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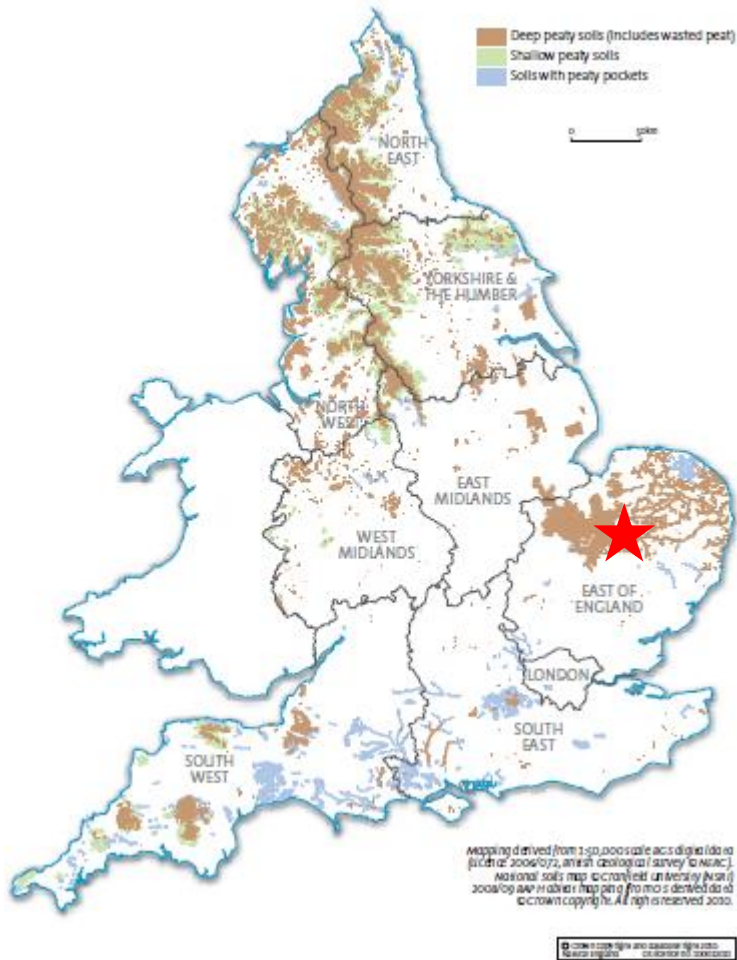
IPS Aberdeen – 29th May 2017

Multi-annual carbon fluxes from a lowland agricultural peatland

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Study site



Above: Image of Rosedene field site (Source: Google Earth, 2007)
Left: Peat map of England (Taken from Natural England report (2010))

- Commercial Farm, N. Norfolk, East Anglia (approx 1,400 ha)
- Mainly vegetables: lettuce, celery, Chinese leaf salad crops, potatoes, onions, radish, leek, beetroot, carrot, sugar beet and maize. But also grasses barley and wheat.

Measurement technique - Instrumentation

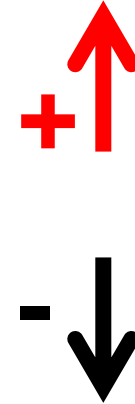


Image right adapted from: Burba (2013)
Below: Photo taken by Alex Cumming



EC system: Li7500 with CSAT3 sonic anemometer and associated meteorology (radiometers, temperature and relative humidity probe, soil moisture, temperature and heat flux instruments, pressure divers)

