**Dataset for: Measuring lotic ecosystem responses to nutrients: a mismatch that limits the synthesis and application of experimental studies to management**

*Micah G. Bennett1,2 and Sylvia S. Lee1*

1National Center for Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C. 20460, United States

**Studies included in literature review**

Dataset 1. Information extracted from studies captured in the literature review, including: study type, study duration, nutrient treatments, nutrients measured, inclusion of TN and/or TP concentration data, explanation of the research-management if it exists, and additional notes if needed.

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| **Study** | **Type** | **Duration** | **Nutrient additions** | **Nutrient measures** | **TN and/or TP reported?** | **Mismatch explanation** | **Study #** |
| Alexander et al. 20131 | Mesocosms (recirculating channels) | 20 days | NaNO3 | NOx, DIN:SRP | No | Nutrient response reported only in terms of NOx & DIN:SRP | 1 |
| Alexander et al. 20162 | Mesocosms (recirculating channels) | 3 weeks | NaNO3 | DIN (NO3-+NO2-+NH4+), DIN:SRP | No | Nutrient response reported only in terms of DIN & SRP | 2 |
| Armendariz et al. 20123 | Field nutrient addition | ~2 years | Fertilizer (12%N, 12%P, 17%K) | NO3-, NO2-, NH4+, PO43- | No | Nutrient response reported only in terms of NO3-, NO2-, NH4+ & PO43- | 3 |
| Artigas et al. 20134 | Field nutrient addition | ~2 years | NH4NO3, NH4H2PO4, fertilizer (12%N, 12%P) | SRP, PO43-, NH4+, NO3-, DIN, N:P | No | Nutrient response reported only in terms of SRP, DIN & N:P | 4 |
| Benstead et al. 20055 | Field nutrient addition | 38 days | NH4Cl, NaH2PO4, KH2PO4 | NH4+, SRP, NO3- | No | Nutrient response reported only in terms of NH4+, SRP, NO3- & molar N & P | 5 |
| Benstead et al. 20076 | Field nutrient addition | Summers for ~22 years | H3PO4, NH4+ | SRP, NH4+, NO3-+NO2- | No | Response to nutrient addition and recovery reported only in terms of SRP, NH4+ & NO3-. | 6 |
| Benstead et al. 20097 | Field nutrient addition | 3 years | NH4NO3, K2HPO4, KH2PO4 | NO3-+NO2-, NH4+, SRP | no | Nutrient response reported only in terms of NO3-+NO2-, NH4+ & SRP. | 7 |
| Boedeltje et al. 20058 | Mesocosms (glass aquaria with flow) | ~ 6 weeks | KNO3, Ca(NO3)2 | PO43-, P, NO3-, NH4+ | No | Nutrient response reported only in terms of PO43-, P, NO3- & NH4+ | 8 |
| Bowden et al. 19929 | Field nutrient addition | ~6 years (enrich.); 8h experiments | H3PO4, (NH4)2SO4 | NH4+, NO3-,TDP, DON | No | Nutrient response reported only in terms of molar N & P (est.) | 9 |
| Bowes et al. 200710 | Mesocosms (streamside flumes) | 6-9 days | KH2PO4 | SRP, TON | No | Nutrient response reported only in terms of SRP & N:P. | 10 |
| Bowes et al. 201211 | Mesocosm (in-stream flumes) | 9 days | KH2PO4, NaNO3 | SRP, N:P | No | Nutrient response reported only in terms of SRP & N:P. | 11 |
| Bumpers et al. 201512 | Field nutrient addition | 2 years | NH4NO3, H3PO4 | DIN, SRP, N:P | No | Nutrient response reported only in terms of SRP, DIN & N:P. | 12 |
| Cashman et al. 201313 | Field nutrient addition | 31 days | Fertilizer pellets (14%N, 14%P, 14%K) | NO3-, NH4+, TDP | no | Nutrient response reported only in terms of NO3-, NH4+, TDP. | 13 |
| Cochero et al. 201314 | Field nutrient addition | 14 months | Fertilizer (12%P, 12%N) | SRP, DIN (NO3- + NH4+) | No | Nutrient response reported only in terms of DIN, SRP & DIN:SRP | 14 |
