

Environmental Course Review Major Content Areas
Snapshot in time since topics and instructors change

| Topic Area | Course # | Course Name |
|------------------------------|--|---|
| Alternatives Analysis | 77 | PCC2 - Planning, Principles, Procedures |
| | 86 | PCC1 - Civil Works Orientation (alternative plan development) |
| | 270 | PCC4 - Economic Analysis - Flood damage reduction alternatives, trade off analysis |
| | 323 | Regulatory II B - alternatives |
| | 348 | Planning for Ecosystem Restoration - Formulation and evaluation of alternative plans, tradeoff analysis, plan comparison, selecting the recommended plan |
| | 349 | Risk Analysis for Water Resources Planning and Management (WRPM) - risk analysis, scenario analysis for macro-level uncertainties, probabilities, distributions, sensitivity & importance |
| | 394 | Advanced Streambank Erosion & Protection - Data to select treatment alternatives |
| | 406 | PCC6 - Plan Formulation - strategies and alternative plans, trade off analysis and plan selection |
| | 426 | Wetland River Function/Ecology for PM's - wetland functional area assessment, alternatives, HGM functional assessment |
| | Authorization & Appropriation Process | 77 |
| 86 | | PCC1 - Civil Works Orientation (congressional authorizations) |
| 281 | | Riparian Zone Ecology, Restoration & Management - Corps environmental restoration authorities (CAP, GI, WRDA) |

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| | 406 | PCC6 - Plan Formulation - authorities and policies for |
| Beach Nourishment | 11 | Coastal Project Planning |
| Beneficial Use of Dredged Materials | 11 | Coastal Project Planning |
| Case Studies | | |
| | 57 | Hydraulic Engineering for Planning (Flood hydrology, synthetic rain floods in CA) |
| | 77 | PCC2 - Planning, Principles, Procedures (Miami Harbor, Roseau, Upper Newport Bay) Water and the Watershed - Case Study of a Community Watershed Program, Yolo Wetlands Restoration, Eco Regional Planning - Use of Watershed Principles |
| | 164 | Environmental Impact Assessment - Case study on HEP, case study on ecological restoration |
| | 169 | |
| | 170 | Environmental Laws & Regulations - NEPA case study, Aberdeen What Went Wrong? |
| | 192 | Creek of Swan River Basin watershed; Nyack site of Middle Fork Flathead River, Jocko River |
| | 239 | Wetland Mitigation Banking - Proactively addressing ecological considerations for mitigation bank site selection and design (case study from VA), unspecified later case |
| | 270 | PCC4 - Economic Analysis - Flood damage reduction urban setting, CE/ICA case study, risk & uncertainty case study |

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| 276 | Wetland Development & Restoration - wetland functional assessment (Nisqually River Restoration), wetland restoration & hydrology case studies |
| 281 | Riparian Zone Ecology, Restoration & Management - Milltown dam site study, assessing the stream system hydrology and fluvial geomorphology |
| 285 | Streambank Erosion & Protection - Tiffentown bridges protection & extension, Section 14 project for the I-20 highway, 18-mile creek restoration video, puzzling student projects |
| 299 | Cultural Resources - field trip to Pecos National Historic site, field trip on architectural history of Santa Fe, |
| 322 | Regulatory II A - student cases on cumulative impacts and endangered species |
| 323 | Regulatory II B - student cases |
| 348 | Planning for Ecosystem Restoration - Everglades case study, Chester Creek, AK, Local restoration project, Corps ecosystem restoration study showcase, case study lessons learned |
| 349 | RISK ANALYSIS FOR WATER Resources Planning and Management (WRPM) - key uncertainties associated with specific business lines or Corps functions, case studies on 2x2 matrix, qualitative risk assessment, variability & uncertainty, probability, Monte Carlo simulation, cost estimate |

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| 392 | Historic Structures Preservation Guidance - Lake Washington Ship Canal, demonstration of repair techniques, case studies in interpreting preservation |
| 394 | Advanced Streambank Erosion & Protection - Delta Headwaters Program, Bellefontaine Creek, MS, 18-mile creek, Worsham Creek, Batupan Bogue, Hickahala Creek, Hotopha Creek, Harris Creek, Godowin Creek, Hoffa Creek, student presentations on case studies |
| 395 | Environmental Remediation Techniques - Nebraska Ordnance Plant |
| 406 | PCC6 - Plan Formulation - plan formulation case study, NER plan with case study |
| 407 | PCC7 - Public Involvement & Team Planning - case study issues |
| 426 | Wetland River Function/Ecology for PM's - Tennessee and case studies, North Fork/Middle Fork/South Fork river, Flathead River, NYACK site, Emery Creek, Coram/White City area, stream restoration case studies. |

Climate Change

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| 161 | Hydraulic Analysis for Ecosystem Restoration (climate change implications for hydrology & restoration) |
| 281 | Riparian Zone Ecology, Restoration & Management - global warming |

Civil Works Process

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| 77 | PCC2 - Planning, Principles, Procedures (overview) |
| 86 | PCC1 - Civil Works Orientation (steps 1-21) |

