Algal-Dependency in Sub-Tropical, Arid Streams: Supplemental

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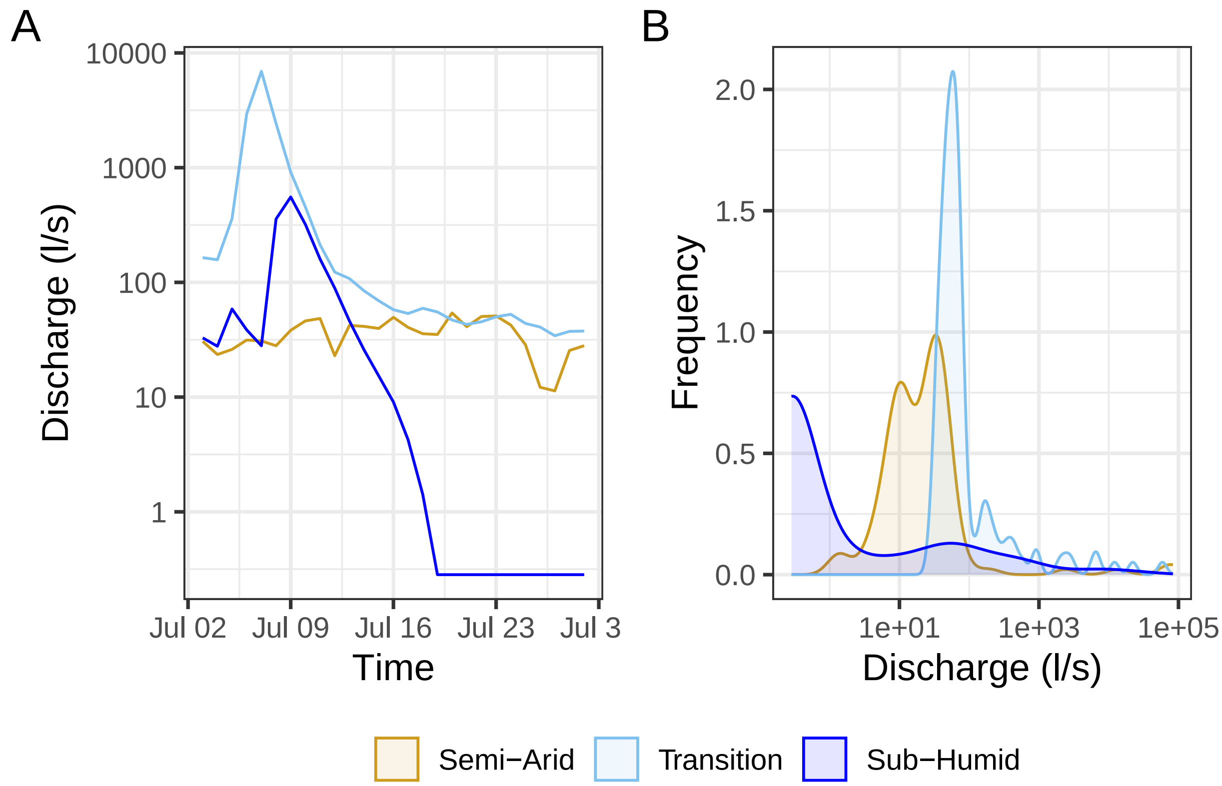
Supplemental: Exclosure Algae Comparisons

Site	Treatment	Algae	CI.95	Sit.Sig	Tre.Sig
Semi-Arid	Exclosure	2.78	(2.30, 3.26)	**	*
Transition	Exclosure	0.40	(0.17, 0.64)	**	
Sub-Humid	Exclosure	0.02	(0.01, 0.03)	**	*
Semi-Arid	Open	1.23	(0.70, 1.74)	**	*
Transition	Open	0.21	(0.10, 0.32)	*	
Sub-Humid	Open	0.10	(0.07, 0.13)	*	*

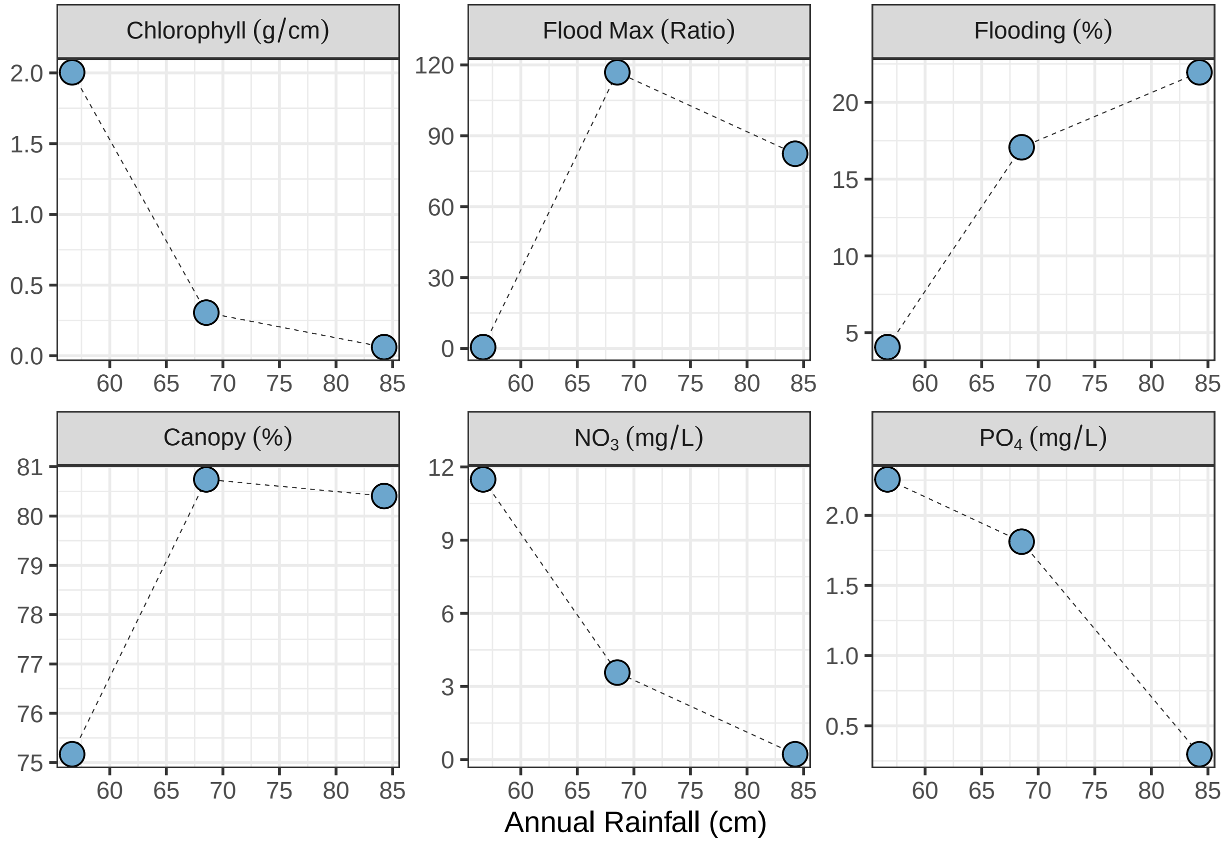
Bootstrap mean and 95% confidence intervals of site and exclosure effects on total algae abundance on ceramic plates measured by irradiance. Stars denote significant differences between a pair of sites (Sit.Sig) or treatments (Tre.Sig).

Supplemental: Exclosure Discharge



(A) Time series and (B) histogram of average daily discharge (l/s) during 2018 exclosure deployment at Semi-Arid (gold), Transition (light blue), and Sub-Humid sites (dark blue). Flows were stable at the Semi-Arid site. The Transition site experienced a large flood in the first week of deployment, but flows were stable thereafter. The Sub-Humid site experienced a small flood in the second week of deployment and then flows stagnated at ~0 l/s for the last 2 weeks of deployment.

