NEON Technical Working Groups

2021 First Quarter Report

1685 38th St., Suite 100 | Boulder, CO 80301 | 720.746.4844 | www.neonscience.org
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The National Ecological Observatory Network (NEON) is a major facility fully funded by the National Science Foundation and operated by Battelle.

Introduction

Since its inception, NEON has relied on expertise within the science, education, and engineering communities to advise on key areas impacting the design, construction, and maintenance of the observatory with the goal to optimize its operation. Currently, two types of external advisory bodies support staff and leadership in making key decisions that guide all of NEON's activities: The Science, Technology & Education Advisory Committee (STEAC) and Technical Working Groups (TWGs). Both bodies are comprised of experts nominated to serve in these roles who are selected by NEON staff following a rigorous selection process.

NEON currently relies upon input from 22 TWGs. These groups play an important role by providing input to NEON's data collection and processing methods and ensuring that NEON infrastructure, data, and programs are a valuable community resource. Working groups are participatory and advisory; they are often tasked with providing input on issues that have scientific, educational, engineering, or operational implications. This document includes a summary of activities, recommendations, and NEON's response to those recommendations for each TWG during the first quarter of the 2021 funding year (November 2020-January 2021).

Airborne Remote Sensing Data Quality TWG

The Airborne Remote Sensing Data Quality Technical Working Group provides expert input and advice regarding NEON's airborne sampling design, data collection requirements and constraints, campaign scheduling, data products and algorithms, and reported quality metrics.

Summary of Activities

New TWG members introduced. Meeting agenda focused on: 1) NSF Approval to AOP Data Products Revisions; 2) of new lidar sensor; 2020/2021 flight seasons review; 3) Earth Engine update; 4) Utility of tower cam metadata for external users; 5) Legacy data products.

TWG Recommendations

TWG members agreed that relaxing solar angles for certain low veg/topography sites would not be a problem for data processing as algorithms are improving; regarding tower cam images, members agreed that since clouds, smoke and aerosols all degrade optical imagery, tower cam images are useful as anecdotal information, providing context to what the atmospheric conditions were during collection. However, it would be difficult to use these data quantitatively. Regarding legacy data preservation, members felt it is important to maintain historical code bases/processing chains if it is impossible to maintain the actual data; they also strongly advocated for open-source code libraries, as much as possible.

NEON Response

Starting in 2021, 35-degree solar elevation timing will be used in flat, lower vegetation sites in addition to Alaska. AOP will continue to explore the best way to share tower cam images as an additional source of metadata for the research community. AOP will maintain and publish the algorithms used to process different releases of data, and transition to open-source software packages, as much as possible.

Algal Taxonomy TWG

Taxonomic identification of algae is difficult. Organisms are typically microscopic, and nomenclature has been changing in recent years. Taxonomic consistency between individual taxonomists, as well as taxonomy labs, is crucial to data quality over the time span of the NEON program. The Algal Taxonomy Technical Working Group seeks to assemble a group of algal taxonomists with broad spatial representation both for soft algae and diatoms.

The Group will be called upon to plan the best way to 1) develop a method for consistent taxonomic identification for NEON contractors, across labs and over time, 2) develop taxonomic comparison or harmonization across NEON Domains, and 3) facilitate and support data quality. The Group may also be called upon to evaluate how best to allocate limited resources while maintaining the best possible science and data product delivery.

Summary of Activities

Kickoff meeting: Introduced members, selected Sarah Spaulding as chair. Introduced Periphyton and phytoplankton collection DP and issue with taxonomic consistency. Discussed need for voucher flora. January meeting: Approved to move forward by OS-IPT, discussed details of how to set up and use voucher flora. Held follow-up meetings with Sarah Spaulding, Pat Kociolek, and Julianne Heinlein after TWG meeting.

TWG Recommendations

WG members unanimously agree that voucher flora workflow would be important. Also suggested changing sample design to fewer times per year, not habitat-specific, and/or not using fixed counts. Also collected details on how to set up and implement the voucher flora.

