



## **FACING THE FUTURE**

### The FACTS II (Aspen FACE) Newsletter

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David F. Karnosky and Janet M. Pikkarainen, Editors

#### **Forest FACE Synthesis Meeting**

Several members of the Aspen FACE science team, including Dave Karnosky (MTU), Kurt Pregitzer (USFS/MTU), Mark Kubiske (USFS), Don Zak (U of MI), Eric Kruger (U of WI), Evan McDonald (USFS), John Hom (USFS), and John King (MTU) recently attended a Forest FACE Synthesis meeting at the New England Conference Center in Durham, New Hampshire. The May 3-6, 2002 meeting, organized by Dr. Richard Norby, Oak Ridge National Lab, was the first attempt to develop cross-site comparisons.

#### **Minnesota Public Radio Broadcast Highlights Aspen FACE**

Bob Kelleher, Minnesota Public radio, recently visited our site and then developed a story for his morning radio program. The story, which included interviews with Dave Karnosky (MTU), Mark Kubiske (USFS), and Bill Mattson (USFS), was broadcast on July 9. The story can be found at: [http://news.mpr.org/features/200207/02\\_kelleherb\\_globalwarming-m/index.shtml](http://news.mpr.org/features/200207/02_kelleherb_globalwarming-m/index.shtml)



Mark Kubiske (USFS, center) describes gas exchange data to George Hendrey (BNL, left) and David Reichle, right.

#### **FACTS II (Aspen FACE) Site Review**

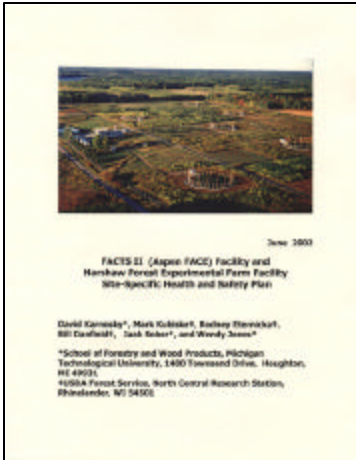
As part of DOE's evaluation of FACE sites as user facilities, Dr. David Reichle visited our site on July 9. This review focused on how users access our site and how the site is being utilized by the scientific community. Thanks to George Hendrey (BNL), Mark Kubiske (USFS), Dave Karnosky (MTU), Kurt Pregitzer (USFS/MTU), Warren Heilman (USFS), John Nagy (BNL), Keith Lewin (BNL), and Bill Mattson (USFS) for their presentations in the review. Thanks also to our scientists who contributed information on users for the review.

#### **Biomass Harvest – 2002**

Our second biomass harvest is being done during July 15-30, 2002. Mark Kubiske (USFS) and Evan McDonald (USFS) are coordinating this effort. Thanks for the many volunteers. Mark tells us we have about 25 people involved in this year's harvest.

## NIGEC RFP

The FACTS II (Aspen FACE) site is being targeted for research in the Midwest section of NIGEC's request for proposals (due out in August, 2002). More details when we have them.



### Safety Manual and Safety Sign-off

We have recently developed a safety manual (left) for the FACTS II (Aspen FACE) site. For all personnel visiting the Aspen FACE project, we ask that you read the manual that outlines safety hazards and risks at the site and describes safety procedures and emergency response procedures. **Note: After August 1, 2002, personnel that have not signed off on the safety manual will not be permitted on the site.**

We have had a few complaints about careless users at the site and the following activities will result in loss of use privileges at the site:

1. Excessive driving speed at the site. The site's roads are narrow and there are many unmarked intersections. Please keep speed down!!
2. Use of the sheds as resting areas. The sheds should be used only for research or operations purposes. We have lost three air conditioners for the sheds this year because unauthorized users have left the shed doors open.
3. There has been noticeable off-walkway activity this year as evidenced by the trampled understory vegetation in some rings. Please stay on the walkways at all times.

### Buffer Strip Tree Moving

In order to accommodate the boom lift for full access around each ring, we moved about 500 trees within 10 feet of each ring to areas outside the path. This accomplished two goals: (1) it filled in gaps around each ring's buffer zone, and (2) it allows access for the boom lift. Thanks to Peterson Tree Service and our grounds crew, headed by Wendy Jones (MTU), for a great job!



### Boom Lift

We recently purchased a self-propelled man-lift. This was made possible by the USFS capital project's program on a canopy access grant obtained by North Central Station Engineer John Jakel (USFS). The lift will be used for operator needs such as changing the emitter slots on the vertical vent pipes. Limited scientific use on the site can be



arranged through Mark Kubiske (USFS), Wendy Jones (MTU) or Jaak Sober (MTU). Only personnel trained on the lift operation can drive the vehicle.

### Canopy Access Update

Swagger Communications is completing final stages of construction on the canopy access walkways and towers for each ring. Again, thanks to John Jakel (USFS-photo on left) for developing the proposal for the USFS capital projects program and for taking the lead role in getting the drawings, bids, etc. The



heights of the walkways are adjustable and are meant to provide access to the current height growth increment for all five aspen clones and the aspen/birch trees on the aspen/birch section. Thanks to Mark Kubiske (USFS) for coordinating the rows to put the walkways in, for organizing the heights, and for coordinating with Swagger Communications. [Note: Safety harnesses are required for all personnel using the walkways. These can be borrowed from the operations building at the site. No more than two people on a walkway section (2 sections per ring). Hard hats are required for anyone working below the canopy access walkways when they are in use. The walkways (right) will be grounded to the general grounding system but we cannot overstate the danger of being caught on these steel walkways and towers in a lightning storm.]



