Budget Justification (University of Idaho)

A. Senior Personnel: $50,013 TOTAL
1. Principal Investigator Laurel Lynch will serve as Principal Investigator of the project and provide overall direction and oversight. Lynch will also oversee field and laboratory experimentation and integration activities and work with Dr. Menna Jones in the School of Natural Resources at the University of Tasmania on all aspects of the field work. She will also co-mentor and co-advise the two PhD students in field work, laboratory experiments, analysis, and modeling components of this project. The Post-Doc and PhD students will also contribute to experimental development, analysis and writing. Lynch will commit 1.3 person months per academic year in Years 1-2 of the project.

2. Co-Principal Investigator Tara Hudiburg will serve as Co-PI of the project. Hudiburg will oversee field work and modeling components of this project. She will also co-mentor and co-advise the two PhD students in all activities. Hudiburg will commit 1.1 person months in Years 2-3 of the project.

3. Co-Principal Investigator Michael Strickland will serve as Co-PI of the project. Strickland will oversee DNA sequencing, analysis, and interpretation. He will also co-mentor and co-advise the two PhD students in all activities. Strickland will commit 1.0 person months in Year 1 of the project.

Per Chapter II.C.2.g(i)(a), of the FY2020 PAPPG (Senior Personnel Salaries & Wages Policy), the Regents of the University of Idaho have determined the definition of salary year to be based on a calendar year.

B. Other Personnel: $140,000 TOTAL
PhD students. $140,000 is requested for one graduate student research assistantship (7.5 person months per year) in Years 1, 2, and 3 and one graduate student research assistantship (7.5 person months per year) in Years 1 and 2. The PhD students will be responsible for help with field work, laboratory experiments, analysis, and writing. All students will participate in the modeling workshop.

C. Fringe Benefits: $18,294 TOTAL
At the University of Idaho, FY2021 federally negotiated fringe benefits are 30.7% for faculty and 2.1% for students.

D. Equipment: $46,000 TOTAL
$10,000 in funds are requested in Year 1 to construct soil monitoring systems for 30 plots (Campbell Scientific; $2,000 x 5, freight included).

$18,000 in funds are requested in Year 1 to purchase Macrorhizon soil porewater samples fitted with plasticizer-free Tygon sampling lines. These systems will be used to collect dissolved organic carbon for high-resolution metabolite analysis (SoilWater Equipment Corp; $150 x 120, freight included).

$18,000 in funds are requested in Year 1 to purchase Swift 3C cameras to estimate the densities of vertebrate scavengers at each field site (Outdoor Camera Australia $300 each x 60 cameras).

E. Travel: $60,500 TOTAL

E.1 Domestic travel: $10,500

We request funding to cover travel costs to seven conferences at a per conference cost of $1,500, which includes airfare ($480), shared lodging ($100/night * 4 nights = $400), per diem ($55/day * 4 days = $220), and conference registration fees ($400). PIs Lynch, Hudiburg, Strickland, and both PhD students will present research findings in Year 2. PIs Lynch and Hudiburg will also present in Year 3.

E.2 International travel; $50,000

We request funding to cover ten trips to Tasmania, where all field work will be conducted. Each trip costs $5,000, which includes airfare ($1,794), shared lodging ($100/night * 14 nights = $1,400), and per diem ($129/day (14 days = $1,806, according to the Hobart, Australia federal rate).

F. Participant Support Costs: None Requested

G. Other Direct Costs: $179,034 TOTAL

G.1 Materials and Supplies: $57,000
$17,550 in funds are requested to cover reagents and consumables necessary to collect samples in the field and transport them to laboratories at the University of Tasmania. Materials and supplies will be used to chemically extract carbon and nutrient fractions, prepare samples for analysis, and conduct laboratory incubation studies at the University of Idaho. Consumables include amber vials for porewater storage, Whirl-pak sampling bags for soil collection, and reagents for soil biogeochemical, metabolomics, and microbiome characterization.

$39,450 in funds are requested to cover the cost of supplies needed to complete the following analyses: $13,500 for DNA extraction, amplification, and sequencing to characterize soil bacterial and fungal community composition ($50 per sample; 270 samples); $17,400 for soil C analyses including elemental and isotopic composition of C and N in bulk, particulate associated, and mineral associated soil pools ($13 per sample; 384 samples), dissolved organic carbon and total dissolved nitrogen ($8 per sample; 912 samples), and microbial biomass elemental and isotopic C composition ($13 per sample; 384 samples); $4,800 for cation and anion analysis and quantification of amorphous and crystalline Fe and Al phases using Inductively Coupled Plasma Mass Spectrometry ($20 per sample; 240 samples); $3,750 for foliar and fine root elemental and isotopic C and N analysis ($14 per sample; 150 samples), foliar lignin, cellulose, and hemicellulose analysis ($14 per sample; 75 samples), and foliar phosphate, nitrate, and ammonium determination ($8 per sample, 75 samples).

G.2 Publication Costs: $3,000 TOTAL
Publication costs will start in Year 2 of the project (page charges, copying, publishing costs for refereed articles and publications pertaining to project activities) and continue through Year 3.

G.3. Contracted Services: $40,000 TOTAL
$40,000 in funds ($20,000 per year in Years 1-2) are requested to purchase supplies and to support field work at remote sites in Tasmania, which will be coordinated by collaborator Menna Jones at the University of Tasmania. Funds will also cover basic sample processing (extractions, freeze-drying, autoclaving) at the University of Tasmania to ensure no soil or carrion pathogens are shipped across international borders (all instrumental analyses and laboratory incubation studies will be performed at the University of Idaho and/or Washington State University).

G.4. Computer Services: None requested

G.5. Subcontract: None requested

G.6. Other Direct Costs: $61,034 TOTAL
Tuition/Fees/Health Insurance: 2020/21 rates for graduate students at the University of Idaho are $11,778/student/year for tuition/fees and mandatory student health insurance, with an estimated increase of 4.5% per year starting in Year 2. Funds are requested for 1 PhD student in Years 1-3 ($36,948) and 1 PhD student in Years 1-2 ($24,086).

EI GC-MS analysis at the Colorado State University Proteomics and Metabolomics User Facility: $18,000 in funds are requested for metabolomics analysis (using an electron impact gas chromatography mass spectrometer) to characterize the molecular composition and reactivity of dissolved organic carbon ($100 per sample; 180 samples). Pricing includes sample derivatization and metabolite assignment.

H. Total Direct Costs: $493,841 TOTAL

I. Total Indirect Costs: $183,733 TOTAL
The federally negotiated rate for on-campus research is 47.5% on Modified Total Direct Costs, which excludes tuition/fees, equipment, and participant support costs.

J. Total Direct and Indirect Costs: $677,574 TOTAL

L. Amount of This Request: $677,574 TOTAL