

WATER, NUTRIENTS AND PRODUCTIVITY PARTITIONING: AN ISOTOPIC APPROACH

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CSIR, WALTER**



SHINGWEDZI NORTH



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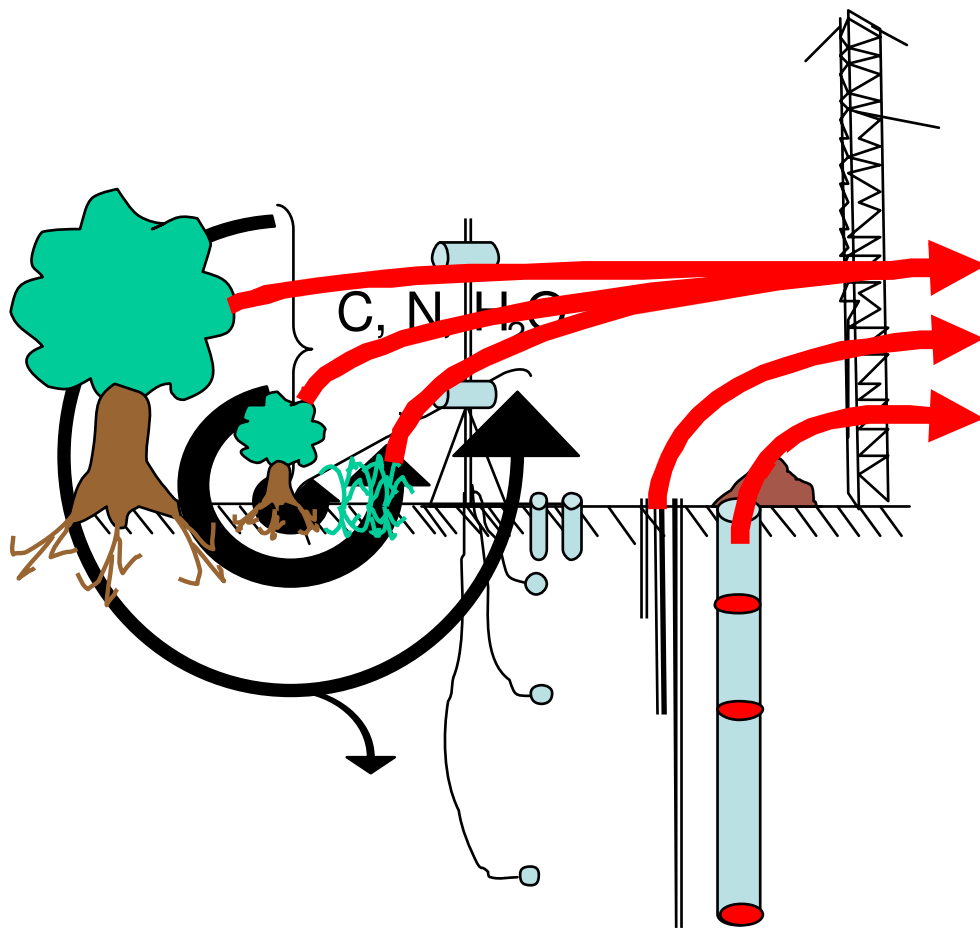
MALOPENI FLUX TOWER:





SKUKUZA FLUX TOWER:
•COMBRETUM ZONE
•ACACIA ZONE

ISOTOPE MONITORING



WEEKLY $\delta^{15}\text{N}$, $\delta^{13}\text{C}$, $\delta^2\text{H}$, $\delta^{18}\text{O}$

