



Land Cover Change Experiments for AR5

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Outline

Introduction

- IPCC proposed short term high resolution vs long lower resolution
 - What resolution should we work with?
- Biophysical vs biogeochemical experiments
- DVGM vs prescribed natural vegetation
- Historical coordination proposal – develop a standard dataset
- Use 2000 from this historical period as present condition
- Integrating additional data
 - Urban
 - Irrigation
 - Other
- Other Collaboration with IMAGE Team



Proposal for a Harmonized Historical Landuse Dataset

- Voluntary proposal
- IAM/ESM coordination proposal: ask all ESMs to use standard dataset
- Develop single historical landuse transition matrix (1700-2000)
 - Hurtt
- IAMs use 2000 from this historical period as present condition
- Develop one priority dataset
- Potentially two datasets for sensitivity purposes

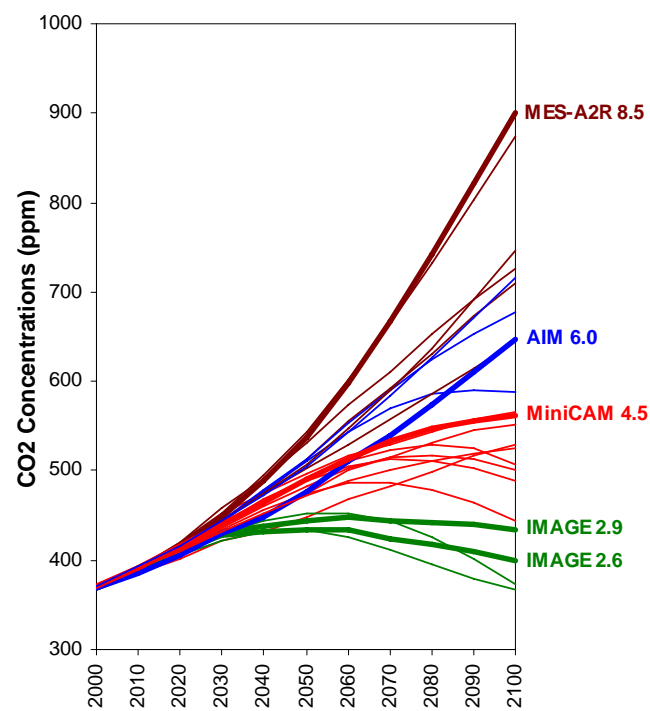
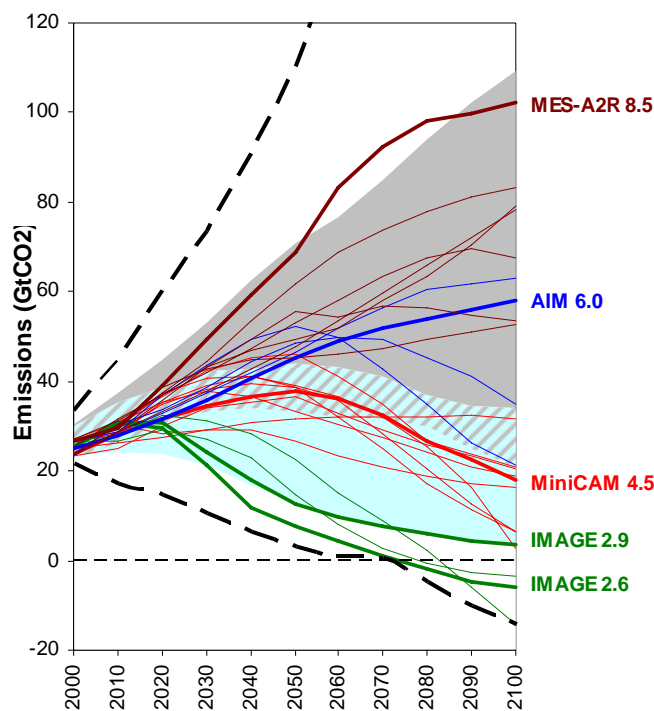
Issues