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| | | Planning for Ecosystem Restoration - Corps guidance, overview of 6-step planning process |
| 348 | | |
| | | PCC6 - Plan Formulation - how to identify measures and put them into plans, authorities and policies, reports, telling the plan formulation story |
| 406 | | |
| | | PCC3 - Environmental Considerations - NEPA, Ecological Assessment in Planning, Collaborative Planning |
| 408 | | |
| | | PCC5 - H&H Considerations in Planning - Civil Works Project Purposes and H&H Input |
| 409 | | |
| Coastal Ecology | | |
| | 11 | Coastal Project Planning |
| | | Coastal Ecology - benthic, wetlands, fish & estuaries, oysters, seagrass, hard bottom habitat, salt marsh beach, invasive species, dunes |
| 263 | | |
| | | PCC5 - H&H Considerations in Planning - Coastal fundamentals, coastal damage reduction |
| 409 | | |
| Coastal Geology & Geomorphology | | |
| | 11 | Coastal Project Planning |
| | | PCC5 - H&H Considerations in Planning - Coastal fundamentals, coastal damage reduction |
| 409 | | |
| Coastal Wave Dynamics | | |
| | 11 | Coastal Project Planning |
| Conflict Management & Dispute Resolution | | |
| | 100 | Regulatory I (basic pertaining to permits) |
| | | Wetland Mitigation Banking - dispute resolution |
| 239 | | |

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| | 407 | PCC7 - Public Involvement & Team Planning - values, communications basics, conflict management, cooperation dilemma, communicating risk, public meetings |
| Construction, Operation & Maintenance | | |
| | 86 | PCC1 - Civil Works Orientation Riparian Zone Ecology, Restoration & Management - riparian restoration stewardship and management |
| | 281 | Streambank Erosion & Protection - streambank protection method design and construction - weirs, stone toe protection, j-hooks, rock vanes, bridge protection, riprap, trenchfill, windrow, dikes, retards, revetment |
| | 285 | Cultural Resources - Construction management, operation/installation management |
| | 299 | Historic Structures Preservation Guidance - historic construction styles, seismic retrofitting, protecting and restoring exterior and interior design elements, repair shops, job order contracts, preservation treatment |
| | 392 | Advanced Streambank Erosion & Protection - Bioengineering techniques, design and construction of streambank protection/stabilization/restoration and erosion control methods |
| | 394 | Environmental Remediation Techniques - Landfill slope stability and landfill drainage design (berms, drainage layer), collection trenches, geosynthetics, alternative covers, vertical barrier walls, excavation & disposal, |
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Continuing Authorities

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| | 86 | PCC1 - Civil Works Orientation |
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281 Riparian Zone Ecology,
Restoration & Management -
Corps environmental restoration
authorities (CAP, GI, WRDA)

**Cost
Effectiveness/Incremental
Cost Analysis/Cost Sharing**

77 PCC2 - Planning, Principles,
Procedures
86 PCC1 - Civil Works Orientation
(cost sharing)

270 PCC4 - Economic Analysis -
Remaining Benefit Remaining
Cost ratio, Cost
Effectiveness/Incremental Cost
Analysis

348 Planning for Ecosystem
Restoration - cost
effectiveness/incremental cost
analysis, IERPLAN, tradeoff
analysis

349 Risk Analysis for Water
Resources Planning and
Management (WRPM) - Monte
Carlo process and realistic cost
estimate

406 PCC6 - Plan Formulation - NED,
cost effectiveness,
incrementation cost analysis
with NER plan, multi-purpose
cost allocation

408 PCC3 - Environmental
Considerations - Cost
effectiveness and incremental
cost analysis/lessons learned

409 PCC5 - H&H Considerations in
Planning - developing scope,
schedules and cost estimates
for PMP's

Cultural & Historic Resources

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| | Environmental Impact Assessment - Prediction and assessment of cultural environment impacts - NAS/NRC reports, human health risk, monitoring, EMS |
| 169 | Cultural Resources - Corps program, intro to historic preservation, archeological resources, preservation, historic resources, statutory background, Corps regulations and policies, Section 106 process, identification of cultural resources, national register, measures of significance, adverse effect, Advisory Council comment process, field sites, construction and operation, regulatory management, tribal interests and consultation, NAGPRA, state grave protection laws, Corps regulatory process |
| 299 | Regulatory II A - historic properties, tribal issues |
| 322 | Historic Structures Preservation Guidance - Section 106, 110 and 305, National Historic Preservation Act, Regulations, Integrated Cultural Resource Management Plans, SOI standards, identification & documentation, accessibility, preservation & restoration, case studies in interpreting preservation, seismic retrofitting, energy conservation and engineering support systems |
| 392 | Native American Environmental/Cultural Resources - tipis, sweathouses, longhouse traditions, foods, ecological implications of first foods, stone tool technology, tule mat making, basket weaving, storytelling, environmental rights protection, |
| 950 | native plants, medicines |

Cumulative Effects

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| 161 | Hydraulic Analysis for Ecosystem Restoration (cumulative effects of restoration in complex watersheds) |
| 169 | Environmental Impact Assessment - cumulative effects assessment - describing the affected environment |
| 322 | Regulatory II A - scope of analysis, cumulative impacts |
| 323 | Regulatory II B - cumulative impacts |
| 408 | PCC3 - Environmental Considerations - Cultural resources and mapping |

Decision Making Methods

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| 169 | Environmental Impact Assessment - methodologies for decision making in EIA Planning for Ecosystem Restoration - inventory & forecast, quantification of ecosystem outputs, evaluation tools, alternative plans, tradeoff analysis, selecting the recommended plan |
| 348 | RISK ANALYSIS FOR WATER Resources Planning and Management (WRPM) - scenarios for uncertainty, vulnerability assessment, simulations, probability, sensitivity & importance |
| 349 | |
| 356 | CERCLA & RCRA - hazard ranking, system scoring |
| 406 | PCC6 - Plan Formulation - problem identification, selection of NED plan, determination of objectives and constraints, strategies and alternative plans, trade off analysis for comparison |
| 408 | PCC3 - Environmental Considerations - selecting an approach, collaborative planning |

