

# **Annual Report 2005-06**

## **Department of Biology**

### **Claudia Douglass, Chair**

#### Summary Data Included:

- Student Credit Hours
- Graduation and Signed Majors/Minors
- Faculty Accomplishments
  - ✓ Publications: Articles, Books, and Chapters
  - ✓ Conference Proceedings
  - ✓ Publications
  - ✓ External Grant and Contract Applications and Awards
- Graduate Student Accomplishments
  - ✓ Research and Research Funding
  - ✓ Presentations
- Undergraduate Student Accomplishments
  - ✓ Capstone Experiences
  - ✓ Research and Research Funding
  - ✓ Presentations

## Biology Department Majors, Minors, and SCH Summary: 2005-06

### Majors, Minors, and SCH Summary: 2005-06

**19,502 SCH → 2.3% increase over 2004-05  
Highest enrollment in history.**

#### Graduate Students:

**11 MS Students Graduated 2005-06  
39 MS Students Enrolled (Sp 2006)**

#### Undergraduate Majors:

**81 Biology Majors Graduated 2005-06  
465 Biology Signed Majors (Sp 06) ↑  
196 Science (DX) Majors Graduated 2005-06  
105 Science (DX) Signed Majors (Sp 06)  
75 Integrated Science (EI) Signed Maj (Sp 06) ↑  
21 Neuroscience Major Graduated 2005-06  
55 Neuroscience Signed Majors (Sp 06) ↑**

#### Undergraduate Minors:

**27 Biology Minors Graduated 2005-06  
93 Biology Signed Minors (Sp 06)  
10 Natural Resources Minors Grad 2005-06  
36 Natural Resources Signed Minors (Sp 06)  
10 Science Minors Graduated 2005-06  
14 Science Signed Minors (Sp 06)  
143 Integrated Science (EI) Signed Min (Sp 06) ↑**

Session	Actual SCH	Change from 04-05
<b>Summer II 2005</b>	192	+66
<b>Fall 2005</b>	11,133	+431
<b>Spring 2006</b>	7,622	-82
<b>Summer I 2006</b>	555	+28
<b>Total 2005-06</b>	<b>19,502</b>	<b>+443</b>

<b>Graduate Programs</b>	<b>Graduated 2005</b>	<b>Currently Enrolled (Sp 06)</b>
<b>MS Biology</b>	11	20
<b>MS Conservation Bio</b>	3	23
<b>Totals</b>	<b>14</b>	<b>43</b>

<b>Undergraduate Major</b>	<b>Graduated 2006</b>	<b>Currently Signed (Sp 06)</b>
<b>Biology Teaching</b>	10	63
<b>Bio: Natural Resources</b>	37	71
<b>Bio: Biomedical Sciences</b>	4	93
<b>Bio: General</b>	29	43
<b>Bio: Medical Technology</b>	6	7
<b>Bio: Microscopy</b>	5	29
<b>Bio: Pregraduate/Preprof</b>	70	159
<b>Total Biology Majors</b>	<b>161</b>	<b>465</b>
<b>Science (DX)</b>	113	105
<b>Integrated Science (EI DI)</b>	New Program	75
<b>Neuroscience</b>	21	55

<b>Undergraduate Minors</b>	<b>Graduated 2005</b>	<b>Currently Signed (Sp 06)</b>
<b>Biology</b>	50	27
<b>Natural Resources</b>	16	36
<b>Science</b>	13	14
<b>Integrated Science (EI DI)</b>	3	143

## Biology Department Publication/Presentation Summary: 2005-06

### Faculty Publication Summary: 2005-06

**26 Refereed Articles (5 with students) ↑**

**1 Chapter**

**4 Conference Proceedings (3 with students)**

**60 Presentations (38 with students) ↑**

### Refereed Articles:

(**Bold** = CMU faculty, ***Bold/italics*** = CMU student)

**Alm, E.W.**, J. Burke and ***E. Hagen***. 2006. Persistence and Potential Replication of the Fecal Indicator Bacteria, *Escherichia coli*, in Shoreline Sand at Lake Huron. *Journal of Great Lakes Research* 32(2): 401-405.

**Colores, G.M.** and S.K. Schmidt. 2005. Recovery of microbially-mediated processes in remediated soil. *Environmental Toxicology and Chemistry* 24:1912-1917.

