Pacific Northwest
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Metis – Bridging tools and approaches for comprehensive multi-sector analysis at stakeholder relevant scales

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U.S. DEPARTMENT OF ENERGY BATTELLE

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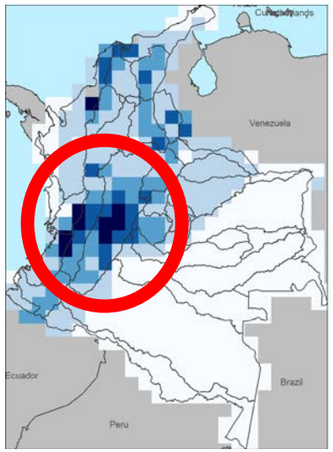
Why Metis?

Water demands = 12 km3
Renewable Water = 2360 km3
Ratio = 0.005

No National Scarcity

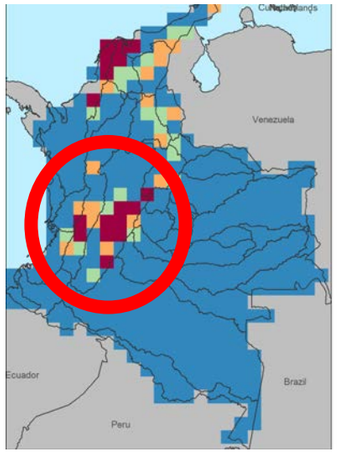
Sub-Regional Detail

Demands



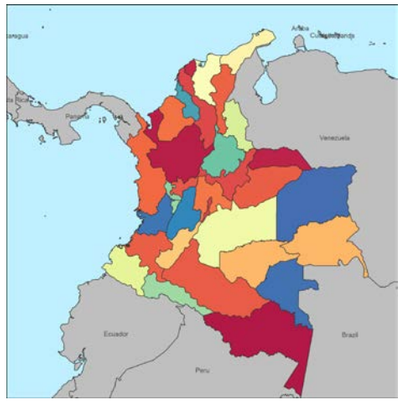
Runoff

Scarcity



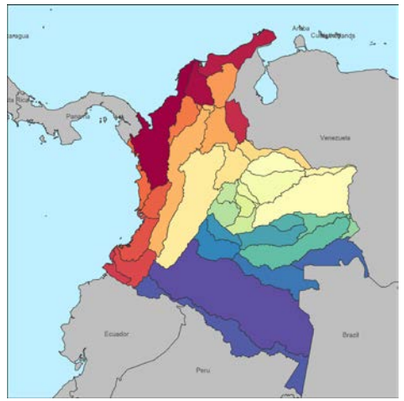
Relevant Boundaries

States



GCAM Basin

Sub-basin

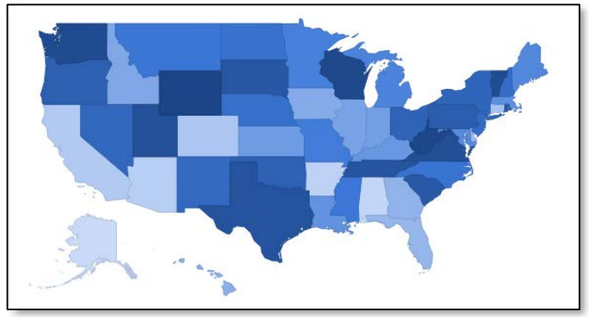


Why Metis?

Breakup GCAM

GCAM China

GCAM USA



GCAM

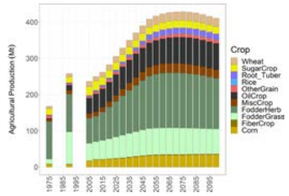
Downscaling (Tethys, Demeter)

Other Models Local Models

METIS

Standardized Templates & Graphics

scenario	region	class	year	value
Local Data	Argentina	Corn	2010	
Local Data	Argentina	FiberCrop	2010	
Local Data	Argentina	FodderGrass	2010	
Local Data	Argentina	FodderHerb	2010	
Local Data	Argentina	MiscCrop	2010	
Local Data	Argentina	OilCrop	2010	
Local Data	Argentina	OtherGrain	2010	
Local Data	Argentina	Rice	2010	
Local Data	Argentina	Root_Tuber	2010	
Local Data	Argentina	SugarCrop	2010	
Local Data	Argentina	Wheat	2010	

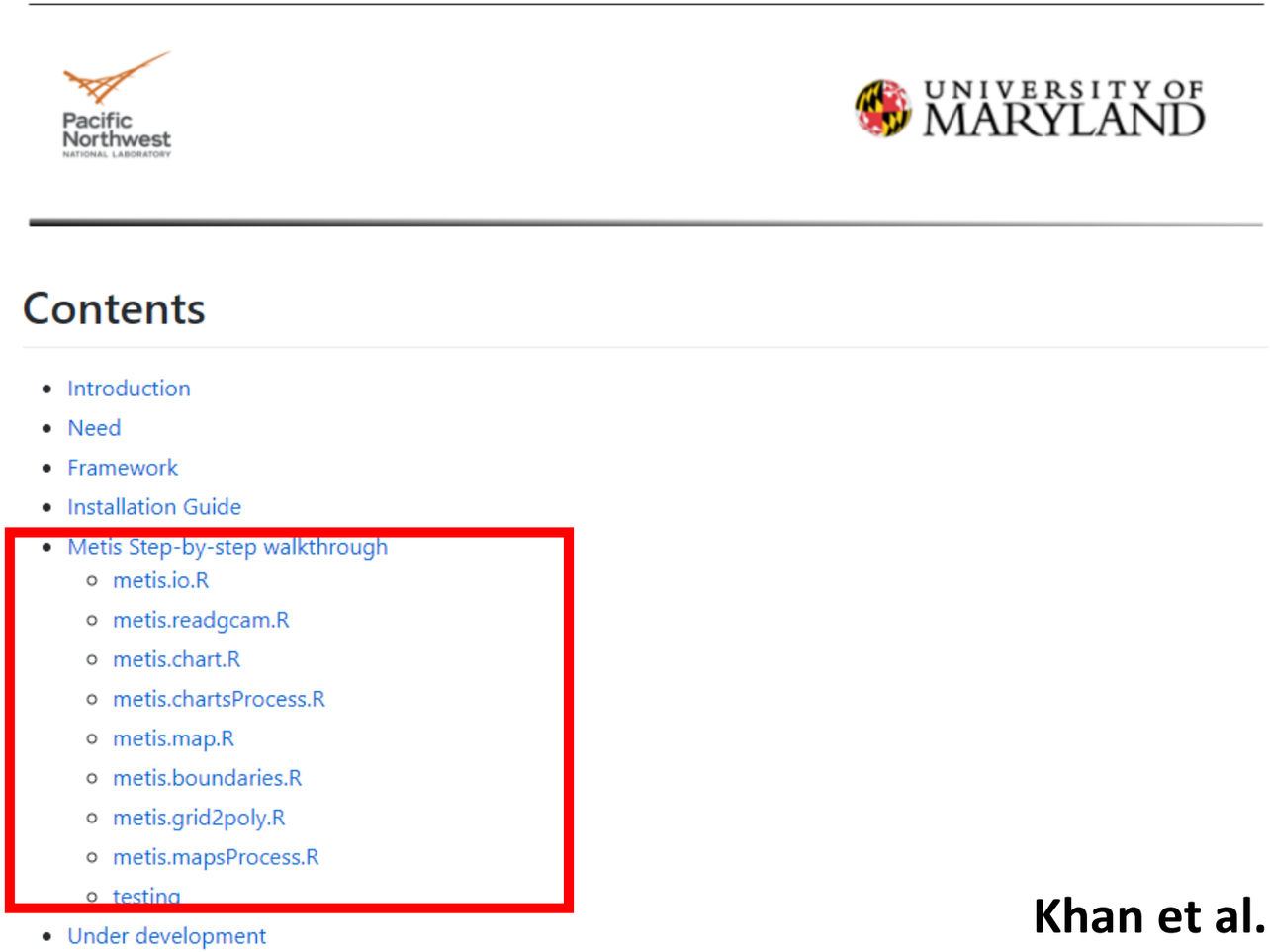


Aggregate to flexible & relevant Scales

Multi-sector interactions at relevant scales

Where can I get Metis?

https://github.com/JGCRI/metis



Khan et al. 2019 (Submitted)

Charts and templates

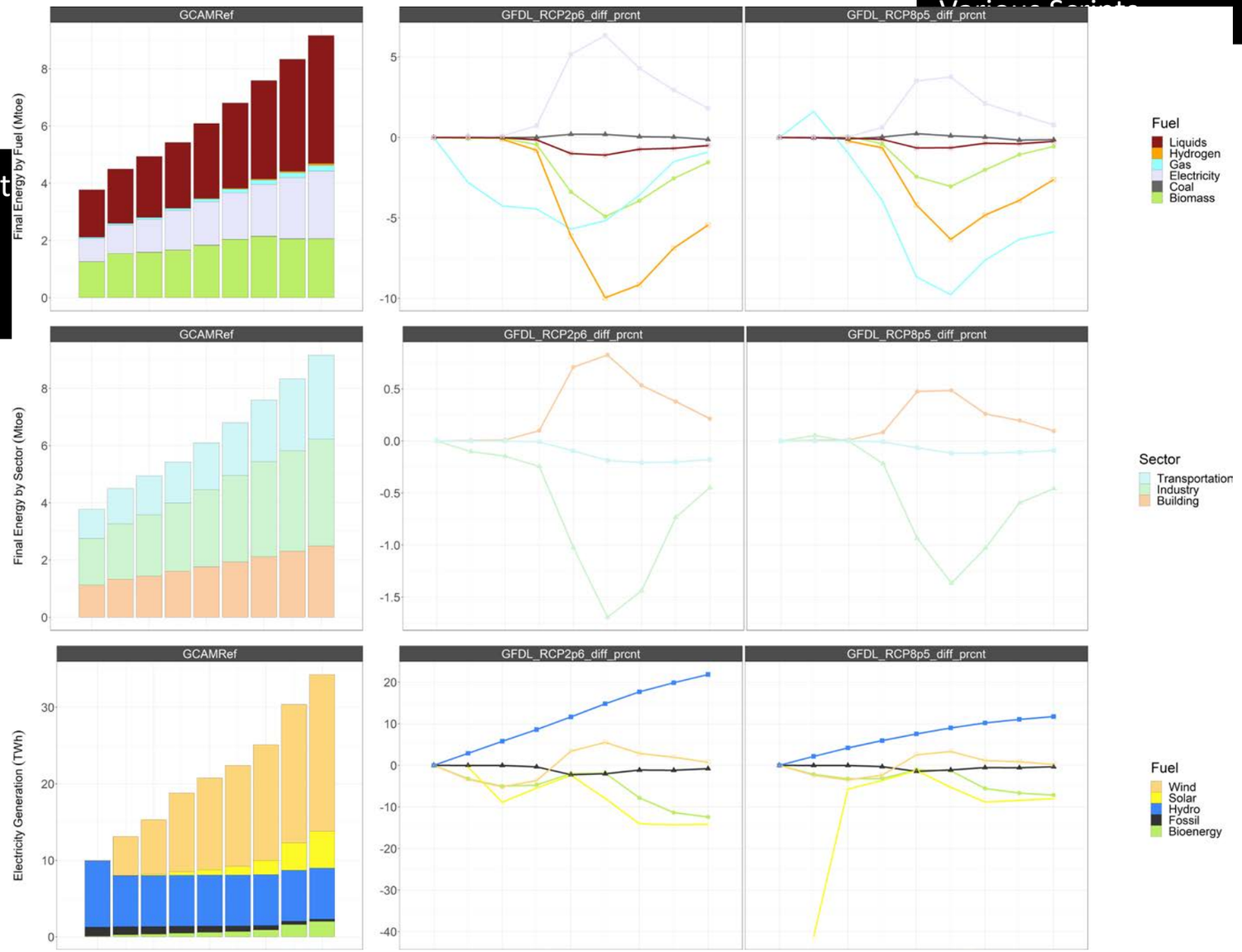
rgcam
pygcam
Dan's Extended ModelInterface
Various Scripts

met

GCAM Database

- Scenario
- Region
- Param
- Years

- Add Scenario
- Add Region
- Change Param
- DiffOn=T



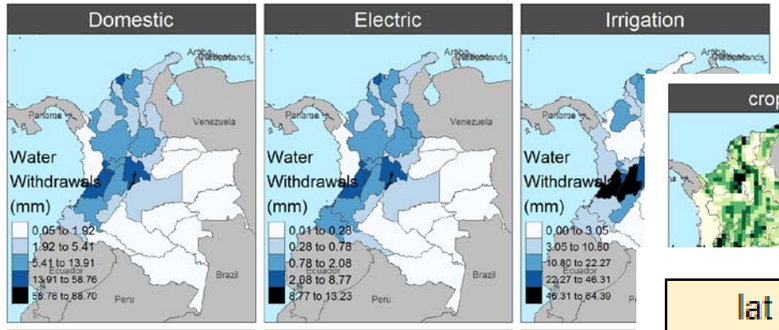
Maps and Spatial Aggregation

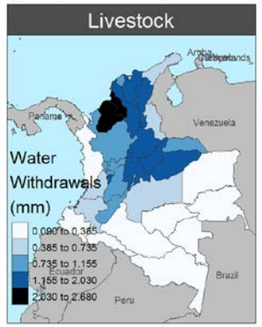
Shapefile
- Region
- Subregion
- Overlap shape

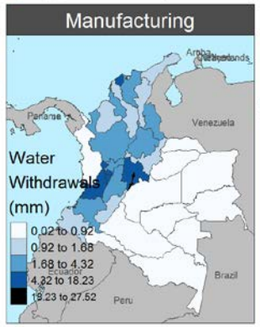
Grid Table
- Lat, lon, value
- Shapefile
- Aggregated Maps

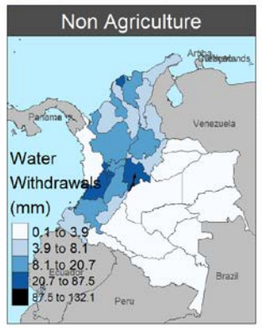
GCAMEcoSystem
- Demeter
- Tethys
- Xanthos

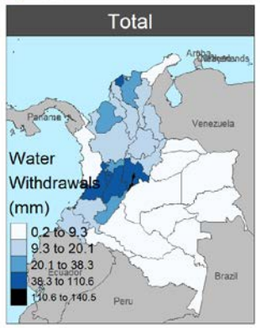
Tethys



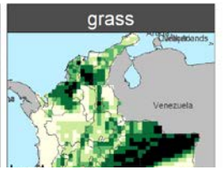




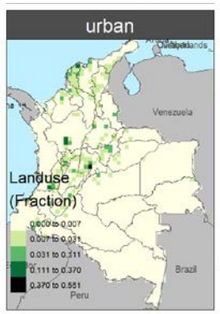


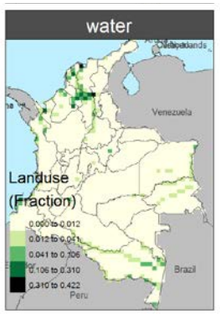


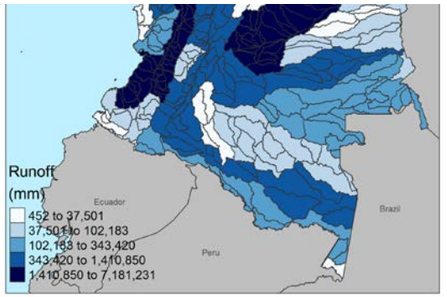
Demeter



lat	lon	scenario	param	year	value
10.75	-75.25	Eg1	runoff	1950	124
10.75	-74.75	Eg1	runoff	1950	172
10.25	-75.75	Eg1	runoff	1950	220
10.25	-75.25	Eg1	runoff	1950	209
10.25	-74.75	Eg1	runoff	1950	197
9.75	-75.75	Eg1	runoff	1950	250





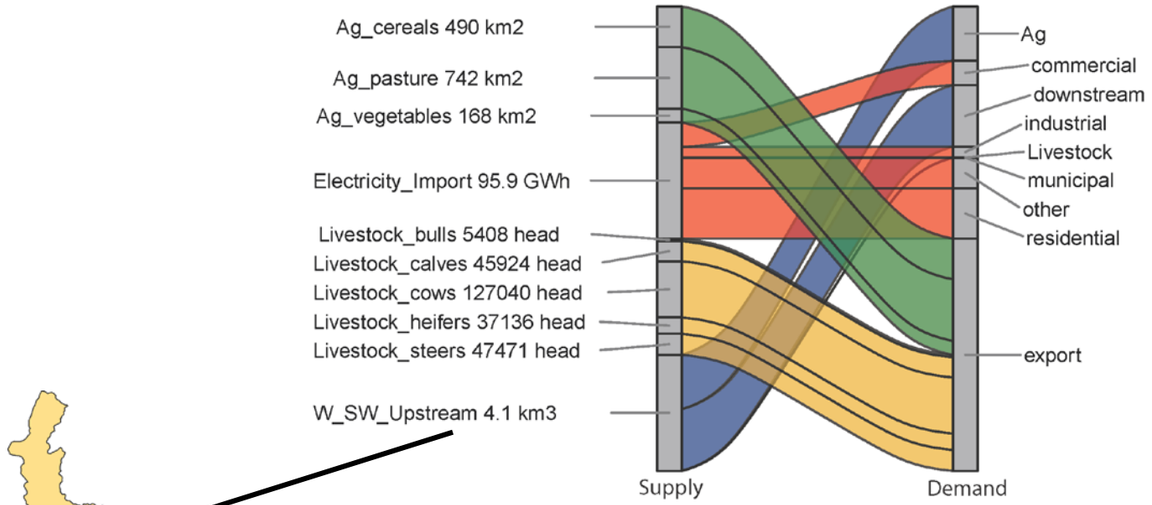


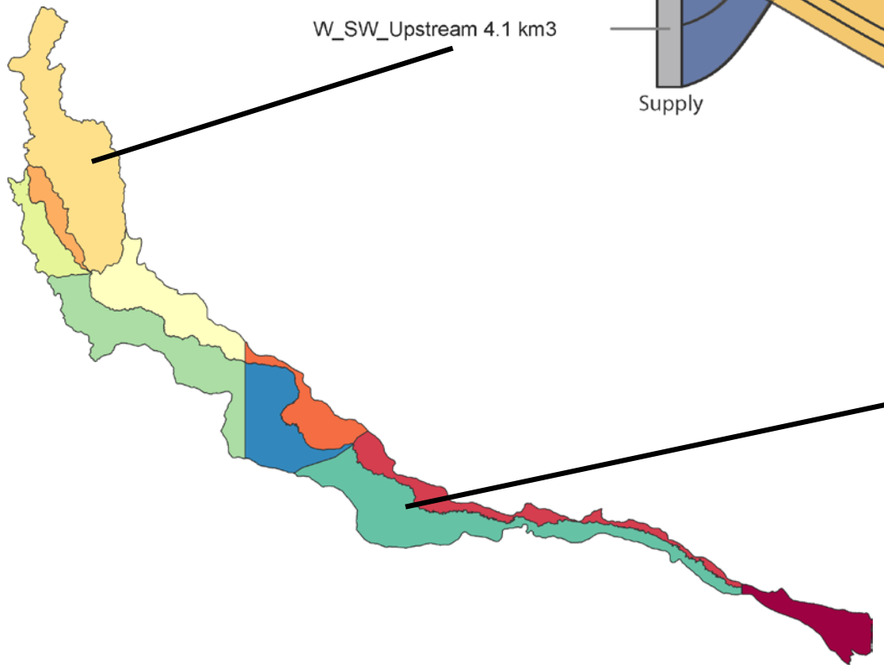
Sub-regional inter-sectoral Links

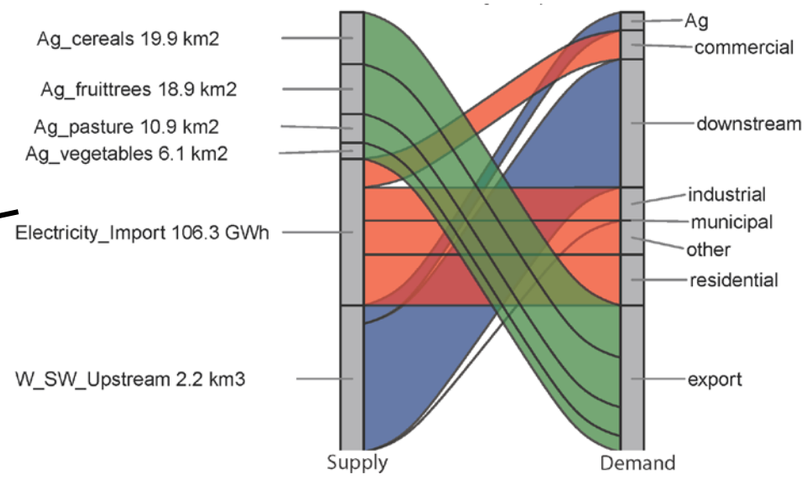
Charts/Templates
- Charts/Data templates
- Check local data

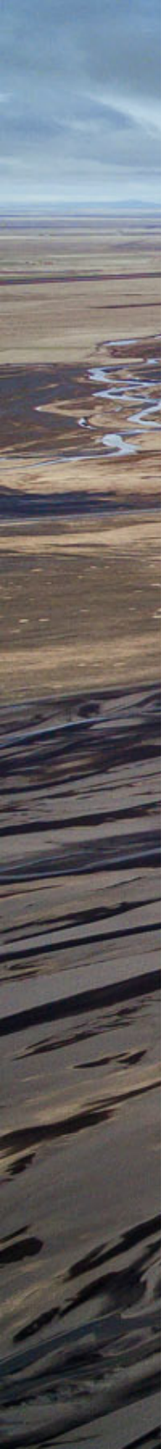
Spatial Aggregation
- Shapefile
- Demeter, Tethys, Xanthos, grids
- Aggregate

Sub-region IO
- IO
- Sankeys









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Summary

- Provides a platform to combine and analyze outputs from **GCAM core and GCAM eco-systems** in one framework.
- Converts data into simple **standardized formats** that can be shared with stakeholders and used to compare additional data from **multiple sources**.
- Quickly leverage downscaled data to analyze multi-sector results at **stakeholder relevant spatial scales**
- Visualize and analyze **inter-sectoral links** at those relevant scales

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Thank you