Dredging Basics

Economic Analysis

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| 11 | Coastal Project Planning |
| 270 | PCC4 - Economic Analysis - economist role, guidance, basic and applied economics, risk analysis, NED, non-structural, trade off analysis, major rehabilitation, recreation, impact analysis, navigation, forecasting, Remaining Benefit Remaining Cost Ratio (RBRCR's), Cost Effectiveness, Incremental Cost Analysis |
| 348 | Planning for Ecosystem Restoration - inventory & forecast, quantification of ecosystem outputs, evaluation tools, cost effectiveness, incremental cost analysis |
| 349 | Risk Analysis for Water Resources Planning and Management (WRPM) - Monte Carlo process and realistic cost estimate |
| 406 | PCC6 - Plan Formulation - NED, cost effectiveness, incrementation cost analysis with NER plan, multi-purpose cost allocation, trade off analysis |
| 408 | PCC3 - Environmental Considerations - cost effectiveness and incremental cost analysis, lessons learned |

Ecosystem Restoration

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| 57 | Hydraulic Engineering for Planning (ecosystem restoration tools) |
| 161 | Hydraulic Analysis for Ecosystem Restoration (models, Lower MS Valley, river ecosystems, principles for stream restoration, watershed research) |

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| 169 | Environmental Impact Assessment - Case study on ecological restoration |
| 192 | Wetland Stream Ecology - Flathead Lake, Montana Game & Fish Jocko River restoration |
| 272 | Fundamentals of Wetland Ecology - restoration, creation and enhancement of wetlands |
| 276 | Wetland Development & Restoration - wetland stream restoration, restoration projects (forested, freshwater), water budget |
| 280 | Interdisciplinary Training for Ecosystem Restoration - geosciences, hydrology, biology, soils, wetland systems, freshwater aquatics, bioassessment, prairie restoration, hydraulic engineering, bioengineering, |
| 281 | Riparian Zone Ecology, Restoration & Management - restoration authorities, planning and design of riparian restoration, buffer strips and corridors |
| 285 | Streambank Erosion & Protection - ecological considerations during streambank and riparian restorations, innovative techniques for stream and riparian areas, environmental impacts of channel restoration features |
| 348 | Planning for Ecosystem Restoration - significant resources, problems & opportunities, objectives and constraints, fundamentals of ecosystem processes 101, management measures, ecosystem outputs, evaluation, comparison, lessons learned, R&D |

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| 394 | Advanced Streambank Erosion & Protection - stabilization/restoration for Goodwin Creek, rooted/stock plants, volunteer plantings, bank stabilization/restoration at Long Creek |
| 395 | Environmental Remediation Techniques - in-situ remediation, biological processes, biotreatment |
| 406 | PCC6 - Plan Formulation - National Ecosystem Restoration (NER) Plan |
| 408 | PCC3 - Environmental Considerations - ecological assessment, ecosystem authorities/restoration/mitigation |
| 409 | PCC5 - H&H Considerations in Planning - ecosystem restoration and exercise |
| 426 | Wetland River Function/Ecology for PM's - Flathead River watershed system, stream ecology, floodplain importance, wetland functional assessment, woody debris, Rosgen channel restoration metho, river restoration structures/function. |

Emergency Operations & Homeland Security

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| 86 | PCC1 - Civil Works Orientation |
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Endangered Species/TES

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| 100 | Regulatory I (ESA) |
| 322 | Regulatory II A - endangered species, essential fish habitat |
| 408 | PCC3 - Environmental Considerations - Fish & Wildlife Coordination Act, Endangered Species Act and Role Play, Essential Fish Habitat, class exercise |
| 426 | Wetland River Function/Ecology for PM's - ESA |

Environmental Operating Principles

57 Hydraulic Engineering for
Planning
Native American
Environmental/Cultural
Resources - Environmental
Operating Principles and You
950

Facilitation Techniques

77 PCC2 - Planning, Principles,
Procedures (brainstorming)
86 PCC1 - Civil Works Orientation
(team building)
407 PCC7 - Public Involvement &
Team Planning - facilitation,
active listening, information
to/from stakeholders,
communications basics, conflict
management, cooperation
dilemma, communicating risk,
public meetings, interactive
meetings

Feasibility Study

86 PCC1 - Civil Works Orientation
(conduct feasibility study)

Flood Damage Reduction

57 Hydraulic Engineering for
Planning
270 PCC4 Economic Analysis - flood
damage reduction urban, flood
damage reduction alternatives
406 PCC6 - Plan Formulation - FDR
formulation, strategies,
measures, incremental analysis
409 PCC5 - H&H Considerations in
Planning - Flood risk
management, levee certification
implications

Flow Concepts

57 Hydraulic Engineering for
Planning

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| 161 | Hydraulic Analysis for Ecosystem Restoration (analyzing flow, developing environmental flow recommendations) |
| 285 | Streambank Erosion & Protection - geomorphic and geotechnical assessments, system protection, channel restoration |
| 426 | Wetland River Function/Ecology for PM's - regulated and unregulated river systems, upwelling and downwelling of water, channel morphology |

Forecasting

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| 77 | PCC2 - Planning, Principles, Procedures |
| 270 | PCC4 - Economic Analysis - Forecasting and exercise on Planning for Ecosystem Restoration - Inventory & forecast |
| 348 | PCC6 - Plan Formulation - ER - problem identification, inventory and forecast for formulation, also for FDR, NAV |

Groundwater

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| 57 | Hydraulic Engineering for Planning |
| 161 | Hydraulic Analysis for Ecosystem Restoration (groundwater/surface water interaction) |
| 169 | Environmental Impact Assessment - prediction & assessment of ground water impacts |
| 192 | Wetland Stream Ecology - Ground water hydrology |
| 225 | Environmental Sampling - ground water sampling, aquifer testing at HTW site, sampling demo, ground water monitoring |
| 280 | Interdisciplinary Training for Ecosystem Restoration - surface water and ground water hydrology |