Duran, M., **E.W. Alm**, R.D. Stedtfeld, B.Z. Haznedaroglu, and S.A. Hashsham. 2005. Detection and Occurrence of Indicator Organisms and Pathogens. *Water Environment Federation Literature Review*. 77 (6): 659-717.

**Galarowicz, T. L.**, J. A. Adams, and D. H. Wahl. In press. The influence of prey availability on ontogenetic diet shifts of a juvenile piscivore. *Canadian Journal of Fisheries and Aquatic Sciences*.

**Galarowicz, T. L.**, and D. H. Wahl. 2005. Foraging by a young-of-year piscivore: The role of predator size, prey type, and density. *Canadian Journal of Fisheries and Aquatic Sciences* 62(10): 2330-2342.

**Gehring, T. M.** and ***B. A. Potter***. 2005. Wolf habitat analysis in Michigan: an example of the need for proactive land management for carnivore species. *Wildlife Society Bulletin* 33:1237-1244.

Graeb, B. D. S., **T. Galarowicz**, D. H. Wahl, J. M. Dettmers, and M. J. Simpson. 2005. Foraging behavior, morphology, and life history variation determine the ontogeny of piscivory in two closely related predators. *Canadian Journal of Fisheries and Aquatic Sciences* 62(9): 2010-2020.

**Hertzler, P.L.** 2005. Cleavage and gastrulation in the shrimp *Litopenaeus vannamei* (Malacostraca, Decapoda, Dendrobranchiata). *Arthropod Structure & Development* 34:455-469.

**Hertzler, P.L.** 2005. Timing of meiotic maturation and first mitosis in the Pacific white shrimp *Litopenaeus vannamei*. *Journal of the World Aquaculture Society* 36:570-576.

**Hertzler, P.L.** 2006. Rhodamine fluorescence after 15-year storage in methyl salicylate. *Microscopy Today*: 48.

Menapace, F. J., **Wujek, D.E.** and B.H.M. Nijalingappa. 2005. Achene micromorphology of some Indian Cyperaceae. V. Achene micromorphology as a possible systematic aid to the taxonomic recognition of *Fimbristylis* sectional parameters. *Bull. Bot. Survey India* 45(1-4):21-28.

**Millions, D. G.**, and **B. J. Swanson.** In Press. Evaluation of habitat fragmentation on population structure in bobcats. *Journal of Wildlife Management*.

**Millions, D. G.**, and **B. J. Swanson.** 2006 An Application of Manel's Model: Detectig Bobcat Poaching in Michigan. *The Wildlife Society Bulletin* 34: 150 - 155.

Peters, G.M., **G.D. Starks** and **D.E. Wujek.** 2005. Annotated checklist of vascular plants of Neithercut Woodland, Clare County, Michigan. *Mich. Bot.* 44(2):57-79.

**Seefelt, N. E.** and **J.C. Gillingham.** 2006. A comparison of three methods to investigate the diet of breeding Double-crested Cormorants (*Phalacrocorax auritus*) in the Beaver Archipelago, Northern Lake Michigan. *Hydrobiologia*.

Steinwald, M. C., **B. J. Swanson**, and P. M. Waser. Effects of spool-and-line tracking on small desert mammals. *Southwestern Naturalist* 51: 71 - 78.

**Swanson, B. J.**, R. T. Fuhrman, R. L. Crabtree. 2005. Elevational isolation of red fox populations in the Greater Yellowstone ecosystem. *Conservation Genetics* 6:123-131.

**Swanson, B. J.**, **L. R. Peters**, and C. J. Kyle. 2006. Demographic and Genetic Evaluation of an American Marten Reintroduction. *Journal of Mammalogy* 87: 272 - 280.

**Swanson, B. J.**, and P. J. Rusz. 2006. Detection and Classification of Cougars in Michigan Using Low Copy DNA Sources. *American Midland Naturalist* 155: 363 - 372.

Triemer, Richard, Eric W. Linton, Woongghi Shin, Maria A. Nudelman, **Anna K. Monfils**, Matthew S. Bennett and Stacy Brosnan. In Press. Phylogeny of the Euglenales based upon SSU and LSU rDNA sequence comparisons and description of *Plathanoglana* gen. nov. (Euglenophyta). *Journal of Phycology*.