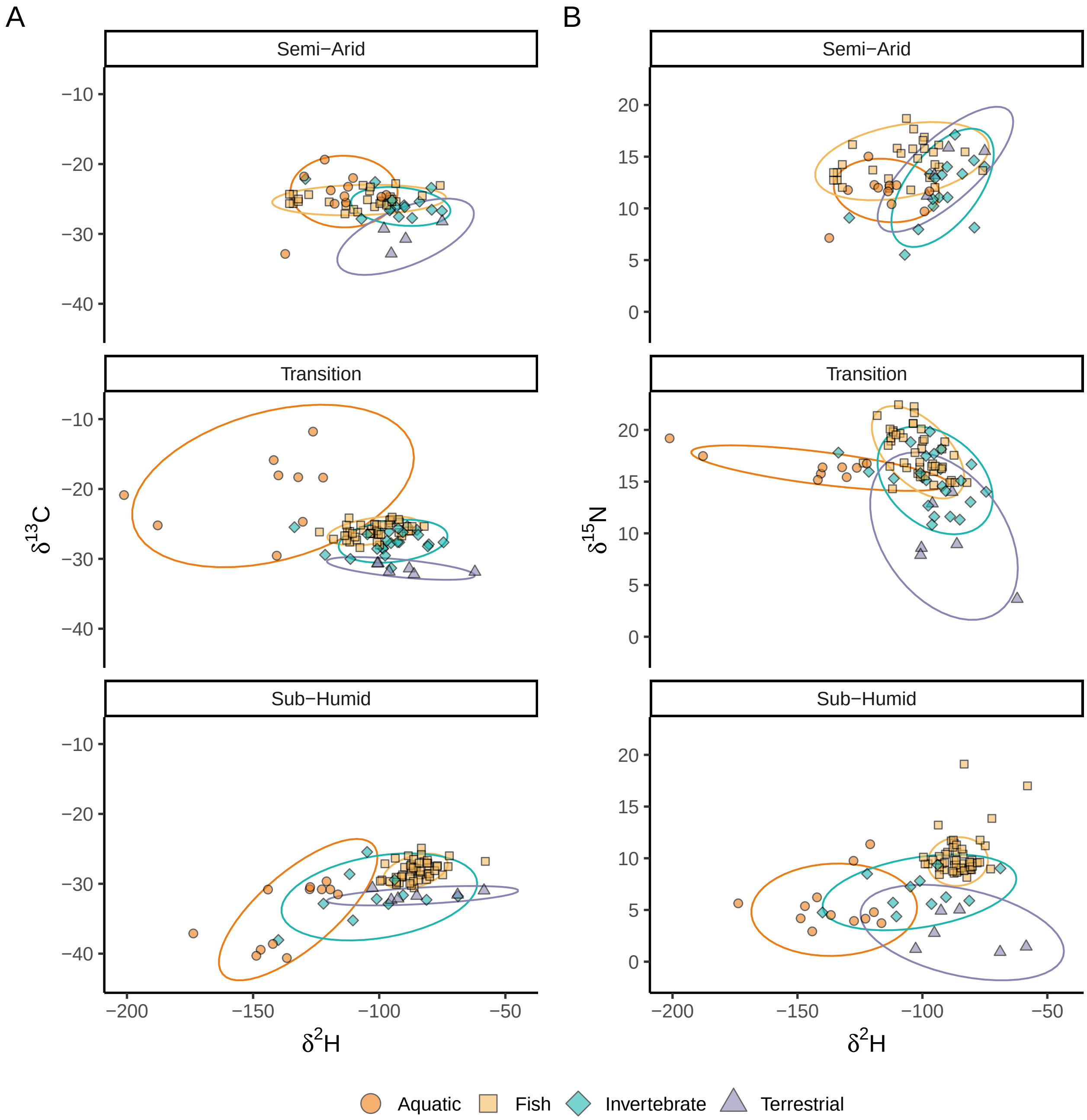
Supplemental: Exclosure Predictors



Total Chlorophyll on tiles after 30-day deployment, maximum flood strength ((max-base)/base), proportion of flows over three times median average daily discharge, canopy coverage, nitrate concentration, and ortho-phosphate concentration at Semi-Arid (55 cm/yr), Transition (70 cm/yr), and Sub-Humid (85 cm/yr) sites.

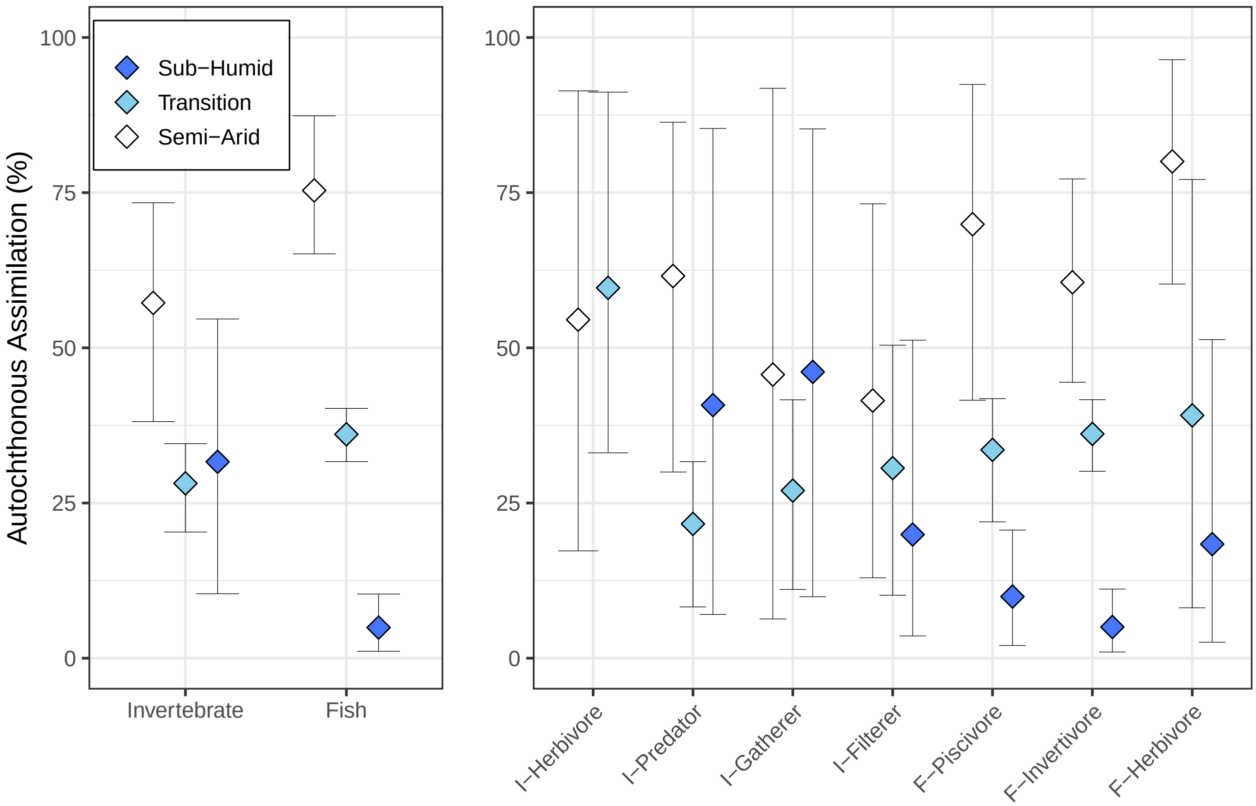
Variable	Units	Semi-Arid	Transition	Sub-Humid
Chl α	μg/cm	2.0	0.3	0.1
Rain	cm/yr	56.7	68.5	84.3
Canopy	%	75.2	80.7	80.4
NO_3^-	mg/l	11.5	3.6	0.2
PO_4^-	mg/l	2.3	1.8	0.3
Q Median	l/s	35.4	58.6	6.7
Q SD	l/s	11.1	1426.2	131.9
Q Max	l/s	0.5	116.9	82.4
Flood	%	4.1	17.1	22.0

Supplemental: Isotope Scatterplots



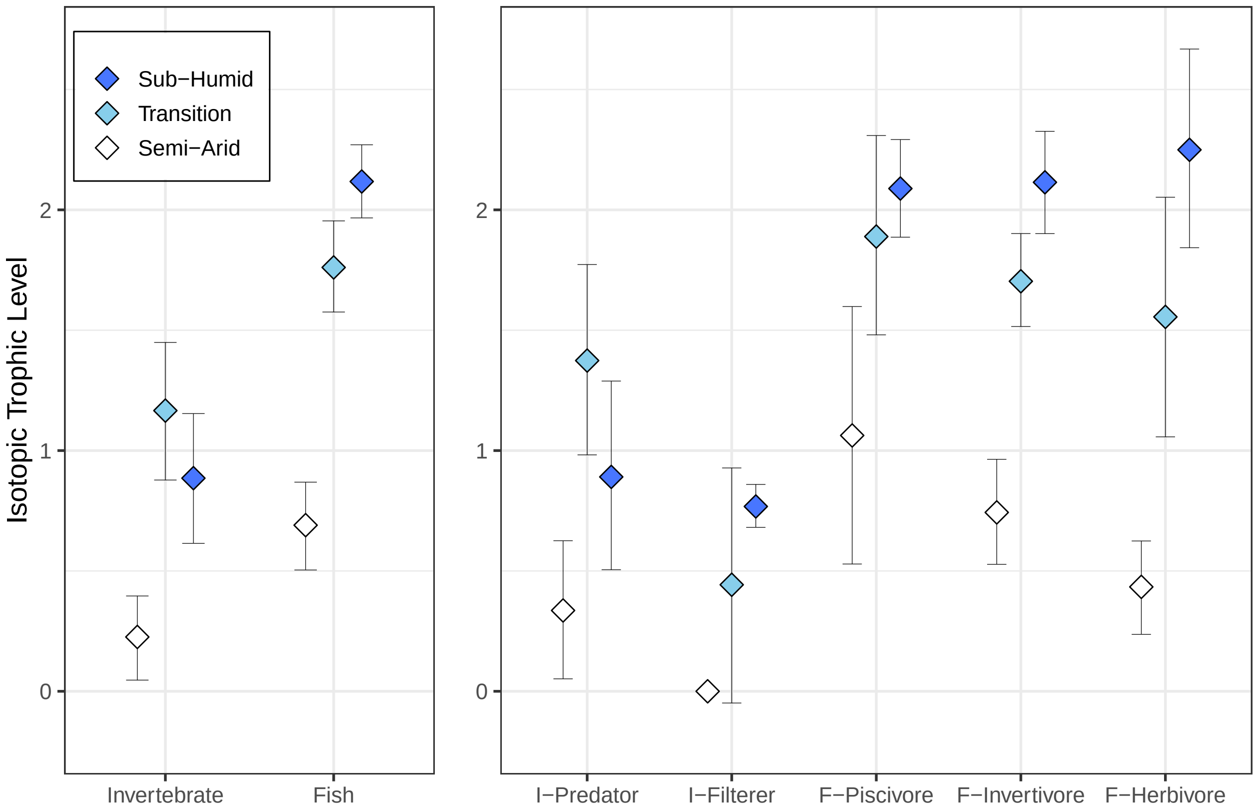
(A) δ^{13}C (‰) or **(B)** δ^{15}N (‰) versus δ^{2}H (‰) scatter plots of aquatic (grey circles) and terrestrial (white squares) sources, as well as invertebrates (blue diamonds) and fish (pink triangles). Samples were collected from Semi-Arid, Transition, and Sub-Humid sites. Dotted lines encompass the area as an ellipse, containing 95% of the estimated t-distribution for each group.

