

# Natural Resource Management

## Why study natural resource management?

This track has a strong social science focus. It assumes that most environmental problems are fundamentally caused by mistakes in human behavior, and that better scientific information is but one of many factors affecting our ability to solve environmental problems. Reflecting that successful environmental managers operate at the junction of overlapping natural and social systems, students supplement ESM's core curriculum in the physical and biological sciences with work in resource economics, law, planning, and public policy. It is geared towards those who are interested in working in policy-oriented roles in environmental affairs. Typical career tracks include working for federal, state or local natural resources agencies, environmental consulting firms, governmental liaison offices of private corporations, or non-profit organizations addressing environmental issues. Many graduates of this track also go to professional or graduate school in law, environmental policy, natural resources management, regional planning, public policy, or related fields.



## Preparatory Subject Matter Requirements

Preparatory Subject Matter		Quarter(s) Offered	Units	Completed	Notes
<b>Written and Oral Expression</b>					
UWP 101, or any from the 102 or 104 series	Upper Division Writing	I, II, III, IV	4	_____	<u>May test out of requirement</u>
CMN 1, 3V, 3Y, or DRA 10	Communication	I, II, III, IV	4	_____	_____
<b>Biological Sciences</b>					
BIS 2A	Essentials of Life on Earth	I, II, III, IV	5	_____	_____
BIS 2B	Principles of Ecology and Evolution	I, II, III, IV	5	_____	_____
BIS 2C	Biodiversity and the Tree of Life	I, II, III, IV	5	_____	_____
<b>Geology</b>					
<i>Choose one of the following</i>					
GEL 1	The Earth	I, II, III	4	_____	_____
GEL 50 (recommended)	Physical Geology	I, II, III	3	_____	_____
<b>Chemistry</b>					
CHE 2A or 2AH	General Chemistry	I, II, IV	5	_____	_____
CHE 2B or 2BH	General Chemistry	II, III, IV	5	_____	_____
<b>Physics</b>					
<i>Complete either 1AB or 7ABC</i>					
PHY 1A	General Physics	I, II, IV	3	_____	_____
PHY 1B	General Physics	II, III	3	_____	_____
PHY 7A	General Physics	I, II, III, IV	4	_____	_____
PHY 7B	General Physics	I, II, III, IV	4	_____	_____
PHY 7C	General Physics	I, II, III, IV	4	_____	_____
<b>Economics</b>					
ECN 1A, 1AV, or 1AY	Principles of Microeconomics	I, II, III, IV	4	_____	_____
<b>Mathematics</b>					
MAT 16A and 16B	Short Calculus	I, II, III, IV	3, 3	_____	<u>Being phased out as of 23-24</u>
MAT 17A and 17B	Calculus for Biology & Medicine	I, II, III, IV	4, 4	_____	<u>MAT 17AB recommended</u>
MAT 19A and 19B and 19C	Calculus for Data-Driven Applications	I, II, III, IV	4, 4, 4	_____	<u>Must take A, B, and C</u>
MAT 21A and 21B	Calculus	I, II, III, IV	4, 4	_____	_____
<b>Environmental Science and Policy</b>					
ESP 1	Environmental Analysis	I, IV	4	_____	_____

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## Core Subject Matter Requirements

NOTE: Students graduating with this major are required to attain at least a C average (2.0 GPA) in all courses taken at the university in Depth Subject Matter *and* pass all coursework. See requirements of the College of Agriculture & Environmental Science in the UC Davis General Catalog.