### Boardwalks

A large number of new cedar boardwalks (left), prepared and laid down primarily by Dr. Kurt Pregitzer's (USFS/MTU) crew, have been put in place in the core of each ring. The wood for the project was provided by USFS North Central Station Engineer John Jakel. The walkways are intended to reduce foot traffic directly on the soils in each ring. Please use the boardwalks whenever possible when in the rings.

### Pest Update

We dodged a bullet this year on the forest tent caterpillar. "We have only minimal damage from them this year", according to USFS Entomologist Bill Mattson (right). Thanks to Bill and his crew for their fantastic efforts to remove egg masses and young larvae from the Aspen FACE rings again this spring.

This year's major pest problem appears to be the small green weevils, called *Phyllobius sericeus*, an introduced pest that are generally considered to be mostly a problem in their larval form as root feeders. However, noticeable feeding on leaves in the top of the canopy is happening now on the paper birch and aspen trees. We'll continue to monitor feeding damage this year. Interestingly, there is very little *Venturia* or aspen blotch miner this year at our site.



### New Ozone Generator Up and Running

We recently purchased a new Praxair-Trailigaz ozone generator to provide a doubled ozone generation capacity for the site as the tree crowns enlarge. Despite a few minor startup problems in the first few days of operation, the new generator is functioning very well. Great job, Jaak Sober (MTU), in getting this generator up and running!



### Pregitzer Receives National Award

Kurt Pregitzer (USFS/MTU), FACTS II Steering Committee member, has been chosen to receive a national award (SAF Barrington Moore Memorial Award for 2002) from the Society of American Foresters (SAF), the professional society for foresters and the accrediting body for the MTU School of Forestry and Wood Products. This award is made in recognition of outstanding achievement in biological research leading to the advancement of forestry.

## Publications

Some new publications:

**Karnosky, D.F., K.E. Percy, B. Xiang, B. Callan, A. Noormets, B. Mankovska, A. Hopkin, J. Sober, W. Jones, R.E. Dickson, and J.G. Isebrands.** 2001. Interacting elevated CO<sub>2</sub> and tropospheric O<sub>3</sub> and predisposes aspen (*Populus tremuloides* Michx.) to infection by rust (*Melampsora medusae* f.sp. *tremuloidae*). *Global Change Biol.* 8:329-338. (See cover photo on right)

**Percy, K.E., C.S. Awmack, R.L. Lindroth, B.J. Kopper, J.G. Isebrands, K.S. Pregitzer, G.R. Hendrey, R.E. Dickson, D.R. Zak, E. Oksanen, J. Sober, R. Harrington, D.F. Karnosky.** 2002. Will pests modify predicted response of forests to CO<sub>2</sub> enriched atmospheres? *Nature* (In press).

Congratulations and thanks Kevin Percy (CFS) and others for pulling this off -- great exposure for our site and for the whole team!

**Larson, J.L., Zak, D.R. & Sinsabaugh, R.L.** (2002) Microbial activity beneath temperate trees growing under elevated CO<sub>2</sub> and O<sub>3</sub>. *Soil Science Society of America Journal* (In Press).

**Phillips, R.L., D.R. Zak, W.E. Holmes, D.C. White.** 2002. Microbial community composition and function beneath temperate trees exposed to elevated atmospheric carbon dioxide and ozone. *Oecologia* 131(2):236-244.

Our first two papers from the soil microbial populations research – nice job Don Zak (U of MI) and others!



### “People at the FACE site” – Caroline Awmack

Position: Postdoctoral Research Associate, University of Wisconsin

Hometown: Lake District, United Kingdom

Degrees: B.S. (Oxford): Plant Sciences; Ph.D. (Imperial College)

Thesis: “Insect/Plant Interactions under CO<sub>2</sub>”

*Editors:* Caroline: How did you end up here?

*Caroline:* Rick Lindroth (U of WI) and I met at an insect meeting in the UK and Rick suggested that I visit the Aspen-FACE site to look at the aphid populations. I was keenly interested in using the techniques I had developed in greenhouse experiments to study the

performance of the insects in a natural ecosystem. It turns out that you can't scale up individual-based studies to predict community responses. Also, my investigations of the impacts of CO<sub>2</sub> and O<sub>3</sub> on the biodiversity and stability of such a complex invertebrate community have allowed me to test whether we can predict the responses of other insects to global environmental change.

*Editors:* What are you up to this season?

*Caroline:* My main project involves investigating the interactions between red clover, herbivorous insects, and their natural enemies. I'm looking at the potential for greenhouse gases to affect gene frequencies in herbivore populations, and the potential for any changes to affect interactions with higher trophic levels such as predators and parasitoids. This work is being supported by an NSF grant. I am also looking at the effects of CO<sub>2</sub> and O<sub>3</sub> on the biological control of the forest tent caterpillar with the friendly fly (*Arachnidomyia aldrichii*). This is a project started by Rick Lindroth. Finally, I am also investigating the composition of the plant communities in the understory vegetation at the Aspen FACE site (in a project funded by the British Ecological Society) to try and relate any changes in vegetation to the effects that we have seen in the invertebrate communities.

*Editors:* We'll miss Caroline's daily visits to our site next year when Caroline must return the UK, although she hopes to continue to collaborate with the Aspen-FACE project. Caroline has logged a phenomenal number of hours at our site over the past three years.