Supplemental: Isotope Mixing Model



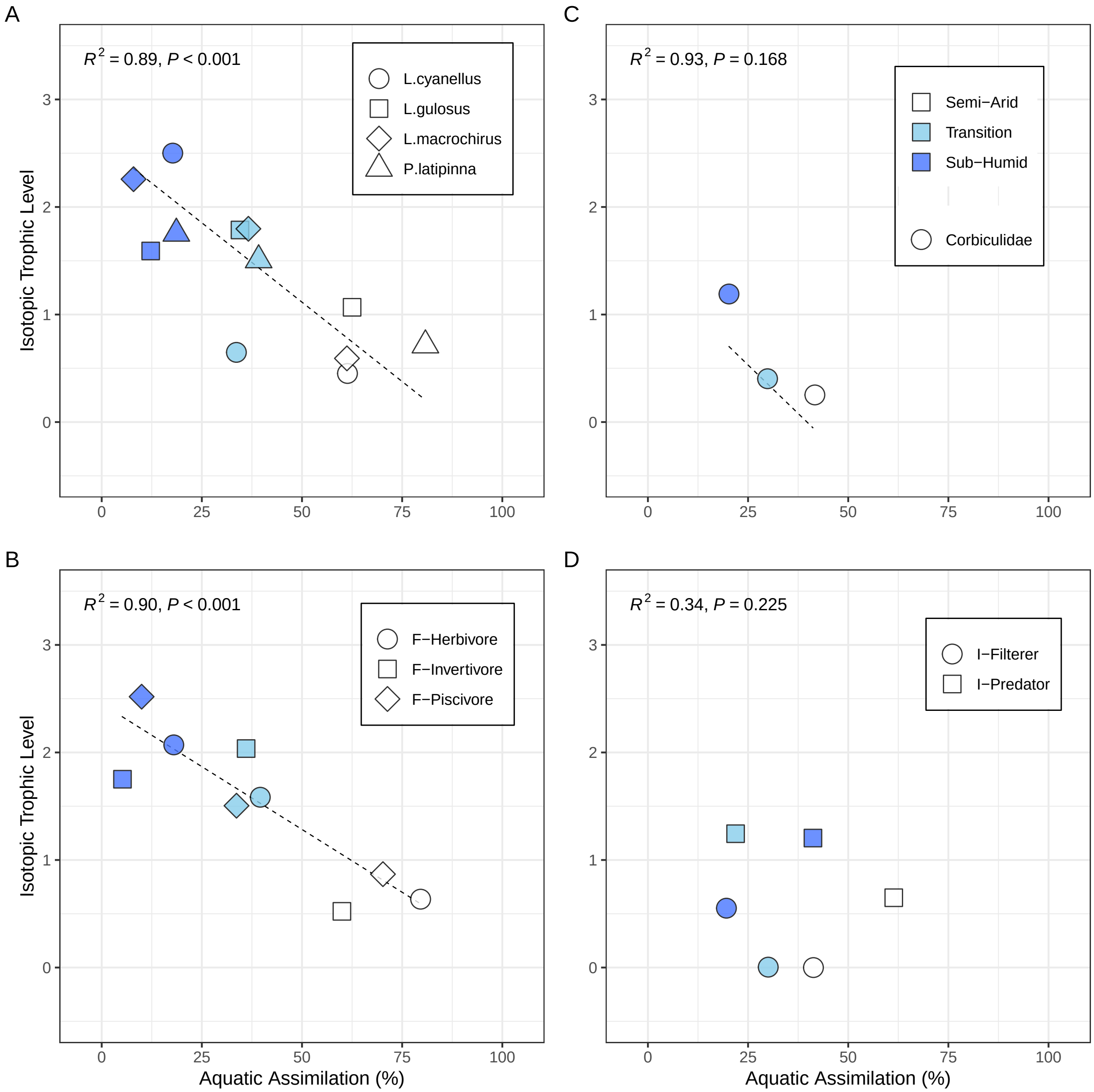
Estimated assimilation of autochthonous (aquatic source) in fish and Invertebrate communities as well as functional feeding groups within Semi-Arid, Transition, and Sub-Humid streams. Diamonds represent mean values and are colored according to sample site (darkening with increased precipitation) with bars extending to the 95% credible interval. Autochthonous assimilation is estimated using $\delta^{13}C$ and $\delta^{2}H$ in a Bayesian mixing model for each group of comparison and calibrated to local source signatures.

Supplemental: Isotopic Trophic Level



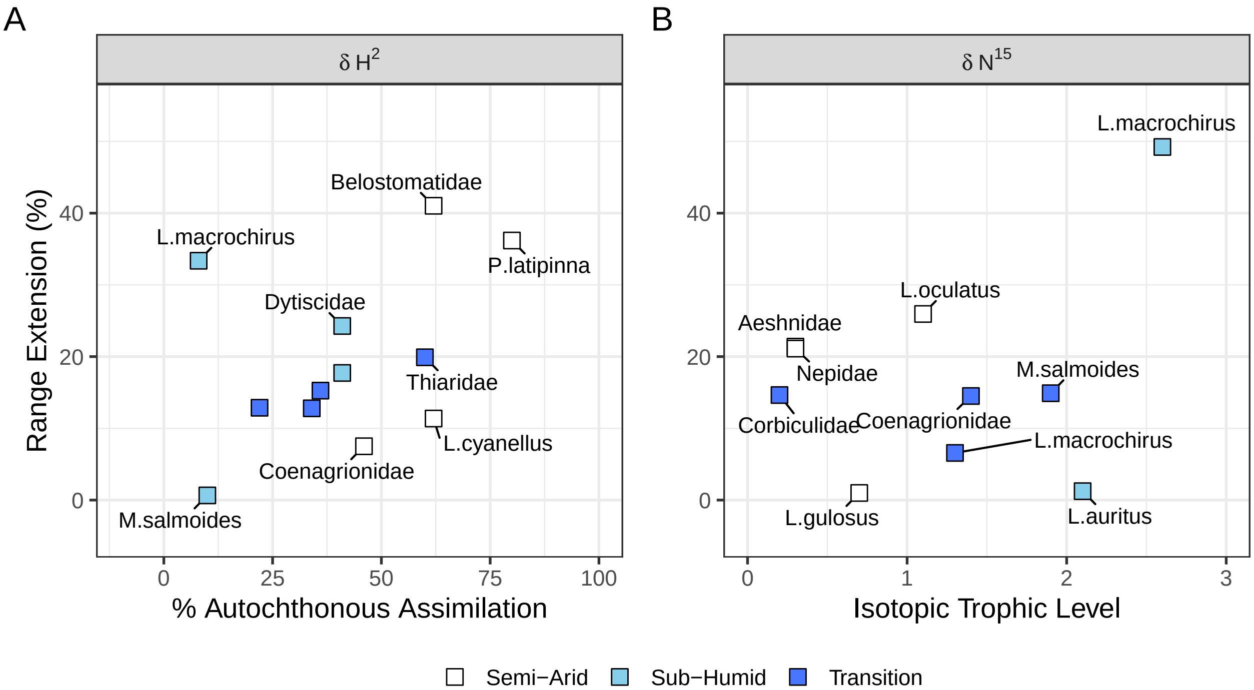
Isotopic trophic levels for fish and invertebrate communities as well as functional feeding groups. Diamonds represent mean values and are colored according to sample site (darkening with increased precipitation) with bars extending to the 95% credible interval. Isotopic trophic levels are estimated using δ^{15}N signatures, calibrated to local source signatures and use a trophic discrimination factor of 3.4‰.

