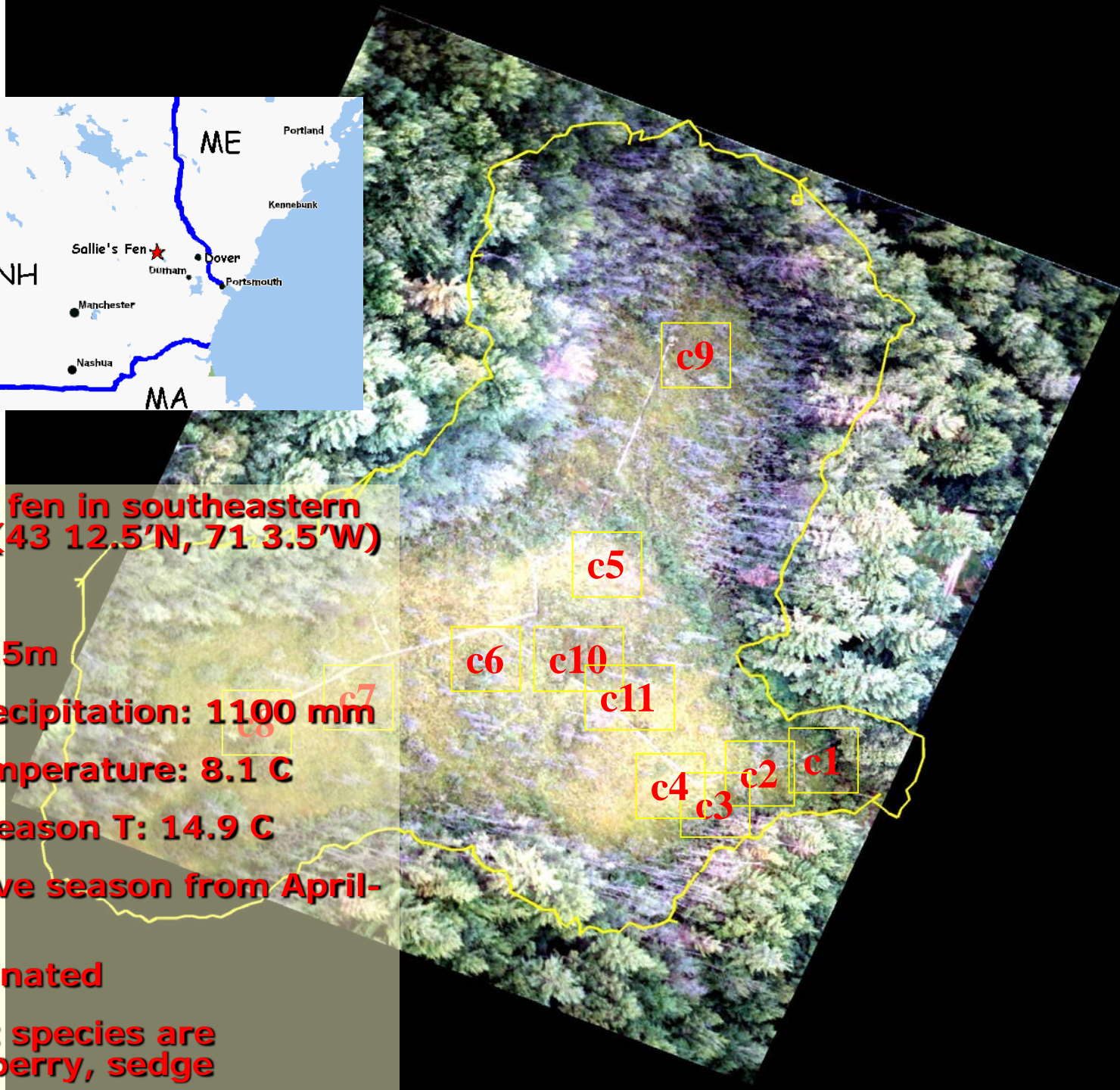
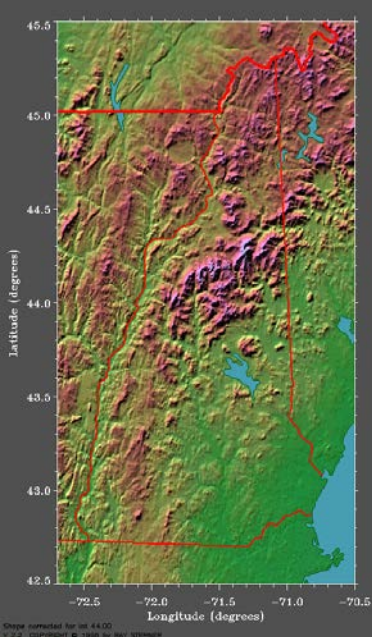


