Site Visit Lite  
Examples of findings  
Discussion (20 minutes)

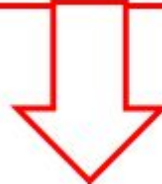


US-ICt

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questions, comments,  
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Technical issues during  
the webinar: AMP-  
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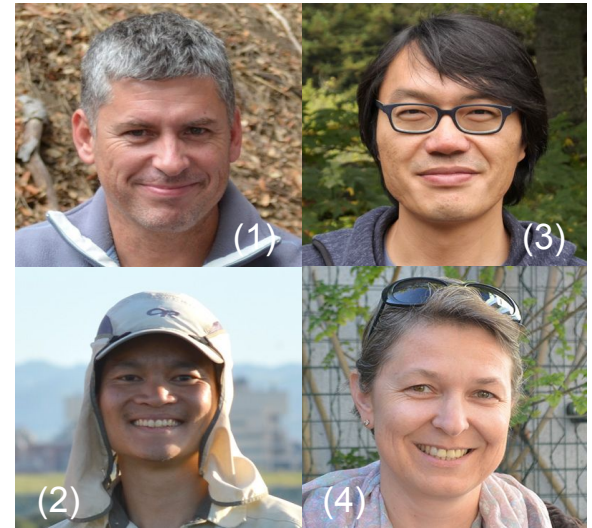
# Introduction to the AmeriFlux Tech Team

Who: Sébastien Biraud<sup>(1)</sup>, Stephen Chan<sup>(2)</sup>, Housen Chu<sup>(3)</sup>, Sigrid Dengel<sup>(4)</sup>

What: Maintain and enhance data quality across the AmeriFlux network

How:

- Comprehensive site visits
- Loaner instruments
- Calibrated PAR sensors
- Year of Methane loaners
- CO<sub>2</sub> & CH<sub>4</sub> calibration gases
- Portable Profile System
- Rapid Response System



[ameriflux-tech@lbl.gov](mailto:ameriflux-tech@lbl.gov)

# Measurement Best Practices

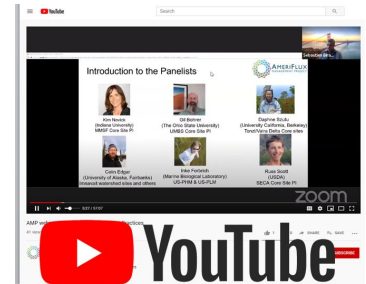
Sharing tips and resources across the community makes the Network stronger. Based on our experiences visiting sites, we have compiled a list of best practices focused around field work activities. The checklist is organized by frequency of each task (weekly, monthly, seasonal). Interacting with site teams also allows us learn from them and see new solutions to common challenges.

Tech Resources: <https://ameriflux.lbl.gov/tech/technical-resources/>

Slides: [https://ameriflux.lbl.gov/wp-content/uploads/2020/09/AMP\\_MeasurementsBestPractices\\_presentation20200925.pdf](https://ameriflux.lbl.gov/wp-content/uploads/2020/09/AMP_MeasurementsBestPractices_presentation20200925.pdf)

Past webinar Recording:

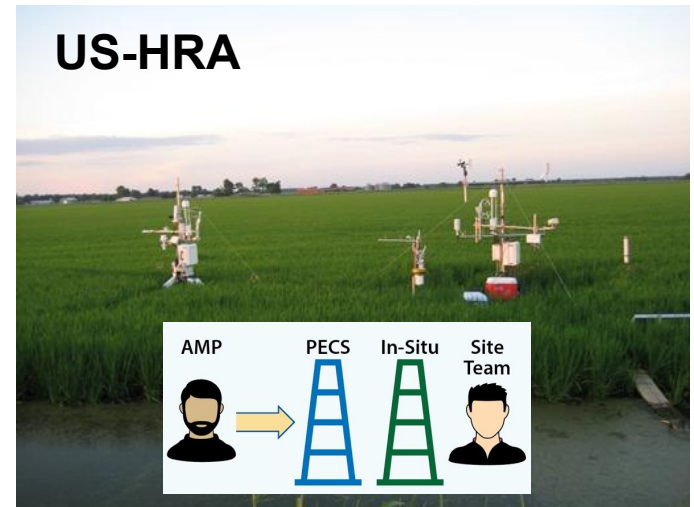
<https://www.youtube.com/watch?v=11LeEJCDhKU>



# Comprehensive site visit overview

- Deploy a carefully calibrated portable eddy covariance system (PECS) at AmeriFlux sites for a side-by-side evaluation
- Close coordination with site team (logistics, data exchange, and more)
- Extensive auxiliary equipment (climbing equipment, gas generators, etc.)
- Tech Team staff travel with PECS for duration of deployment (<14 days)
- Extensive post-visit data analysis including data processing evaluation

<https://ameriflux.lbl.gov/tech/site-visits/>



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# Have you participated in any comprehensive site visit before?

Yes, more than once.

Yes, once.

No, but I am aware of the site visit program.

No, I never heard about the site visit program.