Depth Subject Matter	Prerequisites	Qtr(s)	Units	Completed	
<b>Global Environment</b>					
ESM 120	Global Environmental Interactions	One college-level chemistry and biology course	II	4	_____
<b>Ecology</b>					
<i>(Choose one of the following)</i>					
ESP 100	General Ecology	BIS 2A-C; MAT 16A-B or 17A-B or 21A-B; STA 13 recommended	I, II, IV	4	_____
EVE 101	Introduction to Ecology	BIS 2A-C; MAT 16A-B or 17A-B or 21A-B; or equivalent	I, II, III, IV	4	_____
<b>Policy</b>					
ESP 162	Environmental Policy	ECN 1A or ECN 1AV or ECN 1AY	II	4	_____
<b>Statistics</b>					
<i>(Choose one of the following – Statistics 100 recommended)</i>					
STA 13	Elementary Statistics	Two years of high school algebra or equivalent in college	I, II, III, IV	4	_____
STA 100	Applied Statistics for Biological Sciences	MAT 16B or 17B or 21B with a C- or better	I, II, III, IV	4	_____
<b>Environmental Monitoring</b>					
<i>(Choose one of the following)</i>					
ATM 124	Meteorological Instruments & Observations	ATM 60	I	3	_____
ESM 108	Environmental Monitoring	ESP 100 or EVE 101 or SSC 100 or WFC 100 or equivalent	III	3	_____
ESP 151L	Limnology Lab	ESP 151 (can be concurrent)	III	3	_____
ESP 179	Environmental Impact Assessment	ESP 1 or the equivalent	II, IV	4	_____
<b>Environmental Data Science</b>					
<i>(Choose one of the following)</i>					
ABT/LDA 150	Introduction to GIS	None	I, II, III	4	_____
ESP 106	Environmental Data Science	STA 13 or 32 or 100 (can be concurrent)	II	4	_____
<b>Internship</b>					
ESM/ESP 92/192 Internship		Upper division standing, permission of instructor Variable unit – must take at least 3 units of internship May complete internship in a different area with prior approval (e.g.: PLS, SSC, ATM)	I, II, III, IV	3	_____
<b>Capstone</b>					
ESM 195	Integrating Env Science & Management	Senior standing in ESM	III	2	_____
<b>Honors Thesis</b> <i>(Optional)</i>					
ESM 194H	Senior Honors Thesis	Senior standing, Overall GPA of 3.50 or higher; Consent of the lead faculty advisor		2-6	_____

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*Courses appearing in more than one section can only be used to fulfill one section*