| Cortelezzi et al. 201515 | Field nutrient addition | ~2 years | Commercial fertilizer (12% N, 12% P, 17% K) | DIN, SRP | No | Nutrient response reported only in terms of SRP & DIN. | 15 |
| Cross et al. 200516 | Field nutrient addition | 2 years | NH4NO3, K2HPO4, KH2PO4 | NOx, NH4+, SRP | No | Nutrient response reported only in terms of SRP, NOx & NH4+ | 16 |
| Cross et al. 200617 | Field nutrient addition | 2 years | NH4NO3, K2HPO4, KH2PO4 | NO3-+NO2-, NH4+, SRP | No | Nutrient response reported only in terms of NOx, NH4+ & SRP. | 17 |
| Cross et al. 200718 | Field nutrient addition | 2 years | NH4NO3, K2HPO4, KH2PO4 | NO3-+NO2-, NH4+, SRP | No | Nutrient response reported only in terms of NOx, NH4+ & SRP. | 18 |
| Davis et al. 200919 | Field nutrient addition | 5 years | NH4NO3, K2HPO4, KH2PO4 | DIN, SRP | No | Nutrient response reported only in terms of DIN & SRP | 19 |
| Davis et al. 201020 | Field nutrient addition | ~5 years | K2HPO4, KH2PO4, NH4NO3 | DIN, SRP | No | Nutrient response reported only in terms of DIN & SRP | 20 |
| Deegan et al. 199721 | Field nutrient addition | ~4 years (summers) | H3PO4 | SRP, NH4+, NO3- | No | Nutrient response measured only in terms of SRP, NH4+ & NO3- | 21 |
| Domenech et al. 200622 | Field nutrient addition | 6 months | NH4NO3, (NH4)3PO4 | NH4+, NO3-, SRP | No | Nutrient response reported only in terms of NO3-, NH4+ & PO4. | 22 |
| Elbrecht et al. 201623 | Mesocosms (streamside recirculating channels) | 30 days | NaNO3, KH2PO4 | DIN (NO3- + NH4+), DRP | No | Nutrient response reported only in terms of DIN & DRP | 23 |
| Elwood et al. 198124 | Field nutrient addition | 95 days | H3PO4 | PO43- | No | Nutrient response reported only in terms of PO43- | 24 |
| Fernandez et al. 201625 | Mesocosms (streamside recirculating channels) | 14 days | NaNO3, Na2HPO4 | NO3-, PO43- | No | Nutrient response reported only in terms of NO3- & PO43- | 25 |
| Fernandez-Going et al. 201326 | Mesocosms (recirculating channels) | 8 weeks | Hoagland’s solution, NH4NO3, KH2PO4 | N, P (calculated from molar concentration of chemical additives) | No | Nutrient response reported only in terms of molar N and P. | 26 |
| Ferreiro et al. 201127 | Field nutrient addition | ~6 months | Fertilizer (12% P, 10%N) | SRP, NO3-, NH4+ | No | Nutrient response reported only in terms of SRP, NO3- & NH4+ | 27 |
| Fulton et al. 200928 | Mesocosms (flow-through flumes with river water source) | 14 days | Ca(NO3-)2, KNO3, KH2PO4 | NO3-, PO43-, molar N:P | No | Nutrient response reported only in terms of NO3-, PO43- & N:P. | 28 |
| Gaudes et al. 201229 | Field nutrient addition | 2 years | NH4NO3, (NH4+)3PO4 | NH4+, PO43-, NO3-, N:P | No | Nutrient response reported only in terms of NH4+, NO3-, PO43- & N:P. | 29 |
| Grattan & Suberkropp 200130 | Mesocosm (streamside channels) | ~30 days | KH2PO4, NaNO2 | SRP, NO3-, NH4+ | No | Nutrient response reported only in terms of SRP, NO3- & NH4+. | 30 |
| Greenwood & Rosemond 200531 | Field nutrient addition | 3 years | NH4NO3, NH2PO4, K2HPO4 | NO2-, NO3-, NH4+, SRP | No | Nutrient response reported only in terms of SRP, NOx & NH4+ | 31 |
| Greenwood et al. 200732 | Field nutrient addition | 4 years | NH4NO3, KH2PO4, K2HPO4 | DIN, SRP | No | Nutrient response reported only in terms of DIN, SRP & N:P | 32 |