Supplemental: Isotope Autochthony vs Trophic Level



Isotopic trophic level (estimated using δ^{15}N) plotted against aquatic assimilation (estimated using δ^{13}C and δ^{2}H) for **(A)** common fish species, **(B)** fish feeding groups, **(C)** common invertebrate species, and **(D)** invertebrate feeding groups. Scatter plot points are shaped according to their taxonomic group and colored by site (darkening with annual rainfall). Comparisons within fish display a strong negative relationship between isotopic trophic level and autochthonous resource assimilation which coincides with increasing aridity. Invertebrate comparisons reveal a weak negative relationship between isotopic trophic level and aquatic resource assimilation that weakly coincides with site precipitation patterns.

Supplemental: Isotope Range Influence



Fish and invertebrates influence **(A)** resource breadth σ^2H range) and **(B)** food-chain length (σ^{15}N range) at Semi-Arid (white), Transiiton (light), and Sub-Humid (dark) sites. Range extension reflects the difference between the bootstrapped range estimate with and without each taxa. Semi-Arid resource breadth was largely influenced by Belostomatidae (62% autochthonous) and *P.latipinna* (80% autochthonous) and food-chain length was driven by invertebrate predators (Aeshnidae and Nepidae) as well as piscivorous *L.oculatus*. Excepting Thiaridae (60% autochthonous), no taxa at the Transition extend σ^{15}N or σ^2H ranges more than 20%, which may reflect greater dietary overlap among taxa. At the Sub-Humid site, resource breadth and food-chain length are highly influenced by *L.macrochirus* (8% autochthonous).

Element	Taxa	Range Ext.	Site	R.Abundance	% Autoch.	I.T.L	T.Group
H	Thiaridae	19.9	Transition	3	60 †	†	I-Herbivore
H	Belostomatidae	41.0	Semi-Arid	1	62 †	0.3 †	I-Predator
H	Dytiscidae	24.3	Sub-Humid	1	41 †	0.9 †	I-Predator
H	Corduliidae	17.7	Sub-Humid	1	41 †	0.9 †	I-Predator
H	Corydalidae	12.9	Transition		22 †	1.4 †	I-Predator
H	Coenagrionidae	7.5	Semi-Arid	3	46	0.3 †	I-Predator
H	P.latipinna	36.2	Semi-Arid	42	80	0.4	F-Herbivore
H	L.macrochirus	33.4	Sub-Humid	15	8	2.6	F-Invertivore
H	C.lutrensis	15.3	Transition	35	36 †	1.7 †	F-Invertivore
H	L.cyanellus	12.8	Transition	10	34	1.1	F-Piscivore
H	L.cyanellus	11.4	Semi-Arid	2	62	0.7	F-Piscivore
H	M.salmoides	0.6	Sub-Humid	3	10 †	2.1 †	F-Piscivore
N	Leptophlebiidae	10.7	Sub-Humid	4	46 †	†	I-Gatherer
N	Palaemonidae	3.9	Sub-Humid	4	46 †	†	I-Gatherer
N	Corbiculidae	14.6	Transition	2	31	0.2	I-Filterer
N	Aeshnidae	21.4	Semi-Arid	1	62 †	0.3 †	I-Predator
N	Nepidae	21.1	Semi-Arid	2	62 †	0.3 †	I-Predator
N	Coenagrionidae	14.5	Transition	4	25	1.4 †	I-Predator
N	L.macrochirus	49.2	Sub-Humid	15	8	2.6	F-Invertivore
N	L.macrochirus	6.6	Transition	19	36	1.3	F-Invertivore
N	L.auritus	1.2	Sub-Humid	9	5 †	2.1 †	F-Invertivore
N	L.gulosus	1.0	Semi-Arid	2	63	0.7	F-Invertivore
N	L.oculatus	25.9	Semi-Arid	2	70 †	1.1 †	F-Piscivore
N	M.salmoides	14.9	Transition	5	34 †	1.9 †	F-Piscivore

Influential fish and invertebrate taxa on σ^2H (resource breadth) and σ^{15}N (food-chain length) range extension (Range Ext.) with relative abundance (R.Abundance) and mixing model estimates of autochthonous assimilation (% Autochthonous) and isotopic trophic level (I.T.L). † indicates values are taken from the trophic category.

Supplemental: Isotope Raw Values

Source	Site	δ^2H	δ^{13}C	δ^{15}N
Filamentous Algae	Semi-Arid	-129.6 ± 7.8 (3)	-24.7 ± 7.2 (3)	11.3 ± 4.0 (3)
Filamentous Algae	Transition	-176.5 ± 31.8 (3)	-25.2 ± 6.1 (3)	17.5 ± 2.4 (3)
Filamentous Algae	Sub-Humid	-148.7 ± 14.5 (6)	-37.8 ± 3.7 (6)	4.8 ± 1.2 (6)
Periphyton	Semi-Arid	-110.4 ± 8.7 (8)	-24.2 ± 1.2 (8)	11.5 ± 1.0 (8)
Periphyton	Transition	-132.1 ± 8.5 (6)	-17.9 ± 4.2 (6)	16.1 ± 0.6 (6)
Periphyton	Sub-Humid	-122.4 ± 4.5 (6)	-30.7 ± 0.6 (6)	6.3 ± 3.4 (6)
C3 Grass	Semi-Arid	-75.2 ± 0.3 (2)	-21.6 ± 9.3 (2)	14.4 ± 1.7 (2)
C3 Grass	Transition	-94.8 ± 6.2 (3)	-31.3 ± 0.6 (3)	11.8 ± 2.9 (3)
C3 Grass	Sub-Humid	-85.6 ± 16.9 (3)	-31.3 ± 0.6 (3)	2.4 ± 2.3 (3)
Green Leaves	Semi-Arid	-94.3 ± 4.4 (3)	-30.9 ± 1.8 (3)	13.4 ± 2.3 (3)
Green Leaves	Transition	-83.0 ± 19.5 (3)	-31.6 ± 0.8 (3)	6.8 ± 2.8 (3)
Green Leaves	Sub-Humid	-82.1 ± 20.5 (3)	-31.8 ± 0.7 (3)	3.0 ± 1.8 (3)

δ^2H, δ^{13}C, and δ^{15}N mean ± standard deviation (number of samples) for aquatic and terrestrial resources at three sample sites (Transition, Semi-Arid, and Sub-Humid).