# **Carbon cycling in temperate ecosystems**



**Ruth K. Varner**  
**Climate Change Research Center**





• **Temperate poor fen in southeastern New Hampshire (43 12.5'N, 71 3.5'W)**

• **Area: 1.7 ha**

• **Peat depth: 2-4.5m**

• **Mean annual precipitation: 1100 mm**

• **Mean annual temperature: 8.1 C**

• **Mean growing season T: 14.9 C**

• **Biologically active season from April-October**

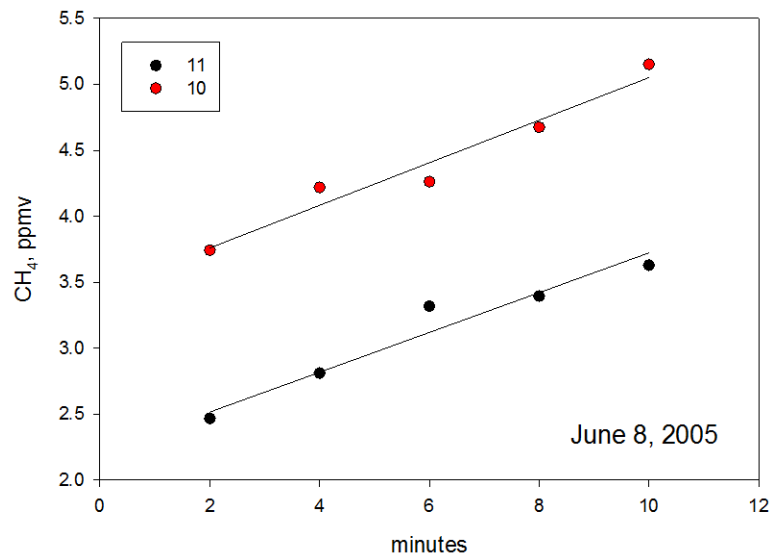
• **Sphagnum dominated**

• **Other important species are leatherleaf, blueberry, sedge**



# Manual Chamber Fluxes

- CH<sub>4</sub>: Grab samples taken during chamber measurements; analyzed on an GC-FID
- CO<sub>2</sub>: IRGA (LiCor 6200) analyzes air from chamber headspace; calculates NEE