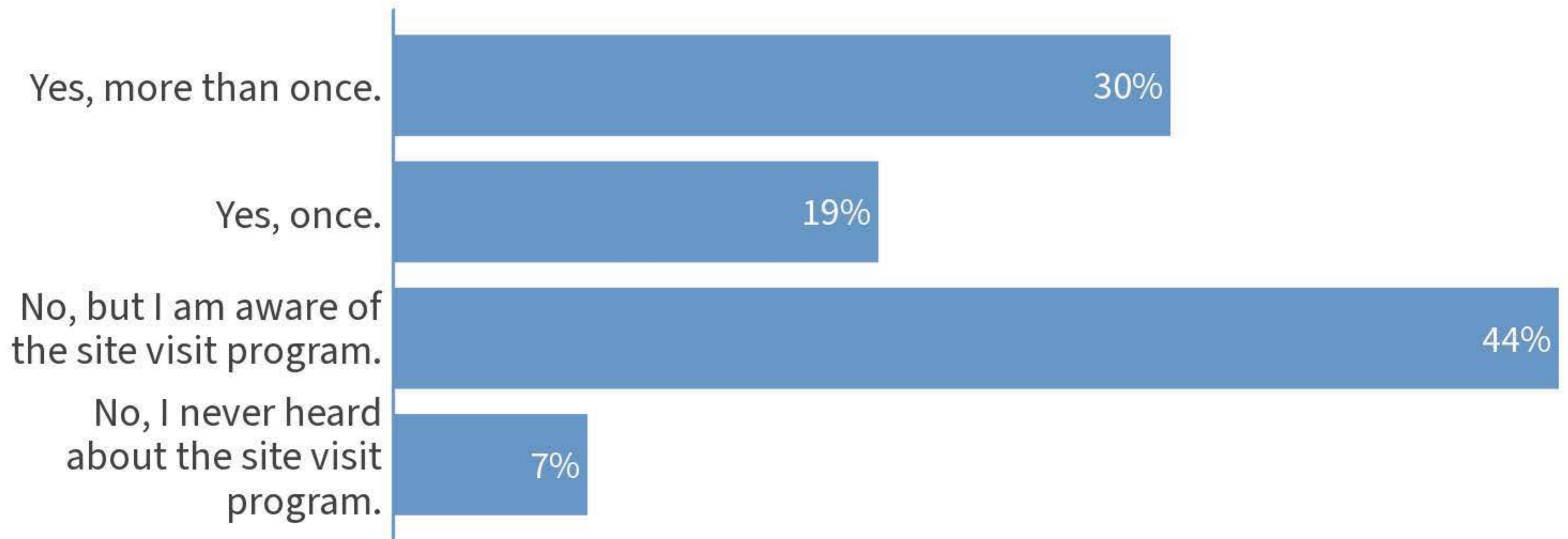




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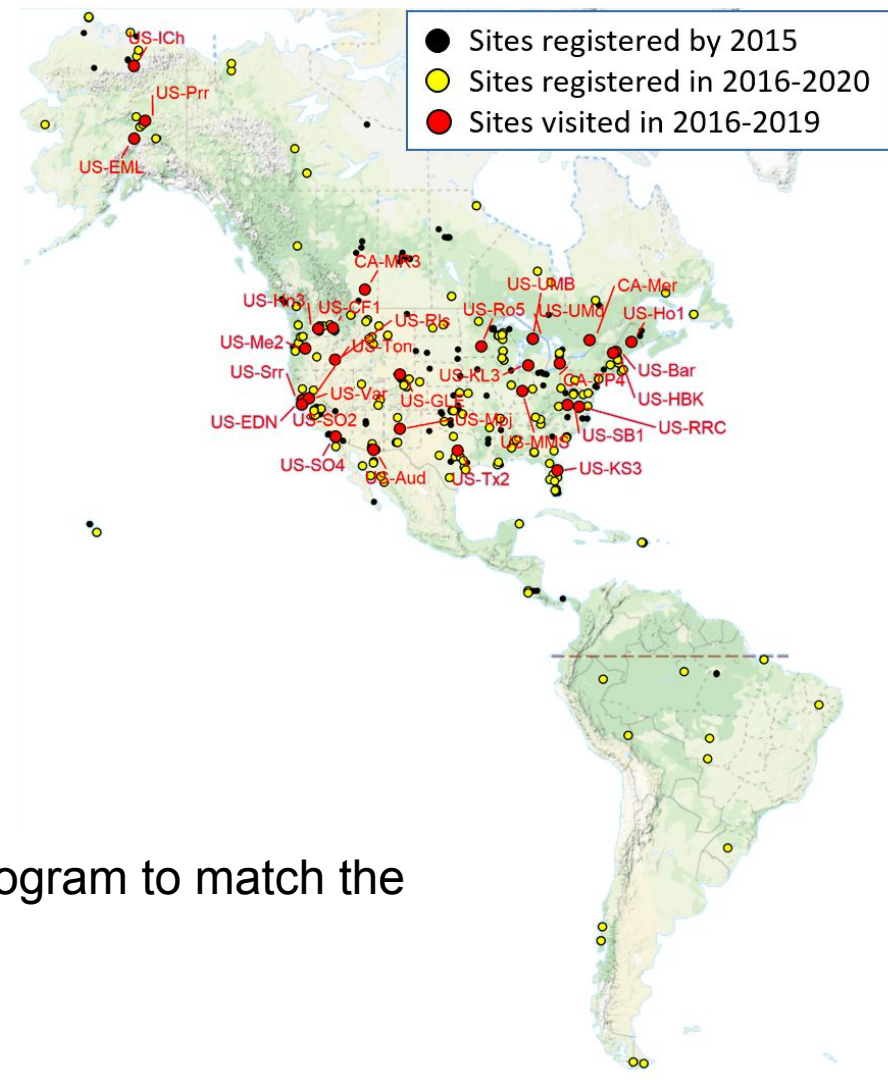
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## Have you participated in any comprehensive site visit before?



# Why a new site visit program?

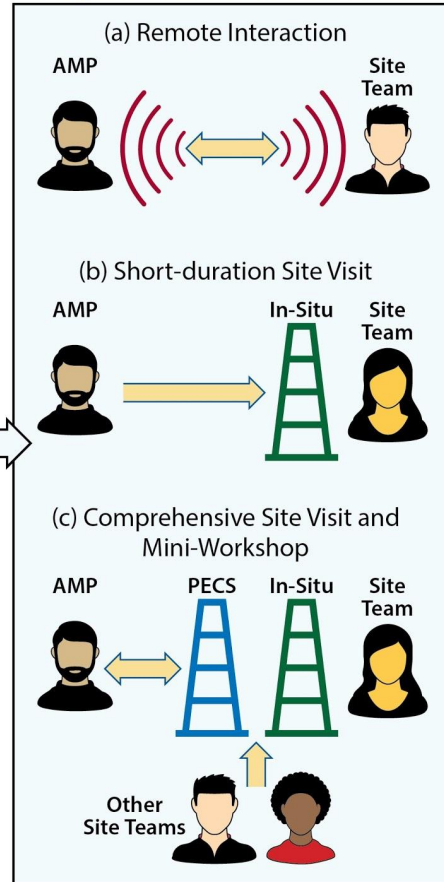
- Network growth
  - 523 registered sites
  - 240 in the last 5 years
- Comprehensive Site Visit:
  - 3-4 months effort per site
  - 8-10 sites per year
  - 210 sites visits since 1997
  - 25+ year return interval



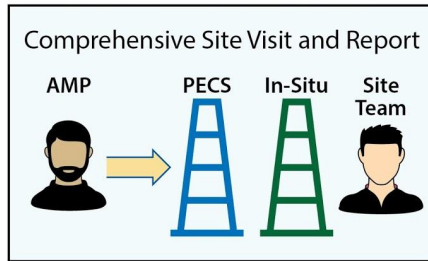
The primary goal is **scaling** the site visit program to match the growth of the Network.