| Guasch et al. 199533 | Mesocosms (in-stream flumes) | 2 8-week periods | Fertilizer (18%N, 8% phosphate, 13% K2O) | NO3-, NH4+, SRP, DIN | No | Nutrient response reported only in terms of NO3-, NH4+, SRP & DIN. | 33 |
| Gudmundsdottir et al. 201134 | Field nutrient addition | 4-5 months over 2 years | NH4NO3 | NH4+, TN, TP | No | Nutrient response reported only in terms of NH4+. TN and TP were measured but only reported for control reaches. | 34 |
| Gudmundsdottir et al. 201335 | Field nutrient addition | 4-5 months over 2 years | NH4NO3 | NH4+, TP, TN | Yes (TP only) | Nutrient response reported in terms of TP and NH4+. | 35 |
| Gulis & Suberkropp 200336 | Field nutrient addition | >200 days | NH4NO3, KH2PO4 | NH4+, NO3-,SRP | No | Nutrient response reported only in terms of inorganic N (NH4++ NO3-) & SRP | 36 |
| Gulis & Suberkropp 200437 | Field nutrient addition | ~3 years | NH4NO3, KH2PO4 | NO3-, NH4+, SRP | No | Nutrient response reported only in terms of PO43-, P, NO3-, NH4+ | 37 |
| Gulis et al. 200438 | Field nutrient addition | ~3 years | NH4NO3, KH2PO4 | NO3-+NO2-, NH4+, SRP | No | Nutrient response reported only in terms of NOx, NH4+ & SRP. | 38 |
| Gulis et al. 200839 | Field nutrient addition | ~ 1 year (~ 4 yr enrich.) | NH4NO3, KH2PO4 | NH4+, NO3-, SRP | No | Nutrient response reported only in terms of NH4+, NO3- & SRP | 39 |
| Guo et al. 201640  | Mesocosms (aerated containers with stream water source) | 17 days | NaNO3, KH2PO4 | NO2-+NO3-, SRP, NH4+, N:P | No | Nutrient response reported only in terms of NOx, NH4+, SRP, & N:P. | 40 |
| Guo et al. 201641  | Field nutrient addition | 6 weeks | Fertilizer pellets (0.45 g N & 0.11 g P m-2 d-2) | (Ambient: TN, NO3-+NO2-, NH4+, TP, SRP) | No | Nutrient response reported only in terms of expected g of N & P released from pellets | 41 |
| Guo et al. 201642  | Field nutrient addition | 6 weeks | Fertilizer pellets (16%N, 3.9%P) | Ambient only: TN, TP, NO3-+NO2-, NH4+, SRP | No | Nutrient response reported as expected g N & P released from pellets. Other nutrients only reported for pre-treatment (ambient) conditions. | 42 |
| Hart & Robinson 199043 | Mesocosms (in-stream flumes) | 105 days | Ca(H2PO4)2 | NO3-, NO2-, NH4+, SRP (ambient); est. SRP from flow and dissolution rates | No | Nutrient response reported only in terms of SRP & N:P (est.) | 43 |
| Harvey et al. 199844 | Field nutrient addition | ~ 4 years | H3PO4, (NH4)2SO4 | SRP, NH4+, NO3- | No | Nutrient response reported only in terms of SRP, NO3-, & NH4+ | 44 |
| Hill et al. 200845 | Mesocosms (channels with stream water source) | 10 days | Na2HPO4, NaNO3 | SRP | No | Nutrient response reported only in terms of SRP | 45 |
| Hill et al. 200946 | Mesocosms (channels with stream water source) | ~2 months | Na2HPO4, NaNO3 | SRP | No | Nutrient response reported only in terms of SRP | 46 |
| Hill et al. 201147 | Mesocosms (channels with stream water source) | 18 & 19 days | Na2PO4, NaNO3 | SRP, NO3- | No | Nutrient response reported only in terms of SRP & NO3- | 47 |
| Hinterleitner-Anderson et al. 199248 | Field nutrient addition | ~6 years | H3PO4, (NH4)2SO4 | None (reference previous studies) | No | Nutrient response reported only as reference to previous studies | 48 |
| Horner et al. 199049 | Mesocosms (flow through channels) | ~8-30 days | K2HPO4, NaNO3 | SRP, DIN (NO3-+NO2-+NH3-), N:P, TP | Yes | - | 49 |
| Hoyle et al. 201450 | Field nutrient addition | ~5 years | NH4NO3 (32-0-0) | TP, TDP, TN, NO3-+NO2-, TN:TP | Yes (as TN:TP) | Nutrient response reported in terms of TN:TP but individual concentrations not reported | 50 |