HGM

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| 395 | Environmental Remediation Techniques - ground water extraction |
| 398 | Environmental Regulations, Practical Applications - Safe Drinking Water Act, Waste Water discharge, Storm water discharge |
| 137 | Regulatory VI HGM |
| 272 | Fundamentals of Wetland Ecology - wetlands HGM |
| 280 | Interdisciplinary Training for Ecosystem Restoration - HGM approach |
| 285 | Streambank Erosion & Protection - geomorphic assessments and geotechnical considerations and design, streambank protection, bendway weirs, rock vanes, stone toe protection, rooting plants, bank stabilization, geotechnical problems, riprap protection, trenchfill, windrow, dikes, revetment designs. |
| 394 | Advanced Streambank Erosion & Protection - bioengineering techniques, hydraulic and geotechnical processes that control bank stability |
| 409 | PCC5 - H&H Considerations in Planning - hydraulics, hydrology, H&H demos, channel roughness, geomorphology |
| 426 | Wetland River Function/Ecology for PM's - HGM wetland classifications, HGM functional assessment, riverine low gradient, role of woody debris, bank stabilization, hydrology |

HTRW

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| 86 | PCC1 - Civil Works Orientation (HTRW Considerations) |
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| 170 | Environmental Laws & Regulations - RCRA, CERCLA - liabilities, defenses, remedies, recoverable costs, other pollution control programs, enforcement |
| 225 | Environmental Sampling - contaminant sampling, quality assurance, geophysics, monitoring wells, decontamination, investigation of derived waste, analytical strategies, statistic analysis of data and GIS |
| 356 | CERCLA/RCRA Remediation process, rule development, preliminary assessments, site inspections, hazard ranking, removal actions, remedial investigations, feasibility studies, applicable/relevant requirements (ARAR's), RODs, remedial design, administrative record, National Priorities list, RCRA corrective action, RCRA facility investigation, interim stabilization exercises, management of remediation wastes |
| 395 | Environmental Remediation Techniques - in situ remediation, ground water extraction, soil vapor extraction, product recovery, natural attenuation, IS air sparging, thermal treatment, chemical oxidation/reduction, flushing, landfills, landfill gas, covers, barrier walls, collection trenches, permeable reaction walls, biotreatment, excavation & disposal, stabilization/solidification, soil washing |

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| | | Environmental Regulations, Practical Applications - rules development, solid waste, waste minimization, identification/classification of hazardous waste, generator requirements, hazardous waste management, land disposal restrictions, used oil, PCB's, Safe Drinking Water Act, Waste Water discharge, Storm water discharge, pesticides, spill preparedness/response, asbestors/lead paint, emergency planning/right to know, Clean Air Act, Underground and Above Ground storage tanks, Environmental Management System |
| | 398 | |
| HQUSACE Reviews/Perspective | | |
| | 86 | PCC1 - Civil Works Orientation - HTRW Considerations |
| | 164 | Water and Watershed History watershed view from HQ |
| | 325 | Regulatory III - HQ perspective |
| Hydraulic Analysis | | |
| | 57 | Hydraulic Engineering for Planning |
| | 140 | Regulatory IV Interagency Wetland ID and Delineation (hydrology as it pertains to wetlands) Hydraulic Analysis for Ecosystem Restoration (groundwater/surface water interaction, hydraulic analysis methods for restoration, application of hydraulic principles for stream restoration) |
| | 161 | Water and the Watershed - Occurrence, Movement & Storage of Water, Hydrologic Regime field trip |
| | 164 | |

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| 192 | Wetland Stream Ecology - introduction to hydrology and geomorphology, first order streams, ground water hydrology, floodplain dynamics, sediments, altered channels, transport of carbon |
| 272 | Fundamentals of Wetland Ecology - wetland hydrology, HGM Interdisciplinary Training for Ecosystem Restoration - water and hydrology, hydrology demonstrations |
| 281 | Riparian Zone Ecology, Restoration & Management - assessing the stream system hydrology and fluvial geomorphology Streambank Erosion & Protection - geomorphic and geotechnical assessments, system protection, channel restoration |
| 285 | Advanced Streambank Erosion & Protection - channel evolution, treatment methods, analysis of channel processes (CEM) and evolutionary trends |
| 394 | PCC5 - H&H Considerations in Planning - hydraulics, hydrology, H&H demos, channel roughness, geomorphology |
| 409 | Wetland River Function/Ecology for PM's - HGM wetland classifications, HGM functional assessment, riverine low gradient, role of woody debris, bank stabilization, hydrology |
| 426 | |

Independent Technical Review

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| 86 | PCC1 - Civil Works Orientation Water and the Watershed - Related - Agency perspectives from various federal agencies and TNC |
| 164 | |

198 Environmental Writing -
Interdisciplinary review of
EA/EIS

Interagency

86 PCC1 - Civil Works Orientation

140 Regulatory IV - Interagency
Wetland ID & Delineation
Water and the Watershed -
Related - Agency perspectives
from various federal agencies
and TNC

164 Wetland Mitigation Banking -
Interagency Review Teams -
their role

239 Interdisciplinary Training for
Ecosystem Restoration - related
- communications among
disciplines

280 Regulatory III - interagency
agreements

325

Invasive Species

263 Coastal Ecology - invasive
species (salt marsh beach,
dunes)

280 Interdisciplinary Training for
Ecosystem Restoration - natives
and invasive species

281 Riparian Zone Ecology,
Restoration & Management -
invasive plants in riparian plant
communities, management and
control