Study site - crops

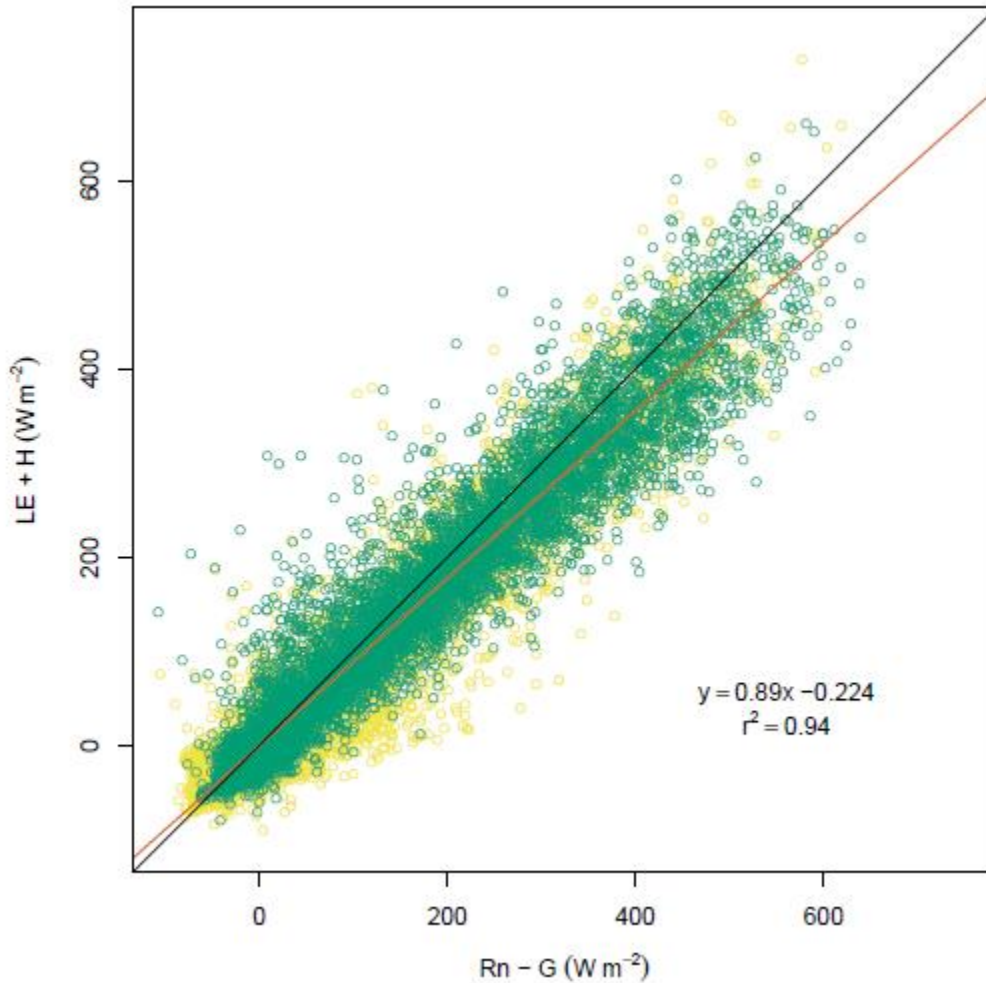
Lettuce



Leek

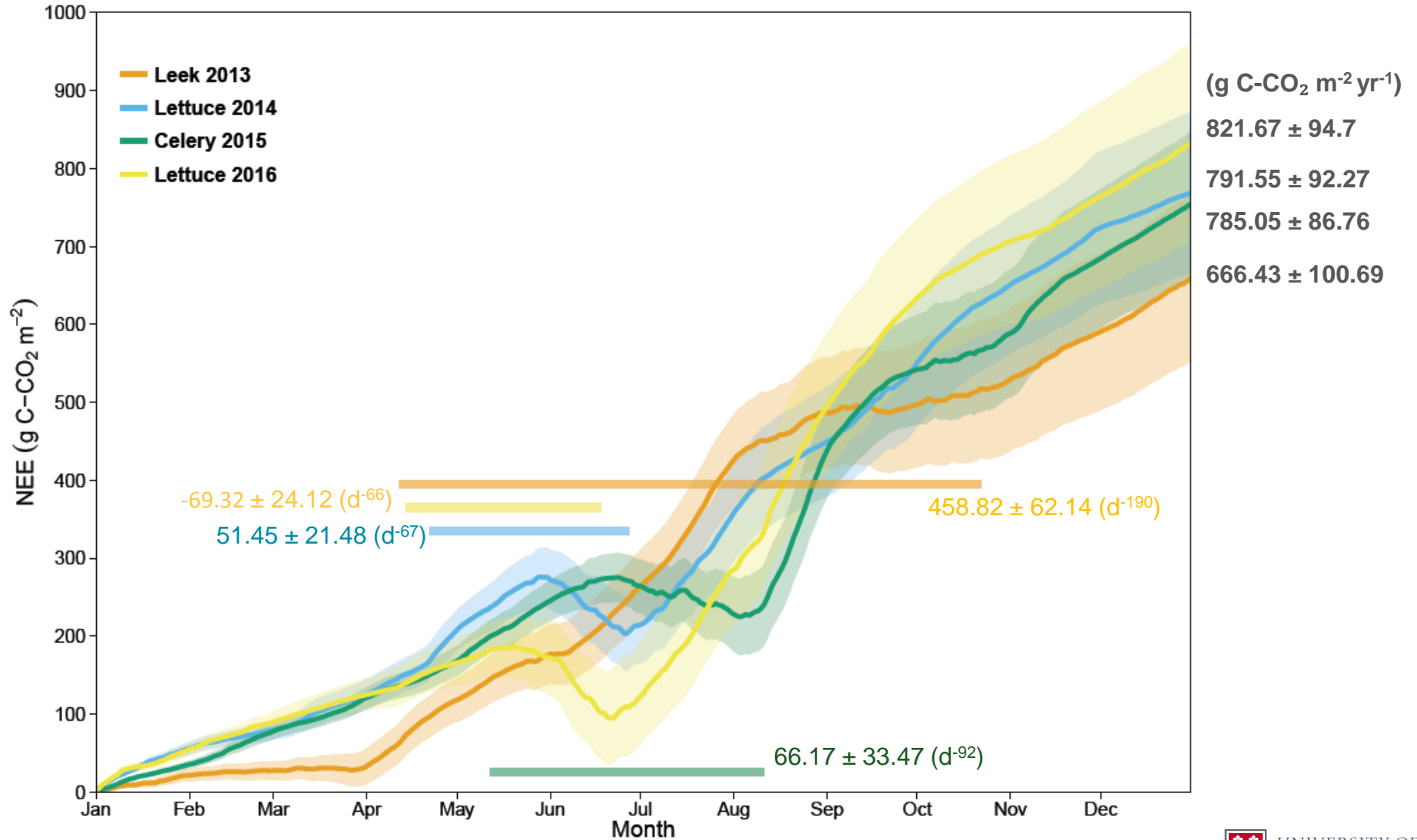


Energy Balance Closure



| 2012-15 | Slope | Intercept | EBR |
|---------|-------|-----------|------|
| Crop | 0.89 | 2.11 | 0.91 |
| Fallow | 0.88 | -1.00 | 0.86 |
| All | 0.89 | -0.22 | 0.89 |

Cumulative Net Ecosystem Exchange



Lateral import/export

| (g C m ⁻² yr ⁻¹) | Leek 2013 | Lettuce 2014 | Celery 2015 |
|---|----------------------|-------------------------|------------------------|
| Import | 5 | 45.64 | 49.25 |
| Export | 142.57 | 28.13 | 51.96 |
| Net | 137.57 | -17.51 | 2.71 |

Literature comparison

- IPCC (2013) wetlands supplement Boreal/Temperate Cropland drained **7.9** t C-CO₂ ha⁻¹ yr⁻¹
 - Drosler et al., (2013) **9.2** t C-CO₂ ha⁻¹ yr⁻¹ (including CO₂ equivalents)
 - Elsgaard et al., (2012) cultivated peatland **3.5 – 13.6** t C-CO₂ ha⁻¹ yr⁻¹ (Barley and grasses, **2.4 - 3.5** t C-CO₂ ha⁻¹ yr⁻¹ export)
- Tiemeyer et al., (2016) **7.6 ± 4.7** t C-CO₂ ha⁻¹ yr⁻¹ grasslands on fen and bog
- Taft et al., (2017) chamber experiments at same study site **3.5 - 8.10** t C-CO₂ ha⁻¹ yr⁻¹ depending on soil type and crop (Celery, red beet, radish, potato)
- This study, **6.67 ± 1.01 (+1.38), 7.92 ± 9.23 (-0.18), 7.85 ± 8.68 (+0.03)** t C ha⁻¹ yr⁻¹