- R&F vs HYDE3
- Multiple crop types and present day data
- Urban landcover representation
- How will it fit with existing MODIS derived data (e.g. bare ground)



Emissions / Concentrations

- CO₂ emission / concentration trends





	Description	Publication
RCP8.5	High emission baseline scenario leading to 8.5 W/m ² in 2100.	Riahi et al. (2007) – MESSAGE
RCP6	Stabilization scenario at 6 W/m ² between 2100-2200	Fujino et al. (2006) – AIM
RCP4.5	Stabilization scenario at 4.5 W/m ² between 2100-2200	Clarke et al. (2007) – MiniCAM
RCP3-PD	Scenario with peak in radiative forcing around 2060 slightly above 3 W/m ² and reaching a radiative forcing level below 3 W/m ² in 2100.	van Vuuren et al. (2006, 2007) – IMAGE



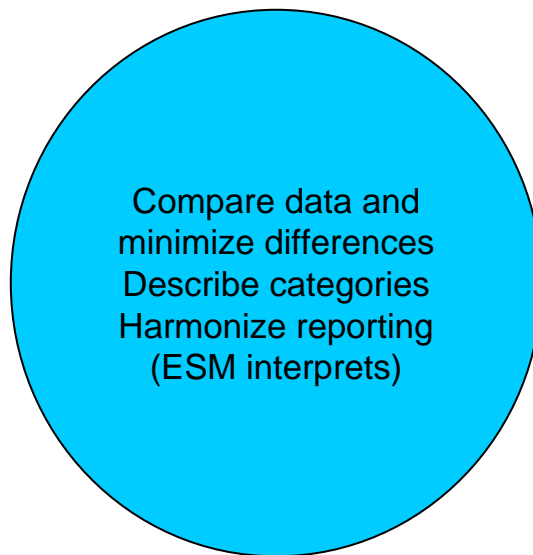
Proposed Handoff Procedure

IAM1
(category1/
Data1/grid1)

IAM2
(category2/
Data2/grid2)

IAM3
(category3/
Data3/grid3)

IAM4
(category4/
Data4/grid4)



Human Land use
Secondary Human practices
Natural Land cover
IAM – ESM comparison Stats

ESM1
(category 1/
Data 1)

ESM *n*
(category *n*/
Data *n*)

EMIC1
(category 1/
Data 1)

EMIC *n*
(category *n*/
Data *n*)