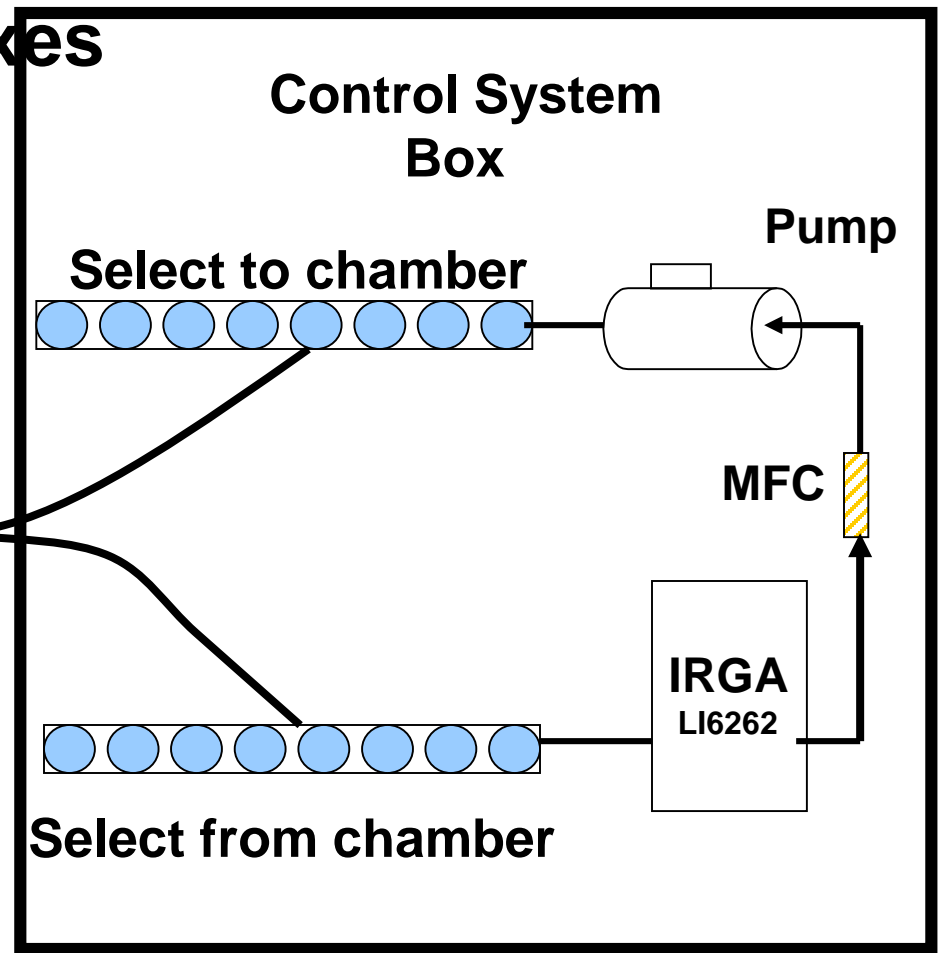
# Automated Chamber Fluxes



**Clear Lexan Boxes**

**0.07 – 0.08 m<sup>3</sup> (5)**

**0.14 – 0.16 