Variance Analysis
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- Partition of variance across programs
- Partition of variance within programs
- Calculate coefficient of variation (CV) and signal to noise ratio (S:N) within programs

Variance Across Programs

Total Variance = Region + Creek (Region) + Protocol (Creek) + Crew (Protocol) + *error*

Calculated for each indicator

Variance Within Programs

Total Variance = Region + Creek (Region) + Crew (Creek) + *error*

Calculated for each indicator

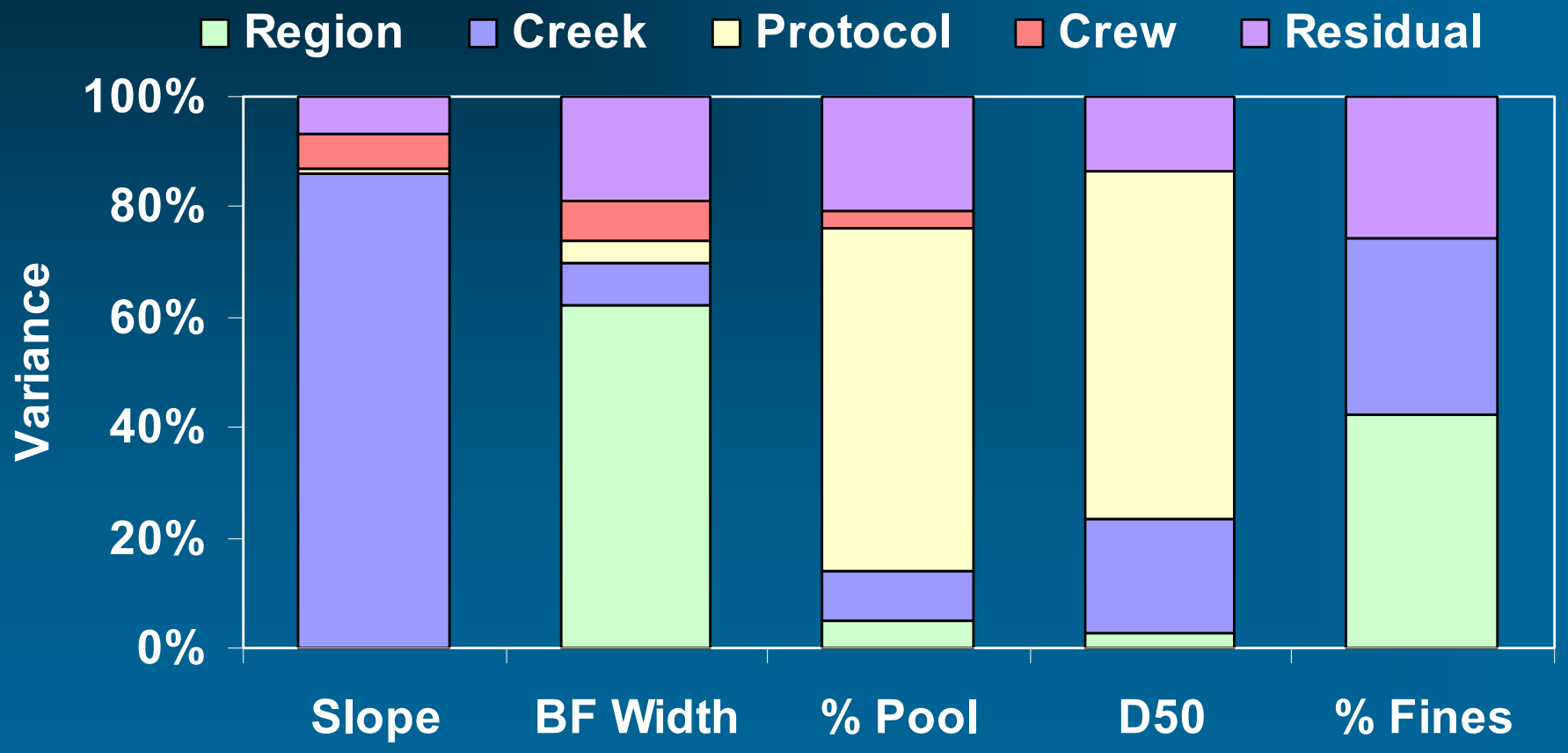
CV and Signal:Noise

Calculated for each indicator and collected by each program

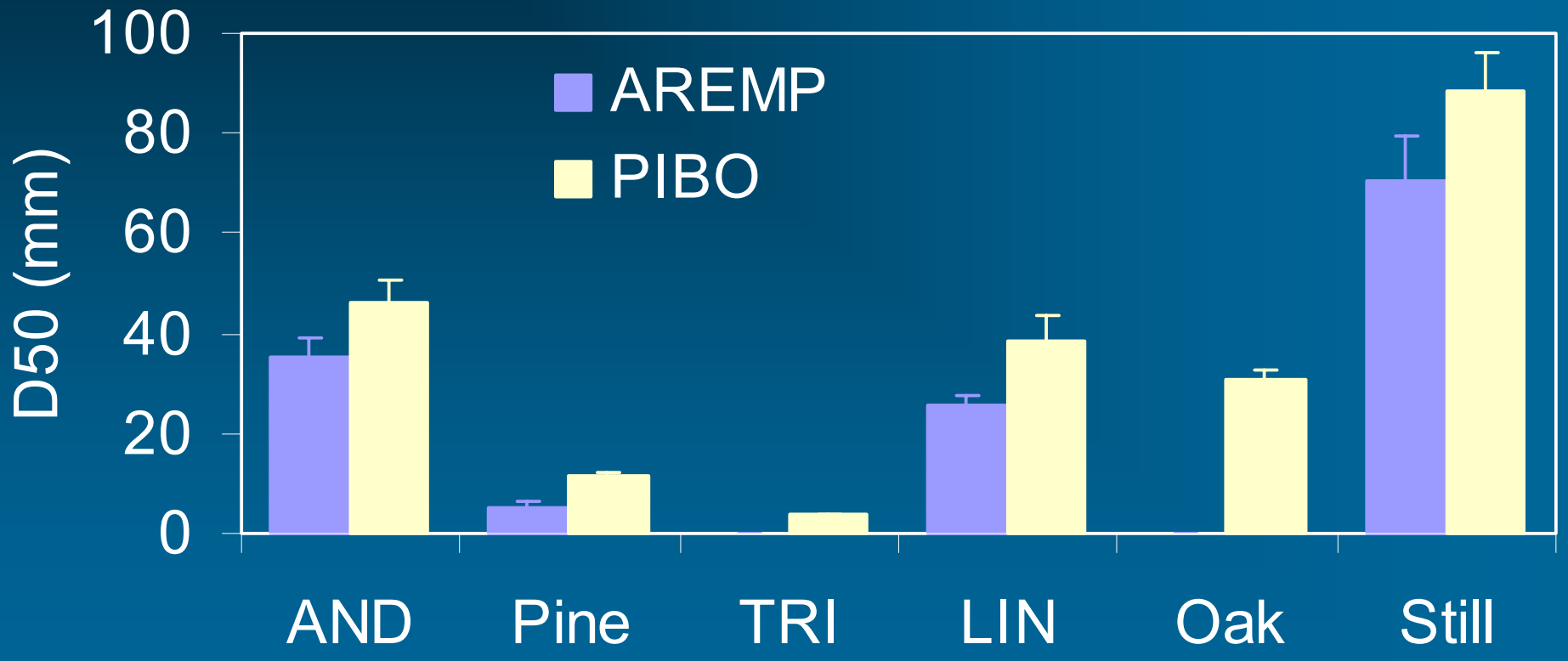
CV = St Dev / Mean

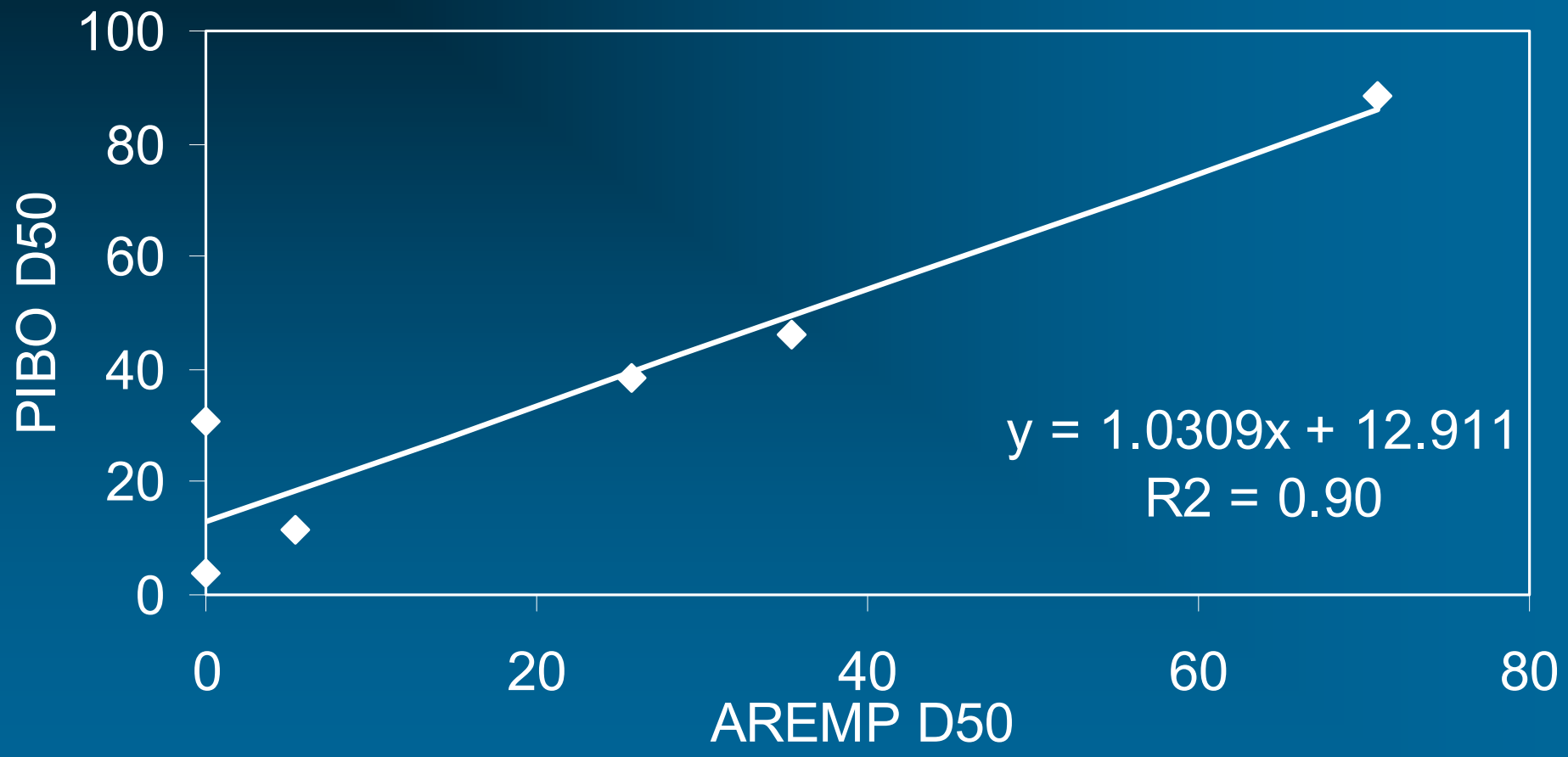
$$S:N = \frac{\text{Region+Creek}}{\text{Crew+Residual}}$$