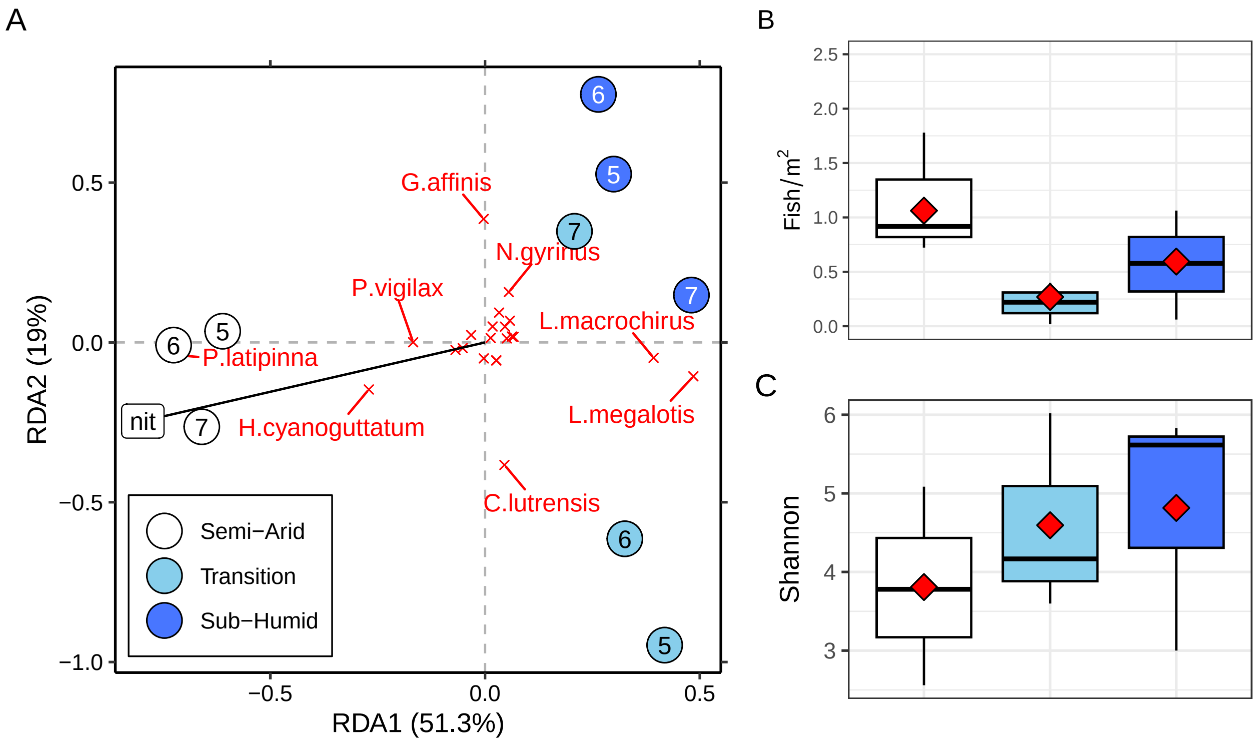
Fish	Site	δ^2H	δ^{13}C	δ^{15}N
A.natalis	Transition	-102.0 ± 15.4 (3)	-26.5 ± 0.6 (3)	19.7 ± 2.0 (3)
A.natalis	Sub-Humid	-85.7 ± 6.8 (12)	-27.9 ± 0.5 (12)	9.2 ± 0.7 (12)
C.lutrensis	Semi-Arid	-93.3 (1)	-25.4 (1)	14.0 (1)
C.lutrensis	Transition	-133.0 ± 26.3 (3)	-27.0 ± 1.5 (3)	18.4 ± 1.5 (3)
E.gracile	Sub-Humid	-86.2 (1)	-30.6 (1)	8.6 (1)
H.cyanoguttatus	Semi-Arid	-93.5 ± 9.6 (4)	-24.5 ± 1.7 (4)	15.5 ± 0.6 (4)
H.cyanoguttatus	Transition	-101.8 ± 9.7 (8)	-26.6 ± 1.0 (8)	18.2 ± 1.9 (8)
I.punctatus	Transition	-110.8 ± 2.8 (3)	-27.8 ± 0.6 (3)	19.7 ± 0.4 (3)
L.auritus	Sub-Humid	-87.2 ± 7.7 (8)	-28.2 ± 1.6 (8)	9.8 ± 1.2 (8)
L.cyanellus	Semi-Arid	-97.5 ± 15.1 (4)	-25.0 ± 1.4 (4)	14.5 ± 2.3 (4)
L.cyanellus	Transition	-95.4 ± 10.7 (9)	-25.4 ± 1.3 (9)	14.9 ± 2.4 (9)
L.cyanellus	Sub-Humid	-87.2 ± 5 (4)	-28.7 ± 2.1 (4)	10.4 ± 1.5 (4)
L.gulosus	Semi-Arid	-104.1 ± 7.9 (3)	-25.6 ± 0.3 (3)	14.8 ± 2.5 (3)
L.gulosus	Transition	-103.0 ± 15.2 (3)	-26.2 ± 0.6 (3)	18.2 ± 0.5 (3)
L.gulosus	Sub-Humid	-82.1 ± 2 (5)	-28.8 ± 0.6 (5)	9.5 ± 0.3 (5)
L.macrochirus	Semi-Arid	-103.2 ± 5.7 (3)	-25.5 ± 1.5 (3)	14.7 ± 1.5 (3)
L.macrochirus	Transition	-101.0 ± 8.2 (9)	-25.2 ± 0.8 (9)	16.5 ± 1.4 (9)
L.macrochirus	Sub-Humid	-80.9 ± 10.1 (10)	-27.4 ± 1.6 (10)	11.8 ± 4.0 (10)
L.megalotis	Sub-Humid	-87.6 ± 8 (4)	-28.9 ± 1.0 (4)	9.6 ± 0.2 (4)
L.microlophus	Sub-Humid	-91.4 ± 3.1 (3)	-29.9 ± 0.2 (3)	8.7 ± 0.5 (3)
L.oculatus	Semi-Arid	-104.9 ± 2.1 (2)	-23.2 ± 0.2 (2)	18.2 ± 0.7 (2)
L.oculatus	Sub-Humid	-79.3 ± 10 (2)	-26.2 ± 0.4 (2)	12.6 ± 1.8 (2)
M.salmoides	Transition	-105.4 ± 3.6 (3)	-26.5 ± 0.3 (3)	22.1 ± 0.4 (3)
M.salmoides	Sub-Humid	-99.6 (1)	-29.6 (1)	10.1 (1)
P.latipinna	Semi-Arid	-123.2 ± 15.5 (11)	-25.2 ± 0.8 (11)	13.4 ± 1.2 (11)
P.latipinna	Transition	-99.3 ± 9.9 (3)	-24.9 ± 1.3 (3)	17.4 ± 1.8 (3)
P.latipinna	Sub-Humid	-86.3 ± 5.4 (4)	-27.0 ± 0.7 (4)	10.9 ± 2.0 (4)
P.olivaris	Transition	-103.7 (2)	-26.4 (2)	20.6 (2)

δ^2H, δ^{12}C, and δ^{15}N mean ± standard deviation (number of samples) for fish at three sample sites (Transition, Semi-Arid, and Sub-Humid).

Invertebrate	Site	δ^2H	δ^{13}C	δ^{15}N
Aeshnidae	Semi-Arid	-87.0 (1)	-27.7 (1)	17.1 (1)
Aeshnidae	Transition	-95.3 (1)	-31.3 (1)	11.6 (1)
Annelidae	Semi-Arid	-84.0 (1)	-25.4 (1)	13.3 (1)
Belastomatidae	Semi-Arid	-115.4 ± 19.5 (2)	-22.4 ± 0.3 (2)	8.5 ± 0.8 (2)
Chironomidae	Semi-Arid	-90.1 (1)	-25.9 (1)	14.0 (1)
Coenagrionidae	Semi-Arid	-86.1 ± 15.5 (2)	-26.2 ± 0.7 (2)	13.7 ± 0.5 (2)
Coenagrionidae	Transition	-97.0 ± 2.3 (3)	-27.9 ± 0.5 (3)	18.3 ± 1.3 (3)
Coenagrionidae	Sub-Humid	-101.0 (1)	-32.2 (1)	7.8 (1)
Corbiculidae	Semi-Arid	-93.7 ± 2.7 (4)	-26.3 ± 0.2 (4)	10.8 ± 0.4 (4)
Corbiculidae	Transition	-90.5 ± 4.7 (4)	-26.2 ± 1.0 (4)	12.1 ± 1.7 (4)
Corbiculidae	Sub-Humid	-89.4 ± 7.6 (3)	-32.3 ± 0.6 (3)	5.9 ± 0.3 (3)
Corduliidae	Semi-Arid	-92.2 (1)	-27.5 (1)	13.2 (1)
Corduliidae	Transition	-80.4 (1)	-27.9 (1)	16.7 (1)
Corduliidae	Sub-Humid	-68.8 (1)	-31.8 (1)	9.0 (1)
Corydalidae	Transition	-74.5 (1)	-27.6 (1)	14.0 (1)
Dogielinotidae	Transition	-100.0 (1)	-26.0 (1)	15.4 (1)
Dogielinotidae	Sub-Humid	-122.1 (1)	-32.9 (1)	8.5 (1)
Dystiscidae	Sub-Humid	-122.4 ± 24.9 (2)	-31.8 ± 8.9 (2)	6.0 ± 1.8 (2)
Elmidae	Transition	-89.6 ± 12.5 (2)	-28.4 ± 0.2 (2)	14.1 ± 1.5 (2)
Gomphidae	Transition	-92.7 (1)	-27.6 (1)	16.2 (1)
Gyrinidae	Transition	-97.7 (1)	-29.5 (1)	12.7 (1)
Gyrinidae	Sub-Humid	-111.8 (1)	-28.6 (1)	5.7 (1)
Hydropsychidae	Transition	-121.4 (1)	-29.4 (1)	16.0 (1)
Leptophlebiidae	Transition	-111.4 (1)	-30.0 (1)	15.3 (1)
Leptophlebiidae	Sub-Humid	-110.4 (1)	-35.2 (1)	4.4 (1)
Nepidae	Semi-Arid	-88.5 ± 16 (3)	-25.9 ± 2.3 (3)	9.4 ± 4.7 (3)
Nepidae	Transition	-87.6 ± 4.3 (2)	-26.4 ± 0.3 (2)	14.6 ± 0.7 (2)
Palaemonidae	Transition	-98.6 ± 8.6 (2)	-26.1 ± 0.6 (2)	18.5 ± 0.5 (2)
Palaemonidae	Sub-Humid	-93.9 (1)	-29.4 (1)	9.4 (1)
Thiaridae	Semi-Arid	-94.9 (1)	-25.2 (1)	12.9 (1)
Thiaridae	Transition	-133.6 (1)	-25.5 (1)	17.8 (1)
Veliidae	Transition	-100.8 (1)	-28.6 (1)	15.8 (1)