WEEKLY $\delta^{15}\text{N}$, $\delta^{13}\text{C}$, $\delta^{18}\text{O}$

BI-MONTHLY $\delta^{15}\text{N}$, $\delta^{13}\text{C}$

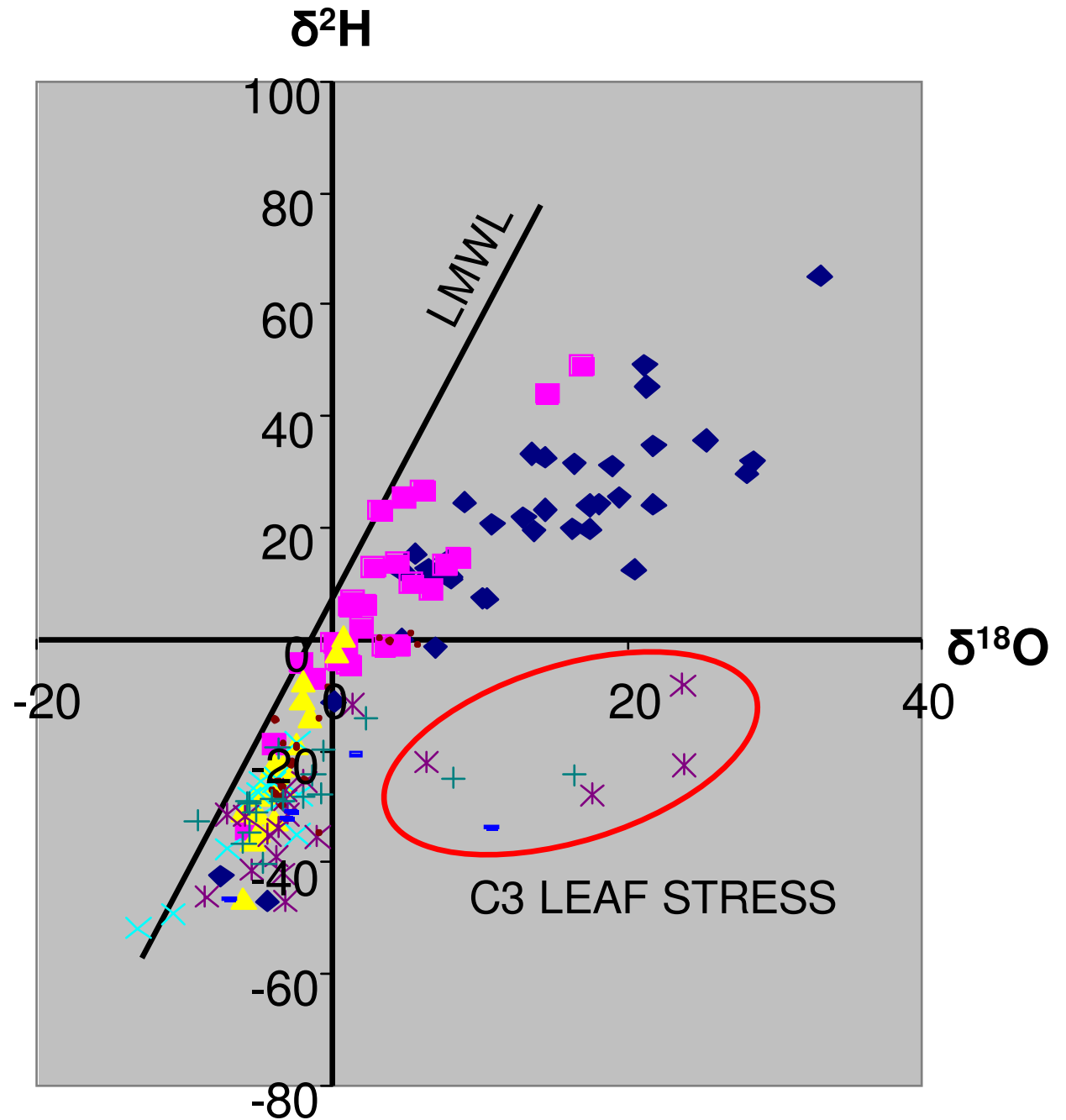
AIMS:

- REFINE MODELS OF WATER AND NUTRIENTS IN NPP
- PARTITION PRODUCTIVITY BETWEEN TREES AND GRASSES



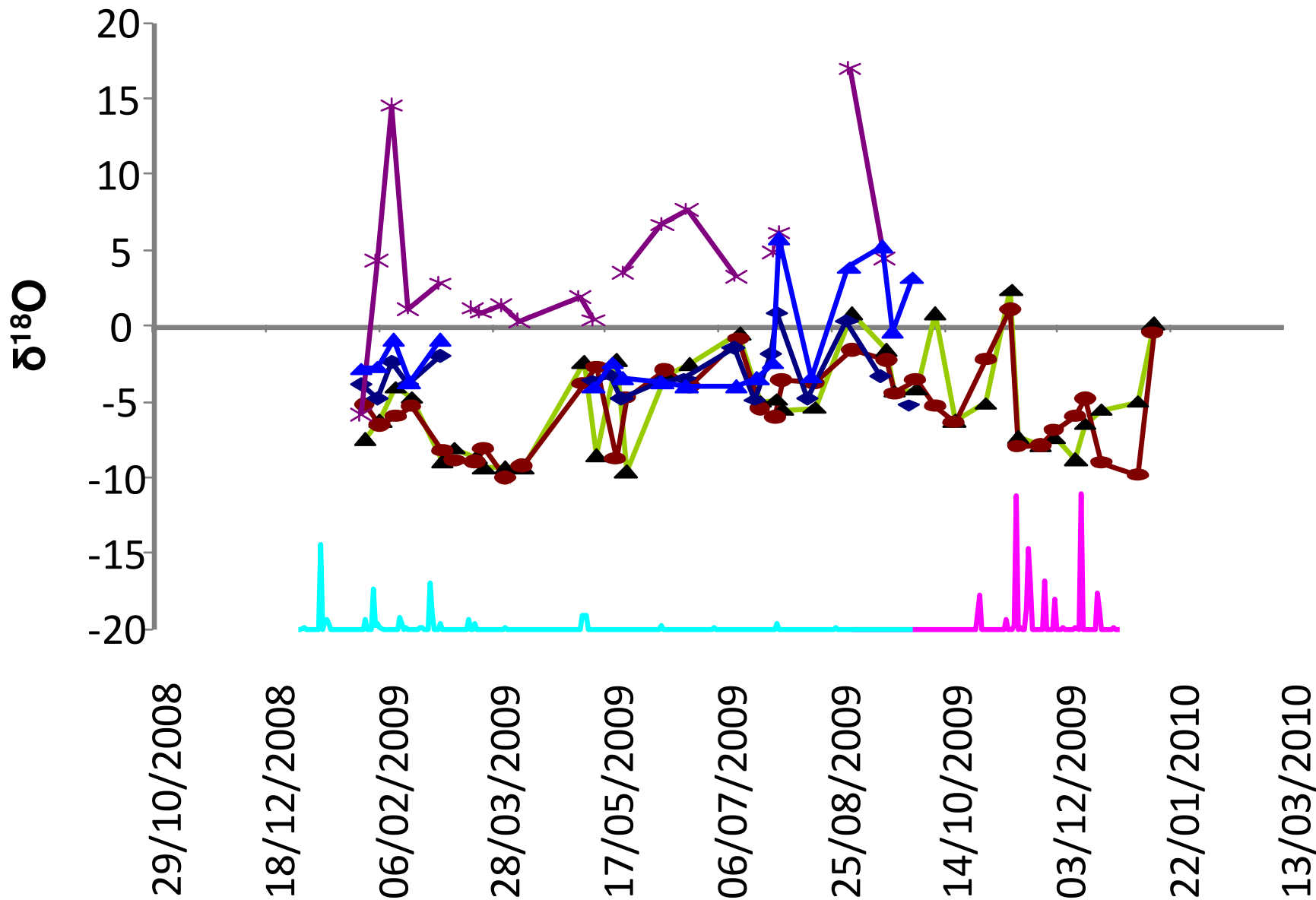
$\delta^2\text{H}$ AND $\delta^{18}\text{O}$ IN PLANT STEM WATER

- SKUKUZA TREE (*A.nigrescens*)
- ▲ SKUKUZA SHRUB (*G.FLAVA*)
- SKUKUZA GRASS
- + SHS TREE (*X.zambeziaca*)
- × SHS SHRUB (*C.megaloborris*)
- ◆ SH GRASS
- SHN TREE (*C.mopane*)
- * SHN SHRUB (*M.pavifolia*)