m<sup>3</sup> (5)**



**Distributed Return  
Manifold**

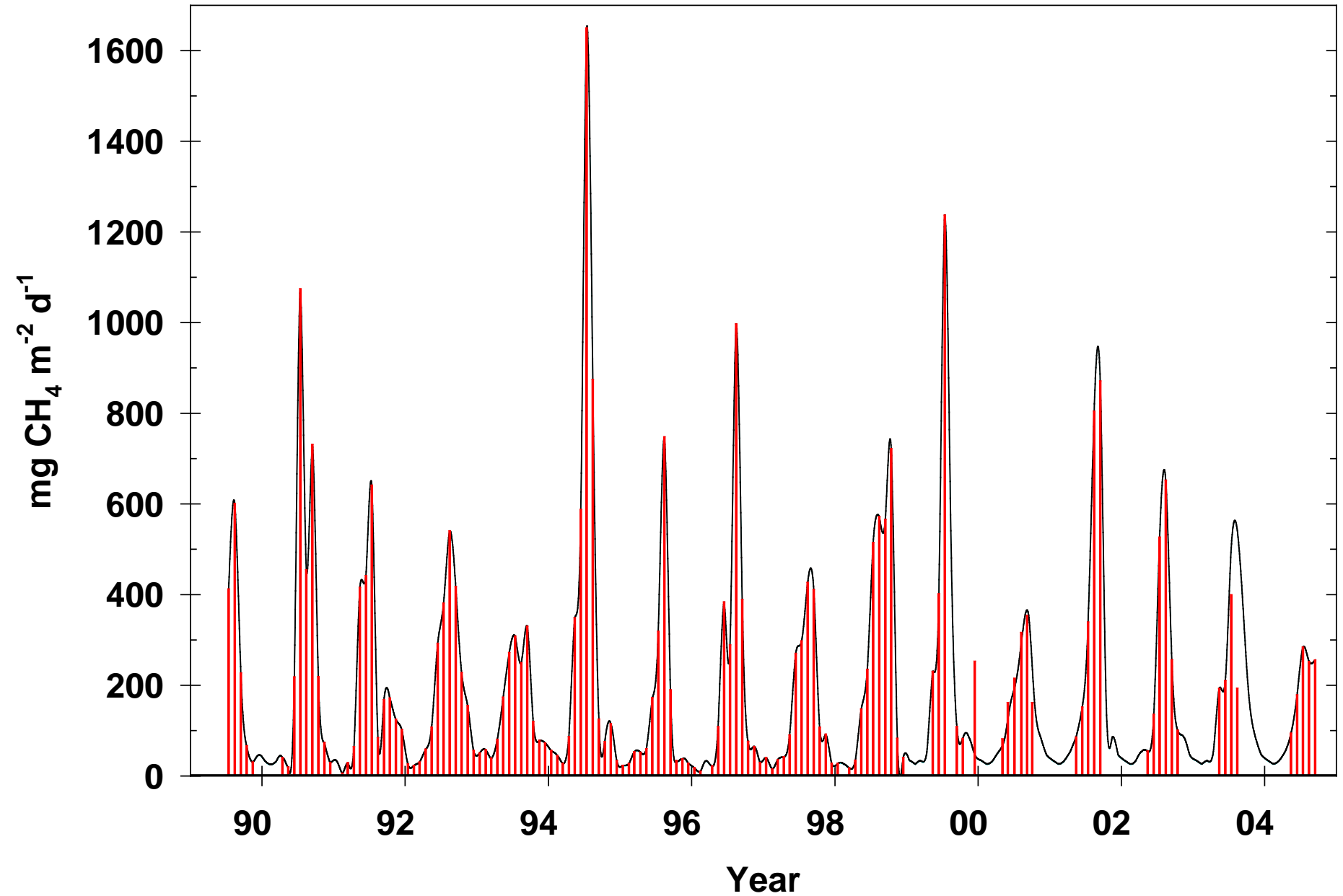
**Fans mix headspace**

**A flux every 20 minutes**