# New framework for site visits and training

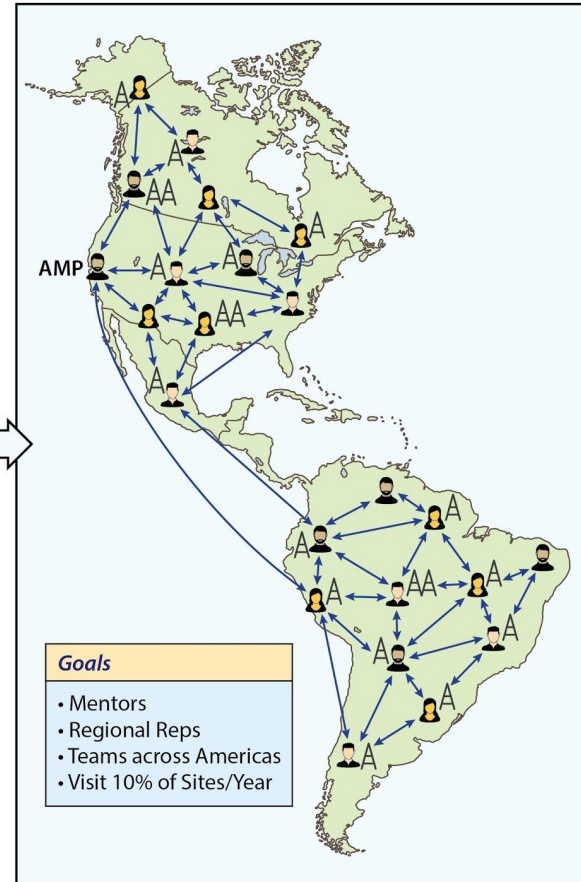
## Proposed Model of Site Visits



## Current Model of Site Visits

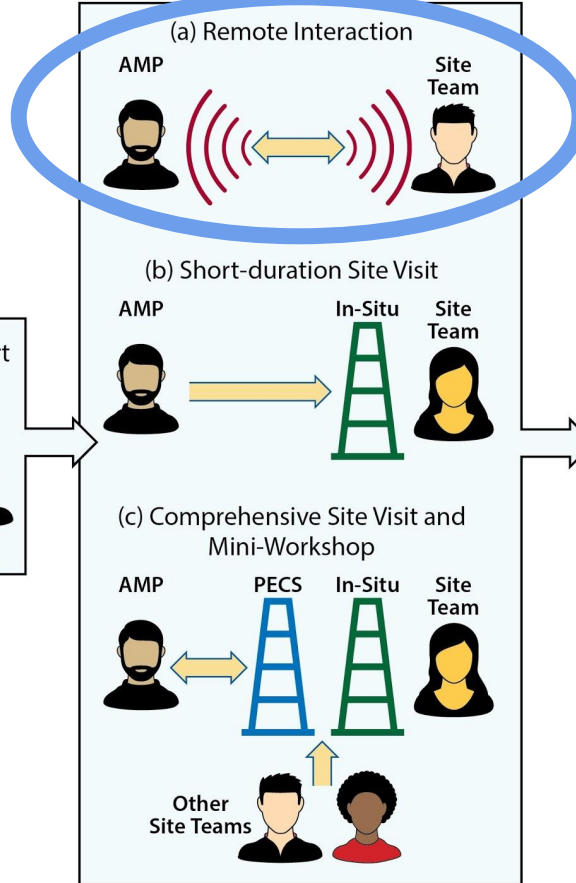


## Outcome of New Site Visit Framework

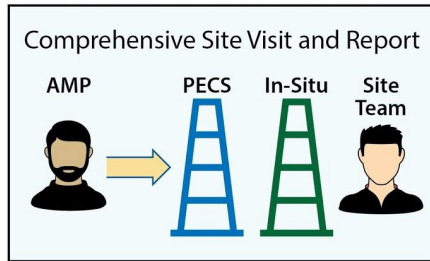


# New framework for site visits and training

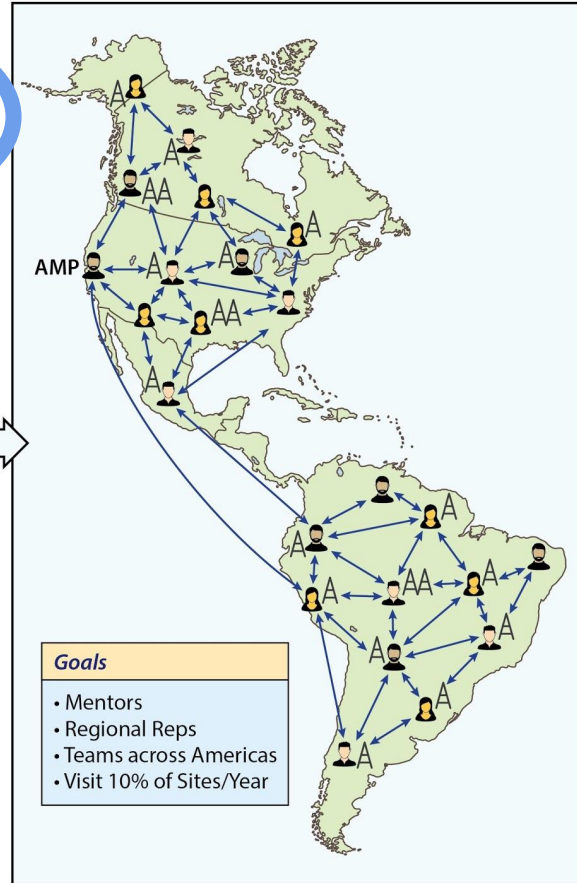
## Proposed Model of Site Visits



## Current Model of Site Visits



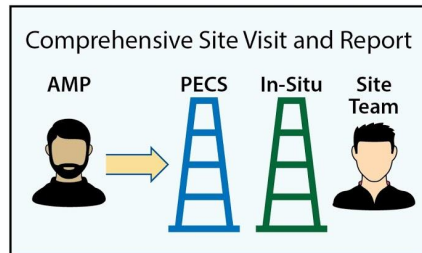
## Outcome of New Site Visit Framework



# Comparing Comprehensive and Lite site visits

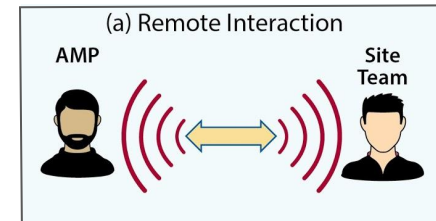
## Comprehensive site visit

- Time consuming process (3-4 months)
- N Visits limited by equipment and staff time
- Side-by-side instruments enable detection of relatively small differences between sensors (instrument bias/error)
- Extensive logistics (shipping, travel, hotels)
- More time consuming for site team
- In-person interaction
- Detailed final report and data analysis



## Site visit lite

- Faster evaluation processes (<1 month)
- Possibly reach greater number of sites per year
- No travel (carbon footprint)
- No instrument deployment
- Less time / resources required from site team
- We love Zoom, right?