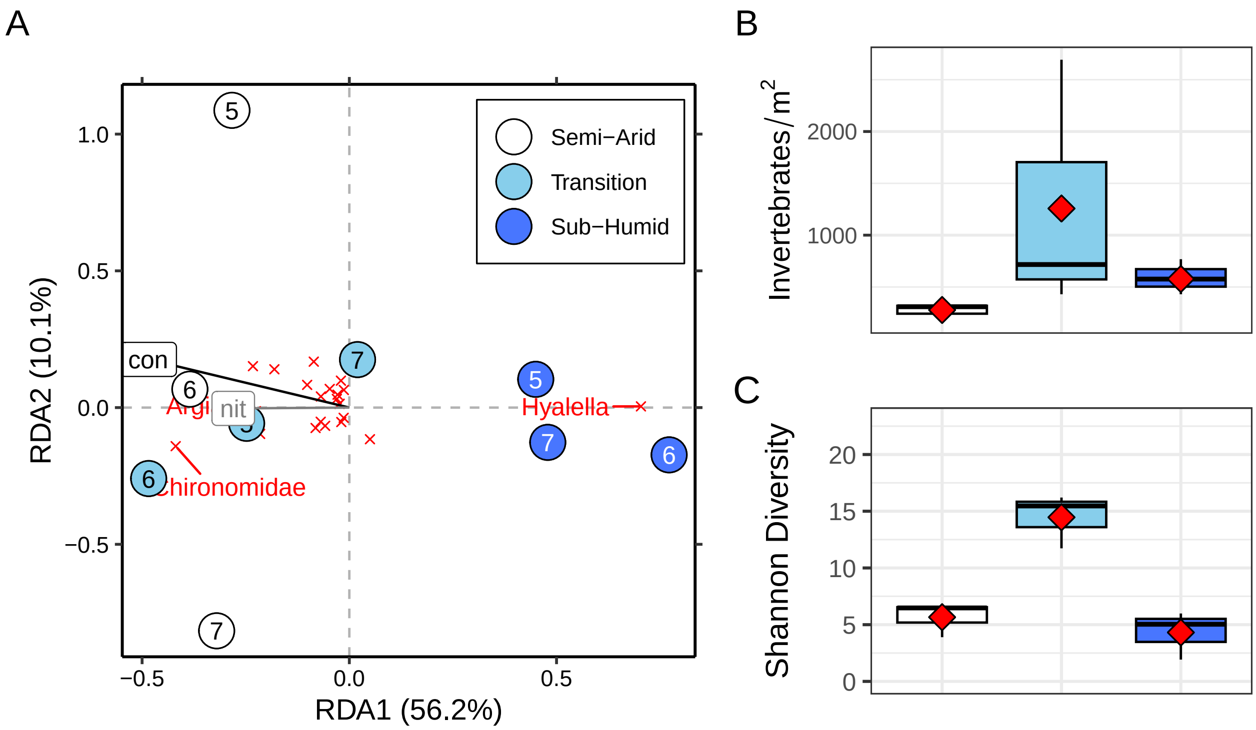
δ^2H, δ^{12}C, and δ^{15}N mean ± standard deviation (number of samples) for Inverterbates at three sample sites (Transition, Semi-Arid, and Sub-Humid).

Supplemental: Community Fish



(A) Ordination of fish communities at Semi-Arid, Transition, and Sub-Humid sites collected in May-July of 2018. Redundancy Analysis axes are labeled with the proportion of variation within the community matrix is explained. The ordination is constrained by 6 environmental variables represented by labeled, arrows (only those with $p<0.1$ are plotted). Circles represent communities with numeric labels for the month sampled and shaded by annual precipitation. Red crosses with spread-out labels represent species; rare and region-wide species ordinate in the center while site-specific and populous species ordinate next to their community. The Semi-Arid site is characterized by *P.latipinna*. The other sites contain more sunfish (*L.macrochirus* and *L.megalotis*) with the Transition site uniquely containing *C.lutrensis* (2/3 months) and the Sub-Humid site containing more *G.affinis*. **(B)** Boxplot of fish densities at semi-arid, transition, and sub-humid sites. **(C)** Boxplot of Shannon-Wiener diversity for fish communities at Semi-Arid, Transition, and Sub-Humid sites. Boxplot colors darken with increasing precipitation and red diamonds represent mean values.

Supplemental: Community Invertebrate



(A) Ordination of invertebrate kicknet communities at Semi-Arid, Transition, and Sub-Humid sites collected in May-July of 2018. Redundancy Analysis axes are labeled with the proportion of variation within the community matrix is explained. The ordination is constrained by 6 environmental variables represented by labeled, arrows (only those with p<0.1 are plotted). Circles represent communities with numeric labels for the month sampled and shaded by annual precipitation. Red crosses with spread-out labels represent taxonomic families; rare and region-wide species ordinate in the center while site-specific and populous species ordinate next to their community. The Sub-Humid site is distinguished from Transition and Semi-Arid site communities by the presence of abundant amphipods (*Hyalella*) **(B)** Boxplot of invertebrate densities at semi-arid, transition, and sub-humid sites surveyed with kicknets May-July in 2018. Box colors darken with rising annual precipitation and red diamonds represent site mean values. Visually, invertebrate densities appear greatest at the transition site, although Tukey comparisons between site means lack statistical significance. **(C)** Boxplot of Shannon-Wiener diversity for invertebrate communities at Semi-Arid, Transition, and Sub-Humid sites surveyed May-July of 2018. Boxplot colors darken with increasing precipitation and red diamonds represent mean values. Invertebrate diversity is highest at the Transition site.

Supplemental: Community RDA

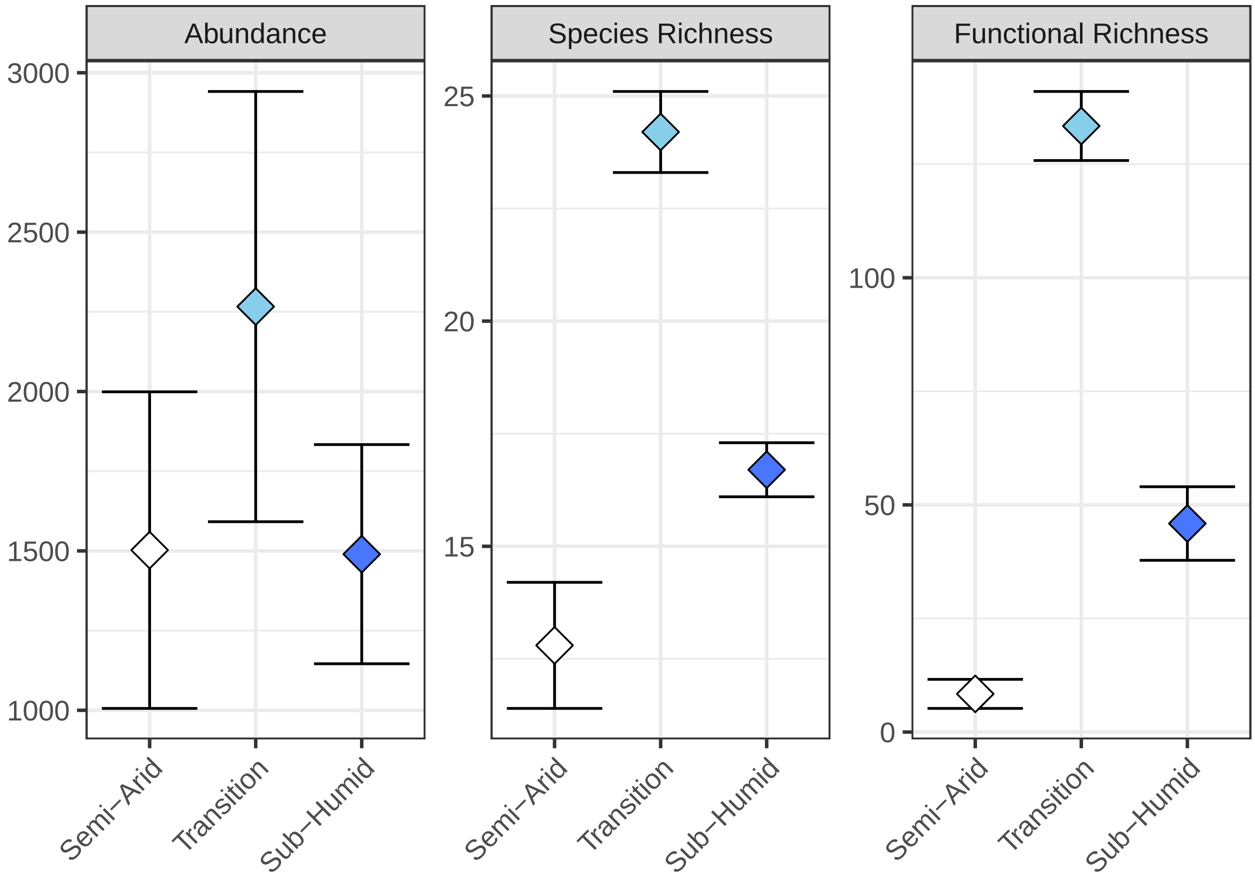
Vector	r	p value	Axis 1	Axis 2
Algae	0.83	-0.56	0.49	0.12
Canopy	0.87	-0.49	0.17	0.58
Conductivity	-0.35	-0.94	0.29	0.35
Flow	-1.00	-0.03	0.09	0.82
Max Depth	0.89	0.46	0.04	0.93
Nitrate	-0.96	-0.30	0.91	0.00**
A.melas	0.03	-0.06	0.24	0.56
A.natalis	0.03	-0.06	0.24	0.56
C.carpio	-0.05	-0.02	0.27	0.44
C.lutrensis	0.05	-0.38	0.77	0.01*
C.variegatus	-0.07	-0.02	0.27	0.44
F.grandis	0.05	0.05	0.18	0.78
G.affinis	0.00	0.39	0.83	0.00**
H.cyanoguttatum	-0.27	-0.15	0.97	0.00**
L.auritus	0.03	0.09	0.32	0.23
L.cyanellus	0.06	0.02	0.26	0.46
L.gulosus	0.00	-0.05	0.01	0.93
L.macrochirus	0.39	-0.05	0.66	0.03*
L.megalotis	0.49	-0.11	0.95	0.00**
L.microlophus	0.02	0.05	0.32	0.23
L.miniatus	0.01	0.01	0.18	0.78
L.oculatus	0.07	0.02	0.27	0.43
M.salmoides	0.05	0.01	0.14	0.72
N.gyrinus	0.06	0.16	0.32	0.23
N.texanus	0.06	0.07	0.23	0.47
O.aureus	-0.03	0.02	0.21	0.64
P.latipinna	-0.72	-0.04	0.98	0.01*
P.vigilax	-0.17	0.00	0.88	0.01*