NEON Response

NEON is moving the voucher flora concept to the next steps of management (OS-IPT, OPS-IPT, STEAC) and has talked to the Biorepository about hosting photos associated with the voucher flora collection. NEON is considering suspending 2021 analysis to help pay for this effort and may need to find more funds in addition to that. NEON will not be altering the sample design or changing fixed counts at this time.

Aquatic TWG

The Aquatic Technical Working Group provides expert knowledge across the fields of Aquatic Ecology, Biogeochemistry, and Ecohydrology. This group is broadly geared toward aquatic observational sampling and instrumentation along with associated data products, design and maintenance documents, protocols, and algorithms.

Summary of Activities

Introduced new members. Re-nominated W. Wolheim as chair. Provided updates on COVID impacts to AOS sampling and AIS deployment. Also provided updates on versioned data release, upcoming updates to IS data pipeline and status of continuous discharge DP. Discussed development of auto alert system for field scientists. Facilitated discussion on addressing aquatic sensor drift.

TWG Recommendations

TWG suggested that drift corrected higher level data products were something that the user community would like for NEON to provide (or standardized code resources for doing it). This would make it easier for users to utilize the corrected data needed for scientific work, while also ensuring that all users were using the same corrected data.

NEON Response

A NEON internal group is investigating the feasibility of correcting drift and has taken into account the community expectation that NEON provides useful data by correcting drift. While not possible to implement in the near-term, drift correction should become easier to implement in the new IS data pipeline.

Atmospheric Stable Isotope TWG

This group provides guidance regarding sensor designs and assemblies, data products, and field and lab procedures and protocols to measure atmospheric stable isotopes of ^{13}C in CO^2 and ^{18}O and 2H in water vapor and precipitation water.

Summary of Activities

The TWG provided feedback for the Drift Working Group.

TWG Recommendations

The TWG provided recommendations for best practices in implementing sensor drift corrections for Picarro sensors, how that research community defines drift, and suggested correction strategies and whether they think NEON should correct for drift in published data products. The responses to the were provided to the Drift Working Group for compilation and summary.

NEON Response

NEON will incorporate the suggestions from this TWG when developing an observatory strategy for sensor drift correction.

Biorepository TWG

The Biorepository Technical Working Group is comprised of curation, archival and museum collections experts as well as ecologists and others who would make use of the NEON Biorepository. The group advises NEON on curation best practices, and discoverability of and ready access to biological samples and specimens for future scientific research. A particular focus is to broaden the availability and use of museum assets for regional to continental-scale ecological research.

Summary of Activities

Kickoff meeting. Discussion centered on implementation of the Extended Specimen concept within NEON collections.

TWG Recommendations

TWG emphasized the need to have dynamic data linkages between the NEON Data Portal and NEON Biorepository Portal (i.e., data on specimens should be presented from an API endpoint from the NEON data portal and not maintained as a copy within the NEON Biorepository Portal). They point out that duplicated records within portals have a tendency to diverge, undermining user confidence in the data.

NEON Response

NEON Biorepository and NEON staff are working to formulate a road map for enhancement of the existing samples API endpoint.

Breeding Landbird TWG

The Breeding Landbird Technical Working Group provides expert input and advice regarding the science design and protocols related to NEON breeding landbirds sampling.

Summary of Activities

TWG did not meet, no pressing issues to discuss.

TWG Recommendations

N/A

NEON Response

N/A

Community Engagement TWG

The Community Engagement Technical Working Group (TWG) provides guidance on the ways in which NEON engages with its existing and potential user community. This includes scientists, educators, and students as well as organizations, agencies, institutions, and companies whose activities align with the mission and goals of the NEON program. Members serve as liaisons to the NEON user community while providing input on the program's strategic engagement plan and the activities and outcomes identified in that plan.

Summary of Activities

We had a meeting of just new members in November for onboarding and to update them on recent activities. All members came together in December. Dr. Paula Mabee, Chief Scientist and Community Engagement Team Lead, joined us to meet new and returning members. Updates were provided on recent engagement activities, including the launch of the new website. Members were asked to provide feedback on the site and send it to the NEON TWG Leads.

TWG Recommendations

None have been made in Q1.