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# Whether you participated in a comprehensive site visit before (or not), select the top two valuable aspects for you (or your team) of a comprehensive site visit

Find and resolve issues at my site

Instrument bench-marking

Data processing bench-marking

Consulting with Tech team

Trouble shooting other issues

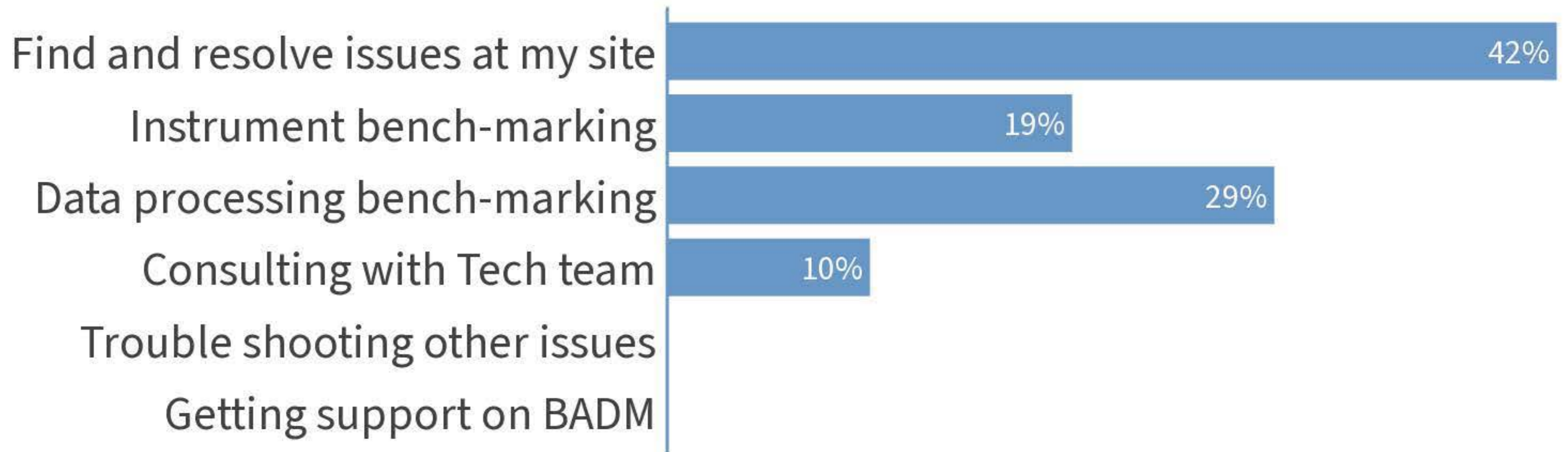
Getting support on BADM



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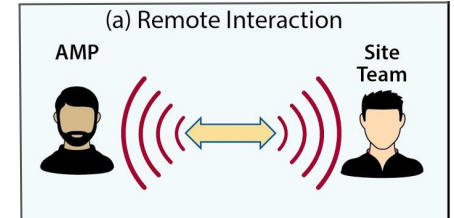
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## Whether you participated in a comprehensive site visit before (or not), select the top two valuable aspects for you (or your team) of a comprehensive site visit



# Site Visit Lite focal areas

- Facilitate validating/gathering of BADM
  - Site General Info (online tool)
  - Vegtype (canopy height)
  - EC Instrumentation (model, height, separation)
  - Others
- Eddy covariance data processing (high frequency to half-hourly fluxes)
  - Our experience from comprehensive site visits found many cases where the most important site visit recommendations were data processing related.





# Site visit lite process

## **Step #1: Identify prospective sites**

- recent data submission
  - duration since last site visit
  - participation in Network activities
  - direct request
- => AMP Initiates contact for participation.

## **Step #2: Gather information**

Send site visit lite questionnaire

- site description
- sensors info (model, heights, settings, etc)
- data processing procedures
- ancillary data (BADM inquiry)

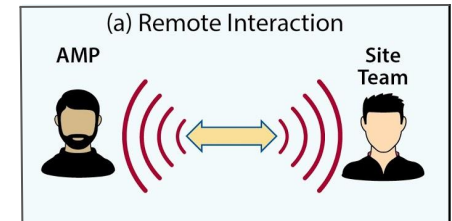
Lastly, request raw and processed data for a representative period (~1 month)

## **Step #3: Data review and analysis**

1. Independently-process the raw data and identify any differences between the site- and independently-processed results.
2. Analysis will include implementation of quality control measures, review of plausibility and consistency of results, spectral analysis, and other tests.
3. Iterative process with site team interaction

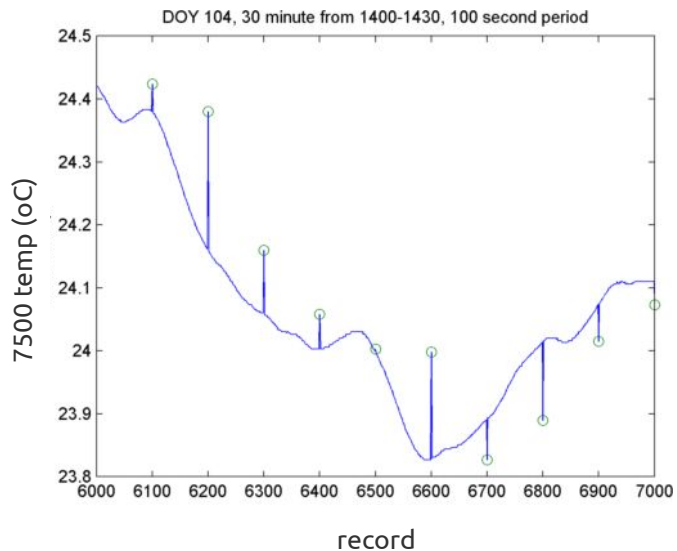
## **Final Step: Share findings**

Note that any findings and reports will only be shared with site staff.