Axes values (in radians), correlation coefficients and p-values for fitted vectors of environmental variables and influential taxa in the Redundancy Analysis of fish communities.

Vector	r	p value	Axis 1	Axis 2
Algae	-0.28	-0.96	0.07	0.79
Canopy	-0.91	-0.41	0.02	0.96
Conductivity	-0.94	0.34	0.72	0.02*
Flow	-0.36	-0.93	0.29	0.35
Max Depth	0.88	-0.47	0.11	0.68
Nitrate	-1.00	-0.01	0.53	0.10
Anax	-0.02	0.01	0.10	0.80
Aphididae	-0.03	0.03	0.05	0.82
Argia	-0.23	-0.01	0.53	0.10
Caenis	-0.18	0.14	0.62	0.05
Carabidae	-0.01	-0.04	0.46	0.23
Ceratopogon	-0.01	0.06	0.70	0.09
Chironomidae	-0.42	-0.14	0.78	0.01*
Chrysomelidae	-0.02	-0.05	0.46	0.23
Corbicula	-0.09	0.17	0.59	0.07
Enallagma	-0.06	-0.07	0.37	0.26
Erpetogomphus	-0.08	-0.07	0.55	0.07
Hyalella	0.70	0.00	0.99	0.00**
Hydropsyche	-0.02	0.10	0.70	0.09
Libellulidae	-0.02	0.01	0.10	0.80
Melanoides	-0.22	-0.10	0.78	0.02*
Microcylloepus	-0.10	0.08	0.62	0.05
Odontomyia	-0.07	-0.05	0.57	0.10
Probezzia	-0.03	0.05	0.01	0.99
Protoneura	-0.07	0.04	0.10	0.80
Ranatra	-0.05	0.07	0.48	0.16
Rhagovelia	-0.23	0.15	0.67	0.03*
Scirtidae	0.05	-0.12	0.16	0.58

Axes values (in radians), correlation coefficients and p-values for fitted vectors of environmental variables and influential taxa in the Redundancy Analysis of invertebrate communities.

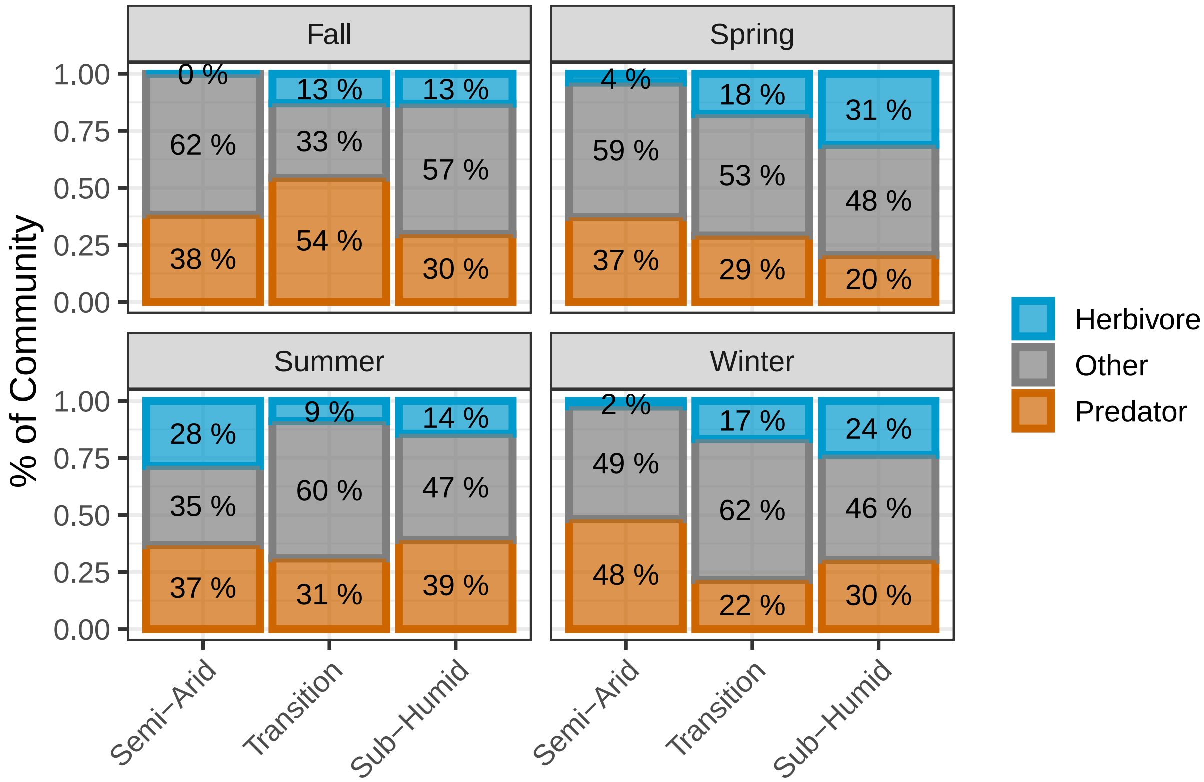
Supplemental: Community *Carvallo et al. 2021* Summary



Annual Mean and standard errors for sediment-core invertebrate abundance (individuals/m^2), species richness, and functional richness at Fernando Creek (Semi-Arid), Aransas River (Transition), and Garcitas Creek (Sub-Humid) (Cavallo et al. 2022).

Site	Functional Richness	Species Richness	Abundance
Semi-Arid	8 ± 3	13 ± 1	1502 ± 497
Transition	133 ± 8	24 ± 1	2266 ± 675
Sub-Humid	46 ± 8	17 ± 1	1490 ± 344

Supplemental: Community *Carvallo et al. 2021* Feeding Groups



Proportions of herbivore, predator, and other invertebrate functional feeding groups in each season of 2018. Data extracted from supplemental table 6 in Carvallo et al. 2022.

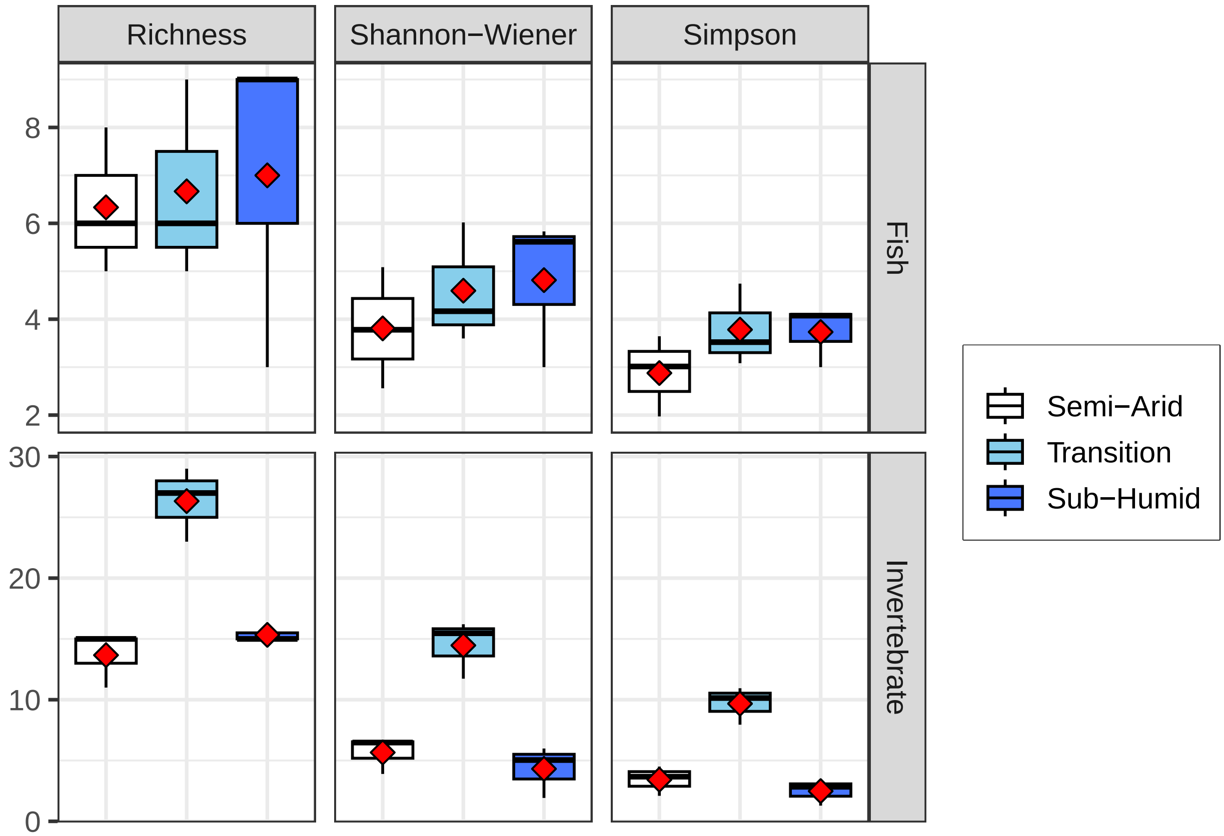
Site	Filter	Collector	Herbivore	Predator	Shredder
Semi-Arid	0.06	0.29	0.28	0.37	0
Transition	0.27	0.33	0.09	0.31	0
Sub-Humid	0.24	0.23	0.14	0.39	0