NEON Response

N/A.

Data Standards TWG

The Data Standards Technical Working Group is tasked with making recommendations about effective ways to provide NEON's data products to the broader scientific, educational, and policy communities. Topics may include 1) principles, standards, and policies for open data and software, 2) data discovery, exploration, and delivery mechanisms, 3) improvement of data products to increase utility, and 4) monitoring impact of NEON data use on research.

Summary of Activities

No meetings.

TWG Recommendations

N/A

NEON Response

N/A

Ecological Forecasting TWG

The Ecological Forecasting TWG provides recommendations to NEON on how to best support ecological forecasting. This may include facilitating community discussions around forecasting needs, providing guidance for data product development, and identifying opportunities for NEON to engage with the forecasting community though workshops, educational materials, and code/data product development.

Summary of Activities

Kickoff meeting (all TWG members). Discussed the EFI RCN forecasting challenge and how the TWG might support it in its first year (2021). Planning meeting (Eric, Christine, and Cayelan (TWG chair)) discussed timeline for the TWG for 2021 and how we might prioritize efforts to algin with the EFI RCN forecasting challenge. Began a pollev poll to collect forecasting related questions for a FAQ to post on a forecasting focused page on NEON's website TWG Recommendations.

TWG Recommendations

In addition to the FY2020 year end report recommendations, the EF TWG recommended we add an Ecological Forecasting clearinghouse webpage on NEON website. The TWG will discuss content for this webpage during Q2 meetings. Our goal is to implement these recommendations in the first half of the 2021 calendar year so that the information will be useful to participants in the EFI RCN forecasting challenge.

NEON Response

Reponses to FY2020 recommendations:
1: Expedite instrumented data access for selected NEON data products.

With the current pipeline to ingest and publish NEON instrument system (IS) data, the smallest unit of data (i.e., temporal granularity of a download package) is monthly. However, a new ingest pipeline should be operational at the end of 2021. With that pipeline, NEON will be able to offer a daily frequency of publication and a minimum latency of ~25-26 hours.

In the interim, the NEON Cyberinfrastructure (CI, Steve Jacobs is POC) team could potentially make a “growing monthly file on a daily basis” or change the current data delivery format slightly to support specific use cases – but the required effort is likely not worth it for an interim solution. Such an interim solution to provide higher frequency data would not even be useful for the 2021 EFI RCN forecasting challenge because the competition has been designed to focus on hindcasting data that have already been published and the parameters have already been set with the assumption that NEON data are not available on a daily basis during 2021. Thus, we recommend that the NEON CI team continue to focus on the implementation the new pipeline with the capability of daily frequency of data publication, rather than trying to create an interim fix for 2021.

Higher resolution than daily is likely not possible given current resources, even with the new pipeline. However, it seems most ecological forecasting use cases will not require higher than daily temporal resolution.

NEON CI would like to know which data products have the most interest in the forecasting community so they can prioritize those for publication using the new pipeline. We can communicate the list to NEON CI and get a timeframe for when it is expected that those data products will be rolled out using the new pipeline with daily frequency and lower (~26 hour) latency.

Recommendation 2: Expedite processing of eddy-covariance data at selected NEON sites.

We have two types of bundled EC files: monthly basic and daily expanded. The expanded files have all the contents of the basic files along with some additional quality information. Daily expanded files are completed within about a week of data collection. Monthly basic files should be available roughly two weeks into the following month. Due to the amount of processing required there may be occasional delays.

As the team updates the pipeline during 2021, EC daily files have the potential to be available to the EFI groups within about a week of data collection. However, there are some details that the team will have to figure out about how to deliver the data to end users to make this work.

Previously, the IS products requested were atmospheric forcing data for CLM simulations:

incident longwave radiation DP1.00023.001
incident shortwave solar radiation DP1.00023.001
precipitation DP1.00006.001
relative humidity DP1.00098.001
surface pressure DP1.00004.001
temperature DP1.00003.001
wind speed DP1.00001.001

Dave Durden and Chris Florian are the NEON contacts to follow up with on this topic. Dave has volunteered to attend an EF TWG meeting to discuss with data products to prioritize for improved (i.e., shortened) latency.

