Completed Example
Exploring detritus-based food webs in streams: Collaborative worksheet

This worksheet provides context for the accompanying data sheet. Students should make observations about the site and compare their observations to other student groups’ work. Other groups work to compare can be found on the QUBES site for this lesson.

Site Observations
Diagram the stream or river ecosystem here, labeling the connections between the aquatic and terrestrial habitats.


Write down any notes about the ecosystem here. What do you see? What do you expect to see?

The stream emerges from a narrow valley heavily canopied with willows (Salix spp.) and alders (Alnus tenuifolia). Quaking aspen (Populus tremuloides) and ponderosa pine (Pinus ponderosa) are dominant tree species on the slopes surrounding the stream. Stream width varies from 2 to 10 m and the gradient is 8%. Substrate consists mainly of rubble in riffles with few pools present.
Metadata

Collection Date: September 1997 through April 1998

Site Coordinates: near 40.63714017670, -105.52384156100

Stream Name: Little Beaver Creek

Basin Name: South Platte

State, Country: Colorado, USA

Ecoregion (from EPA): Southern Rockies

Season of collection: fall-winter

Level of development (circle one):

Urban    suburban    rural    protected area (USFS Wilderness)

Extras:

Estimated stream discharge during collection (if known): 0.1 to 0.2 m³/s

Stream water temperature during collection (if known): always at or near 0 degrees (celcius)

Stream water conductivity during collection (if known): Conductivity unknown. Nutrients are present in low concentrations (PO₄, 10-12 mg/l; NO₃, 22-29 mg/l); the water is soft (9.4-11.3 mg/l CaCO₃); and the pH is near neutral (7.0-7.1)

Stream water oxygen level during collection (if known): saturated (always at or near 100%)

Aridity Index (if known): unknown
Comparisons

Use the data spreadsheets and the worksheets from previous classes to compare the detritus-based food webs with the one you studied. Complete the venn diagram below to detail what was similar and different (ex: leaf type, season, discharge, invertebrate proportions).

Your site: _LITTLE BEAVER (S. ROCKIES)_

Comparison site 1: _MADE UP SONORAN DESERT_

Comparison site 2: _MADE UP GREAT BASIN_
Reflection

Write a paragraph about how detritus fits into stream food webs.

Students should write about:

- allochthonous detritus (coarse particulate organic matter) enters the stream, becomes a food source (leaves, sticks, twigs, dead plant material)
- leaching and colonization by microbes in the aquatic ecosystem
- processing by aquatic invertebrates (mostly by shredders)
- create fine particulate organic matter by shredding and abrasion
  - feeds other functional groups (collectors/gatherers, filterers)
- invertebrates excrete nutrients that fuel primary production (e.g. algae) for more functional groups to feed on (grazers), connecting ‘brown’ and ‘green’ food webs

Match the equipment to the sampling scenario:

A. drift net, tow net
B. core sampler, surber sampler, hess sampler, eckman grab
C. kick net, D-net

Qualitative benthic invertebrate sample ___C___

Quantitative benthic invertebrate or detritus sample ___B___

Water column sampling of detritus or invertebrates ___A___