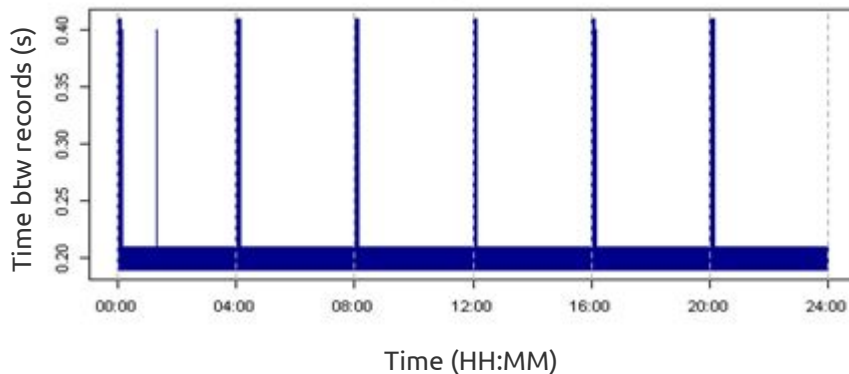


# Data processing - example 1 - look at the raw data

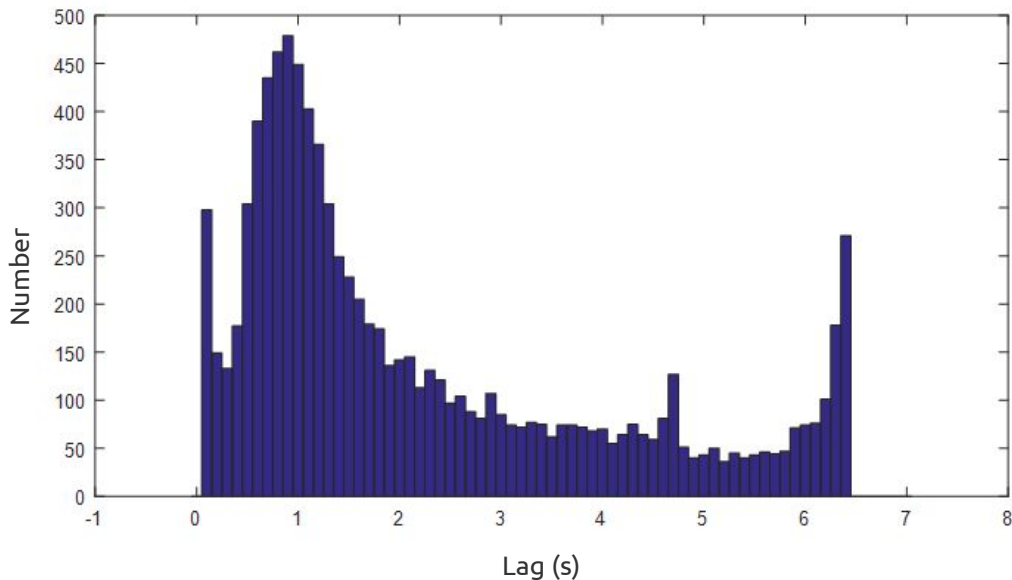
- Plot **all** the data
- Change the timescale (seconds -> minutes -> hours)
- Check the timestamps (do math)



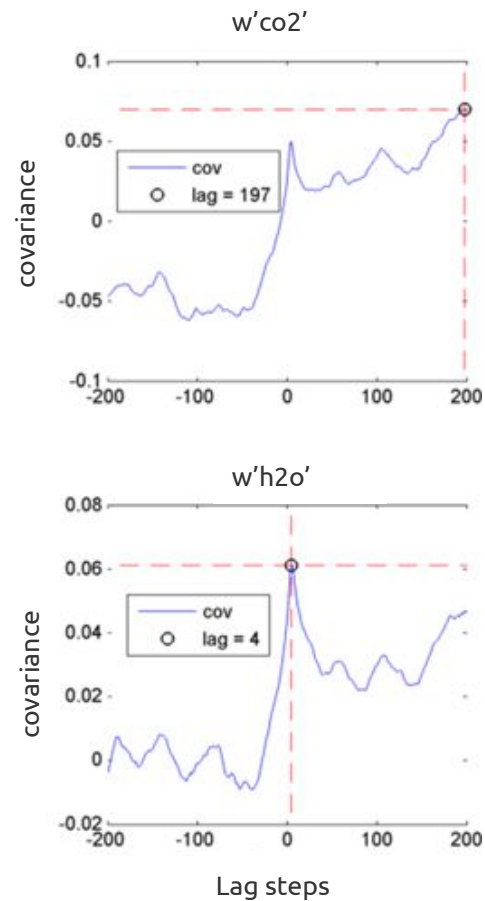
Missing records at the start of each logger file.



# Data processing - example 2 - lag times

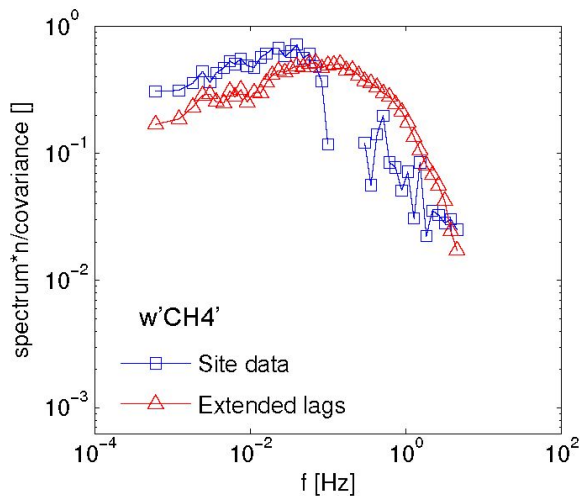


- If lags are incorrect, fluxes will be too.
- Check for consistency across data record.
- Review lag times: are they realistic? Could they be optimized?