**VanOmmeren, L.** and **E.W. Alm.** 2006. Development and application of rapid antibiotic resistance analysis for microbial source tracking in the Black River watershed, Michigan. *Lake and Reservoir Management*. In Press.

Whately, C.E., **D.E. Wujek** and E.E. Leuck, II. 2005. The vascular flora of Hog Island, Charlevoix, County, Michigan. *Mich. Bot.* 44(1):29-48.

**Wujek, D.E.** and **R.M. Dzedzic.** 2005. Silica-scaled chrysophytes from Ecuador. *Gayana Botanica* 62(1):1-8.

**Wujek, D.E.** and R.H. Thompson. 2005. Endophytic unicellular chlorophytes: a review of *Chlorochytrium* and *Scotinosphaera*. *Phycologia* 44(2):97-103.

**Wujek, D.E.** and J.L. Wee. 2006. Silica-scale bearing chrysophytes from the Southern Atlantic Coastal Plain in Louisiana, USA. II. Identification, ecology, and distribution. *Algological Studies* 119:91-103.

**Wujek, D.E.** and E.M. Wright. 2005. Scaled chrysophytes from Florida. VIII. Observations on the flora from the southwest. *Florida Scient.* 68(3):133-139.

## Conference Proceedings

**Alm, E.W.** 2005. "Health Implications of Sand Bacteria". Joint Conference Lake Michigan: State of the Lake and Great Lakes Beach Association. Green Bay, WI. November 3, 2005.

**Gehring, T.M., J.E. Hawely, S.J. Davidson, S.T. Rossler, A.C. Cellar,** R.N. Schultz, A.P. Wydeven, and K.C. VerCauteren. 2006. Are viable non-lethal management tools available for reducing wolf-human conflict?: preliminary results from field experiments. Proceedings of the 22<sup>nd</sup> Vertebrate Pest Conference. Berkeley, California.

**Hertzler, P.L.** and **Freas, W.R.** 2006. Abdominal muscle development in marine shrimp. *Dev. Biol.*

**VanDam, R.** and **J.D. Kelty.** 2005. Adenosine A<sub>1</sub> receptor-mediated modulation of respiration related activity in the neonatal mouse pre-Bötzinger complex. Program No. 523.14. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience. Online

## Chapters

**Seefelt, N.E.** and **J.C. Gillingham.** 2005. The Double-crested Cormorant in Lake Michigan: A Review of Population Trends, Ecology and Current Management. Pages 351-363, *In:* T. Edsall and M. Munawar, Ed. *State of Lake Michigan: Ecology, Health and Management*, Ecovision World Monograph Series.

**Biology Department External Grant and Contract Activity  
July 2005 – May 2006**

**Summary of External Grant and Contract Activity: 2005-06**

**12 Faculty, 1 Staff, and 1 Temporary Faculty** were involved in submitting a total of **41 ↑** external grant and contract proposals requesting **\$5,287,410. ↑**

**30 ↑ Grants and contracts from 11 different faculty, 1 staff, 1 temporary faculty, and 2 students** were funded for **\$1,107,067. ↑**