Required Courses	Prerequisites	Qtr(s)	Units	Completed	
<b>Select three environmental policy courses</b>					
ESP 160	The Policy Process	POL 1; ECN 1A and STA 13 recommended	III	4	_____
ESP 165	Climate Policy	ECN 1A or 1AV or 1AY or ESP 1 or consent of instructor	I	3	_____
ESP 166	Ocean & Coastal Policy	ESP 1 or consent of instructor	I	3	_____
ESP 167**	Energy Policy	ECN 1A; MAT 16B, 17B, or 21B; or consent of instructor	II	4	_____
ESP 168A	Methods of Env Policy Analysis	ESP 1 or 10; STA 13 or 100; ECN 1A or 1AV; ECN 100A recommended	I	5	_____
ESP 169**	Water Policy & Politics	ECN 1A or POL 1 recommended	III	3	_____
ESP 171	Urban & Regional Planning	ESP 1 or ESP 161 or ESP 179 recommended	III, IV	4	_____
ESP 172	Public Lands Management	ECN 1A and POL 1 recommended	I	4	_____
ESP 174	Environmental Justice Policy & Practice	ESP 1 or equivalent recommended	III	4	_____
ESP 179	Environmental Impact Assessment	ESP 1 or the equivalent	II, IV	4	_____
HYD 150	Water Law	Consent of instructor or upper division standing	II	3	_____
SOC 160	Sociology of the Environment	SOC 1 or 2 or 3 recommended	Varies	4	_____
<b>Select one environmental law course</b>					
ESP 161	Environmental Law	Upper div standing; one course in env science; POL 1 and UWP 1 rec	I, III	4	_____
HYD 150	Water Law	Consent of instructor or upper division standing	II	3	_____
<b>Select one statistics course</b>					
ECN 102	Analysis of Economic Data	ECN 1A and 1B; STA 13 or 32; MAT 16B or 17B or 21B with a C- or better	I, II, III, IV	4	_____
STA 101	Advanced Statistics for Bio Science	STA 100 with a C- or better	III	4	_____
STA 103	Applied Stats for Business & Economics	STA 13 or 32 or 100; MAT 16B or 17B or 21B all with a C- or better	I, II, III, IV	4	_____
STA 106	Analysis of Variance	STA 13 or 32 or 100 with a C- or better	I, II, III, IV	4	_____
STA 108	Regression Analysis	STA 13 or 32 or 100 with a C- or better	I, II, III, IV	4	_____
STA 130A	Mathematical Statistics: A Brief Course	MAT 16C or 17C or 21C; STA 13 or 32 or 100; all with a C- or better	I	4	_____
STA 131A	Probability Theory	MAT 21C; MAT 22A or 27A or MAT 67 all with a C- or better	I, III	4	_____
Or equivalent upper division statistics					
<b>Select two biological processes courses</b>					
ENT 104	Behavioral Ecology of Insects	Introductory biology or zoology	II	3	_____
ESM 141**	Fire Ecology	BIS 2A or PLS 2; BIS 2B or 2C	II	4	_____
ESM/PLS 144	Trees & Forests	PLS 2 or BIS 2C	I	4	_____
ESP 151	Limnology	BIS 2A and 2B; BIS 2C and ESP 100 or EVE 101 recommended	III	4	_____
ESP 155	Wetland Ecology	BIS 2A or equivalent; ESP 100 or EVE 101 recommended		4	_____
EVE 115*	Marine Ecology	ESP 100 or EVE 101 or BIS 2B, or consent of instructor	II	4	_____
PLB/EVE 117	Plant Ecology	BIS 2A-C; PLB 111 recommended	I	4	_____
PLS 130	Grassland Ecology	PLS 2 or BIS 2B or BIS 2C or consent of instructor	II	3	_____
WFC 110	Biology & Conservation of Wild Mammals	BIS 2A-C; EVE 101 or ESP 100 or equivalent (can be concurrent)	III	3	_____
WFC 111	Biology & Conservation of Wild Birds	BIS 2A-C; upper division ecology course recommended	I	3	_____
WFC 120	Biology & Conservation of Fishes	BIS 2A-C; upper division ecology course recommended	I	3	_____
WFC 134	Herpetology	BIS 2A-C; upper division ecology course recommended	II	3	_____

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## Natural Resource Management (Cont.)

Required Courses	Prerequisites	Qtr(s)	Units	Completed	
<b>Select two physical processes courses</b>					
ATM 116	Modern Climate Change	None	I	3	_____
ATM 133	Biometeorology	MAT 16B; one course in a biological discipline or consent of instructor	II	4	_____
ESM 121	Water Science & Management	PHY 10 or GEL 1	III	3	_____
ESM 131	Air as a Resource	CHE 2A or 10; CHE 2B	II	3	_____
ESP 116N	Oceanography	GEL 1 or 2 or 16 or 50	II	3	_____
ESP 152	Coastal Oceanography	Acceptance into the Bodega Marine Lab summer program	IV	3	_____
HYD 143**	Echohydrology	HYD 10 or 141 or ESP 1 or ESM 100 or ESM 108 or ESM 120 or GEL 1 or 50 or SSC 100	II	4	_____
SSC 100	Principles of Soil Science	College-level course in each of CHE, PHY, BIS, and GEL recommended	I	5	_____
<b>Select one remote sensing course</b>					
ESM 185	Aerial Photo Interpretation & Remote Sensing	Upper division standing	I	4	_____
ESM 186	Environmental Remote Sensing	MAT 16B; PHY 7C or 9B; ABT 150 rec.; upper division standing	II	5	_____

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