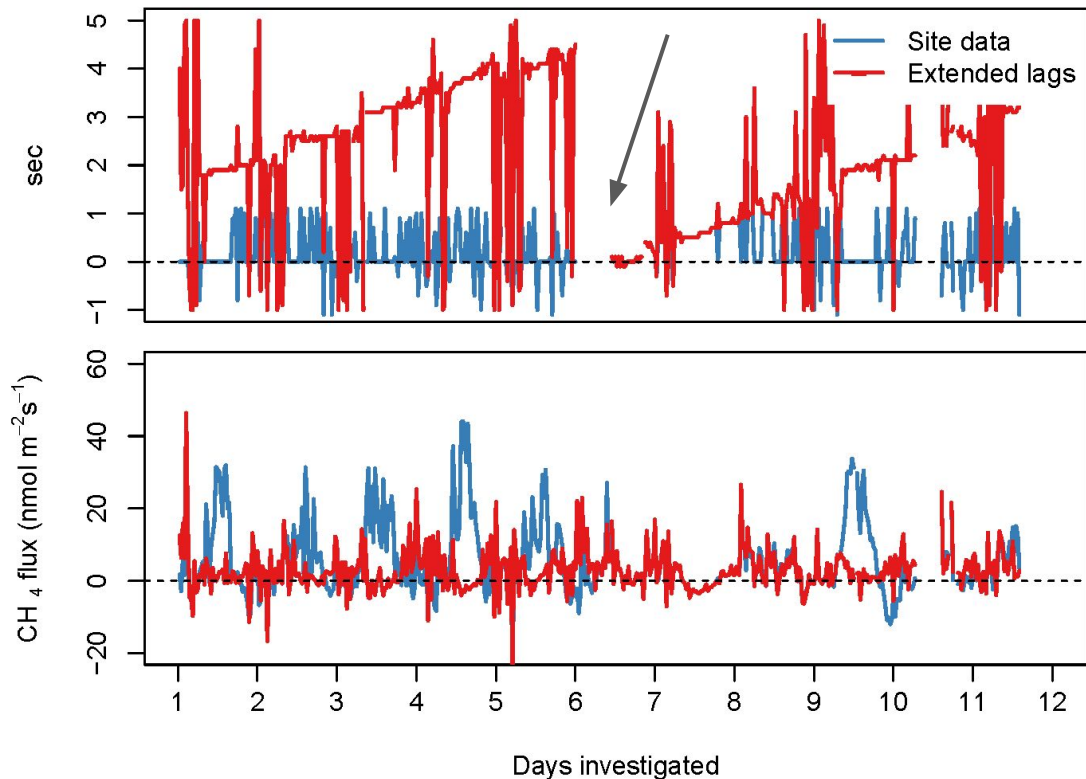


# Data processing - where/how do we see incorrect lags in data?

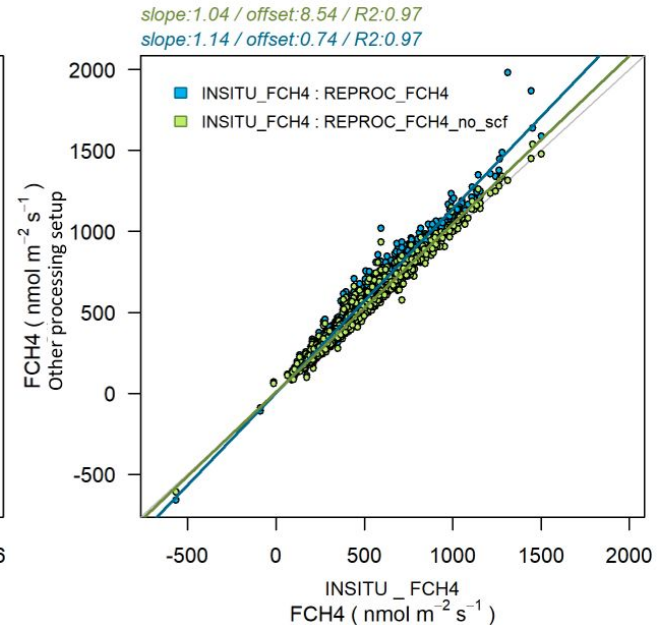
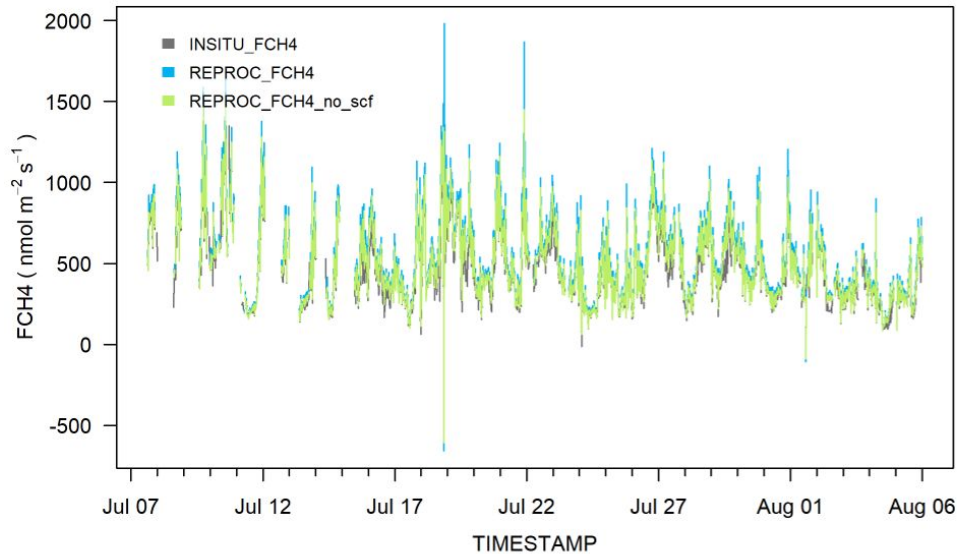
Don't simply rely on default values and processing configurations/steps given by processing softwares!



Measurements stopped for instrument maintenance.



# Data processing - example 4



Know & document processing steps/corrections:

- Many corrections and setups in high-frequency data processing. Are those done and implemented properly as expected?
- How sensitive do the final fluxes depend on those choices?

# Feedback from 2020 Site Visit Lite

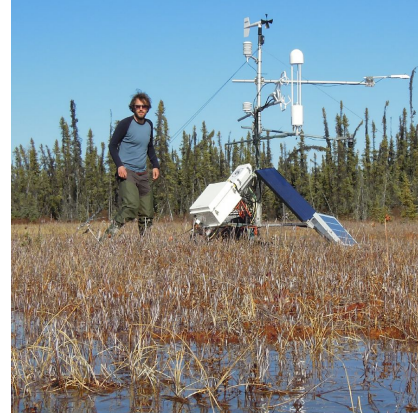
**Steve Kannenberg**  
US-CdM



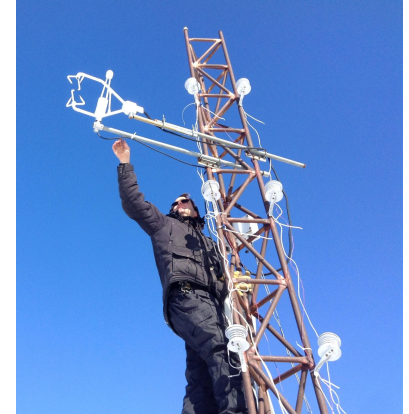
**Gil Bohrer,**  
Yang Ju  
US-OWC



**Gabriel H Gosselin,**  
Oliver Sonnentag  
CA-SCB



**Shannon Brown,**  
Claudia  
Wagner-Riddle,  
CA-ER1



# Interested in a site visit lite?

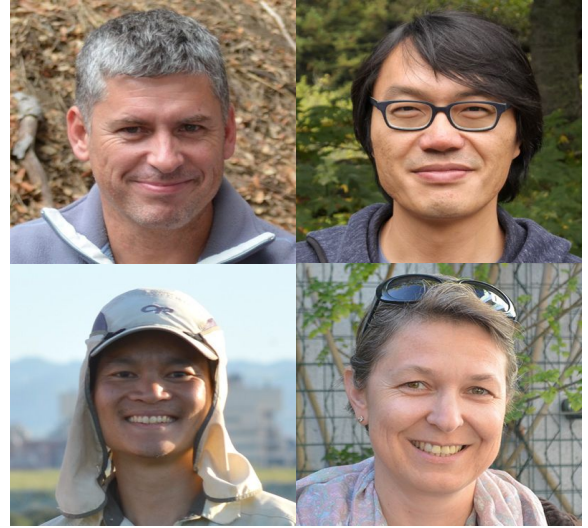
Have questions about data processing?