426 Wetland River Function/Ecology
for PM's - exotics

Inventory & Sampling Methods

168 Ecological Resources -
inventory methods for
freshwater systems, field data
collection for fish, herps,
vegetation, birds (mist nets,
counts), mammals (scent
stations, live and snap traps),
bats (radiotelemetry), GIS,
remote sensing, sampling
standards, Level 1 Natural

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| 192 | Wetland Stream Ecology - field work on benthic invertebrates, role of large wood debris, fishery ecology |
| 225 | Environmental Sampling - sampling strategies and statistics for contaminants, soil gas & air sampling, surface water and sediment sampling, waste sampling, ground water sampling, aquifer testing |
| 272 | Fundamentals of Wetland Ecology - soil surveys, wetland classification and functions, wetland wildlife |
| 280 | Interdisciplinary Training for Ecosystem Restoration - soil profiles, data collection methods, rapid bioassessment technique |
| 281 | Riparian Zone Ecology, Restoration & Management - inventory of riparian fauna (reptiles, birds, amphibians, plants) |
| 348 | Planning for Ecosystem Restoration - Inventory & forecast |
| 394 | Advanced Streambank Erosion & Protection - herpetology and fish sampling demos |
| 406 | PCC6 - Plan Formulation - ER - problem identification, inventory and forecast for formulation, also for FDR, NAV |
| 423 | Wetland Plant Identification, Southeast - nomenclature, references, guides, field trips and plant identification guides (Apalachicola National Estuarine Reserve, Ap Wildlife Management Area, Ap National Forest, Two Mile Island, Tate's Hell) |
| 426 | Wetland River Function/Ecology for PM's - wetland classifications, wetland functional assessment, IBI method, Rosgen method |

950 Native American
Environmental/Cultural
Resources - Fishing nets demo,
native plant resources

Media Coordination

100 Regulatory I
PCC7 - Public Involvement &
Team Planning - public
meetings, communicating risk,
preparing a communications
plan, media training, mock
407 public meeting, taped interviews

Metrics

77 PCC2 - Planning, Principles,
Procedures
239 Wetland Mitigation Banking -
performance standards
Planning for Ecosystem
Restoration - management
measures, quantification of
ecosystem outputs, cost
348 effectiveness
406 PCC6 - Plan Formulation - how
to identify measures and build
them into plans

Mitigation

57 Hydraulic Engineering for
Planning (flood damage)
100 Regulatory I (compensatory
mitigation)
Environmental Impact
Assessment - workshop on
mitigation banking - prediction
and assessment of impacts on
the socioeconomic environment
169 Environmental Laws &
Regulations - Mititgation, section
170 404 implementation issues

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| | interagency review, policy and regulations, banking instruments, ecological considerations for banking site, in lieu fee mitigation, enforceable performance standards, real estate instruments, financial assurances/banking instruments, wetland and stream credit determinations, service area determination, conservation banking, wetland and stream credit releases, long-term management plans, third party oversight, monitoring report, property analysis record |
| 239 | |
| | Fundamentals of Wetland Ecology - wetland mitigation |
| 272 | |
| | Wetland Development & Restoration - mitigation banking |
| 276 | |
| | Regulatory II B - mitigation introduction and definition, mitigation MOA, developing mitigation plans |
| 323 | |
| | Regulatory III - mitigation plans |
| 325 | |
| | PCC3 - Environmental Considerations - ecosystem mitigation |
| 408 | |

Models/Tools

At Risk Software

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| | Risk Analysis for Water Resources Planning and Management (WRPM) - At Risk software, Risk Matrix, CARVER + Shock (vulnerability assessment), Monte Carlo simulations, PSA Model |
| 349 | |

Bank Stability Model

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| | | Advanced Streambank Erosion & Protection - Development of the Bank Stability Model (ARS-National Sedimentation Lab) and use of to design stabilization/restoration for Goodwin Creek |
| | 394 | |
| Basin Models | 57 | Hydraulic Engineering for Planning (unspecified basin modeling concepts for rainfall runoff) |
| Beach-fx | | |
| | 349 | Risk Analysis for Water Resources Planning and Management (WRPM) - Beach-fx |
| Carver + Shock | | |
| | 349 | Risk Analysis for Water Resources Planning and Management (WRPM) - CARVER + Shock (vulnerability assessment) |
| Channel Evolution Model | | |
| | 285 | Streambank Erosion & Protection - channel evolution model |
| | 394 | Advanced Streambank Erosion & Protection - Channel Evolution Model |
| Coastal Models | | |
| | 11 | Coastal Project Planning (summary of unspecified coastal models) |
| | 409 | PCC5 - H&H Considerations in Planning - coastal and riverine models |
| Ecosystem Functions Model | | |
| | 57 | Hydraulic Engineering for Planning |

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| | 348 | Planning for Ecosystem Restoration - ecosystem output models |
| Ecological Dynamics Simulation Model (EDYS) | | |
| | 280 | Interdisciplinary Training for Ecosystem Restoration - EDYS demo |
| Fisheries Modeling | | |
| | 57 | Hydraulic Engineering for Planning |
| Flood Warning Tool | | |
| | 57 | Hydraulic Engineering for Planning |
| GEO-RAS | | |
| | 161 | Hydraulic Analysis for Ecosystem Restoration (Intro to GEO-RAS to investigate ecosystem change) |
| GIS/Remote Sensing/GPS | | |
| | 11 | Coastal Project Planning - assessing project data |
| | 168 | Ecological Resources - Conceptual overview of GIS and remote sensing, practical applications, GPS for terrestrial wildlife inventories |
| | 225 | Environmental Sampling - Contaminant data management and GIS |
| HarborSym | | |
| | 349 | Risk Analysis for Water Resources Planning and Management (WRPM) - HarborSym |
| HEC EFM | | |

