Land model leadership

CROP

CTSM  CLM

FATES
CTSM5.1 Upcoming developments and features

**Atmospheric Fluxes**
- Updated PFT reflectance parameters [Keith]
- New urban datasets, parameters of building properties [Keith]
- Biomass heat storage [Sean]

**Hydrology**
- Irrigation [Bill & Sean]

**Ecosystems & BGC**
- Fire: improved deforestation fires, lightning ignition bug fix [Fang Li]
- LUNA bug fixes [Leah Birch]
- Arctic & boreal phenology & allocation [Leah Birch]
- Matrix-CN [Chris Lu & Yiqi Luo]
- Aerosols: FAN (NH3 emissions) [Julius Vira & Peter Hess]

**Crop model**
- Shifting cultivation [Peter]
- Bioenergy crop [Yanyan Cheng & Maoyi Huang]

**Features**
- Remove hard coded parameters [Keith]
- SSP-RCP anomaly forcing compsets for land only runs
- No anthro compset, turns off irrigation, crop, urban, LULCC, fire
- Prescribed soil moisture
- Soil and snow layer flexibility + trimming PFTs [Sam Levis]
LUNA bugs

1. **Max day length** hard coded to 12 hours, globally.
2. **Average daily values need** to include day & night.
3. **Hard coded initialization** of $V_{cmax}$ and $J_{max}$ in spring.

\[
J_{maxCoef} = J_{maxb1} \times ((\text{hourpd} / 12.0_{r8})\times2.0_{r8})\
\]

**Results: Lower Arctic Vcmax & productivity**
- **Modify parameters**, $j_{maxb1}$ + arctic leafCN & slatop

C. Xu  K. Oleson  L. Birch
GPP Difference, LUNAbugs - CLM5 control

- Modify parameters, jmaxb1 + arctic leafCN & slatop

C. Xu    K. Oleson    L. Birch
LMWG priorities for CESM3

How do ecosystem function and vulnerabilities transform under climate change?

S. Swenson, R. Fisher, J. Shuman, C. Koven

Model components:
Hillslope Hydrology
Ecosystem Assembly
[FATES]
LWMG priorities for CESM3

How do we maintain food and water security in a changing world?

Model components:

- Crop model [APSIM]
- Water & river management [mizuRoute]

D. Lombardozzi, B. Peng, N. Mizukami
<table>
<thead>
<tr>
<th>Component</th>
<th>Contributors</th>
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<tbody>
<tr>
<td>Atmospheric Fluxes</td>
<td>Multilayer canopy [Gordon &amp; Ned Patton]</td>
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<tr>
<td>Hydrology</td>
<td>Hillslope hydrology [Sean] &amp; mizuRoute [Naoki, Erik]</td>
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<td>Ecosystems &amp; BGC</td>
<td>FATES [Rosie, Charlie, Jackie, Ryan &amp; many more]</td>
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<tr>
<td>Crop model</td>
<td>APSIM crop phenology [Danica &amp; Bin Peng]</td>
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<td>Features</td>
<td>CTSM &amp; LILAC [Dave &amp; many more]</td>
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CTSM-FATES Integration
**Goal**: To run CMIP-compatible, fully transient historical simulations of CTSM-FATES by summer 2021.

**Discussion Aims**: In this meeting we aim to prioritize needs, identify specific tasks & interested people to implement CTSM-FATES integration.