Want another set of eyes on your data?

Contact us! We want to hear from you.

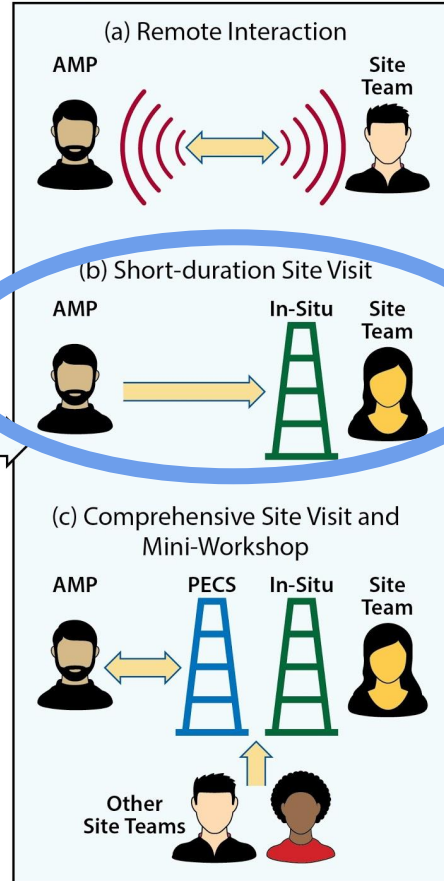
[ameriflux-tech@lbl.gov](mailto:ameriflux-tech@lbl.gov)

