Euc MS intro

Photosynthesis represents the most abundant set of biochemical reactions on the planet.

Photosynthesis links global C and N cycles (Maire 2012?).

Plant function known to be the least robust component of global climate forecasting models.

Leaf N content strongly correlated with protein amount, and therefore capacity of plants to take up carbon from the atmosphere (Evans 1983)

Leaf N an essential characteristic of vegetation and is therefore important in global scale terrestrial biosphere and coupled climate-vegetation models (Kattge 2009).

(Can see leaf N from the air / space)

While leaf N is really useful in models, we now have the technology to decompose leaf N into its constituent protein functional categories.

Proteins are important because they perform biochemical work. Global biosphere models are especially interested in bulk rates of carboxylation across landscapes.

Nearly all plant proteomics has been qualitative (hmm) to date, really need absolute quant to provide useful information for models of vegetation function. Since the amount of work done is a function of the amount of the enzyme.

We have developed proteomics methods that allow high throughput absolute quantification of leaf protein abundance

Nearly all quantitative plant proteomics work has been done in model species so we have little understanding about how plants function at the molecular level in nature.

In this study we analysed X leaf samples for each of three leaf ages across X east Australian species of *Eucalyptus,* from an area of X by X km.

We have created a quantitative ecological proteomics dataset on a scale which has previously/hitherto not been possible.

The number of interesting research questions and hypotheses about how plants might allocate proteins resources to different functional categories in response to their environment is immense. As an initial foray into this field of quantitative ecological proteomics, we test some longstanding hypotheses around photosynthetic capacity, which have previously (mostly – see Scafaro et al 2017) been investigated using leaf N as a proxy for protein content.

Specifically, we assume that leaf N is mostly accounted for by Rubisco and the light independent reactions of photosynthesis

Leaf N vs tavg, see Reich & Oleksyn 2004