Recommendation 3: NEON Staff Support for NEON Forecasting Challenge.

NEON staff are already participating in at least a few of the forecasting challenge design groups. As NEON has specific funding for user support, we will identify specific POCs for each theme, provide their contact info, and coordinate their involvement with the appropriate design and participant teams involved in the challenge.

Challenge Themes and suggested NEON staff to serve as POCs:
Aquatic Ecosystems –
Terrestrial Carbon and Water Fluxes – Dave Durden

Tick Populations – Sara Paull
Phenology – Katie Jones
Beetle Communities – Eric Sokol on design team, Katie LeVan

Recommendation 4: NEON should endorse Cyverse and the EFI-RCN Cyberinfrastructure Working Group's efforts in automating the collection of NOAA GEFS forecasts for NEON sites.

We will coordinate with the EF WG to increase the visibility of this resource by providing appropriate links and guidance on our website for potential forecasters and modelers who would find this resource useful.

Recommendation 5: NEON should provide an FAQ for common questions from the Ecological Forecasting Community.

A general NEON FAQ already exists on the NEON webpage. We will work with the EF TWG during 2021 to develop content for an EF focused FAQ and add the content as an EF specific section to the general FAQ.

Fish TWG

The Fish Technical Working Group provides expert knowledge and support for the development of field-based protocols and strategies for standardization of sampling across NEON aquatic sites.

Summary of Activities

Kickoff meeting: Reviewed accomplishments and challenges of the last year, including COVID challenges. I asked the group to start thinking about how we use vouchers and DNA in house to QC field data. Erin from D17 and Ricky from D10 presented data that they have worked on and presented.

TWG Recommendations

No recommendation- but we have a meeting scheduled to discuss DNA and voucher use, scheduled in this quarter.

NEON Response

N/A

Foliar Sampling TWG

The Foliar Sampling Technical Working Group provides expert input and advice related to sampling sunlit plant foliage, with a key goal of linking field measurements to remotely sensed observations of vegetation chemical and physical properties.

Summary of Activities

Kickoff meeting. Discussed status of foliar sampling to date: number of sites, species, and samples. Reviewed challenges encountered and whether those have been overcome vs still in progress (plus TWG contributions). Discussed a few key data quality priorities for the year. Second meeting was held to discuss bout timing and duration, especially in relation to AOP overflights.

TWG Recommendations

TWG agreed to assist with data quality priorities surrounding collection of crown polygons and identification and possible flagging of 'outlier' foliar trait values. TWG recommended that bout durations should be shortened, and bout collection dates should be timed to coincide more closely with AOP overflights to the degree possible.

NEON Response

A meeting to discuss TWG feedback on 2020 crown polygons has been set up for next quarter. Initial email correspondence around outlier detection and flagging has occurred but a follow-up meeting to delve deeper will be scheduled. The recommendations around bout timing and duration will be taken to NEON leadership for feasibility review.

Ground Beetle TWG

NEON collects ground beetle observations and archival samples at all terrestrial field sites to capture how ground beetles (*Carabidae*) communities change in different habitats and ecosystems over time. This TWG determines targets for sampling that generate data that can reveal significant changes in beetle abundance, diversity, and community composition.

Summary of Activities

Kickoff meeting. Presented current results/proposed changes to beetle sampling protocol; certain results point to an ability to sustainably curtail sampling to 8 bouts per year (budget reduction) without impacting top line diversity estimates.

TWG Recommendations

TWG emphasized the importance of intraseasonal information and the fact that new taxonomic technologies to facilitate identification are coming online all the time. With that context, they recommended evaluating options where perhaps no more than 8 bouts of sampling were processed by NEON staff, but that collections continued to be archived at the NEON Biorepository.

NEON Response

In progress modification to analyses of the beetle program. Revised analysis will look at budget/science impacts of an unmodified program, a sampling program with reduced number of sampling bouts and a hybrid approach where certain samples are not identified.

LiDAR TWG

The LiDAR Technical Working Group assesses and recommends strategies for developing and implementing techniques for instrument calibration and data validation, operational instrument testing, and product data formatting for vegetation remote sensing.

