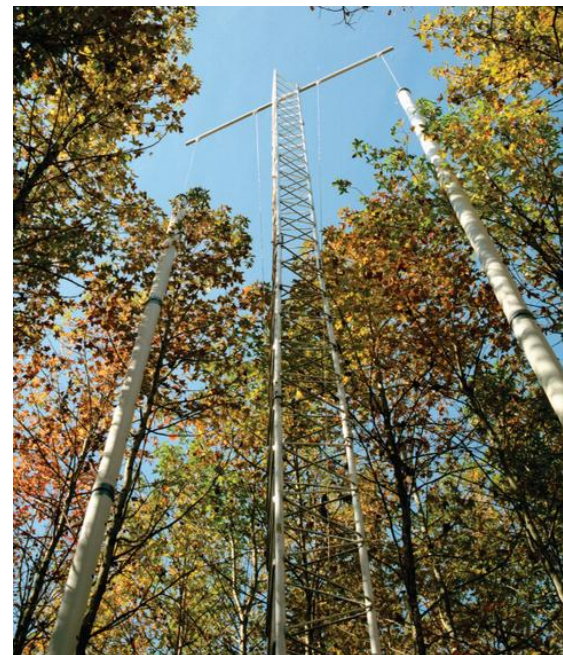


Ecological Lessons From Free-Air CO₂ Enrichment (FACE) Experiments

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- Our understanding of the ecological mechanisms controlling carbon cycling and storage in forests was advanced because of DOE investments in FACE research. The lessons from that decades-long research program have just been summarized in a high-profile article in *Annual Review of Ecology, Evolution, and Systematics*.
- Those lessons include:
 - Carbon cycle responses are time-dependent. A key example: net primary productivity is increased by elevated CO₂, but the response may be diminish with time.
 - Carbon partitioning patterns determine the fate of the extra C taken up by CO₂-enriched plants (leaves vs. wood vs. roots and soil). The understanding of such patterns must be captured by models.
 - The influence of N cycling on plant and ecosystem C cycling continues to be a critical uncertainty. Predictive ecosystem models demand dynamic and interactive carbon and nitrogen cycles.
 - The structure of the plant community can influence the response of the ecosystem to elevated CO₂. Future experiments should incorporate dynamic vegetation effects through experimental design and modeling.
- FACE experiments have provided a strong foundation for the next generation of experiments to be carried out in unexplored ecosystems and those with greater ecological complexity.



Citation

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