<b>Faculty Student</b>	<b>Project Title</b>	<b>Sponsor</b>	<b>Date</b>	<b>Amount Funded</b>
Michael Hamas and Ryan Dziedzic	Differential Habitat Use by Long and Short Distance Migrants at Nayanquing Point State Wildlife Area	Michigan DNR	July 2005	\$1,705
Michael Hamas	A Study of LeConte's Sparrow and Other Grassland Birds at Munuscong Bay	Michigan DNR	(not yet recorded in ORSP data table)	\$2,200
Scott McNaught	Water Analysis Services Lake O'Rourke	Lake Club of Hidden Valley	July 2005	\$8,994
Elizabeth Alm	Genetic Pollution: Coastal Beaches as Reservoirs of Virulence and Antibiotic Resistance Genes	Michigan Sea Grant	July 2005	\$69,305
Scott McNaught	Assessment of Water Quality and the Invertebrate Populations of the Shiawassee River and Its Tributaries	The Nature Conservancy	September 2005	\$3,471
Scott McNaught	Larval Fish Entrainment at the Wyandott Municipal Electric Plant	Goldier Associates, Inc.	September 2005	\$14,400
Bradley Swanson	Molecular Genetic Estimation of Population Size in Black Bear of the Baldwin Ranger District	U.S. Fish and Wildlife Service	September 2005	\$44,997
Bradley Swanson	Ice Seal Movements and Stock Structure in a Changing Cryosphere	North Pacific Research Board	October 2005	\$14,000
John Scheide	Environmentally Benign Antifouling Coatings from Dendritic Nanotechnology	National Science Foundation	November 2005	\$58,352
Philip Oshel	Microscopy Services	Prism Analytical Technologies, Inc.	December 2005	\$6,200
Gregory Colores	Rhizosphere Influence on Hydrocarbon Metabolizing Microorganisms	National Science Foundation	January 2006	\$174,769
Claudia Douglass (with M Libbee)	Environmental Education Curriculum Project Coordination, Evaluation and Teacher Training	Michigan Department of Environmental Quality	January 2006	\$219,188
Scott	Testing and Monitoring Services:	Michigan DNR	January 2006	\$20,000

McNaught	Platte Lake			
Scott McNaught	Larval Fish Identification and Enumeration	AMEC Earth & Environment, Inc.	January 2006	\$6,000
Philip Hertzler	Sample Analysis Services	Genus PLC	February 2006	\$6,200
Thomas Gehring	Study of Wolf Range, Behavior, and Friendly Co-existence with Man in Michigan's Lower Peninsula	U.S. Fish and Wildlife Service	March 2006	\$78,819
Scott McNaught	Testing and Monitoring Services for Water and Sediment Samples Collected from Plate Lake and its Tributaries	Michigan DNR	April 2006	\$238,374
Anna Monfils, Diane Hurlbut	Hybridization in <i>Schoenoplectus americanus</i> in the globally imperiled inland salt marshes of Michigan	Hanes Fund	April 2006	\$5,534
Tracy Galarowicz	Predation of Lake Sturgeon ( <i>Acipenser fulvescens</i> ) by non-native species	Michigan DNR	(not yet recorded in ORSP data table)	\$1,918
Nancy Seefelt	Population Monitoring, Diet Evaluation & Energy Requirements of Double-Crested Cormorants Breeding in the Beaver Archipelago, Northern Lake Michigan: Investigating Possible Direct & Indirect Impacts on Fisheries	U.S. Fish and Wildlife Service	May 2006	\$3,500
Elizabeth Alm	Genetic Pollution: Coastal Beaches as Reservoirs of Virulence and Antibiotic Resistance Genes	Michigan Sea Grant	May 2006	\$69,895
Tracy Galarowicz	Predation of Lake Sturgeon ( <i>Acipenser fulvescens</i> ) by Non-Native Species	Michigan DNR	June 2006	\$1,918
Thomas Gehring	10 small contracts below reporting threshold	Various	June 2006	\$3,324
Michael Hamas, Lena Usyk	A Study of LeConte's Sparrows and Other Grassland Birds at Munuscong Bay	Michigan DNR	June 2006	\$2,169
Scott McNaught	11 small contracts below reporting threshold	Various	June 2006	\$3,723
Scott McNaught	Aquatic Sampling for the Shiawassee River Paired Watershed Study	The Nature Conservancy	June 2006	\$16,491
Bradley Swanson	Genetic Evaluation of the Eastern Massasauga in Michigan	Michigan DNR	June 2006	\$7,740
Nancy Seefelt	Determining Critical Spring Stopover Sites for Neotropical Migrants in and Breeding Bird Survey of the Beaver Archipelago of Northern Lake Michigan	MDNR Nongame Wildlife Fund Grants – Natural Heritage Program	June 2006	\$3,606
Thomas Gehring, A. Cellar	Evaluating the Effectiveness of Livestock Guarding Dogs for Reducing Wolf-Human Conflict in Michigan	USDA – Sustainable Agriculture Research and Education Program	(not yet recorded in ORSP data table)	\$7,504
Thomas Gehring, S. Rossler	Evaluating the Effectiveness of Electronic-Training Collars for Reducing Wolf-Human Conflict in Wisconsin	Wisconsin DNR	(not yet recorded in ORSP data table)	\$9,164

