

Annual Report 2006-07

Department of Biology

Claudia Douglass, Chair

Summary Data Included:

- Student Credit Hours
- Graduation Data 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: 2006-07

Majors, Minors, and SCH Summary: 2006-07

**20,468 SCH → 4.9% increase over 2005-06
Highest enrollment in history.**

Graduate Students:

**11 MS Students Graduated 2005-06
45 MS Students Enrolled (Sp 2007) ↑**

Undergraduate Majors:

**129 Biology Majors Graduated 2005-06 ↑
487 Biology Signed Majors (Sp 07) ↑
87 Science (DX) Majors Graduated 2005-06
30 Science (DX) Signed Majors (Sp 07)
107 Integrated Science (EI) Signed Maj (Sp 07) ↑
29 Integrated Science (Sec) Signed Maj (Sp 07) ↑
15 Neuroscience Major Graduated 2005-06
46 Neuroscience Signed Majors (Sp 07)**

Undergraduate Minors:

**46 Biology Minors Graduated 2005-06 ↑
62 Biology Signed Minors (Sp 07)
16 Natural Resources Minors Grad 2005-06 ↑
29 Natural Resources Signed Minors (Sp 07)
9 Science Minors Graduated 2005-06
24 Science Signed Minors (Sp 07) ↑
190 Integrated Science (EI) Signed Min (Sp 07) ↑**

| Session | Actual SCH | Change from 05-06 |
|----------------------|---------------|-------------------|
| Summer II 2006 | 213 | +21 |
| Fall 2006 | 11,649 | +516 |
| Spring 2007 | 8,101 | +479 |
| Summer I 2007 | 505 | -50 |
| Total 2006-07 | 20,468 | +966 |

| Graduate Programs | Graduated 2006 | Currently Enrolled (Sp 07) |
|----------------------------|-----------------------|-----------------------------------|
| MS Biology | 8 | 26 |
| MS Conservation Bio | 3 | 19 |
| Totals | 11 | 45 |

| Undergraduate Major | Graduated 2006 | Currently Signed (Sp 07) |
|-----------------------------------|-----------------------|---------------------------------|
| Biology | 10 | 14 |
| Biology K-8 | 0 | 15 |
| Biology 7-12 | 0 | 26 |
| Bio: Natural Resources | 30 | 62 |
| Bio: Biomedical Sciences | 5 | 168 |
| Bio: General | 21 | 61 |
| Bio: Medical Technology | 4 | 0 |
| Bio: Microscopy | 4 | 23 |
| Bio: Pregraduate/Preprof | 55 | 118 |
| Total Biology Majors | 129 | 487 |
| Science (DX) | 87 | 30 |
| Integrated Science (EI DI) | New Program | 107 |
| Integrated Science (SecDI) | New Program | 29 |
| Neuroscience | 15 | 46 |

| Undergraduate Minors | Graduated 2006 | Currently Signed (Sp 07) |
|-----------------------------------|-----------------------|---------------------------------|
| Biology | 46 | 36 |
| Biology Teaching | 0 | 26 |
| Natural Resources | 19 | 29 |
| Science | 9 | 24 |
| Integrated Science (EI DI) | 0 | 190 |

Biology Department Publication/Presentation Summary: 2006-07

Faculty Publication Summary: 2006-07

29 Refereed Articles (8 with students) ↑

1 Book

2 Conference Proceedings

60 Presentations (46 with students) ↑

Refereed Articles:

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

Colores, G.M., D.M. Ward and W.P. Inskeep. (2007) Competitive fitness of isolates enriched on phenanthrene sorbed to model phases. *Applied and Environmental Microbiology* 73:XXX-XXX (DOI:10.1128/AEM.02573-06).

Dannenhoffer, J.M., W. Stein, P.M. Bonamo (2007) The primary body of *Rellimia thomsonii*: integrated perspective based on organically connected specimens. *International Journal of Plant Science* 168 (4):491-506.

Fulga, T.A., Elson-Schwab I., Khurana V., **Steinhilb M.L.**, Spires T.L., Hyman B.T., Feany M.B. Abnormal bundling and accumulation of F-actin mediates tau-induced neuronal degeneration *in vivo*. *Nature Cell Biology* (2007) Feb; 9(2): 139-48.

Galarowicz, T.L., J.A. Adams, and D.H. Wahl. 2006. The influence of prey availability on ontogenetic diet shifts of a juvenile piscivore. *Canadian Journal of Fisheries and Aquatic Sciences* 63(8): 1722-1733.

Jud, M., Razelun, J., Bickel, J., Czerwinski, M., and Schisa, J.A. (2007). Conservation of large foci formation in arrested oocytes of *Caenorhabditis nematodes* *Development, Genes, and Evolution* 217: 221-226.

Kelty, J.D. Rapid cold hardening of *Drosophila melanogaster* in nature. *Physiological Entomology*. In Press.

Kiernan, D. and Hertzler, P.L. (2006). Muscle development in dendrobranchiate shrimp, with comparison with *Artemia*. *Evolution & Development* 8: 537-549.

Millions, D. G., and B. J. Swanson. 2007. Evaluation of habitat fragmentation on population structure in bobcats. *Journal of Wildlife Management* 71: 96 – 102.

Moore, J.A. and J.C. Gillingham. (2006). Spatial ecology and multiscale habitat selection by a threatened rattlesnake: the Eastern Massasauga (*Sistrurus catenatus catenatus*). *Copeia* 2006:742-751.