Variance Components

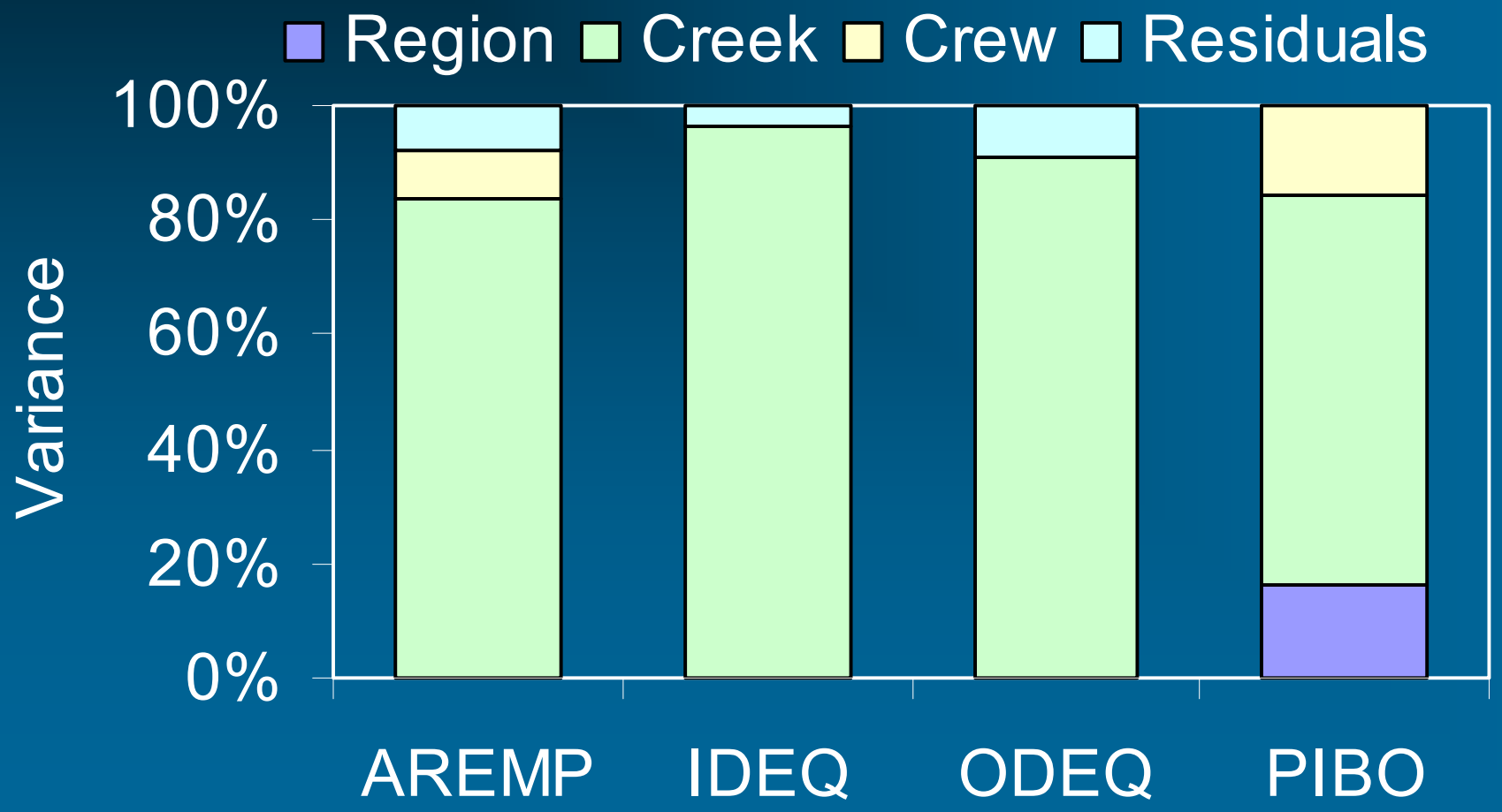


Substrate D_{50}




100
80
60
40
20
0
PIBO D50
0
20
40
60
80
AREMP D50
y = 1.0309x + 12.911
R2 = 0.90