Jennifer Schisa	Genetic and Molecular Analysis of Germ Granule Components in <i>C. elegans</i>	National Institutes of Health	June 2006 (not yet recorded in ORSP data table)	\$179,000
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## Biology Department Graduate Student Research Summary: 2005-06

### Graduate Student Research Summary: 2005-06

#### Graduate Student Research:

9 Masters Theses

2 Plan B Research Papers

2 Graduate Internships

#### Graduate Student Research Funding:

18 Research Awards (ORSP Research Funding) ↑

14 Publication & Presentation Awards ↑

14 Department/CST Summer Research Asst. ↑

6 were for 12 week full support

8 were for 6 week full support

**30 SCREE Presentations (Undergraduate and graduate)**

### Completed Masters Theses

Boetcher, Amy. 2006. Effects of Matrix Type and Human Disturbance on Forest Structural Characteristics in the Kakamega Forest, Kenya. (Gehring and Lung)

Bosak, Amanda. 2006. Water quality and periphyton composition at Cormorant nesting sites and non-nesting sites in the Beaver Island Archipelago. (King)

Dyer, Rebecca. 2005. An Analysis of Selected Ecological and Vegetational Characteristics in Four Suburban Ecosystems. (Wujek)

Kanine, Jennifer. 2005. Microsatellite Analysis of Genetic Variation Within Michigan River Otters (*Lontra canadensis*). (Swanson)

Maddox, Cynthia. 2005. Genetic Evaluation and Comparison of Effective Population Estimators in a Reintroduced Population of Black-Footed Ferrets (*Mustela nigripes*). (Swanson)

Miller, Matthew. 2005. The Accumulation and Depuration of Cadmium in the Pumpkinseed Sunfish (*Lepomis gibbosus*) (Scheide)

Murawski, Jane. 2006. Impacts of Road Salt Runoff on Wetlands and its Effects on the Development and Survival of Wood Frog (*Rana sylvatica*) Tadpoles. (Gillingham)

Potter, Bradley A. 2005. Creating Predictive Models of Wildlife Crossing Locations Along Highways in Michigan. (Gehring)

TerHaar, Ellen. 2006. Nesting Activity of the Painted Turtle on Beaver Island, Michigan and Mechanisms Used by Predators to Locate Nesting Sites. (Gillingham)

Tollenaere, Keith. 2005. Effects of Temperature and Food Concentration on Larval Yellow Perch (*Perca flavescens*) During the Critical Period. (McNaught)

### **Master's Plan B**

Schupbach, Kelly. 2006. A comprehensive review of the phylogenetic relationship between *Escherichia coli* and *Shigella* sp. and an examination of environmental detection approaches. (Alm)

Woodard, Christina. 2006. Cloning mex-5, skn-1, and mex-1 in *Caenorhabditis briggsae*. (Schisa)

## Biology Department Undergraduate Student Research Summary: 2005-06

### Undergraduate Research Summary: 2005-06

#### Undergraduate Capstone Experiences:

8 Undergraduate Internships  
16 Undergraduate Research Projects (BIO 403) ↑  
149 Student Teaching

#### Undergraduate Student Research Funding:

8 Research Awards (ORSP Research Funding) ↑  
2 Publication & Presentations Awards  
7 ORSP/CST Summer Research Scholarships ↑

7 Posters at the Capitol  
30 SCREE Presentations (Undergraduate and Graduate)

### Undergraduate Research (BIO 403)

Celmer, Andrea. 2006. The Role of Ca<sup>2+</sup>-Dependent-K<sup>+</sup> Channels and Rhythmicity by the pre-Botzinger Complex of Neonatal Mice. (Kelty)

Cibulka, Daniel. 2006. Size distribution and diet of yellow perch, *Perca flavescens*, in O'Rourke Lake, Roscommon Co., MI. (McNaught)

Curtis, Tami. 2005. Autophagosomes in *Arabidopsis thaliana* Protoplasts Induced by Stress Conditions. (Dannenhoffer)

Czerwinski, Michael. 2005. Analysis of the Relationship between Oocyte Protein Aggregates and Microtubulins in *C. elegans*. (Schisa)

Geyer, Nicole. 2006. Antibiotic resistance in enteric commensal bacteria in cattle water troughs in northern Michigan. (Alm)

