microorganisms

Table S1: An overview of studies that have aligned spatial and temporal scales, for different resolutions of biological organisation and the environmental response that has been the focus for response trait analysis; cf. Figure 3. Spatial scales are those defined by Pearson & Dawson (2003): Global > 10000 km, Continental 2000 - 10000 km, Regional 200 - 2000 km, Landscape 10 - 200 km, Local 1 - 10 km, Site 10 - 1000 m, Micro < 10 m.

Spatial scale	Temporal scale	Biological scale	Environmental response	Reference
Global	Point measurement	Community	(1) Biogeochemistry; (3) Climate	[1]
Continental	Long-term	Species	(3) Climate	[2]
Continental	Point measurement	Community	(1) Biogeochemistry; (3) Climate	[3, 4]
Continental	Point measurement	Species	(1) Biogeochemistry; (3) Climate	[5]
Regional	Long-term	Community	(4) Fire	[6]
Regional	Long-term	Species	(3) Climate	[7]
Regional	Point measurement	Community	(1) Biogeochemistry; (2) Biotic interactions; (3) Climate; (5) Forest structure; (6) Geomorphology	[8, 9, 10, 11, 12]
Regional	Point measurement	Population	(2) Biotic interactions; (3) Climate; (5) Forest structure	[13, 14]
Regional	Point measurement	Species	(3) Climate	[15]
Landscape	Point measurement	Community	(1) Biogeochemistry; (2) Biotic interactions; (3) Climate; (4) Fire; (5) Forest structure; (6) Geomorphology; (7) Radiation; (8) Soil properties	[16, 17, 18, 19, 20, 21, 22, 23, 24]
Landscape	Point measurement	Population	(5) Forest structure; (7) Radiation	[25, 26]
Local	Long-term	Community	(1) Biogeochemistry; (3) Climate; (4) Fire	[27, 28, 29]
Local	Short-term	Species	(1) Biogeochemistry; (3) Climate	[30]
Local	Point measurement	Community	(1) Biogeochemistry; (3) Climate; (5) Forest structure; (6) Geomorphology	[31, 32, 33, 34, 35]
Local	Point measurement	Species	(3) Climate; (5) Forest structure	[36]
Site	Long-term	Community	(2) Biotic interactions; (3) Climate	[37, 38]
Site	Short-term	Population	(7) Radiation	[39]
Site	Short-term	Species	(1) Biogeochemistry	[40, 41, 42]
Site	Point measurement	Community	(1) Biogeochemistry; (3) Climate; (5) Forest structure; (7) Radiation; (8) Soil properties	[43, 44, 45, 46]
Site	Point measurement	Species	(1) Biogeochemistry	[47]
Micro	Point measurement	Population	(2) Biotic interactions; (3) Climate; (5) Forest structure	[13, 14]

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Table S2: An overview of studies that have aligned spatial and temporal scales, for different resolutions of biological organisation and the ecosystem process that has been the focus for effect trait analysis; cf. Figure 3. Spatial scales are those defined by Pearson & Dawson (2003): Global > 10000 km, Continental 2000 - 10000 km, Regional 200 - 2000 km, Landscape 10 - 200 km, Local 1 - 10 km, Site 10 - 1000 m, Micro < 10 m.

Spatial scale	Temporal scale	Biological scale	Ecosystem process	Reference
Global	Point measurement	Community	(b) Biogeochemistry; (d) Canopy hydrology	[1, 2, 3]
Regional	Long-term	Community	(b) Biogeochemistry; (c) Biotic interactions; (f) Decomposition	[4, 5]
Regional	Point measurement	Community	(b) Biogeochemistry; (d) Canopy hydrology; (e) Climate regulation	[6, 7]
Landscape	Point measurement	Species	(f) Decomposition; (h) Lichenivory	[8]
Landscape-Local	Point measurement	Community	(a) Air purification	[9]
Local	Long-term	Community	(d) Canopy hydrology	[10]
Local	Long-term	Species	(b) Biogeochemistry; (d) Canopy hydrology	[11]
Local	Short-term	Species	(g) Invertebrate communities	[12]
Local	Point measurement	Community	(b) Biogeochemistry; (f) Decomposition; (i) Soil insulation	[6, 13, 14, 15]
Local	Point measurement	Species	(b) Biogeochemistry; (f) Decomposition; (g) Invertebrate communities	[15, 16]
Site	Long-term	Community	(b) Biogeochemistry	[17]
Site	Short-term	Species	(a) Air purification; (e) Climate regulation	[18]
Site	Point measurement	Community	(c) Biotic interactions	[19]
Site	Point measurement	Species	(c) Biotic interactions; (i) Soil insulation	[20]
Site-Micro	Long-term	Species	(e) Climate regulation; (f) Decomposition	[15]
Micro	Short-term	Species	(i) Soil insulation	[21]

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