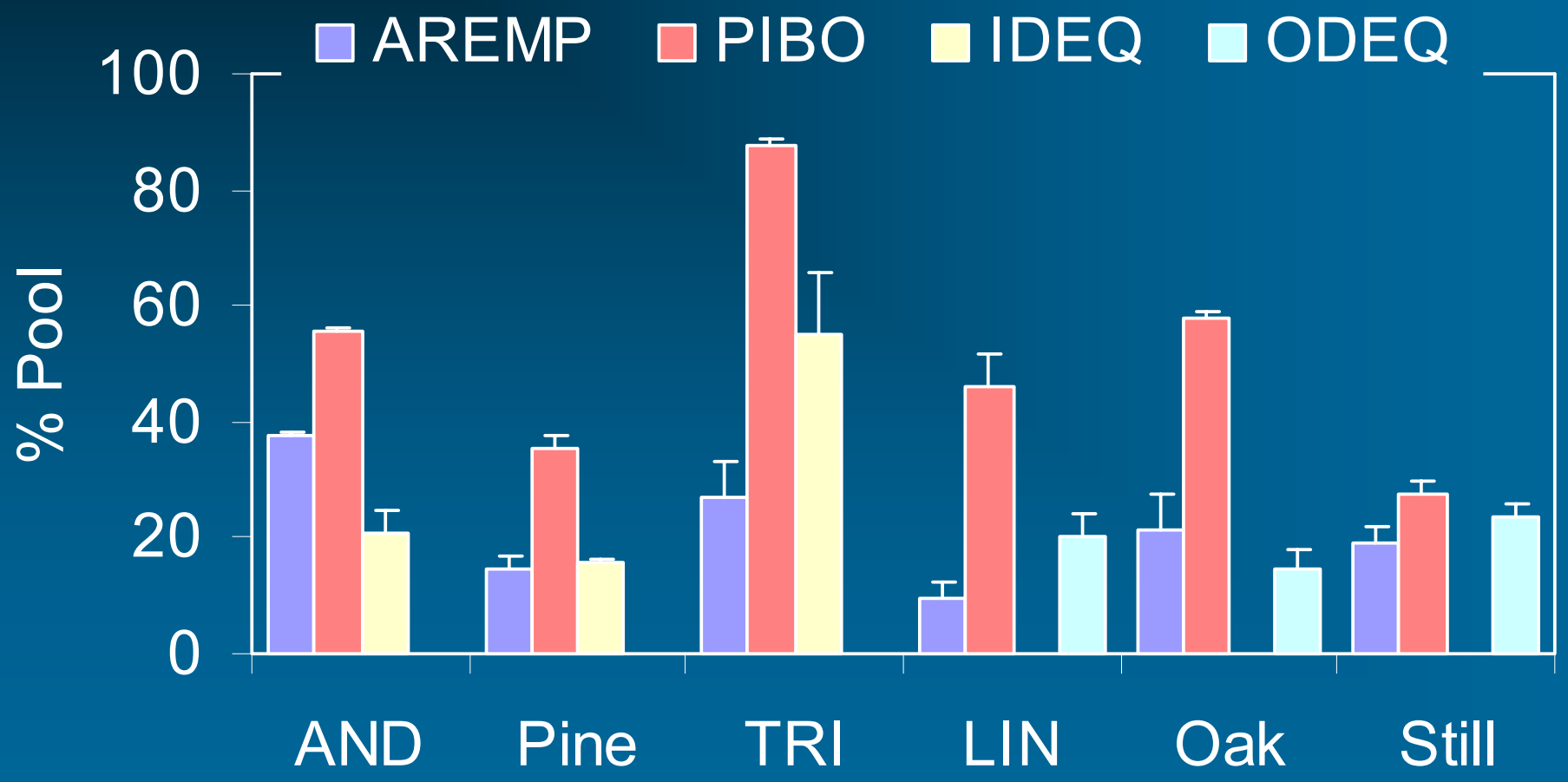
Substrate D_{50}

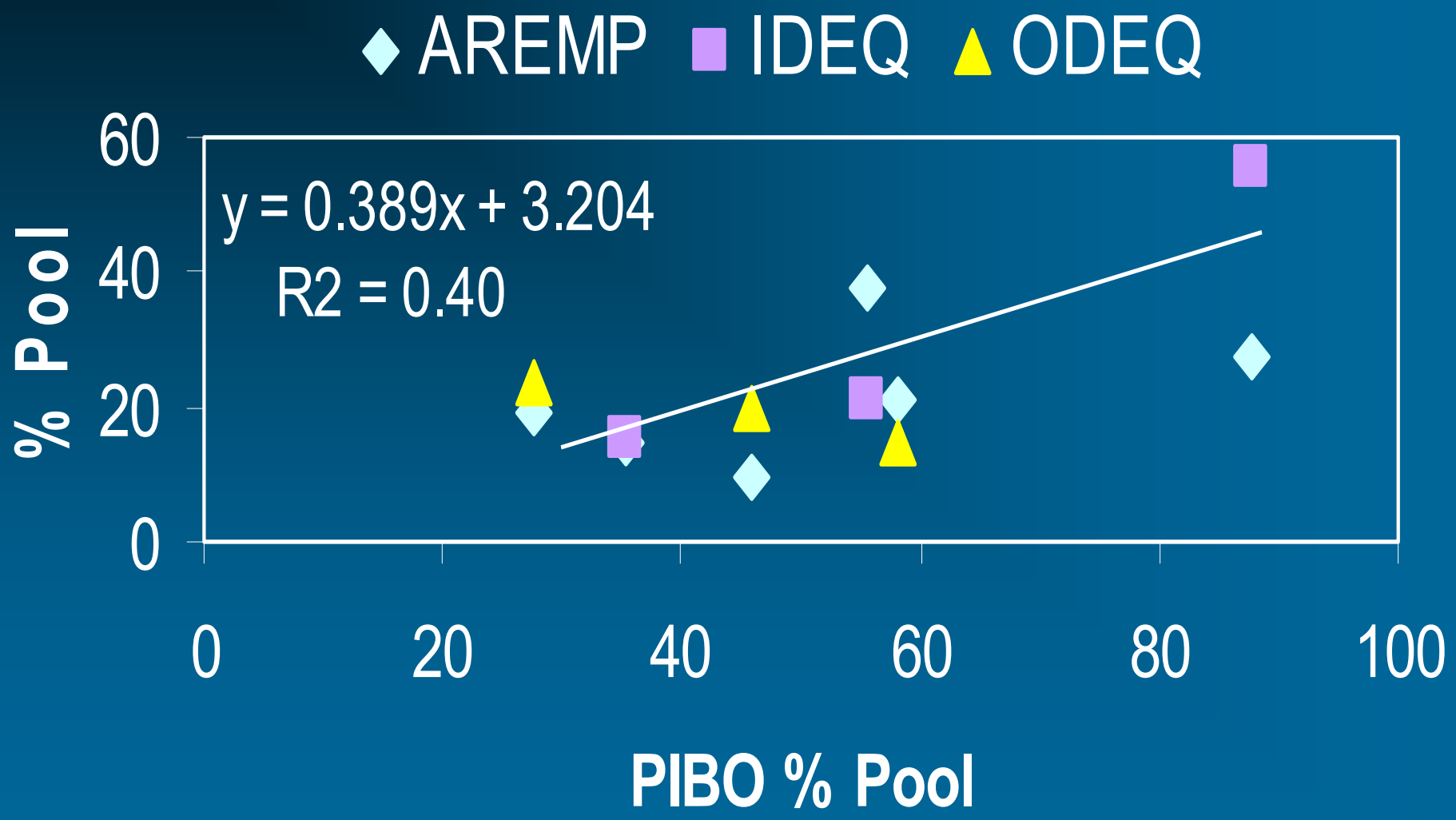


Substrate D_{50}

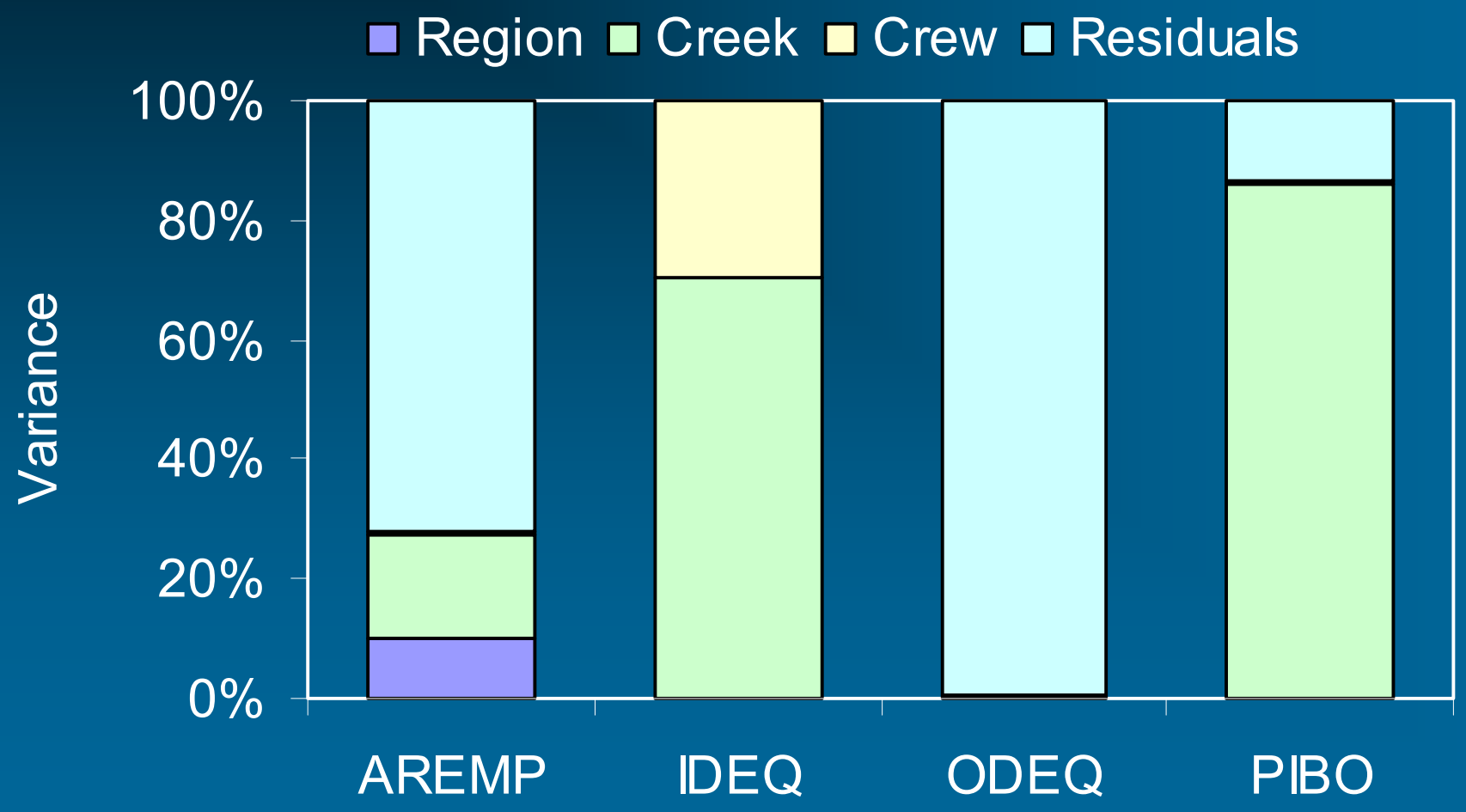
	CV	Tot Var	S:N
AREMP	1.21	855.9	5.1
PIBO	0.83	1064.3	5.4

Percent Pool




AREMP
IDEQ
ODEQ
y = 0.389x + 3.204
R2 = 0.40
% Pool
60
40
20
0
0
20
40
60
80
100
PIBO % Pool