Summary of Activities

Kickoff meeting. Introduced new lidar sensor, discussed planning considerations with additional options available on new lidar, discussed updates to lidar derived Biomass data product, brainstorm on new idar data products that would be beneficial to the community, particularly those pertaining to waveform lidar.

TWG Recommendations

Recommended collecting some test data over a challenging NEON site to assess new options on recent lidar, agreed with Biomass approach, suggested also including a plot bases estimate instead of the tree-based estimate, will come back to new data product ideas at next meeting.

NEON Response

We are looking into a test flight plan at GRSM for testing new lidar options (if lidar is functioning).

Microbial TWG

The Microbial Ecology Sampling Program encompasses measurements of soil and aquatic microbial diversity, composition, and abundances that are deemed critical for understanding long-term changes in biodiversity and ecosystem function. The tools used for measuring microbial diversity in the environment develop and change rapidly. NEON relies on input and guidance from the Microbial Technical Working Group to advise on questions related to methods and analyses, as well as best practices for ensuring data quality, accessibility, and usability.

Summary of Activities

Kickoff meeting. Discussion about NEON soil microbial standard and how to process soils from sites that have biocrusts.

TWG Recommendations

TWG wanted to get feedback from the biogeochemical TWG about how best to work with soils that have biocrusts, and to understand how the BGC TWG will be handling this issue.

NEON Response

Have met with BGC TWG lead and will report back their guidance not to avoid biocrusts in primary arid land samples.

Notes

TWG lead changed at end of Q1.

Mosquito TWG

The Mosquito Technical Working Group is comprised of researchers focused on topics including mosquito surveillance, public health, disease ecology, and phenology. The group advises NEON on sampling approaches that will generate data that reveal significant changes in mosquito abundance, diversity, and community composition. A focus of this group is to ensure compatibility of the mosquito dataset with other surveillance infrastructure used to monitor arboviruses in mosquito populations.

Summary of Activities

Kickoff meeting. We introduced new members as well as NEON mosquito sampling protocol. We discussed potential options for improving captures of key vector species for testing.

TWG Recommendations

One suggestion was to use octanal or other lures in addition to CO2 to help increase captures. This might be particularly effective for Aedes japonicus.

NEON Response

We will continue to discuss options for increasing vector captures in subsequent calls before compiling a strategy for optimizing vector testing.

Small Mammals TWG

The Small Mammal Technical Working Group provides expert input and advice regarding the science design and protocols related to NEON small mammal abundance, diversity, and pathogen sampling.

Summary of Activities

Kickoff meeting. Welcomed new members and reviewed topics from last year that will continue into this year. We discussed storage of archived blood samples (whether to use an anticoagulant or not), and Whatman filter paper was again discussed as a potential versatile storage solution for blood samples. We also talked about collections of fecal samples (fresh vs. trap collected) and began a discussion of the barcoding data product that was continued over email with a subset of interested members.

TWG Recommendations

Although adding an anticoagulant to blood storage tubes can facilitate PCR (especially for the pathogen testing lab), it precludes some other uses such as serology by preventing the separation of blood into plasma and serum. Whatman filters prevent the use of blood samples for RNA analyses. Since we already go to great lengths to preserve a cold chain in the field for all samples, it was recommended that we continue with our current method of freezing whole blood samples at -80 without additives to maximize versatility of blood sample uses. This may need to be revisited after the pilot study for tick-borne disease detection in small mammal blood. For fecal samples, it was determined that trap-collected feces must be stored separately from fresh if they are to be useful for nutritional/hormonal studies which require a fresh sample. Finally, to improve the barcoding data it was strongly recommended that we reserve one of the barcoding plates that would otherwise be sent with field samples, and instead send a handful of high value museum specimens to begin to build a library to help with species identifications in the 50% of cases where this is not currently possible (all bold specimens are submitted by NEON).