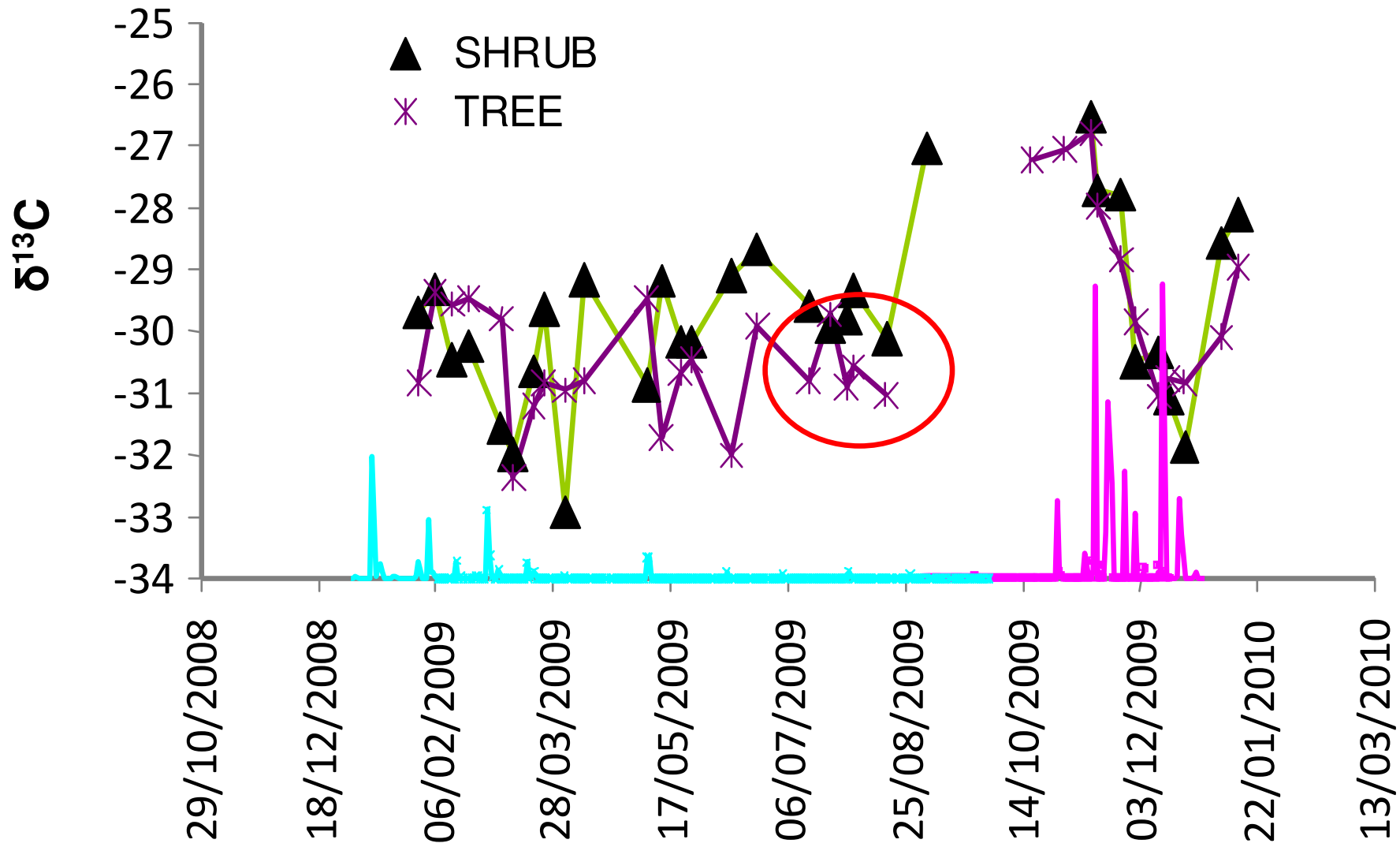


$\delta^{18}\text{O}$ IN SOIL ATM CO_2 AND PLANT STEM WATER

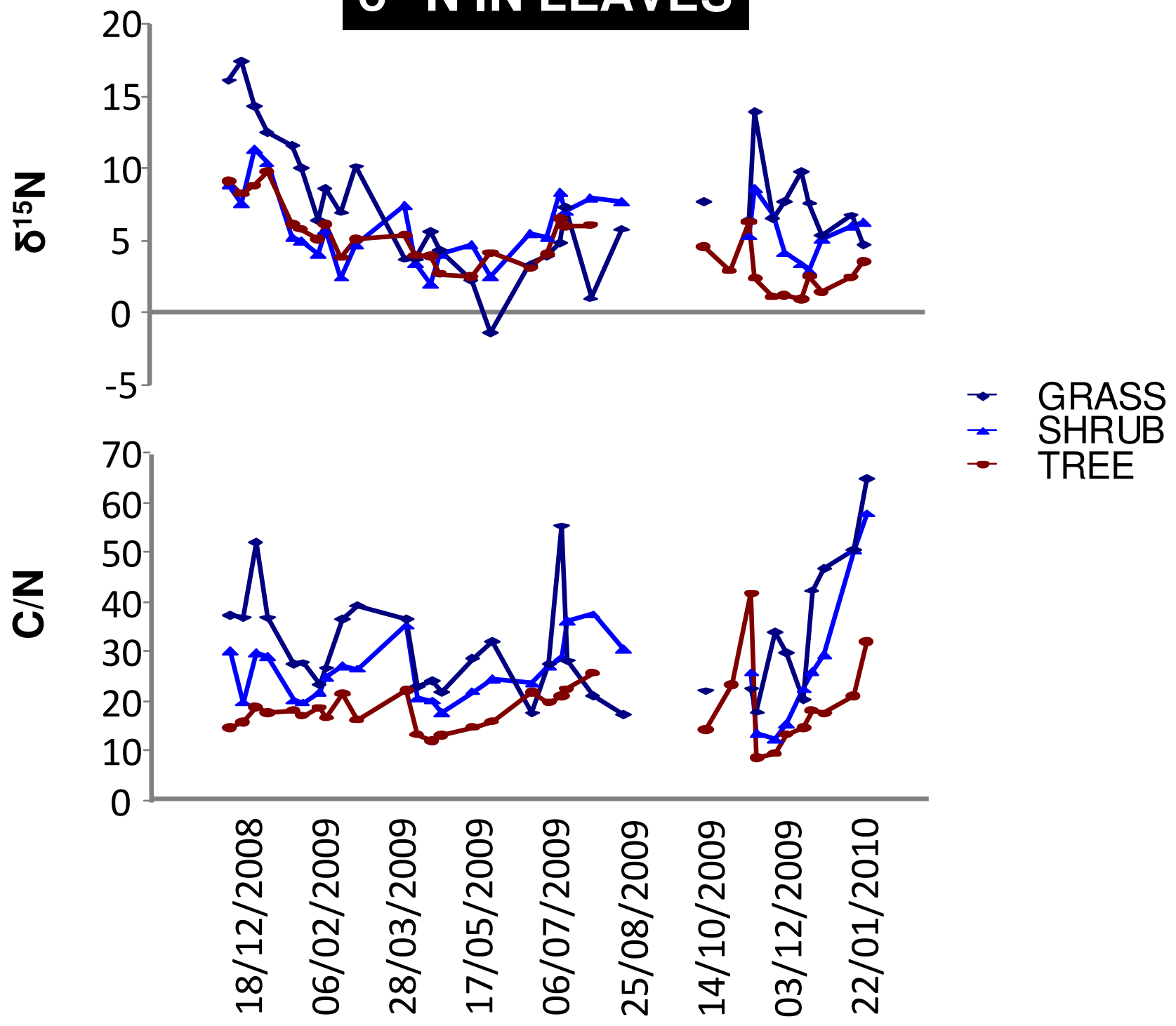
- ▲ SHALLOW SOIL ATM $\delta^{18}\text{O}$
- DEEP SOIL ATM $\delta^{18}\text{O}$
- ◆ SHRUB STEM $\delta^{18}\text{O}$
- ▲ TREE STEM $\delta^{18}\text{O}$
- * GRASS $\delta^{18}\text{O}$