| Hultine et al. 200851 | Mesocosm (experimental stream channels with riparian planting) | Growing season over 2 years | NH4NO3 | NO3- | No | Nutrient response reported only in terms of NO3-. | 51 |
| Humphrey & Stevenson 199252 | Mesocosms (flow-through channels with streamwater source) | 6 days | ‘nutrient solution’ | PO43-, NO3- (Ambient: NO3-, PO43-, TP, TKN) | No | Nutrient response reported only in terms of PO43- & NO3-. TN & TP of periphyton measured as response variable. | 52 |
| James et al. 201553 | Field nutrient addition | 2 years | Fertilizer pellets (N:P:K = 14:14:14) | TP, SRP | yes | Nutrient response reported in terms TP and SRP; no N measures | 53 |
| Kominoski et al. 201554 | Mesocosm (streamside, flow through channels) | 59 days | NH4NO3, H3PO4 | DIN, NO3-, NH4+, SRP | No | Nutrient response reported only in terms of SRP, DIN & N:P. | 54 |
| Lange et al. 201155 | Mesocosms (streamside, flow-through channels) | 41 days | NaNO3, KH2PO4 | NO3-, PO43- | No | Nutrient response reported only in terms of NO3- & PO43- (targets) | 55 |
| Liess et al. 200956 | Mesocosms (circular recirculating channels) | 21 days | NaNO3, KH2PO4 | NO3-, PO43- | No | Nutrient response reported only in terms of NO3- & PO43- | 56 |
| Lock et al. 199057 | Field nutrient addition | 28 days | Phosphate | P | No | Nutrient response reported only in terms of P | 57 |
| Mallin et al. 200158 | Microcosms (4L agitated containers with stream water) | 6-d assays 9 mos. over 2 yrs. | NO3-, NO3-+urea, PO43-, PO43- + glycerophosphate | Ambient: TKN, NO3-, NO3-+NO2-, NH4+, TP, PO43-, TN (as TKN+NO3-)) | No | Nutrient response reported only in terms of N & P molar concentration | 58 |
| Mallin et al. 200459 | Microcosms (4L agitated containers with stream water) | 6 days | NO3-, NO3-+urea, PO43-, PO43- + glycerophosphate | (Ambient: NO3-, NH4+, TN, PO43-, TP, N:P, inorg. N:P) | No | Nutrient response reported only in terms of N & P molar concentration | 59 |
| Manoylov 200960 | Mesocosms (recirculating circular channels) | 18 days | Cobalt NO3-, NaNO3, KPO4 (agar solution) | NO3-, PO43- | no | Nutrient response reported only in terms of NO3- and PO43- | 60 |
| Matthaei et al. 201061 | Mesocosms (streamside, flow-through channels) | 18 days | NaNO3, KH2PO4 | NO3-, PO43-; N & P (unclear how measured, but likely based on molar concentration) | No | Nutrient response reported only in terms of NO3-, PO43- & N&P molar concentration. | 61 |
| McCall et al. 201462 | Mesocosms (in-stream flumes) | 9 days | KH2PO4, NaNO3 | NO3-, SRP, N:P | No | Nutrient response reported only in terms of NO3-, SRP & N:P. | 62 |
| Minshall et al. 201463 | Field nutrient addition | ~7 years | Commercial fertilizer ([NH4PO3]n; 10-24-0) | TDP, TN:TP | Yes (as target TN:TP) | Nutrient response reported in terms of TDP and TN:TP (targets), but actual concentrations not reported. | 63 |
| Moghadam and Zimmer 201464 | Microcosms (1 L containers with stream water source) | 31 days | NH4NO3, KH2PO4, K2HPO4 | NO3-, PO43- | No | Nutrient response reported only in terms of NO3- and PO43- | 64 |
| Mundie et al. 199165 | Mesocosms (streamside recirculating channels) | 7 weeks | NH4NO3, KH2PO4 | SRP, NH4+, NO3-, DIN | No | Nutrient response reported only in terms of SRP, NH4, NO3 & DIN | 65 |