Supplemental: Community Abundance Comparisons

Guild	Semi-Arid	Transition	Sub-Humid	Comparison	Difference	p value
Fish	1.1 ± 0.4	0.3 ± 0.1	0.6 ± 0.4	Transition-Semi-Arid	-5.7e-01	0.33
Fish	1.1 ± 0.4	0.3 ± 0.1	0.6 ± 0.4	Sub-Humid-Semi-Arid	-9.3e-01	0.10
Fish	1.1 ± 0.4	0.3 ± 0.1	0.6 ± 0.4	Sub-Humid-Transition	-3.5e-01	0.62
Invertebrate	278 ± 66	1257 ± 1002	577 ± 137	Transition-Semi-Arid	3.2e+02	0.85
Invertebrate	278 ± 66	1257 ± 1002	577 ± 137	Sub-Humid-Semi-Arid	1.0e+03	0.27
Invertebrate	278 ± 66	1257 ± 1002	577 ± 137	Sub-Humid-Transition	6.9e+02	0.51

Density statistics and mean comparisons for fish or invertebrates densities. Summary statistics for each site include the mean ± the standard deviation for collections during May-July of 2018. Tukey 'Honest Significant Difference' comparisons are described in terms of the differences between means and the associated p-value. The semi-arid site had greater fish densities than the transition or the sub-humid sites.

Supplemental: Community Diversity Comparisons

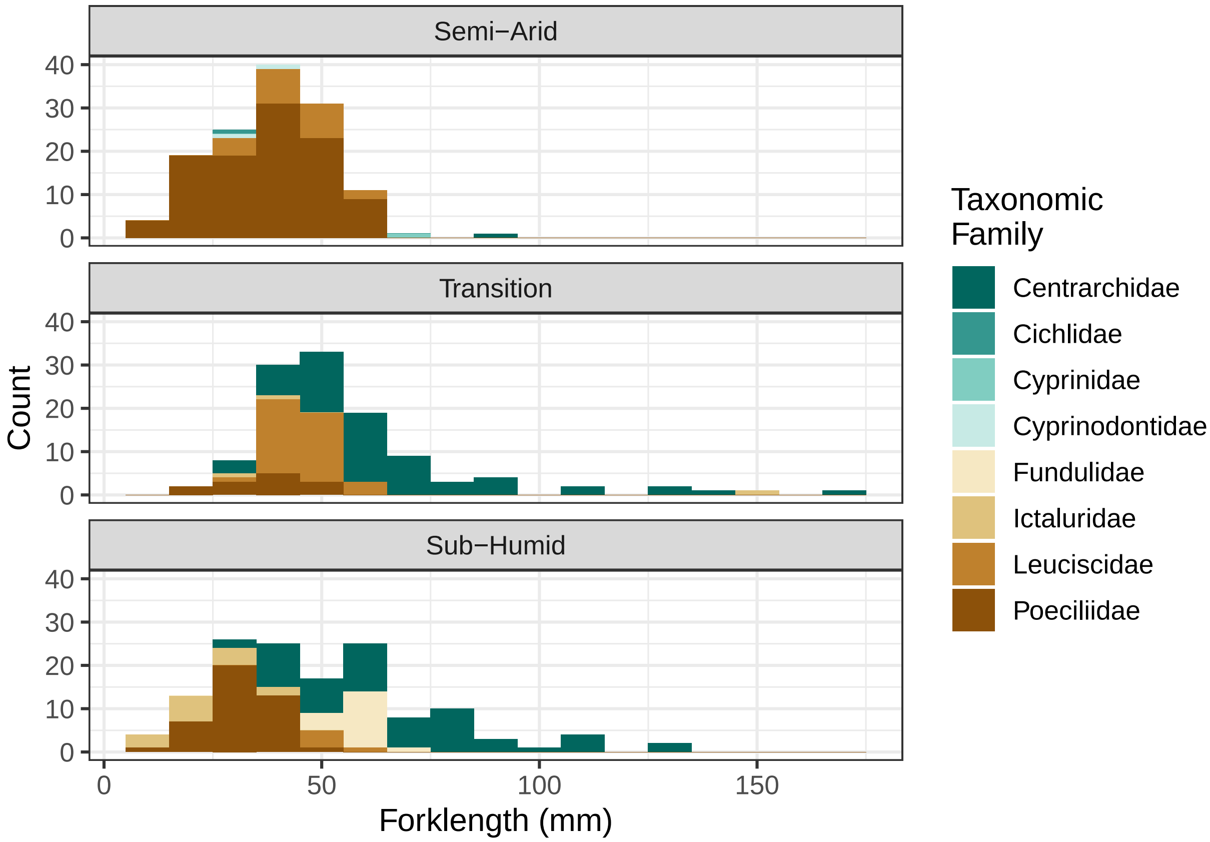


Species richness, Shannon-Wiener, and Simpson diversity estimates for fish and invertebrate communities at Semi-Arid, Transition, and Sub-Humid sites surveyed May-July of 2018. Boxplot colors darken with increasing precipitation and red diamonds represent mean values. Fish species richness and evenness were lowest at the Semi-Arid site and highest at the Sub-humid site. Invertebrate species richness and evenness were greatest at the Transition site.

Guild	Comparison	Difference	Lower	Upper	p value
Invertebrate	Transition-Semi-Arid	9.0	3.6	14.4	5.1e-03
Invertebrate	Sub-Humid-Semi-Arid	-1.4	-6.8	3.9	0.71
Invertebrate	Sub-Humid-Transition	-10.5	-15.8	-5.1	2.4e-03
Fish	Transition-Semi-Arid	1.7	-1.6	5.0	0.32
Fish	Sub-Humid-Semi-Arid	3.0	-0.3	6.3	0.07
Fish	Sub-Humid-Transition	1.3	-2.0	4.6	0.50

Comparisons of mean Shannon-Wiener indices of fish or invertebrates across sites using Tukey's 'Honest Significant Difference' method. Comparisons are described in terms of the differences between means, the lower interval limit, upper interval limit, and associated p-value. Invertebrate diversity is greater at the Transition site compared to Semi-Arid and Sub-Humid sites.

Supplemental: Community Fork Length Comparisons



Histogram of fish forklengths at Semi-Arid, Transition, and Sub-Humid sites surveyed in May-July of 2018. Bar chunks are colored by taxonomic family. to ease visual comparison six spotted gar (*L.oculatus*) with forklengths over 170 mm were omitted; one at the transition site, and five at the sub-humid site. Whole community average forklength is smaller in Semi-Arid compared to Transition and Sub-Humid sites, due to a lack of centrarchids and spotted gar.

TukeyHSD Comparison	Difference	Lower	Upper	p-value
Transition-Semi-Arid	20.6	5.82	35.5	0.00326
Sub-Humid-Semi-Arid	21.1	7.11	35.1	0.00126
Sub-Humid-Transition	0.456	-14.7	15.6	0.997
June-May	-2.68	-15.7	10.3	0.879
July-May	-3.98	-21.4	13.5	0.854
July-June	-1.3	-19.3	16.7	0.984

Comparisons of mean fish forklength across sites using Tukey's 'Honest Significant Difference' method. Comparisons are described in terms of the differences between means, the lower interval limit, upper interval limit, and associated p-value. Invertebrate diversity is greater at the Transition site compared to Semi-Arid and Sub-Humid sites.