Minimal Land Use Classes

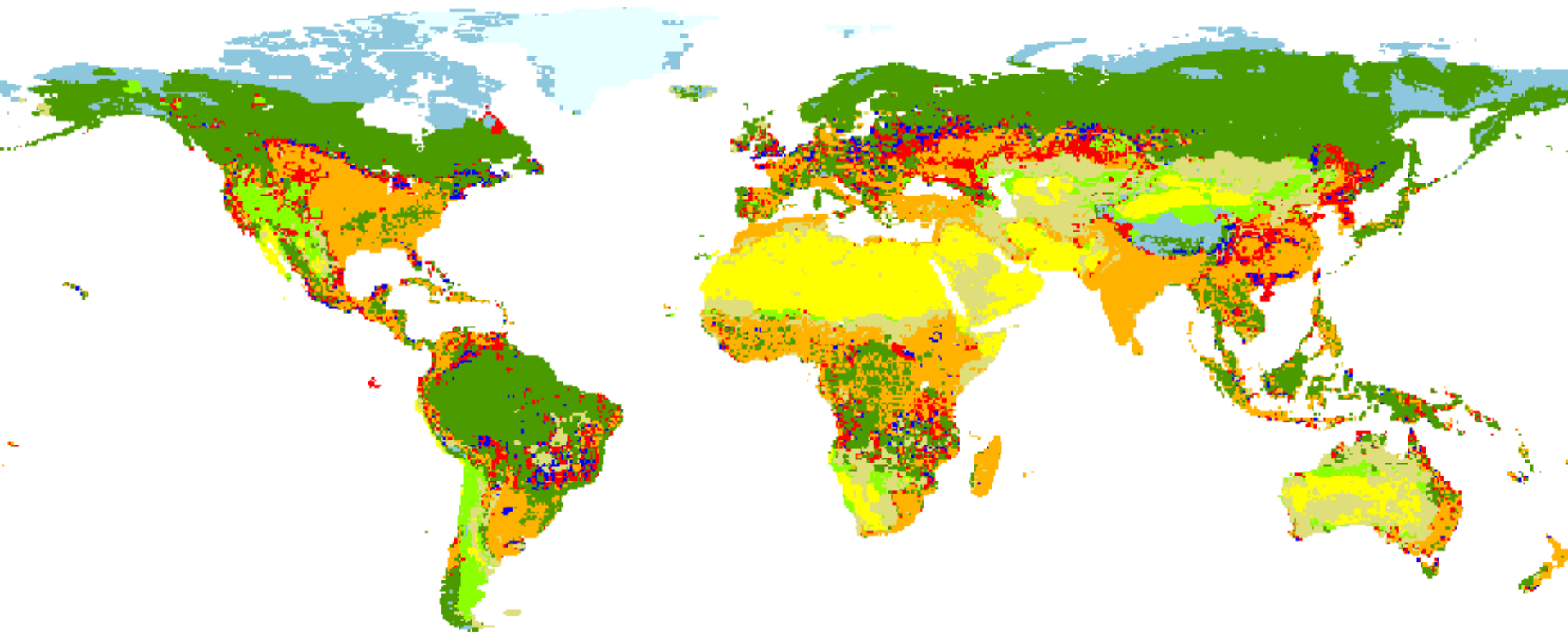
1. Cropland
 - FOA definition
 - By type(s) if possible or groups
2. Managed forest
 - By plant type if possible
3. Pasture
 - By types
4. Grazing land
5. Urban



	AIM	MESSAGE	MiniCam	IMAGE
MANAGED SYSTEMS				
Cropland	Agriculture land	cultivated land	Cropland (4 crop types + Hay) Other Arable Land Biomass Crops	Cropland (7 crop types) Biomass crops (3 crop types)
Pasture	Pasture including grassland	*	Permanent Pasture	Pasture Extensive grassland
Forestry	Land for forestry	Managed forests	Managed forests	Regrowth forests after timber
Other		built-up land		built-up land
NATURAL LANDS				
Forests		Unmanaged forests	Natural Boreal forests Other primary natural forests Other secondary natural forest	Boreal forest Cool conifer Temp Mixed forest Tem. Deciduous forest Warm mixed forest Tropical woodland Tropical forests
Grasslands		grassland/shrubland/woodland	Other Grassland Other Shrubland	Grassland Shrub Savannah Tundra Wooded tundra
Other		other land (=water, desert, rocks, ice).		Ice Desert



Land use/cover pattern in IMAGE '3 W/m²' mitigation scenario (2100)



Source: Van Vuuren



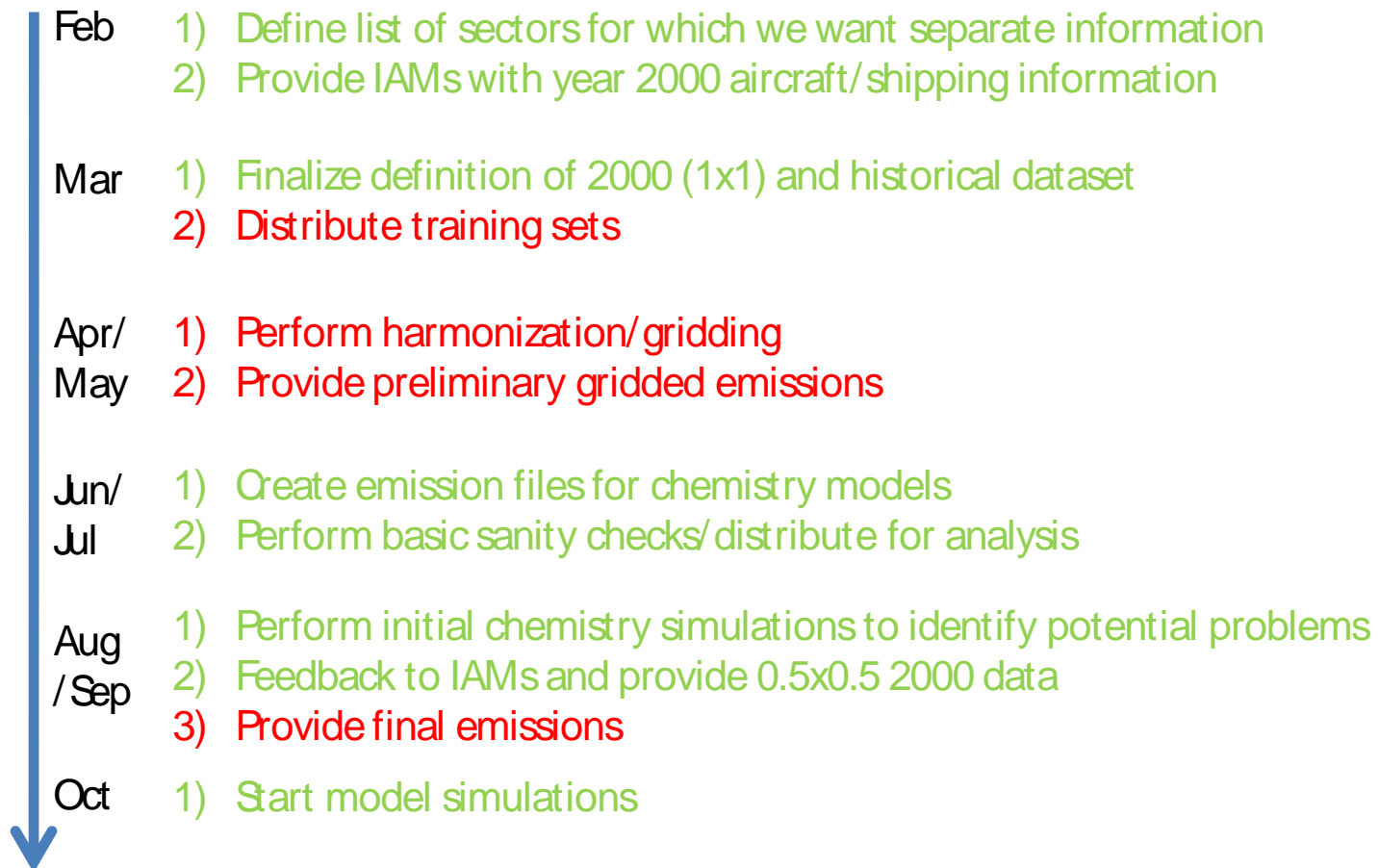
Secondary (overlay) Information

1. Irrigated area
 - Water source?
2. Timber harvest
3. Wood use – destination of wood harvest (from difference of wooded areas)
 - burning
 - permanent storage
 - other etc. expressed as fraction of total harvest
4. Grazing (guidance on how to interpret)
5. Fertilizer
6. Transition matrix
7. Standard of living index
8. Other



IAMs
ESMs

Time line





Links with IMAGE Team

Future cooperation

- Link to IMAGE (interactive)
- IMAGE (others?) can provide info for all scenarios. Ensembles with alternate land cover scenarios?
- Multiple IMAGE land cover scenarios for same emissions scenario
- Especially focus on 2.6