| Murdock et al. 201166 | Mesocosms (recirculating flumes) | 35 days | KNO3, KH2PO4 | NO3--, TN & TP retention (e.g., TNoutflow (L-1 d-1)/TNinflow), TN loading (mg/day), TN loading, NO3-- loading | Yes (TP estimated.) | - | 66 |
| Notestein et al. 200367 | Field nutrient addition | 21 days | KNO3, KH2PO4 | (Ambient: TN, NH4+, NO3-, TP, SRP) | No | Nutrient response reported only in terms of target NO3- & PO43- concentrations. | 67 |
| O’Callaghan et al. 201568 | Mesocosms (streamside, flow through channels) | ~4 weeks | MgNH4PO4 | PO43- | No | Nutrient response reported only in terms of PO43-. | 68 |
| Ocon et al. 201369 | Field nutrient addition | 21 months | Fertilizer (nitrates, ammonium salts, phosphoric anhydride) | SRP, DIN | No | Nutrient response reported only in terms of SRP & DIN | 69 |
| Pan & Lowe 199470 | Mesocoms (cylindrical recirculating channels) | 6 days | PO43-, PO43-+NO3- (specific additions not reported) | Ambient: PO43-, NO3- | No | Nutrient response reported only in terms of molar N and P concentrations. | 70 |
| Pearson and Connolly 200071 | Mesocosms (streamside channels) | 7 months | Fertilizer pellets | NO3-, PO43- | No | Nutrient response reported only in terms of N & P | 71 |
| Peckarsky et al. 201572 | Mesocosms (streamside flow-through) | 14 days | Fertilizer pellets (NH4+, PO43-) | NH4+, SRP | No | Nutrient response reported only in terms of NH4+ & SRP | 72 |
| Perrin et al. 198773 | Field nutrient addition | ~5 months | Fertilizer (34-0-0) | NO3-+NO2-, NH3-+NH4+, SRP | No | Nutrient response reported only in terms of NO3-+NO2-, NH3-+NH4+ & SRP | 73 |
| Peterson et al. 199374 | Field nutrient addition | 4 years | H3PO4, (NH4)2SO4 | SRP, NH4+, NO3-+NO2- | No | Nutrient response reported only in terms of SRP, NO3-, & NH4+ | 74 |
| Piggott et al. 201575 | Mesocosms (streamside channels) | ~42 days | NaNO3, KH2PO4 | NO3-, SRP | No | Nutrient response reported only in terms of NO3- & SRP | 75 |
| Piggott et al. 201576 | Mesocosms (streamside channels) | ~42 days | NaNO3, KH2PO4 | NO3-, SRP | No | Nutrient response reported only in terms of NO3- & SRP | 76 |
| Piggott et al. 201277 | Mesocosm (streamside channels) | 30 days | NaNO3, KH2PO4 | NO3-, PO43- | No | Nutrient response reported only in terms of NO3- & PO43-; and N & P based on molar concentration. | 77 |
| Prieto et al. 201678 | Mesocoms (streamside flow-through channels) | 21 days | Not given | TN, NO3-, PO43- | Yes | Nutrient response reported in terms of initial input differences in TN, NO3- & PO43- ; no TP measurement | 78 |
| Proia et al. 201279 | Field nutrient addition | 52 days | NH4NO3, (NH4)3PO4 | NH4+, SRP | No | Nutrient response reported only in terms of NH4+ & SRP | 79 |
| Rier & Stevenson 200680 | Mesocosms (partially recirculating channels) | 16 days | NaNO3, KH2PO4 | SRP, NO3--N, NO3-+NO2-, NH4++, DIN, TP, TN | Yes and No | TN and TP response to addition not reported, but ecological response models include TN & TP as factors | 80 |
| Robinson & Gessner 200081 | Field nutrient addition | 77 days | Fertilizer briquettes (MgNH4PO4) | None | No | Nutrient response reported only in terms of % N & P of fertilizer addition. | 81 |
| Romani et al. 200482 | Field nutrient addition | 44 days | Ammonium phosphate, ammonium nitrate | PO43-, NH4+, NO3- | No | Nutrient response reported only in terms of approximate increase in PO43-, NO3- & NH4+. | 82 |