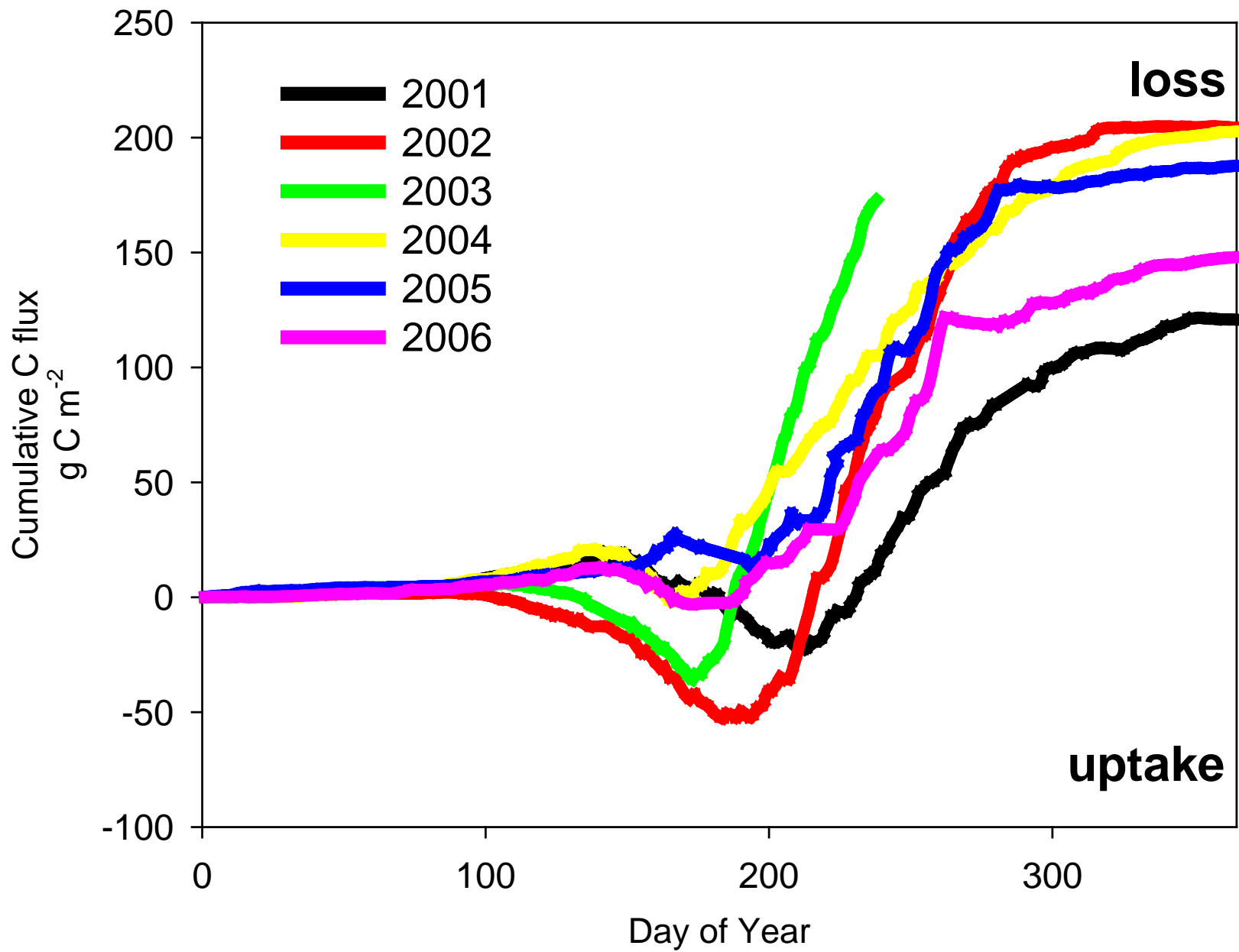
**96 fluxes per day**



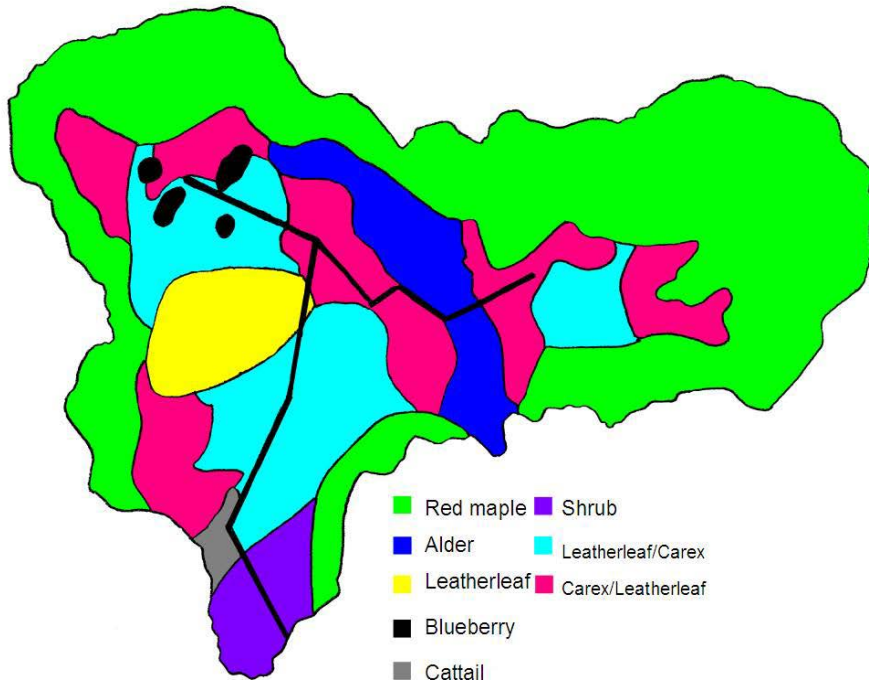
# Sallie's Fen, NH monthly averaged $\text{CH}_4$ flux