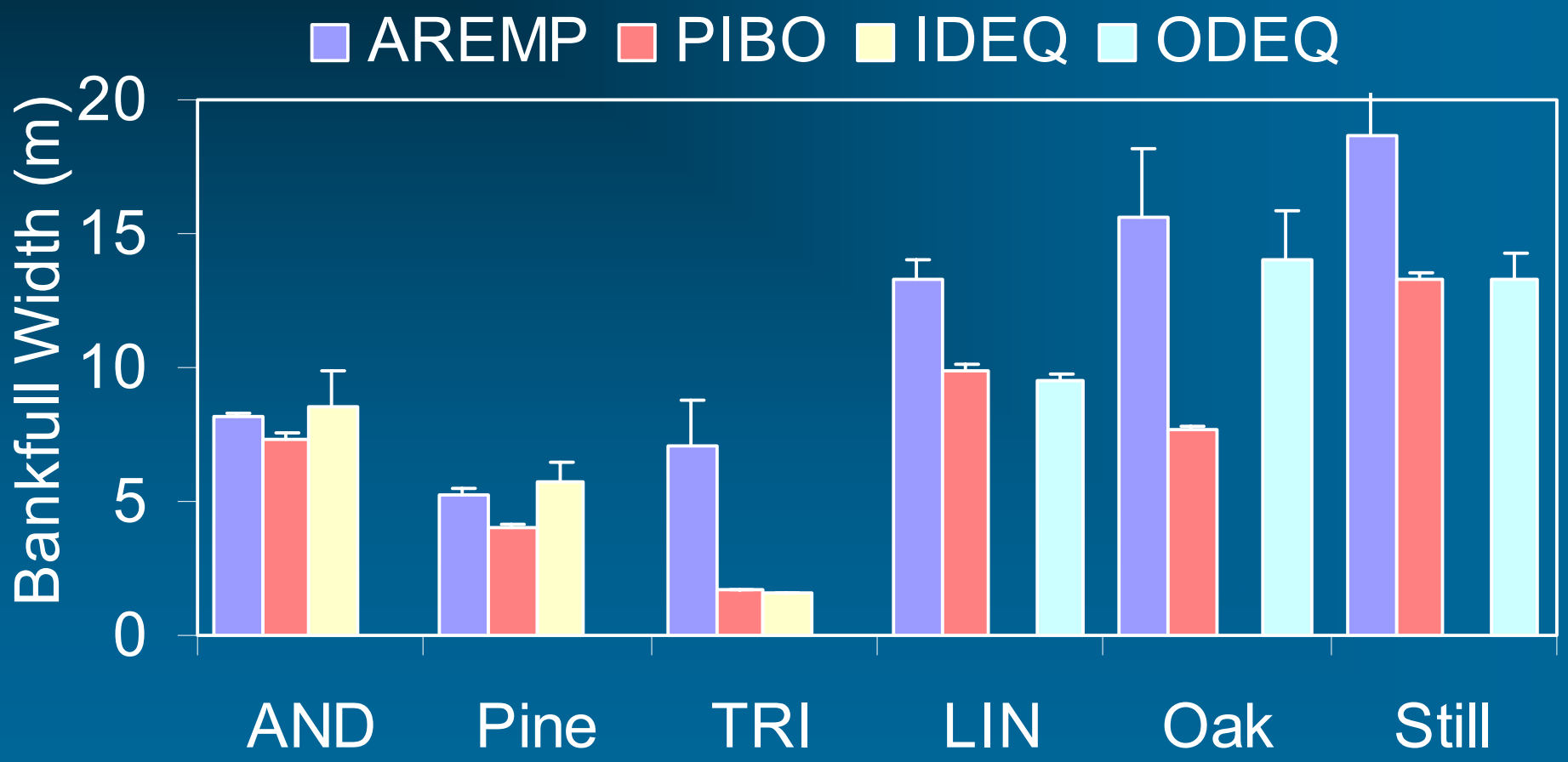
Percent Pool

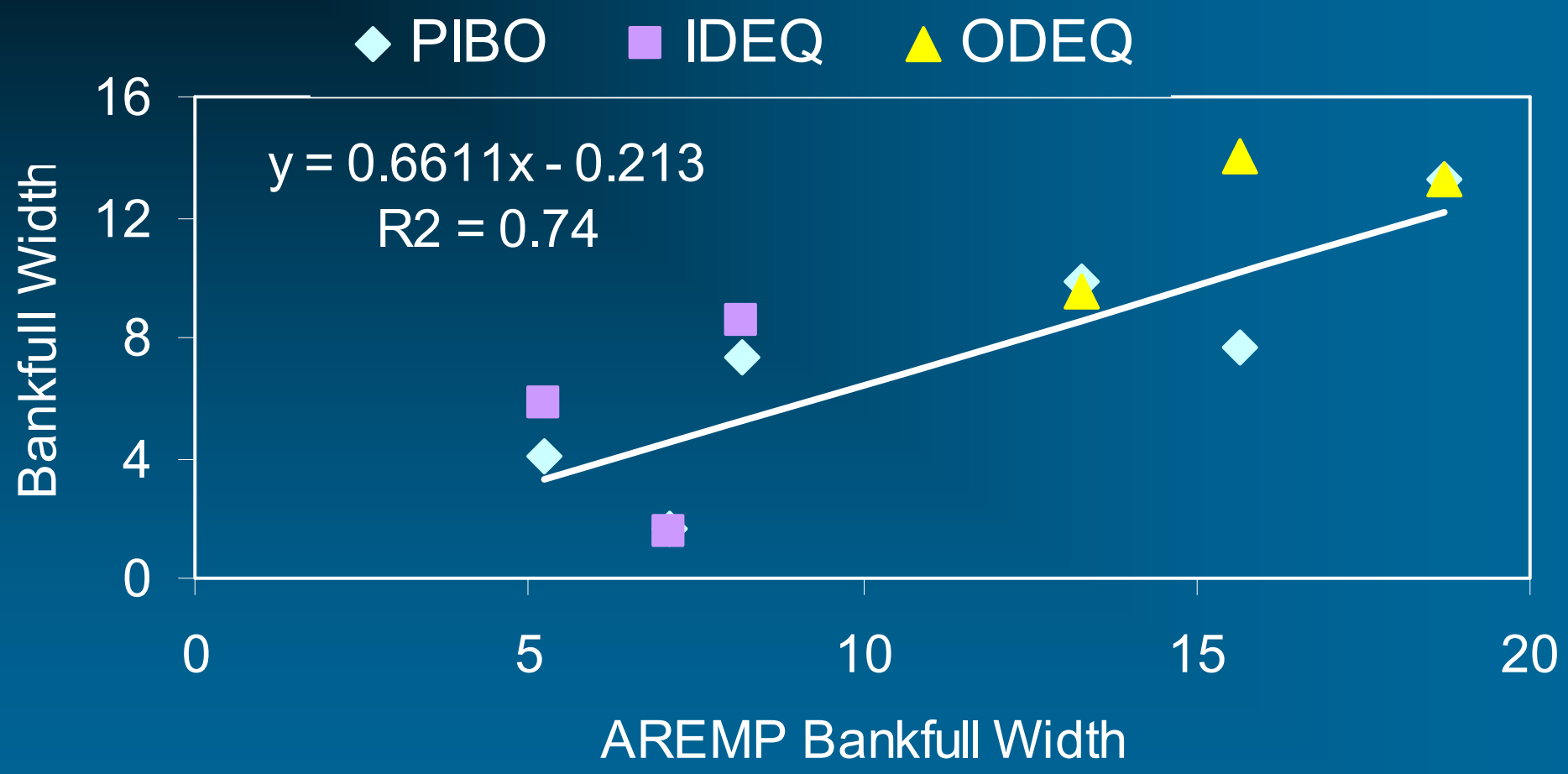


Percent Pool

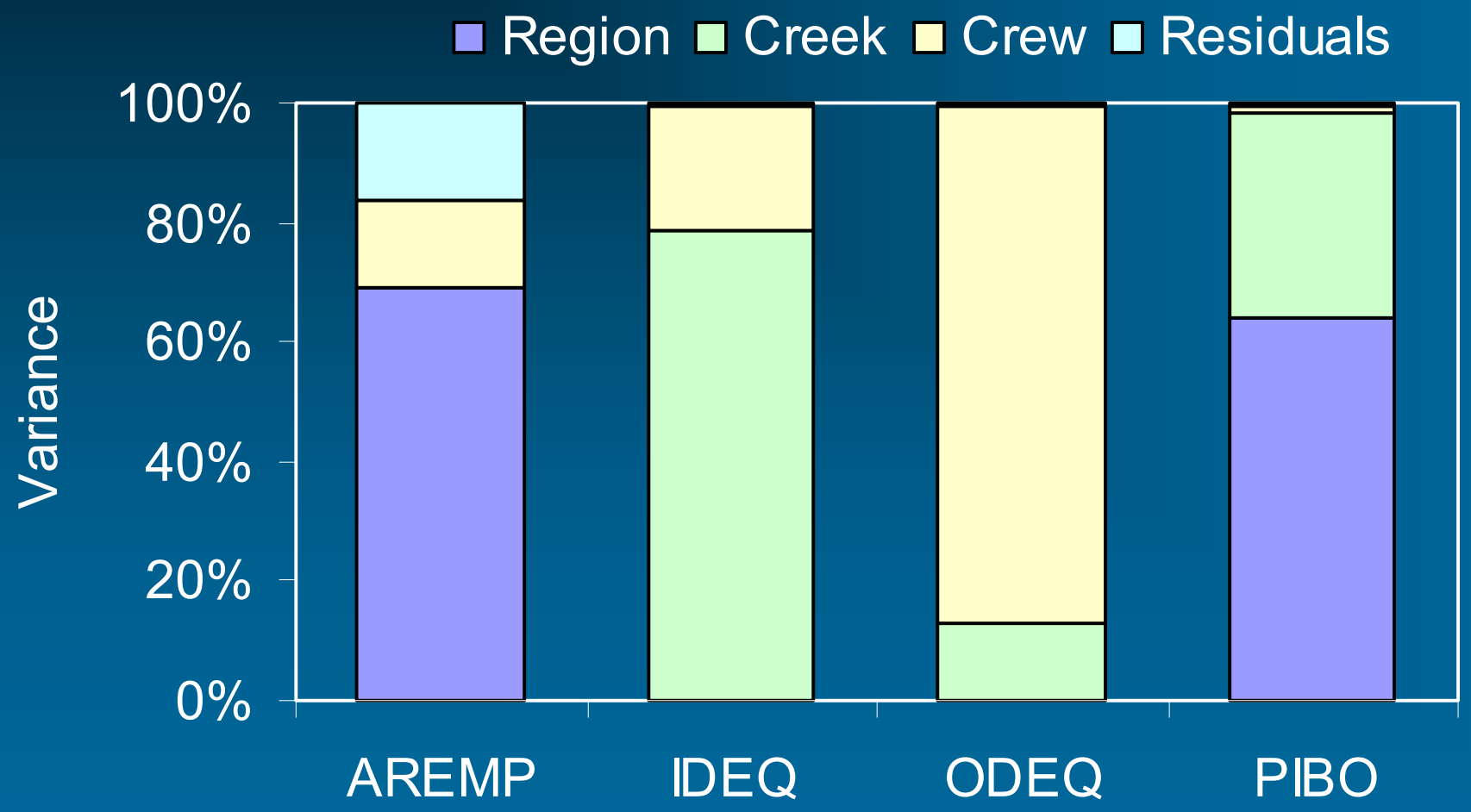
	CV	Tot Var	S:N
AREMP	0.64	205.4	0.4
IDEQ	0.71	546.7	2.4
ODEQ	0.48	89.1	0.0
PIBO	0.41	491.3	6.3

Bankfull Width




PIBO
IDEQ
ODEQ
y = 0.6611x - 0.213
R2 = 0.74
Bankfull Width
16
12
8
4
0
0
5
10
15
20
AREMP Bankfull Width