Elsaidi, Lily. 2006. The *in vitro* Effects of Ibuprofen on the ability of Avian Macrophages to Phagocytize Sheep Erythrocytes. (McCorkle)

Freas, William. 2006. Abdominal Muscle Development in the Larval Shrimp. (Hertzler)

Hund, Matt. 2006. Survey of Attitudes Towards Recolonization of Gray Wolves (*Canis lupus*) in the Northern Lower Peninsula of Michigan (Gehring)

Lange, Ashley 2006. A Structural Analysis of the Multivulva and Vulvaees Phenotypes in *C. elegans* using SEM. (Schisa)

Miller, Danielle. 2005. Analysis of the Floral Anatomy of *Peperomia caperata* (Dannenhoffer)

Noyes, Corey. 2005. Pumpkin fruit trypsin inhibitor mRNA localization in the common pumpkin, *Cucurbita maxima* (Dannenhoffer)

Shields, Edward. 2006. Gap Junction Connectivity in the Neonatal Mouse Pre-Botzinger Complex as Assessed by Fluorescence Recovery After Photobleaching. (Kelty)

Simons, Ashlie. 2005. Analyzing the growth habit of *Populus tremuloides* in an alvar ecosystem. (Dannenhoffer)

Snay, Jessie. 2005. Localization of Pumpkin Fruit Trypsin Inhibitor in the Sieve Elements and Companion Cells of *Cucurbita maxima* (Dannenhoffer)

Walworth, Aron. 2005. Where is the Pumpkin Fruit Trypsin Inhibitor Synthesized? (Dannenhoffer)

Zimble, Daniel. 2006. Antibiotic resistance in enterococci isolated from freshwater beaches in Michigan (Alm)

### Student Teaching

<b>Secondary</b>	<b>Fall 2005</b>	<b>Spring 2006</b>
Biology Major	5	2
Biology Minor	3	2
Earth Science Major	8	8
Earth Science Minor	3	7
Integrated Science Major		1
<b>Elementary</b>		
Science Major	50	27
Biology Minor	9	6
Earth Science Major		1
Earth Science Minor	6	1
Integrated Science Major		4
Integrated Science Minor		4
<b>Total</b>	<b>86 ↓</b>	<b>63↓</b>

### Posters at the Capitol

Celmer, Andrea. The Role of Ca<sup>2+</sup>-Dependent K<sup>+</sup> Channels in the Generation of Rhythmic Activity of the Pre- Bötzing Complex of Neonatal Mice. (Kelty)

Czerwinski, Mike. Analysis of the relationship between oocyte protein aggregates and microtubules in *Caenorhabditis elegans*. (Schisa)

Gibbons, Kelsey. The Ghost of Bottlenecks Past: Population structure of smallmouth bass (*Micropterus dolomieu*) in the Beaver Island Archipelago. (Swanson)

Kropiewnicki, Rachael. Population size, interpopulation dispersal rate, inbreeding, and population structure in *Sistrurus catenatus catenatus*. (Swanson)

Noyes, D. Corey w/Aaron Walworth. Localization of Pumpkin Fruit Trypsin Inhibitor (PFTI) mRNA. (Dannenhoffer)

Shields, Ed. Gap Junction Connectivity in the Neonatal Mouse Pre-Bötzing Complex as Assessed by Fluorescence Recovery after Photo-bleaching. (Kelty)

Simons, Ashlie. Analysis of the growth habit of *Populus tremuloides* in an alvar ecosystem. (Dannenhoffer)

### **Student Research & Creative Endeavors Exhibition (Undergraduate and Graduate Students)**

Alan, S. Noyes, D. and Walworth A. Where is the Pumpkin Fruit Trypsin Inhibitor Synthesized? (Dannenhoffer)

Bickel, J. Analysis of Aggregates in Oocytes of *Caenorhabditis elegans* (Schisa)

Bicker, S. Callison, T. Nelson, E. and Swanson, B. Genetic Bottleneck Analysis in Reintroduced Populations of American Martens in Michigan. (Swanson)

Boetcher, A., Gehring T. and Lung, M. Understanding the Relationship between Trail Systems and Forest Use in the Kakamega Forest, Kenya. (Gehring)

