



**McGill**



**Program Proposal Form**

(09/2003)

**AC-04-109**

<p><b>1.0 Degree Title</b> <i>Bachelor of Science</i></p> <p><b>1.1 Major (Subject)</b> <i>Environment</i></p> <p><b>1.2 Concentration (Option)</b> <i>Water Environ &amp; Ecosys - Phys</i> (Note: This is a <u>Domain</u> in the Major Program in Environment, and is offered by both Agricultural &amp; Environmental Sciences and by Science.)</p> <p><b>1.3 Minor</b></p> <p><b>1.4 Complete Program Title</b> <i>B.Sc.; Environment; Water Environments and Ecosystems Domain - <b>Physical</b></i></p>	<p><b>2.0 Administering Faculty</b> <i>Arts</i></p> <p style="text-align: center;"><b>Offering Faculty</b> <i>Science</i></p> <p><b>3.0 Effective Term of Proposal:</b> <i>200509</i> (eg. 200409)</p> <p><b>4.0 Program Info</b></p> <p><b>4.1 Program Type:</b> <i>Bachelor</i></p> <p><b>4.2 Category:</b> <i>Major</i></p> <p><b>4.3 Level:</b> <i>Undergraduate</i></p> <p><b>5.0 Total Credit Weight:</b> <i>60</i></p> <p><b>6.0 Consultation</b> <b>With related Units:</b> <i>Yes</i> Morton Mendelson, AD Academic, Science Sharon Bezeau, Recorder, Faculty of Science Marj Russell, Degree Evaluation Officer, ARR</p> <p><b>Financial Consult:</b> <i>No</i></p>
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**7.0 Description (150 words max)**

This program explores in depth the transport and transformation mechanisms of water on the planet, from rivers to the oceans and atmosphere. The biological processes taking place in water bodies are also covered.

Graduates of this Domain are qualified to enter the work force or to pursue advanced studies in fields such as marine biology, geography, physical oceanography and atmospheric science.

**8.0 Existing and Proposed program course lists**

Courses offered at Macdonald Campus are marked with (M).

Proposed Program (60 credits)

NOTE: Students are required to take a maximum of 30 credits at the 200-level and a minimum of 12 credits at the 400-level or higher. This includes Core and Required courses.

- Core: Required Courses** (18 credits)
- ENVR 200 (3) The Global Environment
  - ENVR 201 (3) Society and Environment
  - ENVR 202 (3) The Evolving Earth
  - ENVR 203 (3) Knowledge, Ethics and Environment
  - ENVR 301 (3) Environmental Research Design
  - ENVR 400 (3) Environmental Thought

**Core: Complementary Course – Senior Research Project (3 credits\*)**

AGRI 519 (6) Sustainable Development Plans (in Barbados)

ENVR 401 (3) Environmental Research

ENVR 451 (6) Research in Panama (in Panama)

\* Only 3 credits will be applied to the program; extra credits will count as electives.

**Domain: Required Courses (9 credits)**

ATOC 215 (3) Oceans, Weather and Climate

ATOC 315 (3) Water in the Atmosphere

GEOG 372 (3) Running Water Environments

**Domain – Complementary Courses (30 credits)**

6 credits chosen from:

WILD 205 (3) Principles of Ecology (M)

or BIOL 308 (3) Ecological Dynamics

ABEN 217 (3) Hydrology and Water Resources (M)

or GEOG 322 (3) Environmental Hydrology

3 credits of statistics or calculus:

AEMA 310 (3) Statistical Methods 1 (or equivalent) (M)

AEMA 202 (3) Intermediate Calculus (M)

MATH 203 (3) Principles of Statistics 1

MATH 222 (3) Calculus 3

3 credits of field courses

GEOG 495 (3) Field Studies - Physical Geography (at Mont St. Hilaire)

GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy)

or an equivalent aquatic field course

12 credits chosen from:

ABEN 430 (3) GIS for Bioresource Management (M)

or GEOG 306 (3) Raster Geo-Information Science

ABEN 416 (3) Engineering for Land Development (M)

ABEN 506 (3) Advances in Drainage Management (M)

or ABEN 509 (3) Hydrologic Systems and Modelling (M)

or GEOG 522 (3) Advanced Environmental Hydrology

AEMA 305 (3) Differential Equations (M)

or MATH 315 (3) Ordinary Differential Equations

AGRI 435 (3) Soil and Water Quality Management (M)

ATOC 308 (3) Principles of Remote Sensing

or GEOG 308 (3) Principles of Remote Sensing

ATOC 309 (3) Weather Radars and Satellites

ATOC 568 (3) Ocean Physics

CIVE 323 (3) Hydrology and Water Resources

EPSC 549 (3) Hydrogeology

GEOG 201 (3) Introductory Geo-Information Science

GEOG 537 (3) Advanced Fluvial Geomorphology

GEOG 305 (3) Soils and Environment

or SOIL 210 (3) Principles of Soil Science (M)

NRSC 510 (3) Agricultural Micrometeorology (M)

6 credits chosen from:

AGRI 452 (3) Water Resources in Barbados (in Barbados)

BIOL 432 (3) Limnology

BIOL 441 (3) Biological Oceanography

NRSC 315 (3) Science of Inland Waters (M)

BIOL 442 (3) Marine Biology

BIOL 465 (3) Conservation Biology

BIOL 553 (3) Neotropical Environments (in Panama)

GEOG 350 (3) Ecological Biogeography

GEOG 505 (3) Global Biogeochemistry

### 9.0 Rationale

Originally, the Water Environments and Ecosystems Domain was offered with two separate “Streams”, one called “Biological”, and the other “Physical”. Banner/Minerva does not recognize “Streams”, so the streams were not distinguished on the student’s transcript, nor in Degree Audit. By retiring these streams and proposing them as separate programs, this issue will be resolved. Note that current students will be allowed to finish and graduate from their original program, or transfer to this new one.

This program’s course list and credit count are the same as for the Water Environments and Ecosystems Domain – Biological Stream as offered in 2004-05, with minor maintenance changes. These changes are outlined below, with their rationales.

Changed from 2004-05 (no change in credit total):

Core: Complementary Courses

1. Delete ENVR 466 (6) Research in Atlantic Canada

Domain: Complementary Courses

2. Change AEMA 205 (3) Differential Equations to AEMA 305 (3) Differential Equations.
3. Change AEPH 510 (3) Agricultural Micrometeorology to NRSC 510 (3) Agricultural Micrometeorology.
4. Add AGRI 452 (3) Water Resources in Barbados to the 2<sup>nd</sup> to last complementary course list (starts with BIOL 432).
5. Remove “or” before BIOL 441 and NRSC 315 in the 2<sup>nd</sup> to last complementary course list (starts with BIOL 432).

1. ENVR 466 is being retired.
2. AEMA 205 was changed to AEMA 305 last year by the Faculty of Agricultural and Environmental Sciences.
3. AEPH 510 was changed to NRSC 510 last year by the Department of Natural Resource Sciences.
4. AGRI 452 is part of the Barbados Field Study Semester, and is relevant to this domain.
5. BIOL 432, BIOL 441, and NRSC 315 are not mutually exclusive. The “or” statements were originally meant to force students to diversify their selections in this list. Given the irregularity of the course offerings in this list in recent years, and the low number of Macdonald courses, these statements are not needed. Removing them will afford students, especially those at Macdonald, greater flexibility.

**10.0 Approvals**

Routing Sequence	Name	Signature	Date
Department	Colin Chapman		
Curric/Acad Cmty			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

**Submitted by:**

Pete Barry, MSE Program Coordinator, Tel. 4306 Fax 1643, [Pete.barry@mcgill.ca](mailto:Pete.barry@mcgill.ca)

Submission Date:

To be completed by ARR:

CIP Code: