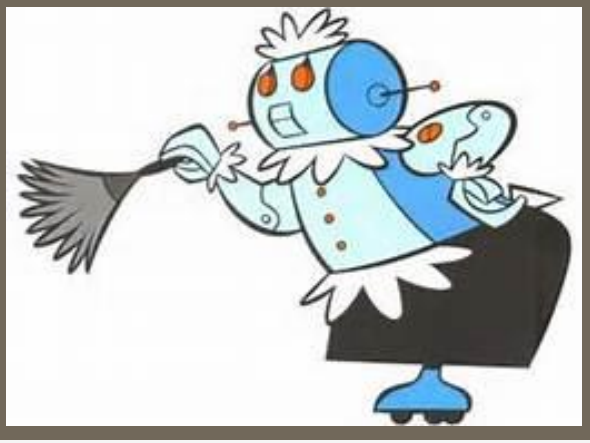


CHaMP Metric House Keeping

2011-2013 Field Seasons and beyond.

Metric and Indicator Housekeeping

- **CHaMP metric background**
- **Metric development process and timeline**
  - **Review current list of cm.org metric outputs**
  - **Potential list of new metrics for RBT 2014**
  - **Calculation review**
  - **Metadata documentation (cm.org, mm.org, client definitions)**
  - **Standard metric diagnostics—tools for metric evaluation**
  - **Review criteria for metric release to public**
- **Indicator Review**
  - **Update list?**
- **Other considerations for February**
  - **Update metric justification table?**

Characterizing stream habitat quality

- **Measurements** are the 'fine scale' descriptions of the physical, chemical, hydrologic, geomorphic, etc. characteristics of a stream, usually taken at a reach or habitat unit scale.
- **Metrics** are derived by combining a set of relevant measurements to characterize a stream site (such as a reach), e.g., mean reach width or depth; average pool tail fines, number of pools/100m
- **Indicators** synthesize (or scale up) the site scale metrics to describe habitat across the spatial/temporal (S/T) domain of interest. Indicators are quantitative summaries of a metric across the target S/T domain of interest.

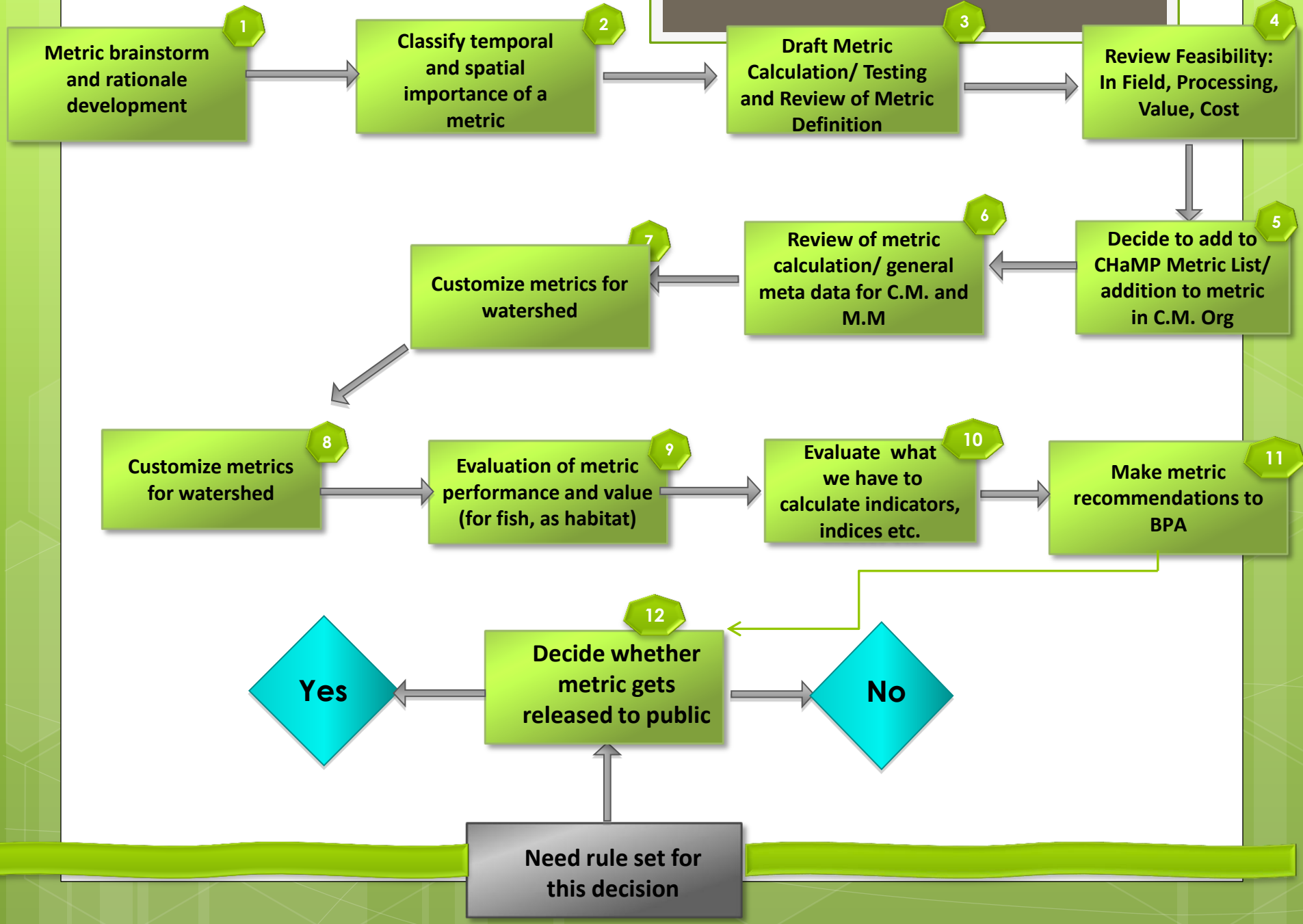
Metric Inclusion Rules

1) Information Content: Habitat metrics and indicators must provide information directly related to salmonid productivity, including survival and growth, as documented by peer reviewed literature, modeling, or existing data analysis.

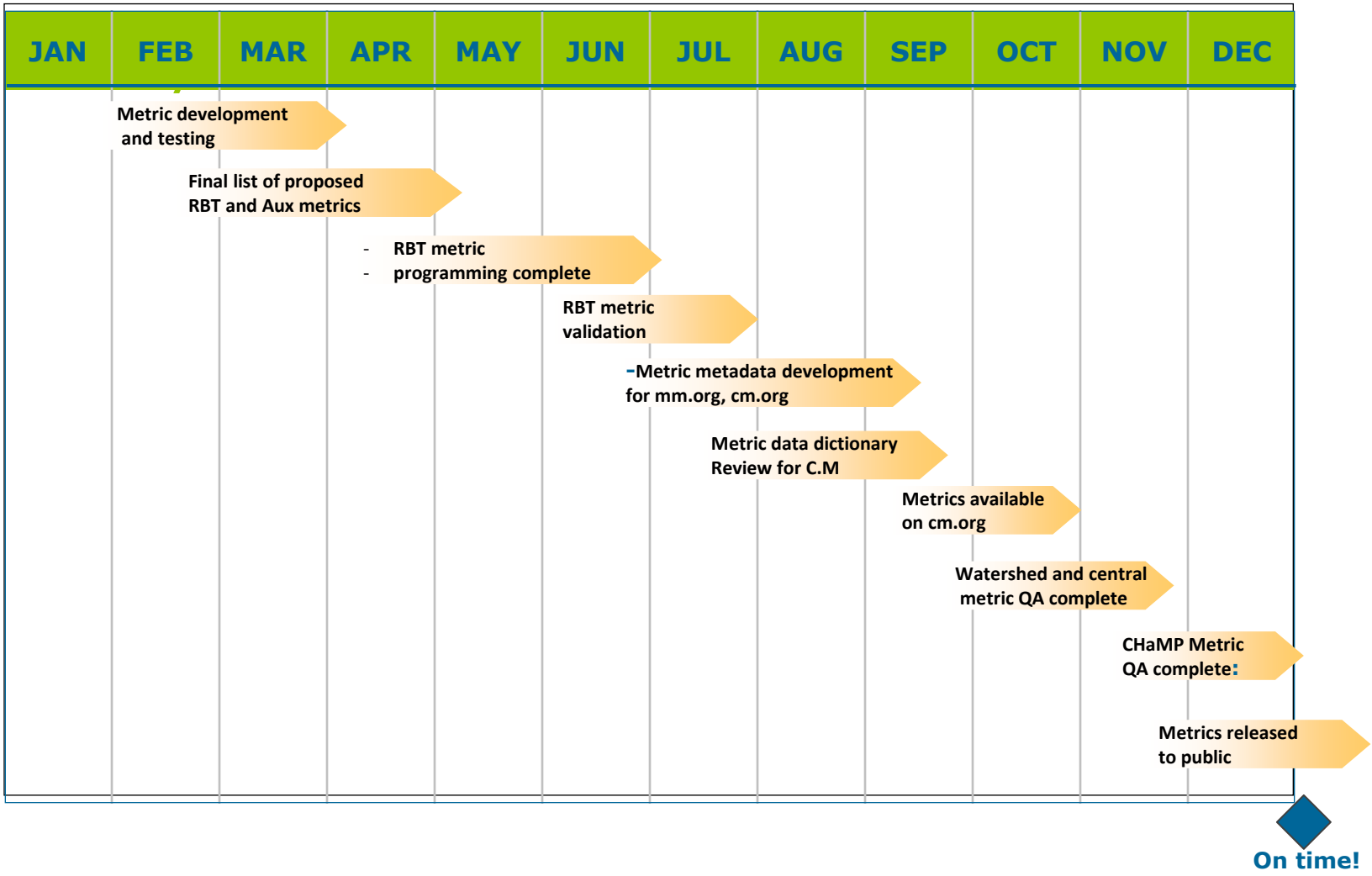
2) Data Form: Habitat metrics and indicators must provide statistical information with robust data quality. The data generated for a prospective metric must be repeatable, detect heterogeneity, and have adequate properties for modeling/statistics (e.g., variance distributions must meet statistical assumptions for modeling or testing).

3) Feasibility: Habitat metrics and indicators need to be generated by field tools or software that are readily implementable as of the time field testing in fall 2010 (i.e., does not rely on future technological advances). Feasibility is also bounded by the need to fit all survey work within a three-person-day field survey at 80-90 percent of all sites likely to be encountered.

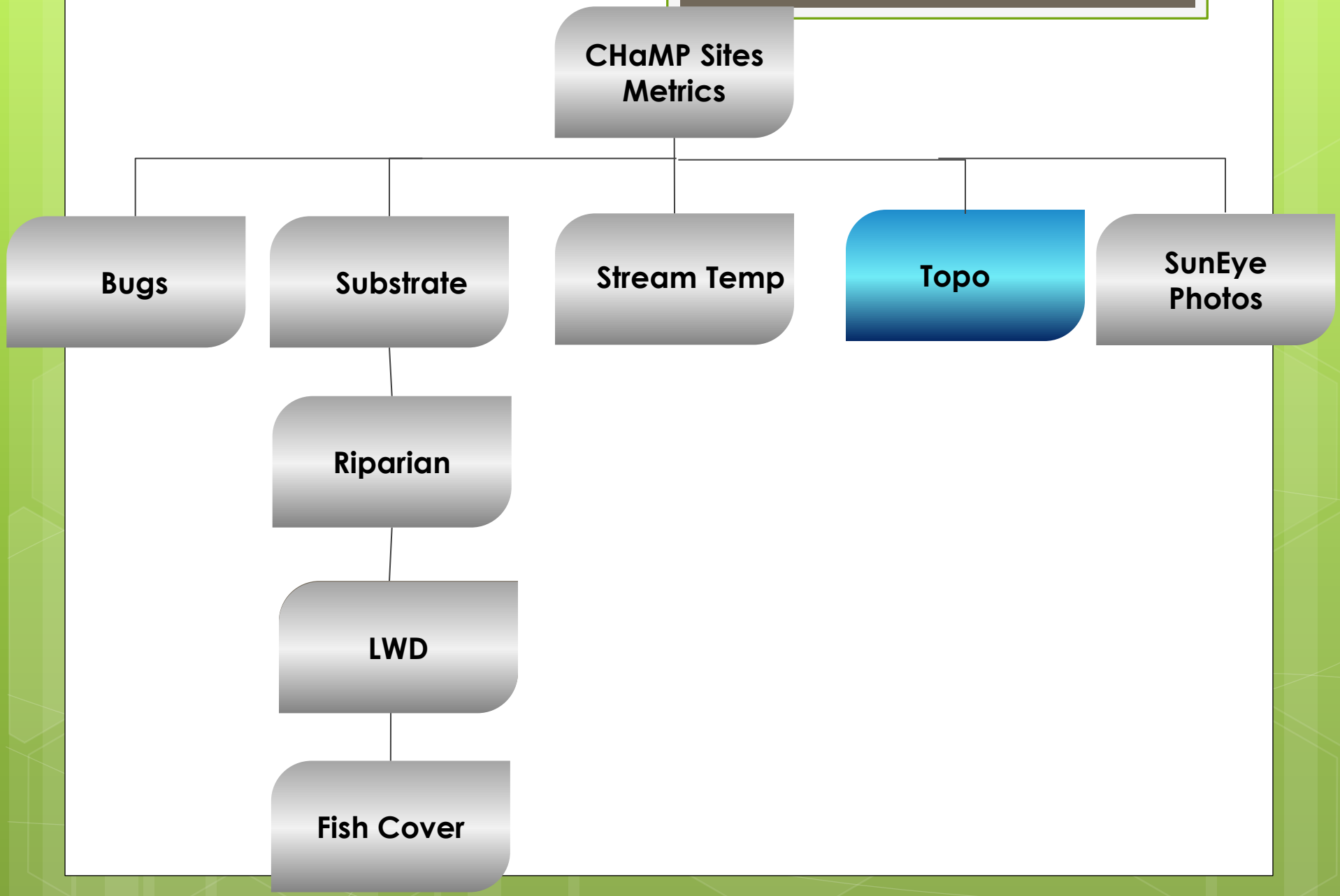
NEW METRIC FLOWCHART

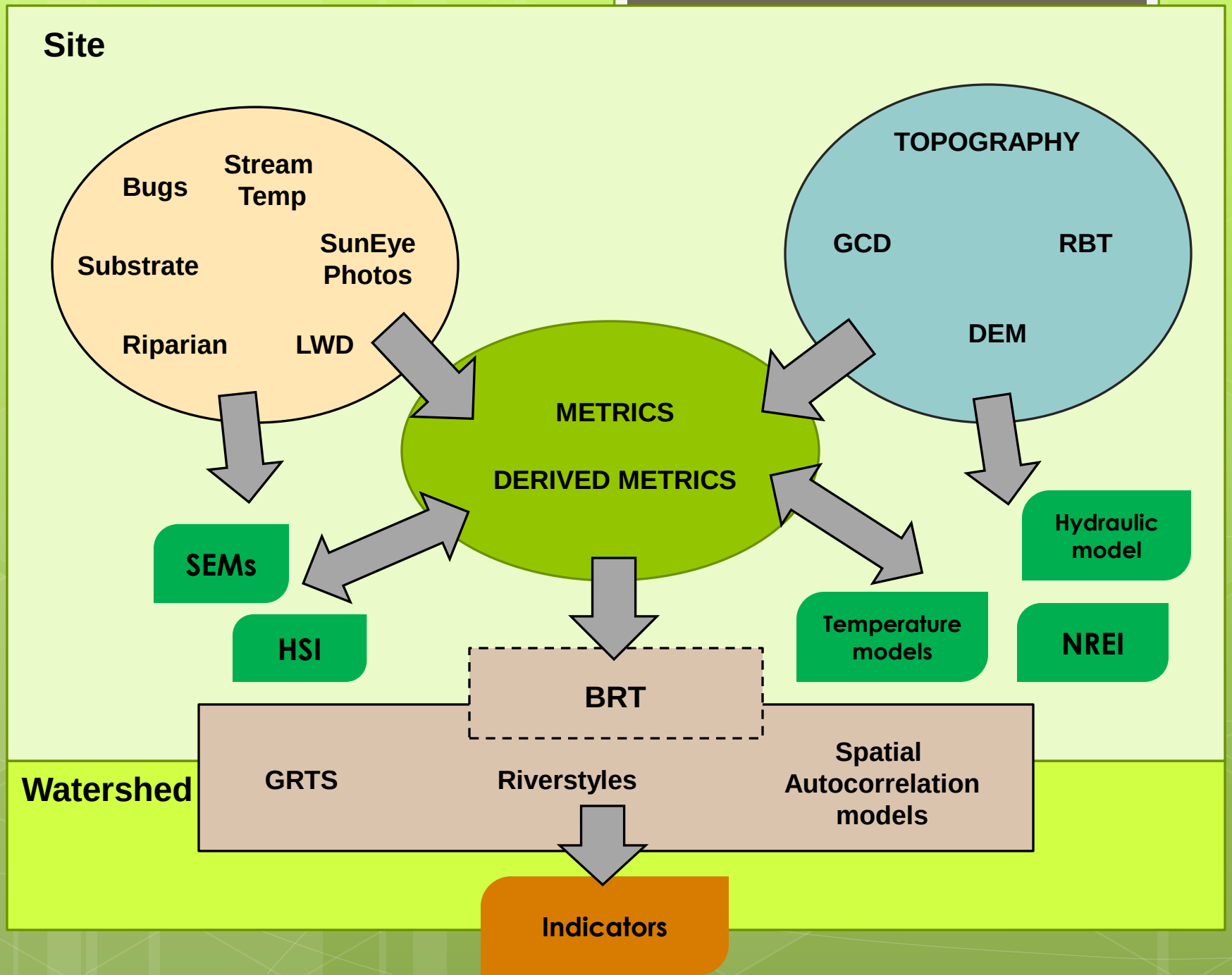


CHaMP Metric Annual QA



NEW TYPE FLOWCHART




Site
Bugs
Stream Temp
Substrate
SunEye Photos
Riparian
LWD
TOPOGRAPHY
GCD
RBT
DEM
METRICS
DERIVED METRICS
SEMs
HSI
Hydraulic model
Temperature models
NREI
BRT
GRTS
Riverstyles
Spatial Autocorrelation models
Watershed
Indicators

Review cm.org metric lists

- Develop list of ‘recommended’ metrics for analysis
- Review internal list of metrics
- Client metrics

EXCEL FILE

Master Metric Documentation

- Monitoring Methods
- RBT Technical Documentation
- CHaMP Monitoring
- Access Database
- GCD HTML report

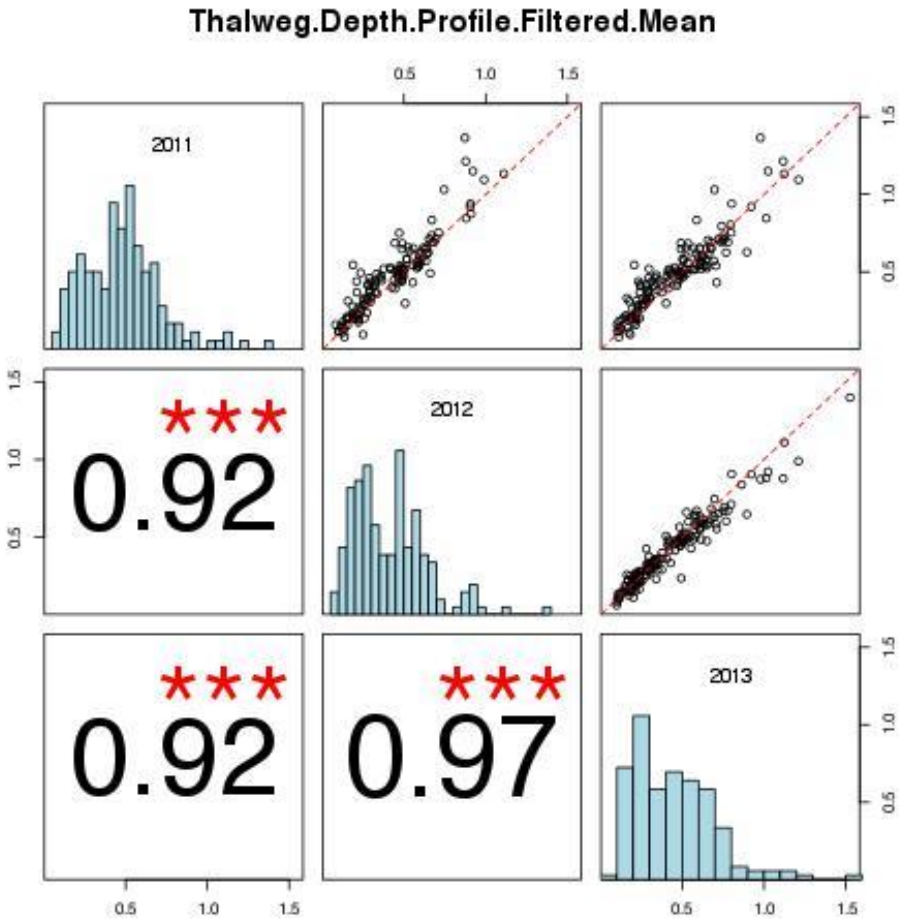
We need consistency in terminology, units, calculations, display, descriptions and structure!

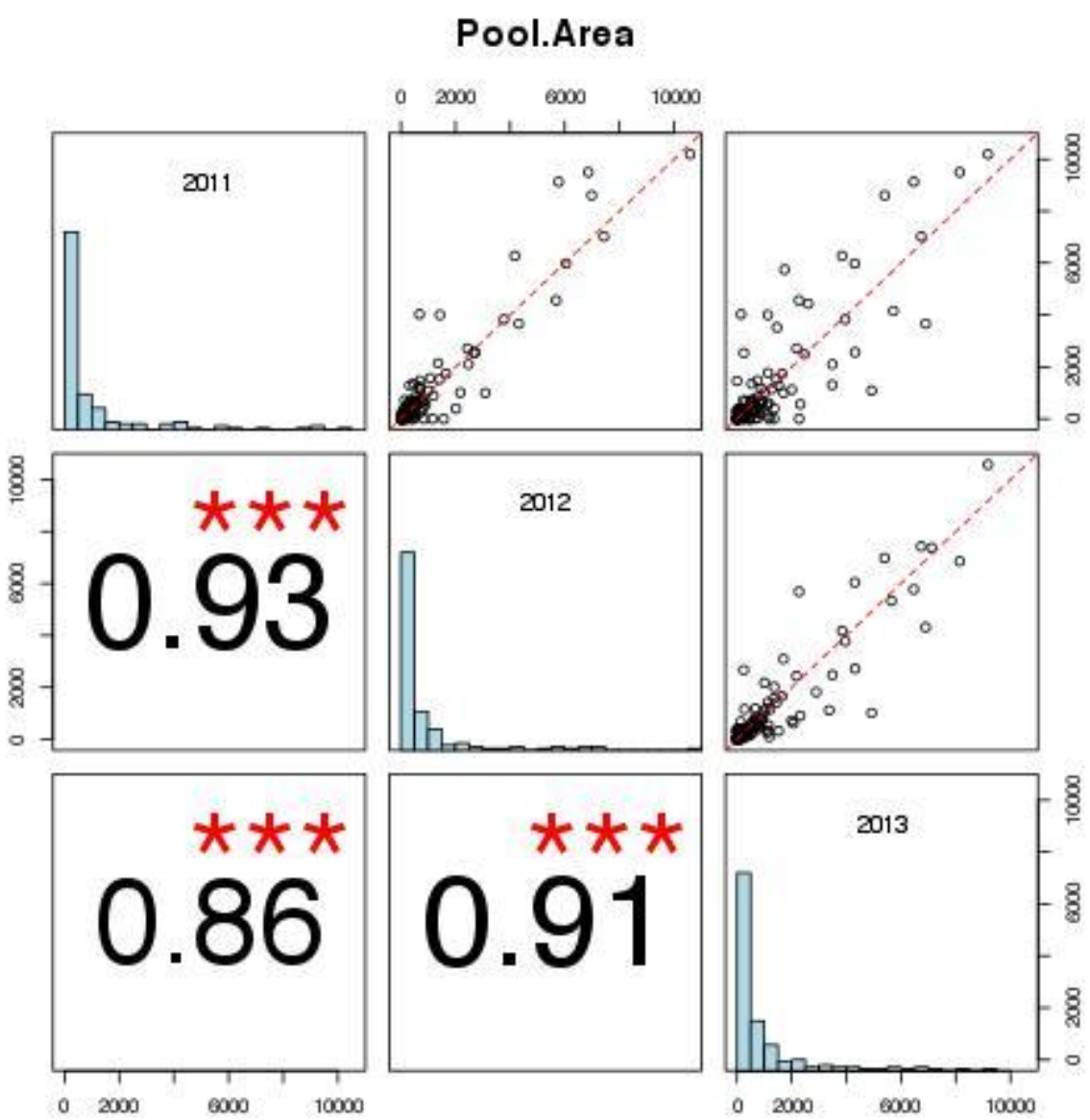
Metric Diagnostics

Metric	Mean	Var	Visit.Corr	RMSE	CV	S.N
Site.Water.Surface.Gradient	1.78	2.68	0.97	0.39	21.87	17.31
Particles.Less.Than6mm	22.65	498.84	0.47	13.42	59.24	1.99
Coarse.And.Fine.Gravel	40.62	235.45	0.52	9.43	23.23	1.71
Boulder.And.Cobbles	39.45	405.40	0.84	7.45	18.89	6.60
Sinuosity.Via.Centerline	1.52	19.84	0.64	0.26	17.08	365.10
Pool.Area	812.39	4240435.22	0.71	1411.70	173.77	1.19
Pool.Frequency	47.50	11035.43	0.46	79.98	168.37	1.10
D50	57.15	2070.15	0.79	10.46	18.31	18.88
D84	145.99	12831.03	0.89	24.94	17.08	20.33
Wetted.Volume	1088.85	4247365.12	0.91	609.96	56.02	10.60
Fish.Cover.Composition.Total	18.24	209.40	0.25	6.01	32.93	5.07
Wetted.Large.Wood.Volume.By.Site	26.15	3502.88	0.88	26.38	100.88	4.21
Bankfull.Width.Profile.Filtered.Mean	13.25	113.56	0.97	1.20	9.07	80.40
Thalweg.Depth.Profile.Filtered.Mean	0.38	0.05	0.79	0.11	29.95	3.18
Avg.Fast.Water.Cobble.Embeddedness	19.43	122.14	0.12	7.78	40.04	1.21
Standard.Deviation.Of.The.Detrended.DEM	0.70	0.22	0.64	0.28	40.99	1.92
Site.Length.Thalweg	233.03	16968.95	1.00	7.67	3.29	285.74

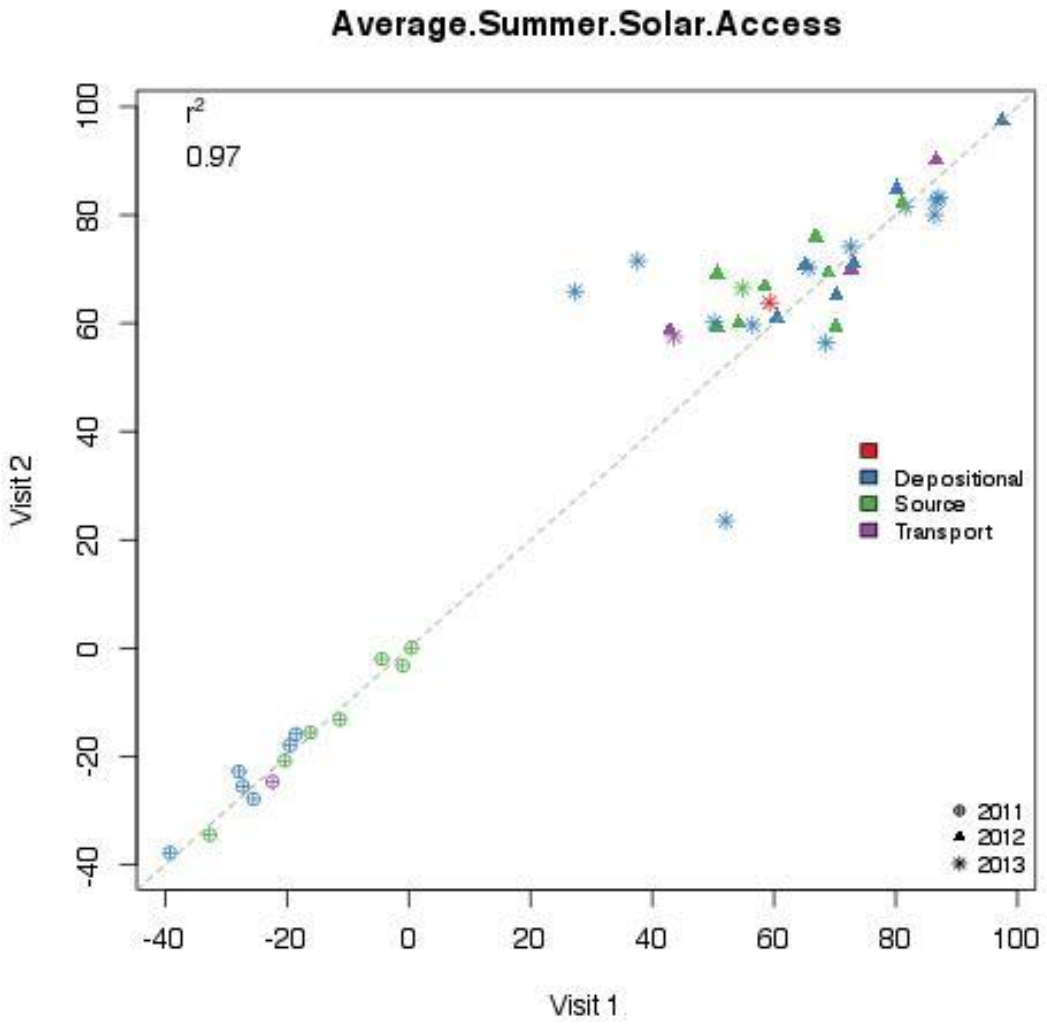
Metric diagnostics and evaluation

- Developing the “standard” first round of review

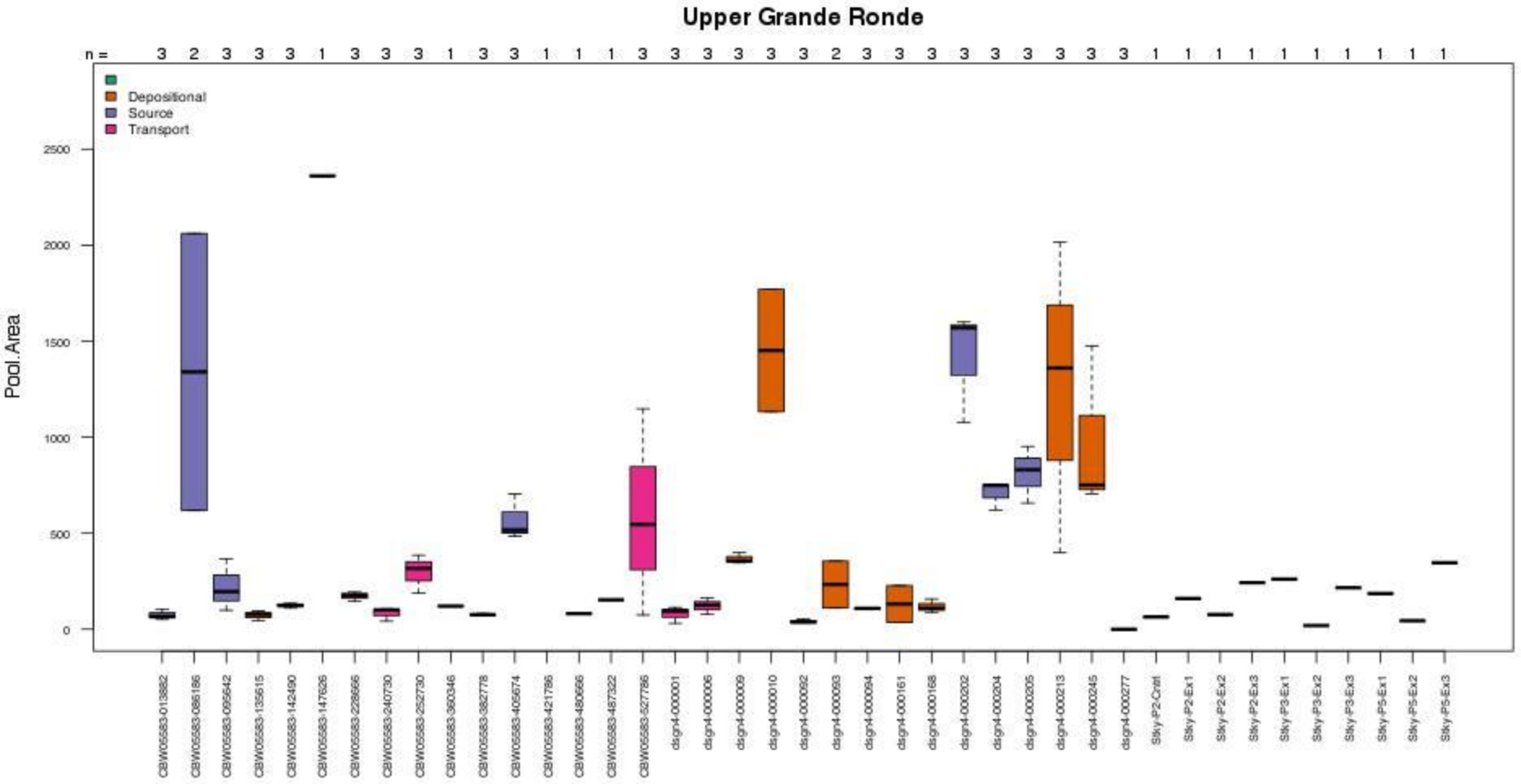


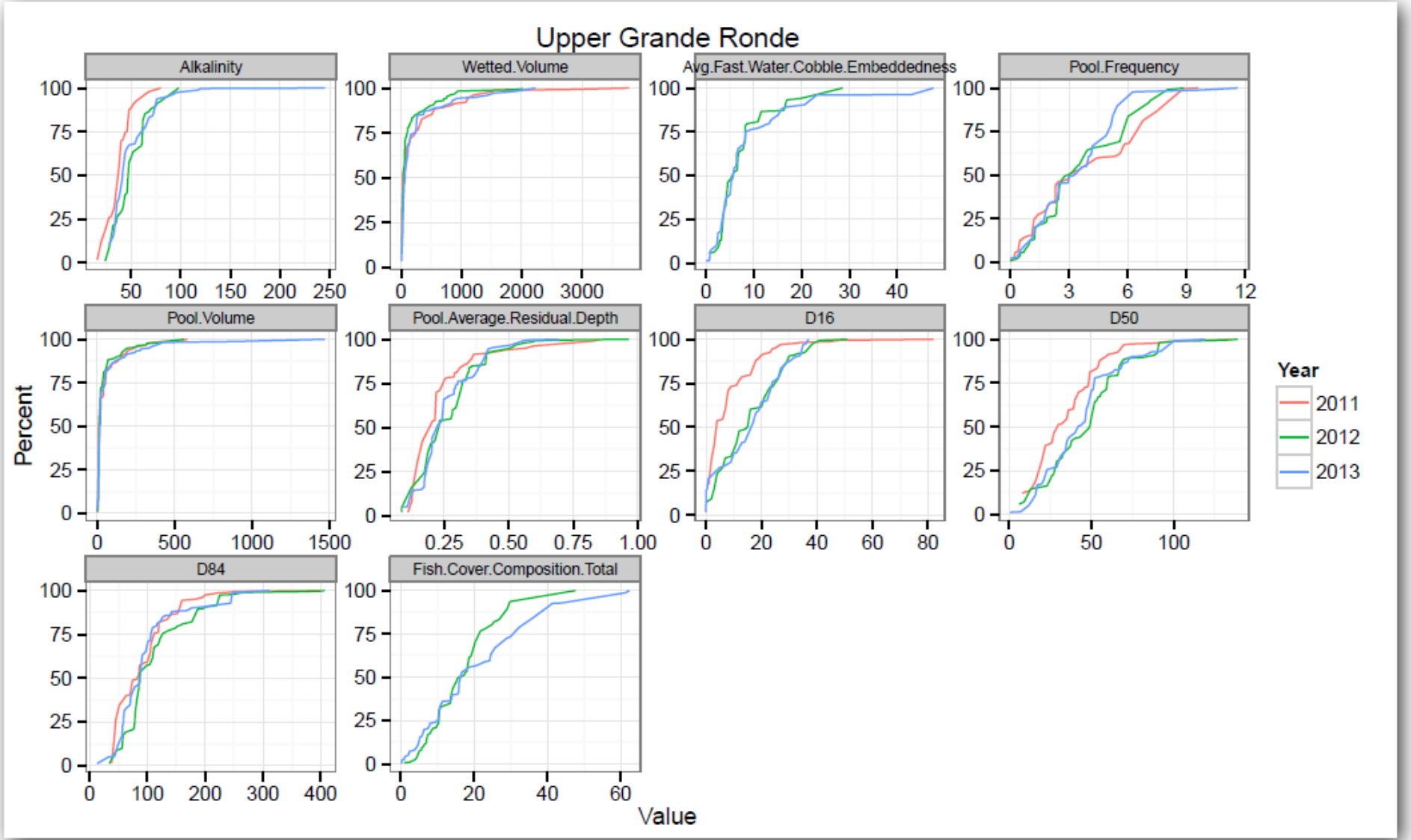

Pool.Area
2011
2012
2013
***
0.93
***
0.86
***
0.91
0
2000
6000
10000

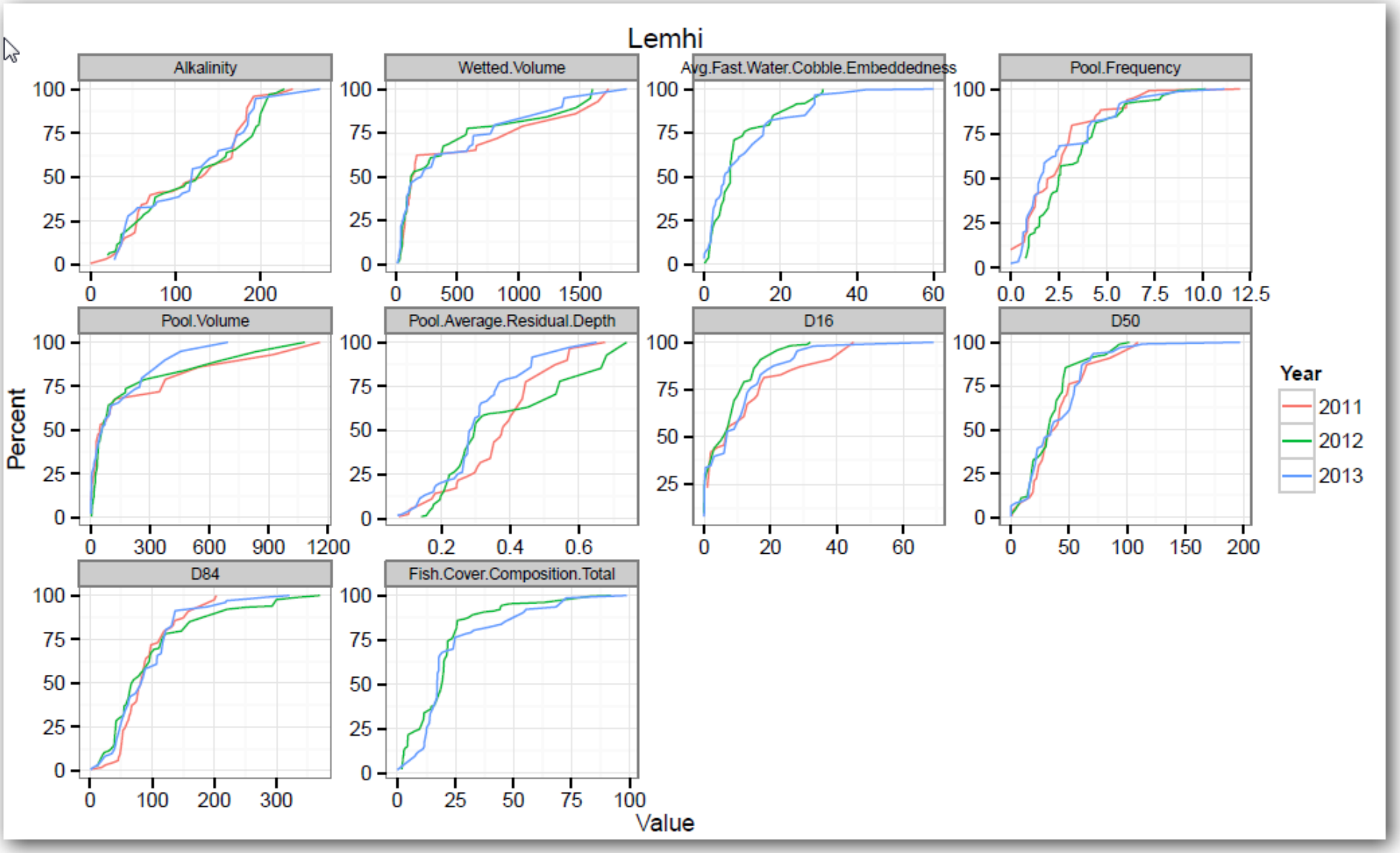
Within Year Repeat Visits

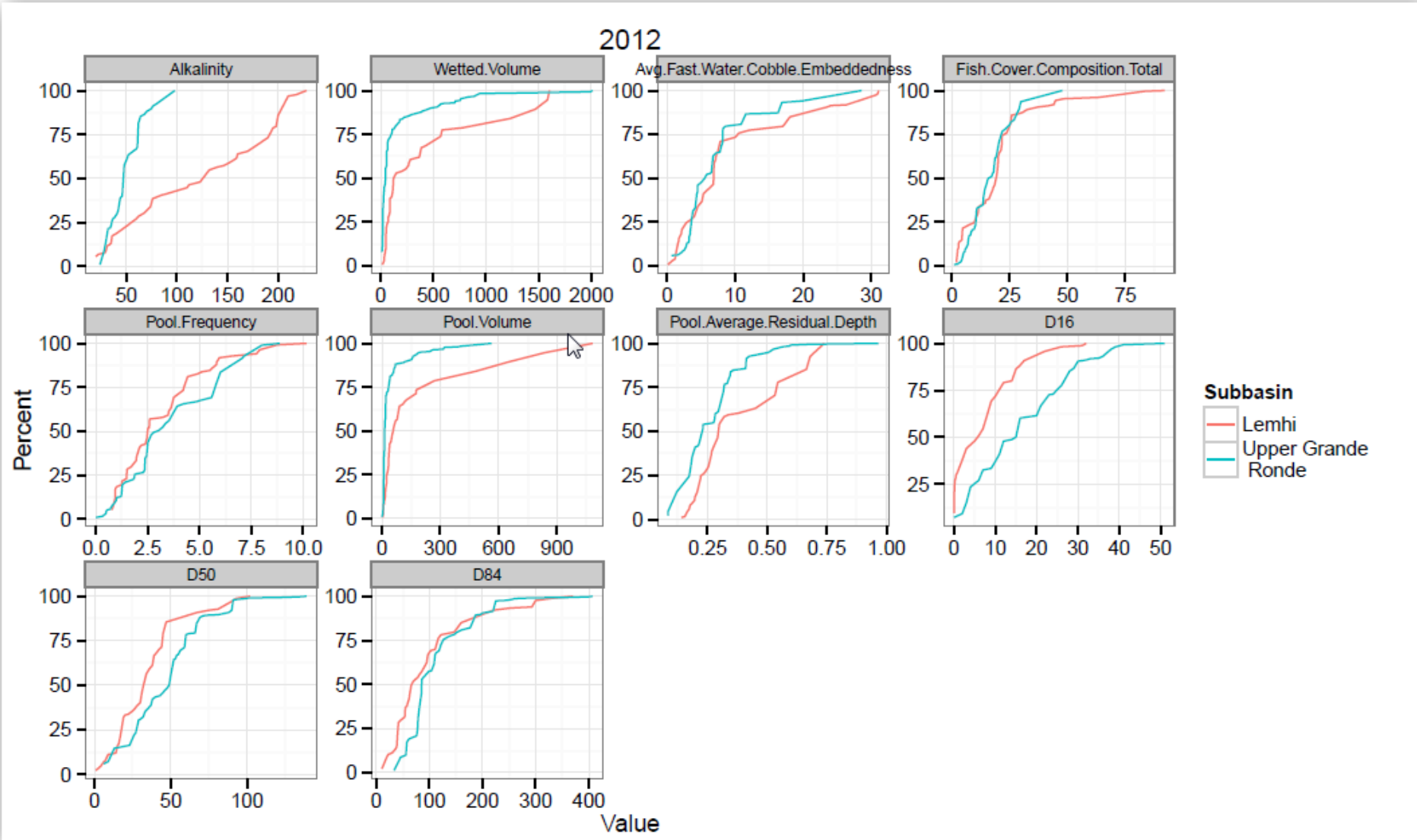


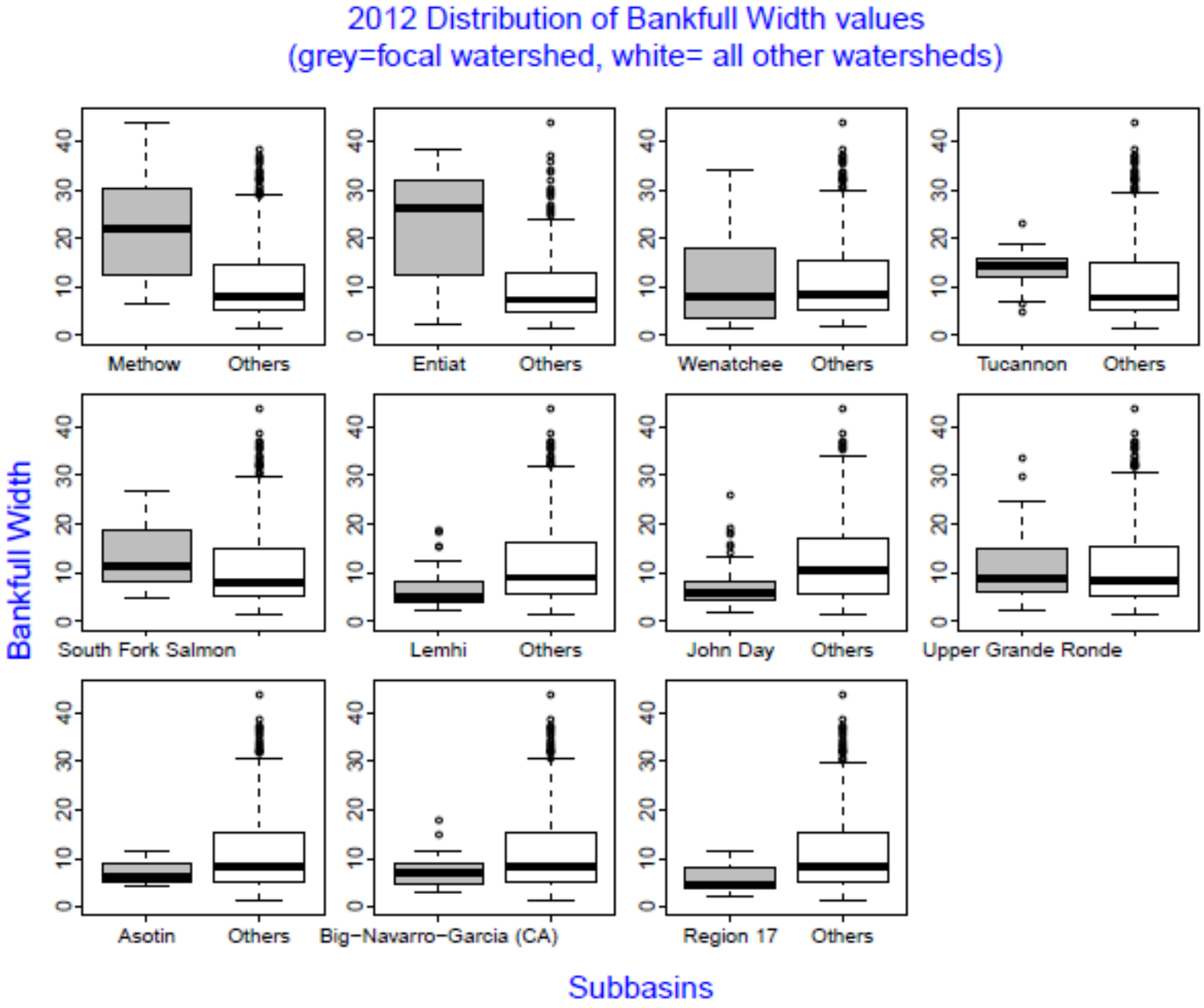
Annual site review




Upper Grande Ronde
Alkalinity
Wetted.Volume
Avg.Fast.Water.Cobble.Embeddedness
Pool.Frequency
Pool.Volume
Pool.Average.Residual.Depth
D16
D50
D84
Fish.Cover.Composition.Total
Percent
Value
Year
2011
2012
2013


Lemhi
Alkalinity
Wetted.Volume
Avg.Fast.Water.Cobble.Embeddedness
Pool.Frequency
Pool.Volume
Pool.Average.Residual.Depth
D16
D50
D84
Fish.Cover.Composition.Total
Percent
Value
Year
2011
2012
2013


2012
Alkalinity
Wetted.Volume
Avg.Fast.Water.Cobble.Embeddedness
Fish.Cover.Composition.Total
Pool.Frequency
Pool.Volume
Pool.Average.Residual.Depth
D16
D50
D84
Percent
Value
Subbasin
Lemhi
Upper Grande Ronde


2012 Distribution of Bankfull Width values
(grey=focal watershed, white= all other watersheds)
Bankfull Width
0
10
20
30
40
Methow
Others
Entiat
Others
Wenatchee
Others
Tucannon
Others
South Fork Salmon
Others
Lemhi
Others
John Day
Others
Upper Grande Ronde
Others
Asotin
Others
Big−Navarro−Garcia (CA)
Others
Region 17
Others
Subbasins

Criteria for recommended metrics to release to public

- Common
  - Crosswalk utility
- Not-redundant
  - Reduces confusion
- Useful
  - Potentially related to fish
  - Model inputs (ours or others)

Metric Type and Audience

- Master List- Big
- Analyst- Useful
- Client- Recommended

Specific metric questions

If protocol changed, are metrics interchangeable between years?

- **Pebble counts from 2012 to 2013**
- **Solar access methods between 2011 and 2012**
- **Inclusion of side channels vs. main channel metrics (?)**

Metric relationships (not fish related)