NEON Response

We will continue as previously with our blood sample and fecal sample storage methods given that space constraints at the biorepository would preclude separate storage of additional fecal samples. I have submitted an OS-IPT request to use one of the barcoding plates that we were unable to fill due to COVID-19 sampling reductions to build a library for some high-value/yield samples to improve the barcoding data product utility. The TWG members have volunteered to help compile the list and source the individual specimens from the museums with which they are affiliated.

Soil Sensor TWG

The Soil Sensor Technical Working Group (TWG), provides feedback on all aspects of sensor measurements made in the TIS soil plots, including soil temperature, soil moisture and salinity, soil CO_2 concentration, soil heat flux, throughfall, soil surface photosynthetically active radiation (PAR), net longwave radiation, and soil surface/litter/vegetation infrared temperature measurements. In addition, the Soil Sensor TWG provides recommendations on approving or disapproving requests for large amounts of soil from the NEON Megapit Soil Archive.

Summary of Activities

Kickoff meeting. Discussion of progress over the last year and presented prioritization of activities for the upcoming year.

Requested feedback on a replacement combined soil temperature, moisture, and salinity sensor.

TWG Recommendations

TWG agreed with prioritization for the upcoming year. TWG members provided input on the selection of a replacement soil temperature, moisture, and salinity sensor.

NEON Response

Priorities for the upcoming year were adopted. TWG sensor feedback will feed into the sensor selection process.

Surface Atmosphere Exchange TWG

NEON measures the surface-atmosphere exchange of momentum, heat, and several climate-relevant trace gases. This Technical Working Group advises on the operation of NEON's surface-atmosphere exchange assets, development of novel, scale-aware data products, adaptive algorithms, and usability tools, and active contribution to network science. The Technical Working Group accomplishes these tasks by working closely with NEON's Surface-Atmosphere Exchange Group. This includes prioritizing quarterly developments, pre-reviewing new resources, and bringing forward community input.

Summary of Activities

Updated the TWG regarding our path forward for testing data impacts of adding wicks to the CSAT3 sensor. Requested feedback for the Drift Working Group.

TWG Recommendations

implementing sensor drift corrections for the Surface-Atmosphere Exchange sensors, how that research community defines drift, suggested correction strategies and whether they think NEON should correct for drift in published data products. The responses to the were provided to the Drift Working Group for compilation and summary.

NEON Response

NEON will incorporate the suggestions from this TWG when developing an observatory strategy for sensor drift correction.

Terrestrial Biogeochemistry TWG

The Terrestrial Biogeochemistry Technical Working Group provides expert input and advice regarding the science design and protocols related to measurements of plant and soil biogeochemistry within the NEON Observational System (e.g., not sensors).

Summary of Activities

Kickoff meeting. Welcomed new members, then reviewed TWG scope. Provided updates on recent sampling protocol changes made with TWG input and how those are faring. Discussed priorities for the year around data quality and data use. Lastly, asked for input on sampling in arid lands with biological soil crusts. Second meeting was held to discuss soil nitrogen transformations data product - how to increase awareness and use of this unique and time-intensive data stream.

TWG Recommendations

TWG members agreed to assist in development of a data tutorial focused on biogeochemistry sampling and to give feedback on a new method for litter biogeochemistry currently being prototyped. In arid lands, they recommend we do not avoid soil sampling in areas with crusts since these are biogeochemically very important - should be sampled and documented. Several members also thought it worth exploring a paper on the soil nitrogen transformations data product, to increase community awareness - introduce the resource and show early patterns, similar to Iversen et al 2017 for the FRED dataset.

NEON Response

As soon as data are available from the litter prototype, a meeting will be scheduled to review and get TWG feedback. This will help to inform possible protocol modifications. Preliminary ideas for data tutorials have been shared, the group will expand on this topic over the next 1-2 quarters. Biocrust input will be taken to NEON leadership for consideration of protocol modification. A follow-up meeting to continue discussing the nitrogen transformations product has been set up for next quarter.

Terrestrial Instrument Data QA/QC TWG

The Terrestrial Instrument Data QA/QC Technical Working Group represents a diverse set of NEON data users and experts, in the relevant disciplines of biometeorology, soil science, ecology, and data science. The overarching goal of the TWG is to ensure that NEON delivers the highest quality data possible with the available resources and that quality information is adequately communicated to data users. The TWG broadly covers terrestrial instrument measurements, data processing, data monitoring, and data publication as they relate to quality.