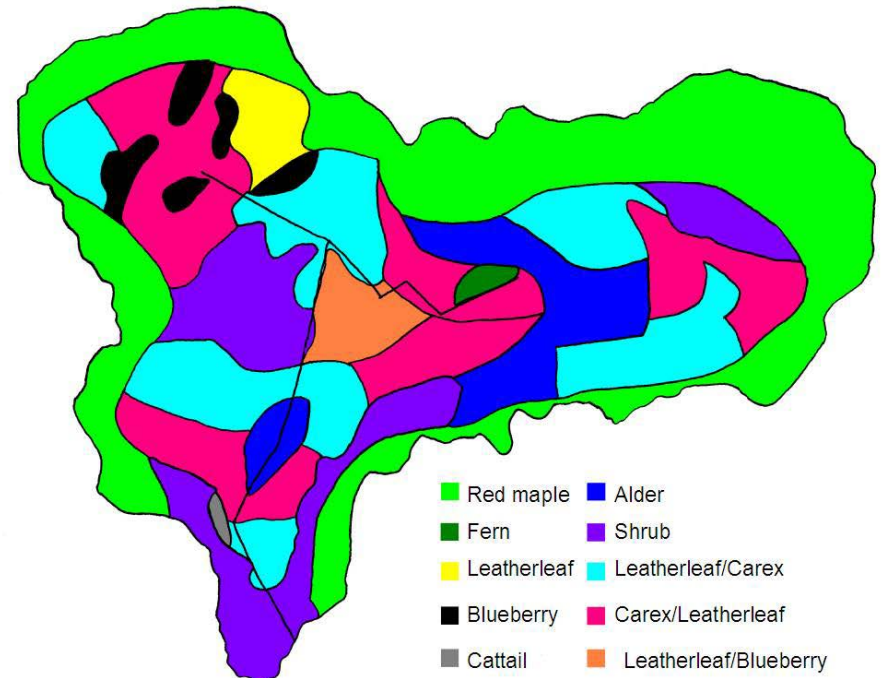




1995



2007



Vegetation survey maps of Sallie's Fen from 1995 and 2007.





# Automated chambers at Harvard Forest

# Tapajos autochambers



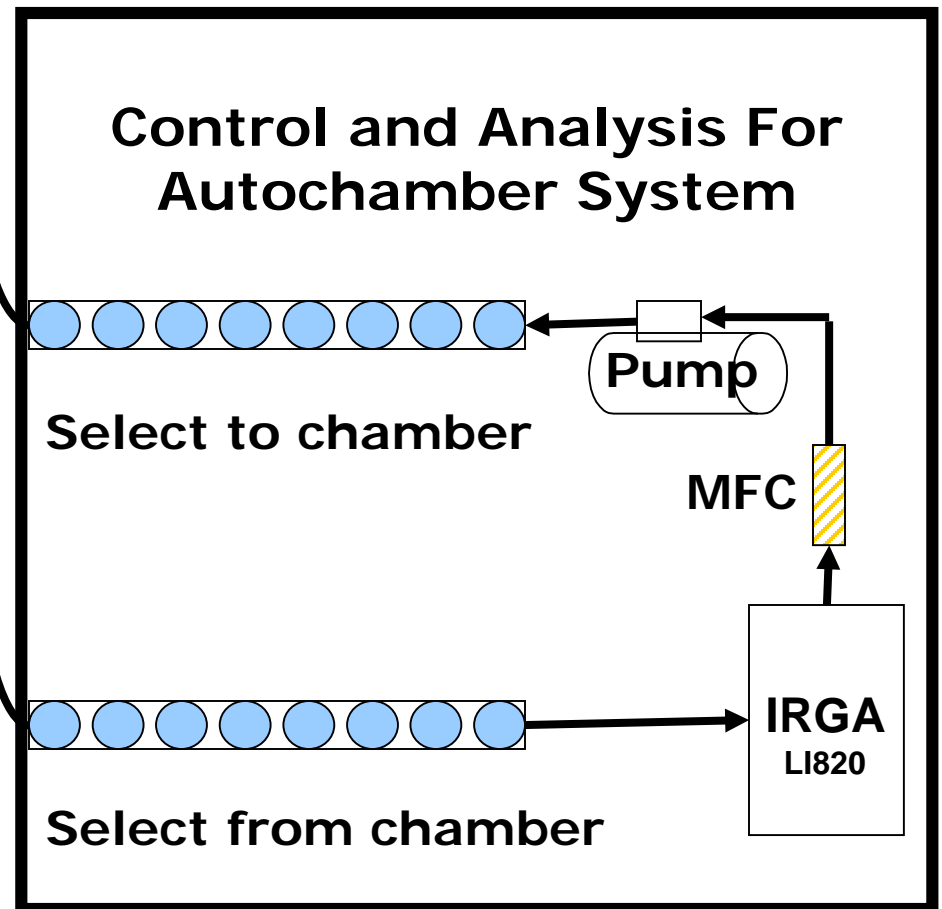


**Dark Aluminum Boxes**  
~0.04 m<sup>3</sup> (8)

**6 x's / day (high frequency,  
half hourly measurements)**



**Distributed Return Manifold**  
**No Temperature Control**





• Wetland margin • Mid-slope • Upland --- Wetland margin gap-filled --- Mid-slope gap-filled --- Upland gap-filled