- **Riparian structure metrics to solar access**
- **Drift repeatability (Nick)**
- **Stream temperature to land surface temperature**

Indicators

Spatially continuous

-predictive map of metrics (watershed)

Indicators

-watershed summaries

Do we need to revise our list of indicators to consider spatially continuous maps?

GRTS-based indicator

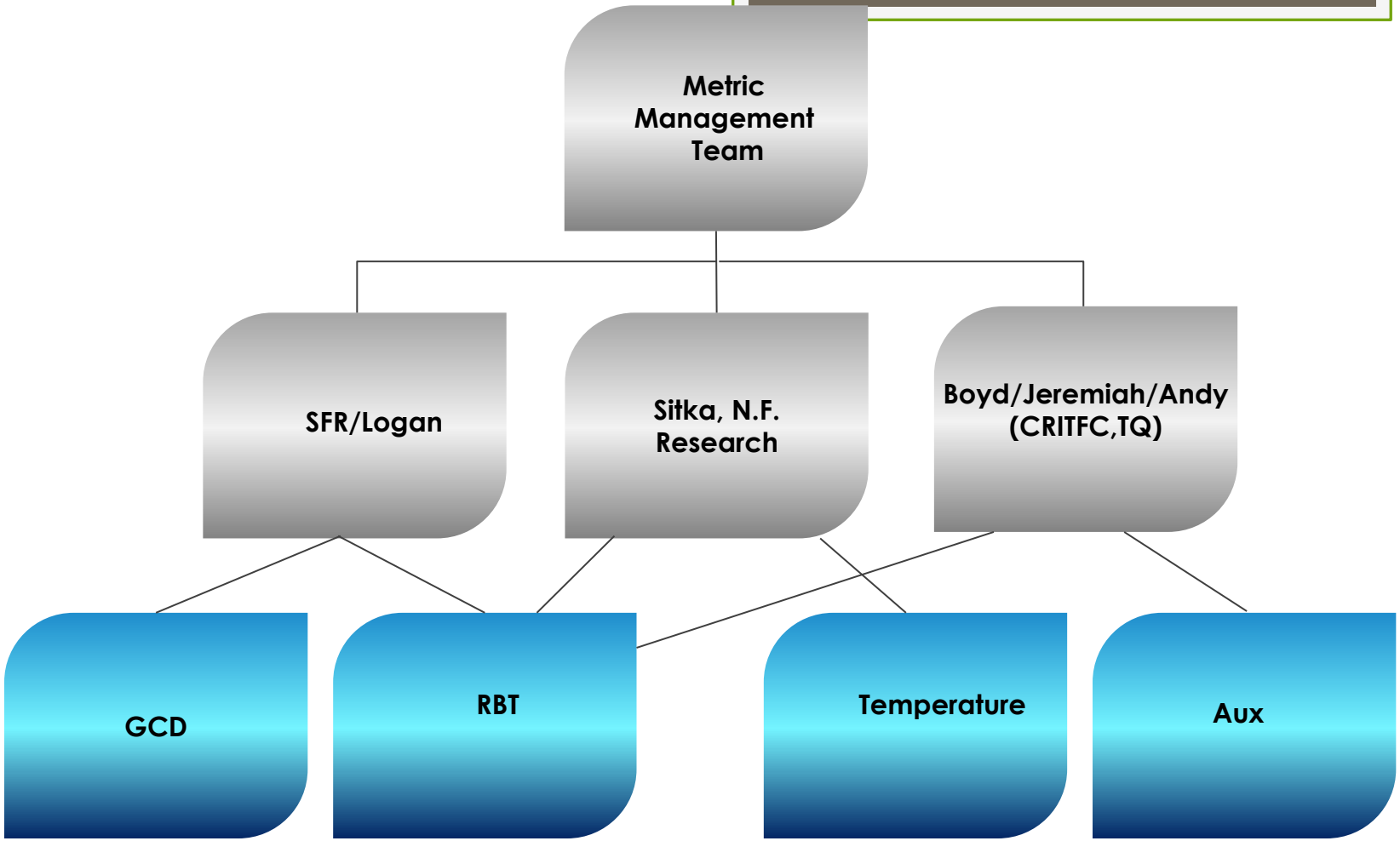
- Cdf example

Review core indicators

- Excel file

Predictive map of metrics

- temperature



Who Else Wants to Play?

Items for discussion

- Indicators—where do we go from here?
  - Review indicator list
- Review metrics related to the core indicators

Temperature across the