Casler, J. and Militello, J. Leaf Decomposition at Chippewa River Sites Above and Below Lake Isabella, Isabella County, Michigan. (King)

Cellar, A. and Gehring, T. Integrating and Evaluation Livestock Guarding Dogs for Reducing Wolf-Human Conflict on Michigan Farms. (Gehring)

Celmer, A. and Shields, E. The Role in Ca<sup>2+</sup>Dependent K<sup>+</sup> Channels in the Generation of Rhythmic Activity of the Per-Bötzing Complex of Neonatal Mice. (Kelty)

- Czerwinski, M. Analysis of the Relationship between Oocyte Protein Aggregates and Microtubules in *Caenorhabditis elegans*. (Schisa)
- DeBruyne, R., Claramunt, R. and Galarowicz, T. Von Bertalanffy Growth Model Changes for Lake Whitefish from 1980-2005. (Galarowicz)
- Dziedzic, R. Differential Habitat Use by Long-and Short-distance Migrants at Nayanquing Point State Wildlife Area, Lake Huron, Michigan. (Hamas)
- Eilers, C. A Comparison of Fish Assemblages in Vegetated and Non-Vegetates Areas of the Littoral Zone. (Galarowicz)
- Eilers, C. Movement, Home Range, and Habitat Selection of the Muskellunge (*Esoxmasquinongy*). (Galarowicz)
- Hale, L. and Starks, G. Research Columns Written by CMU Professor Faith Johnston (Starks)
- Kloosterman, G. An Analysis of Stream Quality Parameters of Slagle Creek Upstream and Downstream of Harrietta State Fish Hatchery, Wexford County, Michigan (King)
- Kloosterman, G. and Thomas, M. Influence of the Agriculturally Disturbed North Branch of Leaf Decomposition Rates and Macroinvertebrate Communities in the Chippewa River, Isabella County, MI (King)
- Knoll, M., Galarowicz, T. and Smith, K. Survival of Larval Walleye in Michigan Hatchery Ponds. (Galarowicz)
- Marsack, K. and Swanson, B. Habitat Fragmentation Effects on the Eastern Box Turtle (*Terrapene c. carolina*) (Swanson)
- Nelson, E., Bicker, S. and Swanson, B. Genetic Evaluation of Michigan's Northern Lower Peninsula Reintroduced American Marten. (Swanson)
- Pressler, M. and Vibber, L. Atrazine Metabolism by Novel Soil Isolates (Colores)
- Rosler, S., Gehring, T., Li, B., Rosler, M., Schultz, R. and Wydeven A. Testing the Effectiveness of Shock Collars as a Non-Lethal Control for the Site-Aversive Conditioning of Wild Wolves in Northwestern Wisconsin. (Gehring)
- Sawyers, M. The Effects of Brood Parasitism on Yellow Warblers at Nayanguing Point State Wildlife Area, Bay County, MI (Hamas)
- Schild, J. Paleolimnological Assessment of Lake Geneserath, Beaver Island, Charlevoix County, MI Using Fossil Diatom Assemblage, Nutrients, and Chlorophyll. (McNaught)

Sharp, S. An Analysis of Modern Biotechnology Controversies and the Opinions of Central Michigan University Students and Faculty. (Schisa)

Shields, E. Gap Junction Connectivity in the Neonatal Mouse Per-Böttinger Complex as Assessed by Fluorescence Recovery after Photo-bleaching. (Kelty)

Shunta, L., Gehring, T. and Callison, T. Home-Range Dynamics of American Martens (*Martes americana*) in Michigan's Northern Lower Peninsula. (Gehring)

Simons, A. Analysis of the Growth Habit of *Populus tremuloides* in an Alvar Ecosystem. (Dannenhoffer)

St. Onge, R. and Will, A. Physical and Chemical Parameters of Various Locations on the Chippewa River, Isabella County, MI. (King)

Tonon, M. Characteristics of Environmental and Clinical *Achromobacter xylosoxidans* Isolates. (Colores)

Vibber, L. Analysis of Atrazine-Degrading Genes in Uncharacterized Atrazine-Degrading Microorganisms. (Colores)

Weber, A. Morphological Response of *Bosmina* to the Cladoceran Predator *Leptodora kindti*. (McNaught)