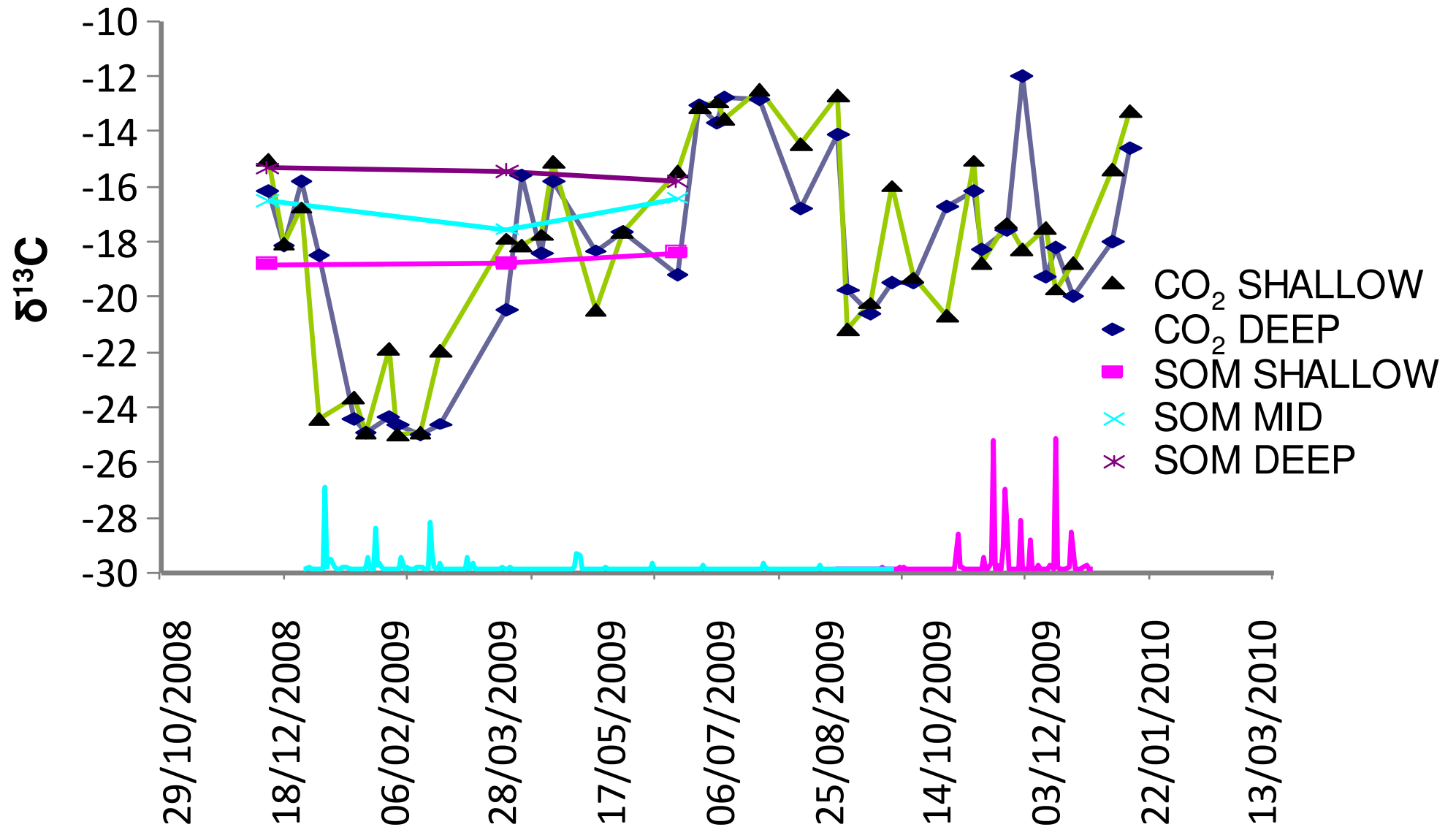
$\delta^{13}\text{C}$ IN LEAVES



$\delta^{15}\text{N}$ IN LEAVES



$\delta^{13}\text{C}$ IN SOIL ORGANIC MATTER AND SOIL ATM CO_2



CONCLUSIONS

ISOTOPES ARE CONTRIBUTING TOWARDS OUR UNDERSTANDING OF:

- SOIL MOISTURE DYNAMICS
- SOIL WATER/PLANT INTERACTIONS
- PLANT WATER-USE ADAPTATION
- SOIL NITROGEN CHEMISTRY
- PARTITIONING OF SOIL RESPIRED CO₂