More info: <https://ameriflux.lbl.gov/tech/site-visits/site-visit-lite/>

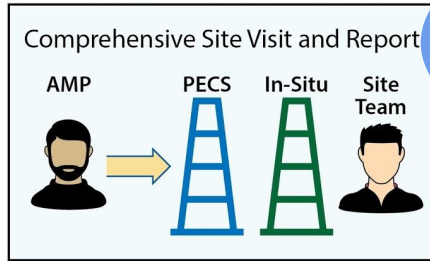


# New framework for site visits and training

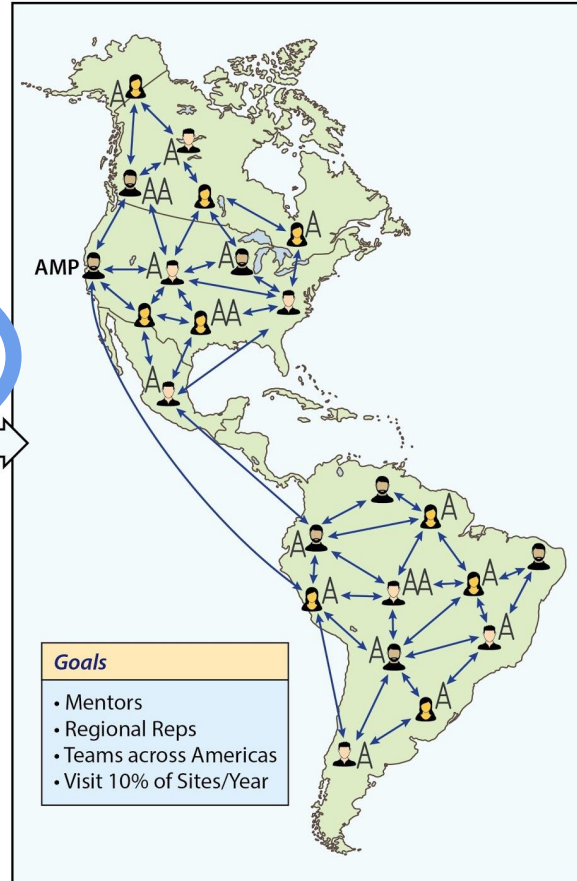
## Proposed Model of Site Visits



## Current Model of Site Visits

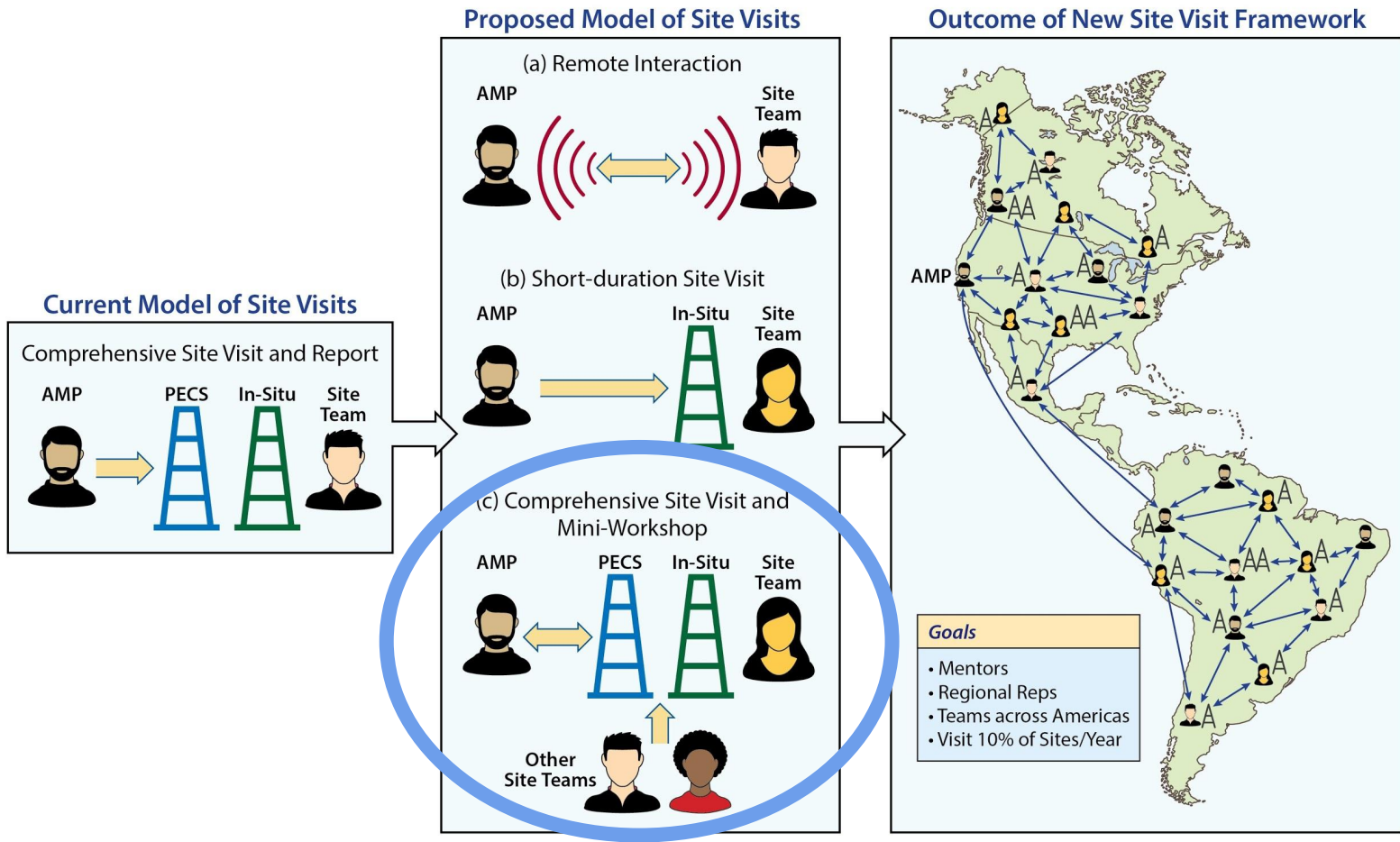


## Outcome of New Site Visit Framework





# New framework for site visits and training

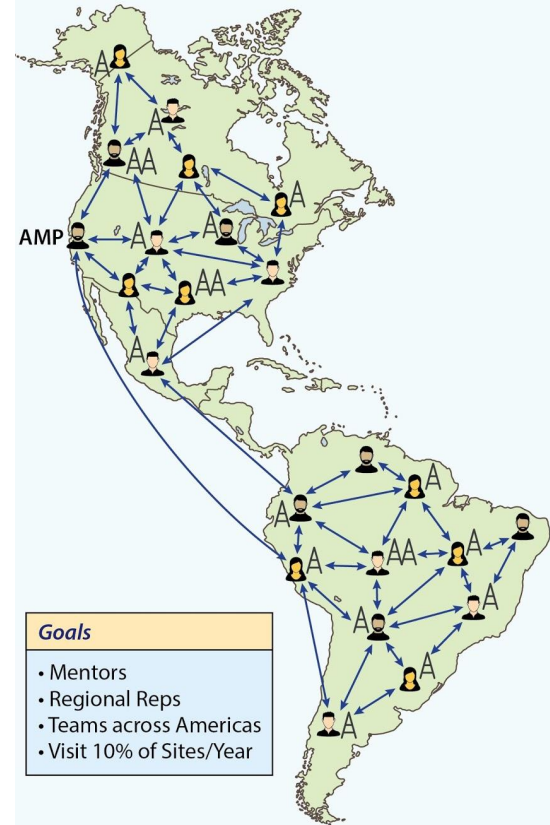


# New framework for site visits and training

This new approach would allow us to:

- Reach more of the network;
- Strengthen the AmeriFlux community;
- Foster peer mentoring (across site teams);
- Empower regional AmeriFlux ambassadors to aid in Network initiatives.

## Outcome of New Site Visit Framework



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## Which of the following initiatives would the most appealing/helpful to your site?

Site Visit Lite

In-person Site Visit

Mini-workshop

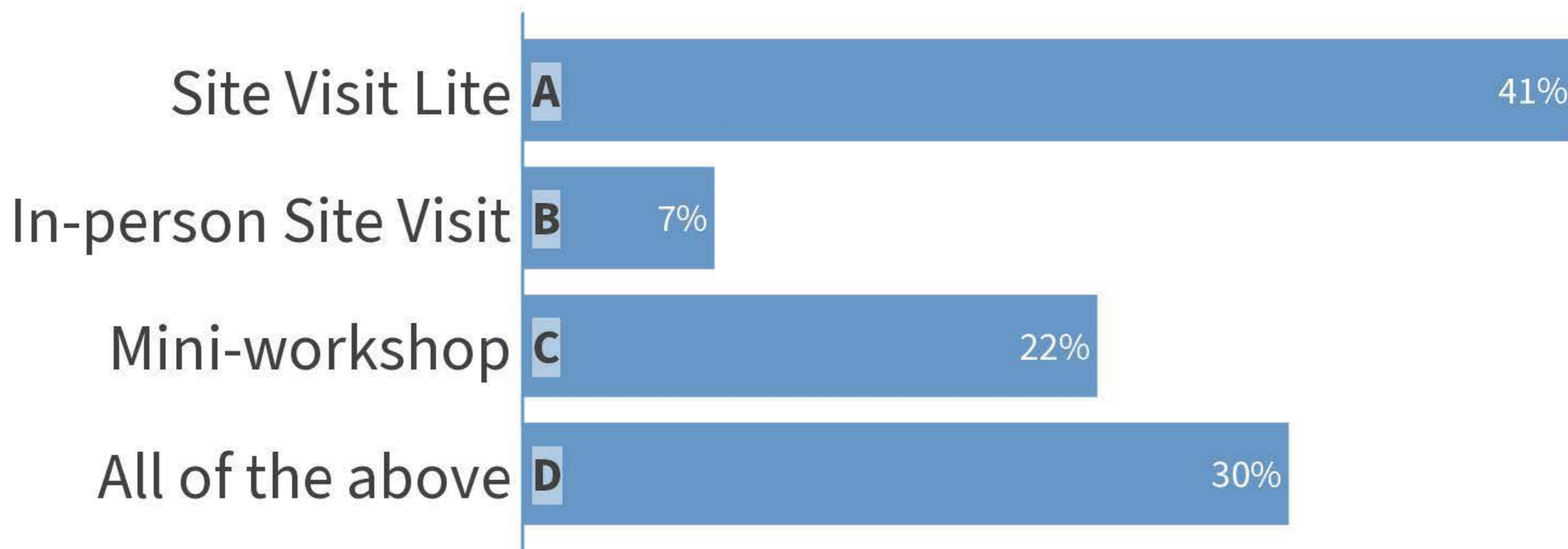
All of the above



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## Which of the following initiatives would the most appealing/helpful to your site?



# Q&A session

# Thank you for joining the webinar

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- Data support: [ameriflux-support@lbl.gov](mailto:ameriflux-support@lbl.gov)
- Get involved: [ameriflux@lbl.gov](mailto:ameriflux@lbl.gov)