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| | 161 | Hydraulic Analysis for Ecosystem Restoration (Intro to Ecosystems Functions Model & formulating EFM relationships, demo, using statistical features of model to assess ecological change) |
| | 164 | Water and the Watershed - Introduction to HEC-EFM, using EFM to analyze eco-hydro relationships |
| HEC FDA | | |
| | 349 | Risk Analysis for Water Resources Planning and Management (WRPM) - HEC FDA tool |
| HEC RPT | | |
| | 161 | Hydraulic Analysis for Ecosystem Restoration (Regime Prescription tool) |
| HEC RAS | | |
| | 57 | Hydraulic Engineering for Planning (Intro to HEC RAS - River Analysis Stream) |
| | 161 | Hydraulic Analysis for Ecosystem Restoration (Intro to HEC RAS to investigate ecosystem change) |
| HEC DSSVue | 161 | Hydraulic Analysis for Ecosystem Restoration (data storage system tool for working with time) |
| HEP | | |
| | 137 | Regulatory VI HGM (discusses basic plant community & wildlife habitat functions versus HEP model) |

168 Ecological Resources - HEP Overview, HEP Community Models, HEP and vegetation inventories. Also unspecified demos of tools.

169 Environmental Impact Assessment - Comparison of Habitat Evaluation Methods - HES and HEP, case study on HEP

408 PCC3 - Environmental Considerations - HEP analysis

HES

169 Environmental Impact Assessment - Comparison of Habitat Evaluation Methods - HES and HEP

IHA

161 Hydraulic Analysis for Ecosystem Restoration (The Nature Conservancy's Indicators of Hydrologic Alteration) Water and the Watershed - Introduction to IHA, Using IHA, additional demo of requested, unspecified models

164

Index of Biotic Integrity

280 Interdisciplinary Training for Ecosystem Restoration - index of biotic integrity

IWRPLAN

348 Planning for Ecosystem Restoration - IWRPLAN

Model Certification

348 Planning for Ecosystem Restoration - Model Certification

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| Monte Carlo Simulations | 349 | Risk Analysis for Water Resources Planning and Management (WRPM) - Monte Carlo process and simulations |
| PSA Model | 349 | Risk Analysis for Water Resources Planning and Management (WRPM) - PSA Model |
| Recreation Economic Impact Analysis | 270 | PCC4 - Economic Analysis - Demo of Economic Impact Analysis for Recreation etc. |
| RIBITS | 239 | Wetland Mitigation Banking - RIBITS demo |
| SIAM 1-D Sediment Model | 285 | Streambank Erosion & Protection - channel evolution |
| | 348 | Planning for Ecosystem Restoration - ecosystem output models |
| | 394 | Advanced Streambank Erosion & Protection - SIAM Model (Hickahala Creek) |
| Monitoring | 239 | Wetland Mitigation Banking - monitoring report |

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| 281 | Riparian Zone Ecology, Restoration & Management - riparian fauna inventory and monitoring, stewardship and management inventory and monitoring, restoration planting monitoring |
| 285 | Streambank Erosion & Protection - Goal and Function-Based Design, Maintenance and Monitoring |
| 325 | Regulatory III - compliance monitoring |
| 394 | Advanced Streambank Erosion & Protection - Delta Headwaters Program monitoring |

Navigation

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| 270 | PCC4 - Economic Analysis - Inland navigation, deep draft navigation |
| 406 | PCC6 - Plan Formulation - NAV - authorities and policies, problem identification, inventory & forecast, determination of objectives and constraints, measures, strategies and plans |
| 409 | PCC5 - H&H Considerations in Planning - navigation |

NEPA

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| 86 | PCC1 - Civil Works Orientation (environmental considerations, NEPA) |
| 100 | Regulatory I |

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| | Environmental Impact Assessment - background, regulations, teams, environmental indices, prediction and assessment of impacts (air, surface water, ground water, habitat, TES, cultural, noise), ecological restoration, mitigation banking, socioeconomic factors, human health risk, adaptive management, public participation, decision making, writing documents. |
| 169 | Environmental Laws & Regulations - NEPA, Fish & Wildlife Coordination Act, National Historic Preservation Act, Coastal Zone Management Act, Essential Fish Habitat, Endangered Species Act, State Water laws, Section 404 and Section 10, Ocean Dumping Act, Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation & Liability Act, Clean Water Act, Clean Air Act. When to prepare an EIS and its contents |
| 170 | |
| 198 | Environmental Writing - organizing and writing NEPA documents (EA/EIS) |
| 398 | Environmental Regulations, Practical Applications - Safe Drinking Water Act, Emergency Planning and Right to Know Act, Clean Air Act PCC3 - Environmental Considerations - NEPA breakout exercise, introduction to NEPA, NEPA procedures & terminology, NEPA documents and formats, NEPA principles and guidelines, EPA's NEPA review authority, Fish & Wildlife Coordination Act, Endangered Species Act, Marine Mammal Protection Act, Essential Fish Habitat |
| 408 | |

Partnerships

164 Water and the Watershed -
Watershed partnerships at the

Planning

11 Coastal Project Planning -
planning considerations

77 PCC2 - Planning, Principles,
Procedures (Two Phase
Planning, Steps 1-6, etc.)
PCC1 - Civil Works Orientation -
Project Management Plan,
Feasibility study, alternative
plans

86

164 Water and the Watershed -
watershed planning

225 Environmental Sampling -
project planning
Riparian Zone Ecology,
Restoration & Management -
riparian restoration planning and
design

281

348 Planning for Ecosystem
Restoration - planning process,
fundamentals, plan
comparisons, lessons learned
Risk Analysis for Water
Resources Planning and
Management (WRPM) - nature
and causes of uncertainty in the
Corps' planning and operating
environments