| Rosemond 199383 | Mesocosms (streamside flow-through channels) | 7 weeks | NaNO3, NH4Cl, K2HPO4 | SRP, NH4+, NO3-+NO2- | No | Nutrient response reported only in terms of SRP, NO3- & NH4+. | 83 |
| Rosemond et al. 199384 | Field nutrient addition | ~4 months | NaNO3, NH4Cl, K2HPO4 | NO3-, NH4+, PO43- | No | Nutrient response reported only in terms of PO43-, P, NO3- & NH4+ | 84 |
| Rosemond et al. 200085 | Mesocosms (streamside flow-through channels) | 7 weeks | NaNO3, NH4Cl, K2HPO4, H3PO4 | SRP, NO3-, NH4+ | No | Nutrient response reported only in terms of SRP, NO3- & NH4+. | 85 |
| Rosemond et al. 200186 | Field nutrient addition | 10 days | K2HPO4 | SRP, NH4+, NO3- | No | Nutrient response reported only in terms of NH4+, NO3-,SRP & N:P | 86 |
| Rosemond et al. 201587 | Field nutrient addition | 27 ann. meas. | NH4NO3, PO43- | DIN, SRP | No | Nutrient response reported only in terms of DIN & SRP | 87 |
| Royer & Minshall 200188 | Field nutrient addition | 17 days | Fertilizer pellets (7%N, 18%P) | (Ambient: NO3-, NH4+, SRP) | No | Nutrient response reported only in terms of expected release from pellets of NH4+ & PO43- | 88 |
| Sabater et al. 200589 | Field nutrient addition | 44 days | NH4NO3, (NH4)3PO4 | PO43-, NH4+, NO3- | No | Nutrient response reported only in terms of NO3-, NH4+ & PO43- | 89 |
| Sabater et al. 201190 | Field nutrient addition | 4 years | NH4NO3, (NH4)3PO4 | PO43-, NH4+, NO3- | No | Nutrient response reported only in terms of NO3-, NH4+ & PO43- | 90 |
| Stelzer & Lamberti 200191  | Mesocosms (flumes with stream water source) | 28 days | NaNO3, NaH2PO4 | DIN, SRP, NO3+NO2, NH4+, N:P (ambient only: TP) | No | Nutrient response reported only in terms of DIN, SRP, and N:P | 91 |
| Stelzer et al. 200392 | Field nutrient addition | ~11-17 weeks | NaNO3, NaH2PO4 | PO43-, NO3- | No | Nutrient response reported only in terms of PO43- & NO3- | 92 |
| Stevenson et al. 199193 | Mesocosms (streamside flumes) | 30 days | KNO3, H2PO4 | NO3-, PO43- | No | Nutrient response reported only in terms of NO3- & PO43- | 93 |
| Suberkropp et al. 201094 | Field nutrient addition | 5 years | NH4NO3, KH2PO4 | DIN (NH4++NO3-), SRP | No | Nutrient response reported only in terms of DIN & SRP | 94 |
| Tant et al. 201395 | Field nutrient addition | 7 years | K2HPO4, NH4NO3 | DIN, SRP | No | Nutrient response reported only in terms of DIN & SRP | 95 |
| Townsend et al. 200896 | Field nutrient addition | 4 weeks | granulated fertilizer (16%N, 3.5%P) | Soluble N, soluble P, molar N:P | No | Nutrient response not clearly reported in terms of any water column measurement | 96 |
| Townsend et al. 201297 | Field nutrient addition | 10 weeks | Fertilizer pellets (15%N, 4.4%P) | NH4++, NO2--, NO3--, FRP (filterable reactive phosphorus) | No | Nutrient response reported only in terms of NH4+, NO2-, NO3-, and FRP | 97 |
| Veraart et al. 200898 | Field nutrient addition | ~2 years | NH4NO3, (NH4)3PO4 | PO43-, NH4+, NO3-, N/P | No | Nutrient response reported only in terms of PO43-, NH4+, NO3-, and N/P | 98 |
| Wagenhoff et al. 201299 | Mesocosms (circular channels with stream water source) | 21 days | NaNO3, KH2PO4 | DIN, DRP, N:P | No | Nutrient response reported only in terms of DIN, DRP & N:P | 99 |
| Wagenhoff et al. 2013100 | Mesocosms (streamside, flow-through channels) | 20 days | NaNO3, KH2PO4 | DIN, DRP, DIN:DRP | No | Nutrient response reported only in terms of DIN & DRP | 100 |

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