Summary of Activities

Kickoff meeting to welcome new members. NEON staff updated the TWG on the ongoing investigation of positive night-time PAR readings across NEON, and the group shared experiences around this issue. The TWG completed an email survey on drift correction practices and expectations, and the results were discussed in detail at the meeting.

TWG Recommendations

The TWG approved of the approach to investigating occurrences of positive night-time PAR readings across NEON, and also shared ideas to test it further. The TWG recommended that NEON provide drift-corrected data where robust corrections can be developed, but also recommended that uncorrected data be published.

NEON Response

Ideas for troubleshooting occurrences of positive night-time PAR readings were incorporated into NEON's investigation. An internal NEON working group is currently testing the robustness of drift correction for individual data products, and NEON plans to follow the TWG recommendation of providing drift corrected as well as uncorrected data.

Terrestrial Plant Diversity and Phenology TWG

Membership of the Terrestrial Plant Diversity and Phenology Technical Working Group includes researchers and practitioners from universities, federal and regional government agencies, and coordinated research networks. This group represents the community of plant diversity and phenology data users that NEON aims to serve; members provide expert input and advice regarding the science design, protocols, and data quality issues related to NEON plant diversity and phenology sampling.

Summary of Activities

TWG did not meet, no pressing issues to discuss.

TWG Recommendations

N/A

NEON Response

N/A

Terrestrial Plant Productivity and Biomass TWG

The Terrestrial Plant Productivity Technical Working Group advises which methods, protocols, and equipment are employed to create robust ground-based estimates of live and dead woody biomass, woody and herbaceous productivity, coarse downed wood volume and density, fine and coarse litterfall, belowground plant biomass, and leaf area index across a suite of different vegetation types. The TWG also considers optimal spatial and temporal integration of ground-based measurements with remote-sensing hyperspectral and LiDAR datasets (i.e., the NEON AOP system), and with data streams generated by the NEON Terrestrial Instrument System. Finally, the TWG is also deeply invested in determining how NEON Plant Biomass and Productivity data products can be optimized to enhance usability and value for the NEON end-user community.

Summary of Activities

TWG did not meet, no pressing issues to discuss. A subset of TWG members continued to make progress on a memo for the NSF, to advocate for creation of a derived above-ground biomass product. NEON POC Meier interacted via email with new TWG members, and a meeting will be scheduled in Q2 to evaluate the Vegetation Structure protocol, DPUG, and data product, as part of ongoing push for TWGs to evaluate NEON products and documentation.

TWG Recommendations

N/A

NEON Response

N/A

Tick Sampling TWG

The Tick Technical Working Group provides expert input and advice regarding the science design and protocols related to NEON tick abundance, diversity, and pathogen sampling.

Summary of Activities

Kickoff meeting. We talked about whether to focus tick-borne disease testing of small mammal samples for the pilot study across fewer sites/species vs. get more data with fewer replicates of each site-species. We also discussed which of the pathogen-testing options to use on the samples and used figures of timing of peak abundance across sites and years to determine which sample collect dates to use for pathogen testing. We finished by gauging interest in a group side-project on climate/tick abundance.

TWG Recommendations

While diversity of sites and species was determined to be favorable for the pilot, it was recommended to have at least 13 replicates to detect a prevalence of ~20% (e.g., caution was recommended not to spread sampling too thin). It was recommended to test small mammal blood samples for all the various tick-borne disease options being offered by the laboratory, and even to pool samples for detection of rare viruses such as Powassan, Bourbon and Colorado Tick fever. It was recommended to send species in proportion to the species captured at a site as long as there are at least 15 individuals from that species to send and then these data can be used to optimize species selection in future years.

NEON Response

The individual small mammal blood and ear samples to send for the pilot tick-borne disease testing were selected based on these recommendations and delivered to field science to be set aside for shipping when the contract is finalized in February. The extra side-project will continue to be a basis of future TWG meetings.