349

395 Environmental Remediation
Techniques - overview and
planning for in situ remediation
Environmental Regulations,
Practical Applications -
Emergency Planning and Right
to Know Act

398

406 PCC6 - Plan Formulation - plan
formulation components

407 PCC7 - Public Involvement &
Team Planning - planning
process and public involvement

Policy

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| 408 | PCC3 - Environmental Considerations - ecological assessment in planning, collaborative planning |
| 11 | Coastal Project Planning (changing coastal policies) |
| 168 | Ecological Resources - ER Considerations during Project Development, Construction & Operations and Laws, Regulations & Policies |
| 281 | Riparian Zone Ecology, Restoration & Management - federal, state and regional initiatives |
| 299 | Cultural Resources - Corps program, USACE regulations and policies |
| 325 | Regulatory III - program and policy, statues, constitution and legal foundation, regulations |
| 392 | Historic Structure Preservation Guidance - laws and regulations, planning and historic districts |
| 406 | PCC6 - Plan Formulation - authorities and policies for |
| 408 | PCC3 - Environmental Considerations - ecosystem authorities |

Pollinators

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| 281 | Riparian Zone Ecology, Restoration & Management - fragmentation of pollnation networks |
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Preconstruction E&D

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| 86 | PCC1 - Civil Works Orientation |
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| | 281 | Riparian Zone Ecology, Restoration & Management - planning and design for restoration |
| Project Management Process | | |
| | 86 | PCC1 - Civil Works Orientation (PMP etc.) |
| | 409 | PCC5 - H&H Considerations in Planning - developing scope, schedules, and cost estimates for PMP's |
| Public Participation | | |
| | 100 | Regulatory I - Public interest review |
| | 169 | Environmental Impact Assessment - Scoping and Public Participation in |
| | 323 | Regulatory II B - public interest review and documentation Environmental Regulations, Practical Applications - |
| | 398 | Emergency Planning and Right to Know Act |
| | 407 | PCC7 - Public Involvement & Team Planning - planning process and public involvement, mock public meeting |
| Quality Management | | |
| | 86 | PCC1 - Civil Works Orientation |
| Regional Sediment Management & Sediment Mgmt. | | |
| | 11 | Coastal Project Planning Hydraulic Engineering for Planning (sediment transport in natural streams) |
| | 57 | Hydraulic Analysis for Ecosystem Restoration (Eco- Geomorphology & Sediment Management) |
| | 161 | |

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| 285 | Streambank Erosion & Protection - fundamentals of fluvial geomorphology, nutrient reduction with the reactive stream, stabilization, watershed sediment |
| 394 | Advanced Streambank Erosion & Protection - history of Hickahala Creek Project' Systems Approach to Sediment Management, design S-bend section of eroding stream to stabilize banks and restore lost functions |
| 394 | Environmental Remediation Techniques - berms, erosion control, soil washing |
| 409 | PCC5 - H&H Considerations in Planning - sediment transport and geomorphology |

Regulatory - Clean Water Act etc.

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| 100 | Regulatory I (jurisdiction, delineation, scope of analysis, permits, pre-app meetings, application, coordination, evaluation, public interest review, documentation, site inspection, enforcement, construction methods, 404 , 106 etc.) |
| 137 | Regulatory VI - HGM Approach to Assess Wetland Functions & Values (HGM overview, regional subclasses, headwater slope wetlands, water storage, carbon cycling, plants and wildlife, defining assessment objectives) |

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| | regulatory iv - interagency Wetland ID & Delineation (Intro, Corps manual, National Food Security Act manual, 3-Factor approach, regional supplements, background on hydrology, vegetation, soils, wetland hydrology indicators, hydrophytic vegetation indicators, hydric soil indicators, on site delineation, data gathering, atypical situations, problem areas) |
| 140 | Corps regulatory watershed view |
| 164 | Ecological Resources - Laws, Regulations & Policies |
| 168 | Environmental Impact Assessment - NEPA regulations & laws, Regulatory programmatic impact studies, Environmental Justice |
| 169 | Environmental Laws & Regs - Introduction to the American legal system and Administrative Law. See NEPA section of complete listing of laws covered. Includes enforcement and criminal + citizen lawsuits. Includes Section 404 and Section 10 overview, EPA relationship, wetlands problems. |
| 170 | Environmental Writing - Why NEPA was needed and passed, Sections 101 and 102, NEPA chapters, writing EA/EIS, NEPA legal compliance minimums and document quality criteria, checklists |
| 198 | Fundamentals of Wetland Ecology - wetland laws & regulations |
| 272 | Riparian Zone Ecology, Restoration & Management - federal statutes |
| 281 | |
| 299 | Cultural Resources - Corps regulatory process |

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| 322 | Regulatory II A - scope of analysis, cumulative impacts, administrative appeals, tribal issues, TES, essential fish habitat |
| 323 | Regulatory II B - applicant perspective, jurisdictions, exemptions, general permits, nationwide permits, 404 b(1) guidelines Regulatory III - introduction to program and policy, communication, statutes, constitution and legal foundation, HQ perspective, elements of a violation, waters of the US, regulations, interagency agreements, initiating investigations, site access and legal aspects, civil litigation process, prevention of a violation, wetland determinations in disturbed sites, restoration/mitigation plans, compliance monitoring, 33 CFR, enforcement, administrative fine, evidence, pre-complaint settlement, assessing penalties, criminal enforcement |
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| 356 | CERCLA & RCRA Historic Structures Preservation Guidance - National Historic Preservation Act, SOI standards for the treatment of historic properties |
| 392 | |

