

File S1. This spreadsheet illustrates how Multi Gear Mean Standardization (MGMS) is calculated and how this standardization effects the Coefficient of Variation for data on different numeric scales. In this simulation, data for Gear 1 are random integers between 0 and 100, and data for Gear 2 are a proportion of the data for each species at each site in Gear 1. The initial proportion is set to 0.1 (i.e. Gear 1 reduced by an order of magnitude). Users can change this porportion by entering a different value in cell K9. The graphs at the bottom show how this standardization maintains patterns across species within a site, and patterns across sites within a species. New random data can be generated by changing the number in the cell F9 Note that we have used spatial observations (e.g., site means) in this example, but MGMS would also be appropriate if the observations were temporal (e.g., monthly or annual means).

Change this value to generate new random data:

Gear 2 Catchability 0.1

Gear 1 - Catch Per Unit Effort (CPUE)

	Species 1	Species 2	Species 3	Species 4	Species 5	Total CPUE
Site a	99.00	84.00	62.00	75.00	60.00	380.00
Site b	6.00	7.00	59.00	30.00	45.00	147.00
Site c	42.00	58.00	60.00	68.00	71.00	299.00
Site d	60.00	6.00	60.00	14.00	78.00	218.00
Site e	73.00	93.00	96.00	16.00	85.00	363.00
	Mean Total CPUE =					281.4

Gear 2 - Catch Per Unit Effort (CPUE)

	Species 1	Species 2	Species 3	Species 4	Species 5	Total CPUE
Site a	9.90	8.40	6.20	7.50	6.00	38.00
Site b	0.60	0.70	5.90	3.00	4.50	14.70
Site c	4.20	5.80	6.00	6.80	7.10	29.90
Site d	6.00	0.60	6.00	1.40	7.80	21.80
Site e	7.30	9.30	9.60	1.60	8.50	36.30
	Mean Total CPUE =					28.14

Gear 1 - MGMS

	Species 1	Species 2	Species 3	Species 4	Species 5
Site a	0.35	0.30	0.22	0.27	0.21
Site b	0.02	0.02	0.21	0.11	0.16
Site c	0.15	0.21	0.21	0.24	0.25
Site d	0.21	0.02	0.21	0.05	0.28
Site e	0.26	0.33	0.34	0.06	0.30

Gear 2 - MGMS

	Species 1	Species 2	Species 3	Species 4	Species 5
Site a	0.35	0.30	0.22	0.27	0.21
Site b	0.02	0.02	0.21	0.11	0.16
Site c	0.15	0.21	0.21	0.24	0.25
Site d	0.21	0.02	0.21	0.05	0.28
Site e	0.26	0.33	0.34	0.06	0.30

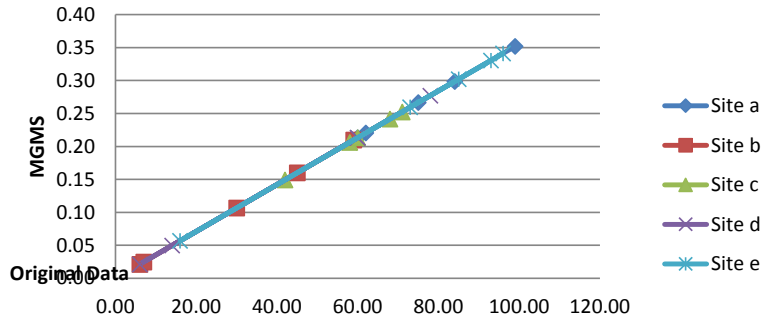
Coefficient of variation across Species

	Gear 1 Original	Gear 2 Original	Gear 1 MGMS	Gear 2 MGMS
Site a	0.21	0.21	0.21	0.21
Site b	0.79	0.79	0.79	0.79
Site c	0.19	0.19	0.19	0.19
Site d	0.73	0.73	0.73	0.73
Site e	0.45	0.45	0.45	0.45

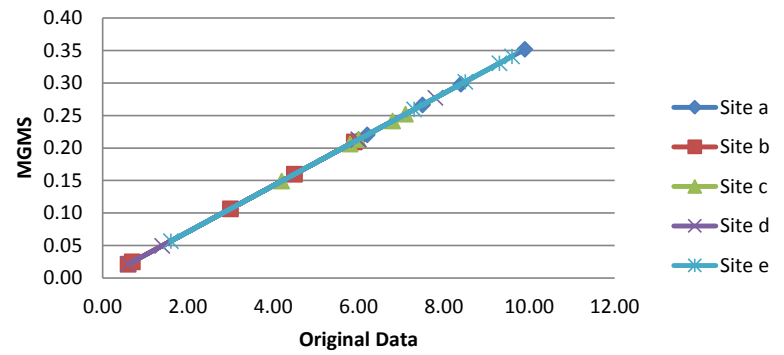
Coefficient of variation across sites

	Gear 1 Original	Gear 2 Original	Gear 1 MGMS	Gear 2 MGMS
Species 1	0.62	0.62	0.62	0.62
Species 2	0.83	0.83	0.83	0.83
Species 3	0.24	0.24	0.24	0.24
Species 4	0.71	0.71	0.71	0.71
Species 4	0.23	0.23	0.23	0.23

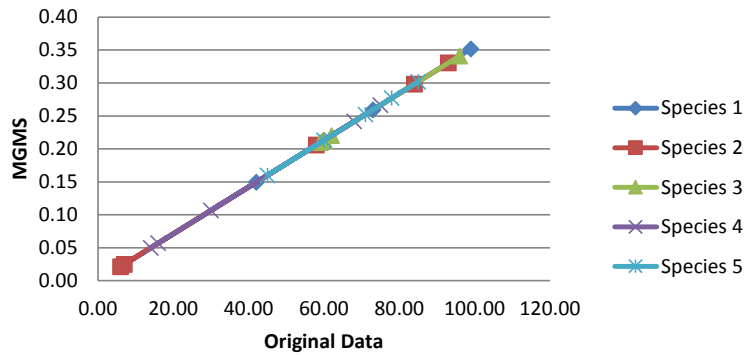
Gear 1 - Patterns Across Species



Gear 2 - Patterns Across Species



Gear 1 - Patterns Across Sites



Gear 2 - Patterns Across Sites