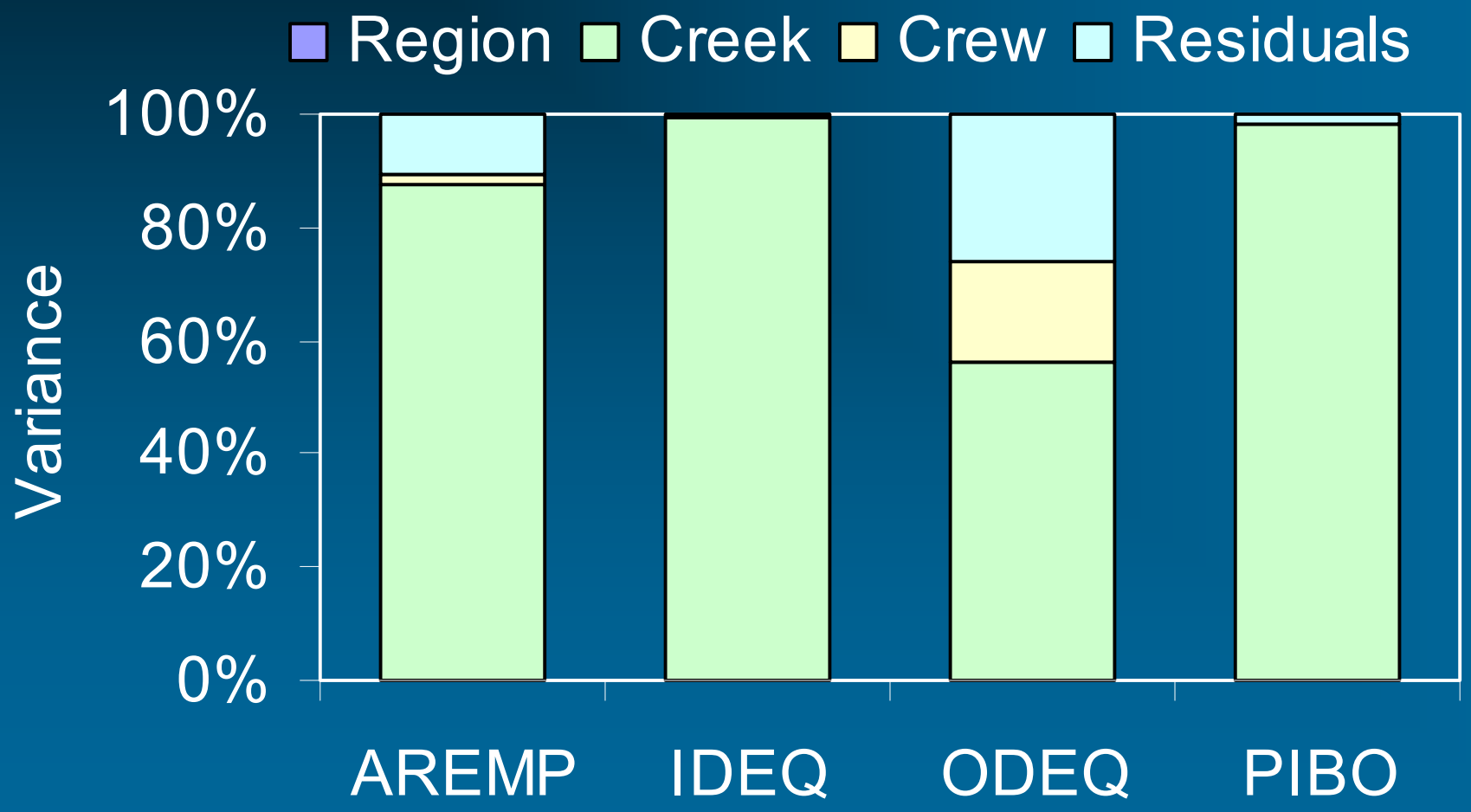
Bankfull Width



Bankfull Width

	CV	Tot Var	S:N
AREMP	0.54	56.5	2.2
IDEQ	0.65	14.0	3.7
ODEQ	0.30	14.3	0.2
PIBO	0.53	23.0	54.0

Slope


Region
Creek
Crew
Residuals
100%
80%
60%
40%
20%
0%
Variance
AREMP
IDEQ
ODEQ
PIBO

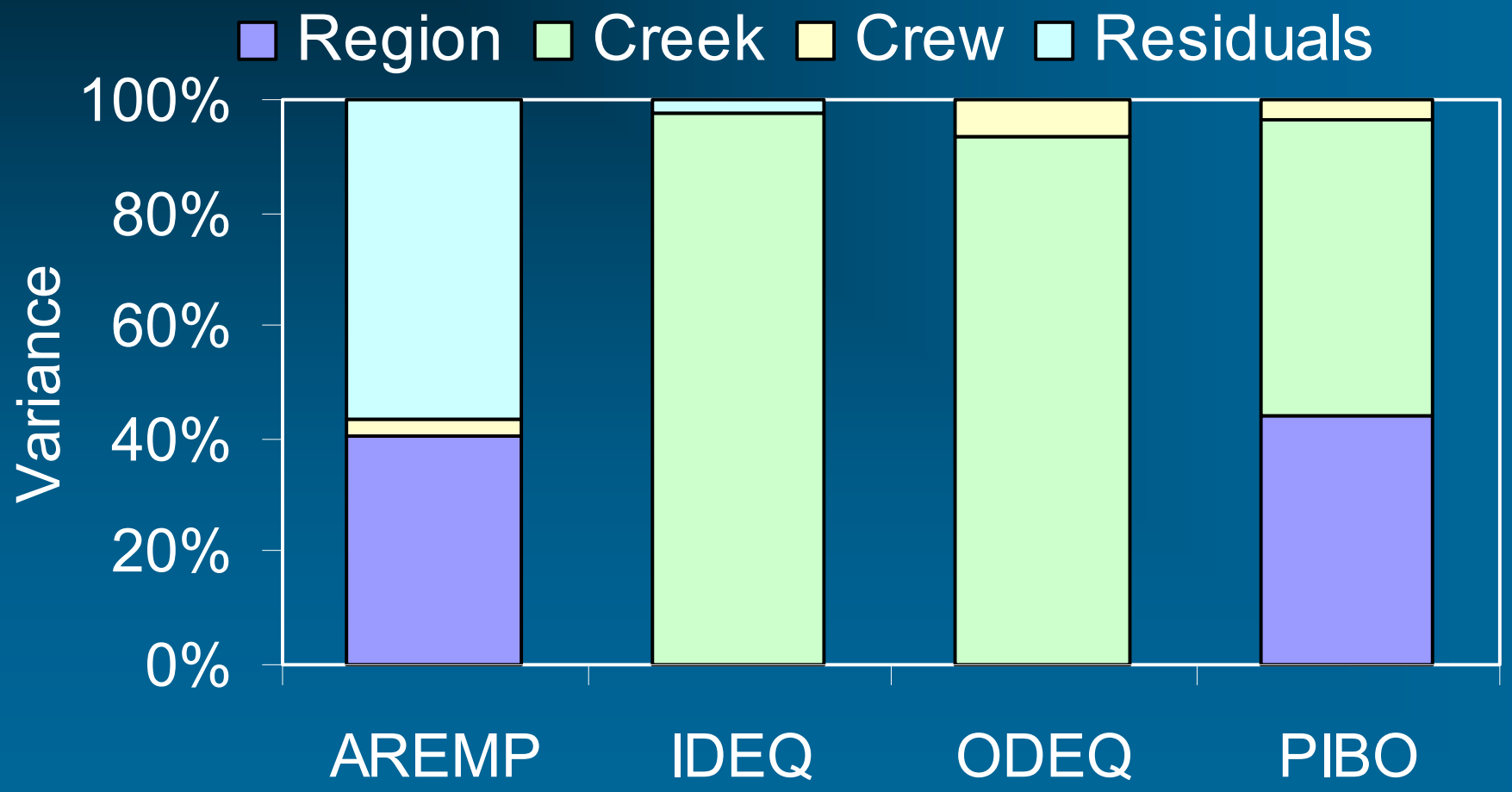
Slope

	CV	Tot Var	S:N
AREMP	0.63	1.3	7.0
IDEQ	0.82	3.2	117.8
ODEQ	0.33	0.5	1.3
PIBO	0.66	1.0	53.0

Conclusions

- Mean differences between programs can be attributed to protocols.
- The differences between protocols for substrate and bankfull width are predictable.
- In this exercise, PIBO gets gold star…least amount of observer and residual error, highest signal to noise ratios.

Percent Fines



Percent Fines

	CV	Tot Var	S:N
AREMP	1.15	1228.4	0.7
IDEQ	0.53	966.0	39.3
ODEQ	0.70	251.4	14.8
PIBO	1.00	1504.7	27.1