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| | | Environmental Regulations, Practical Applications - rules development, solid waste, waste minimization, identification/classification of hazardous waste, generator requirements, hazardous waste management, land disposal restrictions, used oil, PCB's, Safe Drinking Water Act, Waste Water discharge, Storm water discharge, pesticides, spill preparedness/response, asbestors/lead paint, emergency planning/right to know, Clean Air Act, Underground and Above Ground storage tanks, Environmental Management System |
| | 398 | PCC3 - Environmental Considerations - NEPA breakout exercise, introduction to NEPA, NEPA procedures & terminology, NEPA documents and formats, NEPA principles and guidelines, EPA's NEPA review authority, Fish & Wildlife Coordination Act, Endangered Species Act, Marine Mammal Protection Act, Essential Fish Habitat |
| Reservoirs | 408 | |
| | 57 | Hydraulic Engineering for Planning |
| Risk & Uncertainty | | |
| | 11 | Coastal Project Planning - risk based planning |
| | 57 | Hydraulic Engineering for Planning (RA for FDR) |
| | 270 | PCC4 Economic Analysis - Risk analysis, risk & uncertainty case study, trade off analysis |

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| | | risk analysis for water Resources Planning and Management (WRPM) - risk analysis, scenario analysis for macro-level uncertainties, probabilities, parametric and nonparametric distributions, sensitivity & importance, 3 parts of risk analysis, qualitative risk assessment, enhanced criteria ranking, risk matrix, At Risk software, variability & uncertainty, simulations |
| | 349 | Environmental Regulations/Practical Applications - waste minimization, hazardous waste mgmt |
| | 398 | |
| | 407 | PCC7 - Public Involvement & Team Planning - communicating risk |
| | 409 | PCC5 - H&H Considerations in Planning - hydraulic fundamentals of risk and uncertainty, flood risk management |
| Shore Protection | 11 | Coastal Project Planning |
| | 409 | PCC5 - H&H Considerations in Planning - coastal fundamentals, coastal damage reduction |
| Sponsors | 77 | PCC2 - Planning, Principles, Procedures |
| | 86 | PCC1 - Civil Works Orientation (can the Corps help us; cost & schedule negotiations) |
| Stage Discharge Data | 57 | Hydraulic Engineering for Planning |
| Sustainability | | |

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| 161 | Hydrologic Analysis for Ecosystem Restoration (balance between man and nature, Lower MS River; Ecological Sustainable Water Management (ESWM) framework (TNC, Corps) |
| 164 | Water and the Watershed - Ecosystem flow prescriptions/ecologically sustainable water management |
| 392 | Historic Structure Preservation Guidance - sustainable design, preservation of historic landscapes |

Tidal Zones

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| 11 | Coastal Project Planning (sea waves, shore protection, coastal inlet geomorphology, beach nourishment, beneficial use of dredged material, sea level change) |
| 161 | Hydrologic Analysis for Ecosystem Restoration (management and conservation restoration in tidal zones - Columbia River estuary) |

Tribal Interests

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| 299 | Cultural Resources - Native American tribal interests, NA consultation, protection of NA religious sites, NA Grave & Repatriation of Human Remains and Cultural Items |
| 322 | Regulatory II A - historic properties, tribal issues |
| 950 | Native American Environmental/Cultural Resources - tipis, sweathouses, longhouse traditions, foods, ecological implications of first foods, stone tool technology, tule mat making, basket weaving, storytelling, environmental rights protection, native plants, medicines |

Water Supply

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| 270 | PCC4 Economic Analysis - Water supply cost effectiveness |
| 398 | Environmental Regulations/Practical Applications - Safe Drinking Water Act |

Watershed

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| 161 | Hydrologic Analysis for Ecosystem Restoration (watershed trends and research) water and the watershed (management, trends, regulatory, agency perspectives (NRCS, USGS, USEPA, USFWS, TNC), community level, partnerships, sculpting the watershed, eco regional planning) |
| 164 | |
| 285 | Streambank Erosion & Protection - watershed sediment continuity |
| 394 | Advanced Streambank Erosion & Protection - Delta Headwaters Program |
| 426 | Wetland River Function/Ecology for PM's - Flathead River watershed |

Wetlands

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| 11 | Coastal Project Planning - wetlands as they relate to coastal areas (protection, assessment, etc.) Regulatory VI - HGM Approach to Assess Wetland Functions, Values - classification, headwater slope wetlands in AL and MS Coastal plains, water storage, carbon cycling, plants and wildlife, habitat functions |
| 137 | |

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| | Regulatory IV - Interagency Wetland ID and Delineation - manuals, hydrology, vegetation, soils, data gathering, atypical situations |
| 140 | Hydrologic Analysis for Ecosystem Restoration - Yolo Bypass wetlands field trip, hydrology and restoration |
| 161 | Water and the Watershed - Yolo Wetlands restoration field trip, stream ecology |
| 164 | Environmental Laws & Regulations - Film on Wetlands Stewardship - A Call to Action, wetlands problems |
| 170 | Wetland Stream Ecology - geomorphology, etc. |
| 192 | Wetland Mitigation Banking - interagency review, policy and regulations, banking instruments, ecological considerations for banking site etc. See Mitigation section for more complete information |
| 239 | Fundamentals of Wetland Ecology - introduction to wetlands, hydrology, soils, classification systems, functions and values, evaluation methods, laws & regulations, mitigation, wetland communities, biogeochemistry, created and restored wetlands, landscape ecology |
| 272 | Wetland Development & Restoration - functional assessment and classification, low gradient river systems, wetland stream restoration, mitigation banking, restoration projects (forested, freshwater), water budget |
| 276 | Regulatory III - waters of the US, wetland determinations |
| 325 | Wetland River Function/Ecology for PM's - introduction of HGM wetland classifications, functional assessment |
| 426 | |