Nicholson, K.E., L.J. Harmon, and J.B. Losos. 2007. Evolution of *Anolis* Lizard Dewlap Diversity. PLoS ONE. 2007; 2(3): e274.

Preuss, T.S., and **T.M. Gehring**. 2007. Landscape analysis of potential bobcat habitat in the northern Lower Peninsula of Michigan. Journal of Wildlife Management. In Press.

Schisa, J.A., Tenlen, J., Diede, S., and Page, B.P. (2006). Reduced dosage of *pos-1* suppresses Mex mutants and reveals complex interactions among CCCH zinc finger proteins during *Caenorhabditis elegans* embryogenesis. *Genetics* 174: 1933-1945. (Dec. 2006)

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* (special publication) 567(1)57-67.

Seefelt, N.E. and **J. C. Gillingham**. 2006. Foraging locations of Double-crested Cormorants in the Beaver Archipelago of northern Lake Michigan: implications for Smallmouth Bass declines. *Waterbirds* 29(4):473-480

Slininger, P.J., Dien, B.S., **Gorsich, S.W.**, Liu Z.L. 2006. Nitrogen source and mineral optimization enhance D-xylose conversion to ethanol by the yeast *Pichia stipitis* NRRL Y-7124. *Appl Microbiol Biotechnol* 72 (6): 1285-96.

Stedtfeld, R.D.; D. Yurtsever, M. Duran, **E.W. Alm**, and S.A. Hashsham. 2006. Detection and Occurrence of Indicator Organisms and Pathogens. *Water Environment Research* 78 (10):1054-1077.

Steinhilb M.L., Dias-Santagata D., Mulkearns E.E., Shulman J.M., Biernat J., Mandelkow E.M., Feany M.B. S/P and T/P phosphorylation is critical for tau neurotoxicity in *Drosophila*. *Journal of Neuroscience Research* (2007) May 1, 85(6): 1271-8.

Swanson, B. J. and C. J. Kyle. In Press. The importance of temporally separated reintroductions compared to geographically separated reintroductions in Michigan martens. *Journal of Mammalogy*.

Swanson, B. J., B. P. Kelly, **C. K. Maddox**, and J. Moran. 2006. Shed skin as a source of DNA for genotyping marine Phocids. *Molecular Ecology Notes* 6: 1006 - 1009.

Triemer, Richard, **Eric W. Linton**, Woongghi Shin, Maria A. Nudelman, **Anna K. Monfils**, Matthew S. Bennett and Stacy Brosnan. 2006. Phylogeny of the Euglenales based upon SSU and LSU rDNA sequence comparisons and description of *Discoplastis* gen. nov. (Euglenophyta). *Journal of Phycology*. 42 (3):731-740

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. *Journal of Lake and Reservoir Management*. 22(3): 240-244.

Vibber, L.L., **M.J. Pressler** and **G.M. Colores**. (2007) Isolation and characterization of atrazine-degrading microorganisms from an agricultural soil. *Applied Microbiology and Biotechnology* 75:921-928.

Walk, S.T., **E. Alm**, L.M. Calhoun, J.M. Mladonicky, T.S. Whittam. 2007. Genetic diversity and population structure of *Escherichia coli* isolated from freshwater beaches. *Environmental Microbiology*. In Press.

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(1):91-103.

Wujek, D.E., E.M. Wright and F.J. Menapace. 2006. Silica-scaled chrysophytes from east central New York. *J. Torrey Bot. Soc.* 133(3):482-489.

Wujek, D.E. 2006. Freshwater heliozoa from Florida. *Florida Scient.* 69(3):171-191.

Wujek, D.E., P. Timpano and R.H. Thompson. 2006. Differentiation and development of *Volvox aureus* (Volvocales). *Trans. Kansas Acad. Sci.* 109(3-4):139-148.

Wujek, D.E. The first occurrence of the chrysophyte alga *Amphirhiza epizootica* from North America. *Mich. Bot.* (45(3):193-196.

Wujek, D.E. and L.C. Saha. 2006. Freshwater scaled heterotrophic flagellates and heliozoa from India including a description of a new species of *Choanocystis*. *J. Bombay Nat. Hist. Soc.* 103(1):195-205.

Conference Proceedings

Alm, E.W. 2006 "Pathogenic *E. coli*". EPA National Beaches Conference. Niagara Falls, NY. October 13, 2006.

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. *Developments in Hydrobiology: Limnology & Aquatic Birds*, A.R. Hanson and J. J. Kerekes, eds., Springer Publishing, The Netherlands, 567(2006):57-67

Books

Douglass, C. *Study Guide to Accompany Biology of Humans: Concepts, Applications, Issues (2nd Ed)* by Goodenough, McGuire, and Wallace published by Prentice Hall, both print and online, January 2007. (446 pp)

Presentations

Alm, E.W. 2006 "Pathogenic *E. coli*". Invited talk. EPA National Beaches Conference. Niagara Falls, NY. October 13, 2006.

Alm, E.W. 2007. "*E. coli* in Great Lakes Beach Sand". Invited talk. Michigan Environmental Health Association. Kalamazoo, MI. March 27, 2007

Alm, E.W. 2007. "*E. coli* is a Naturalized Species in Beach Ecosystems". Invited talk. American Society for Microbiology General Meeting. Toronto, CA. May 25, 2007.

Bauer, L., D. Sadler, L. Assis, and **E. W. Alm.** 2007. Genes Associated with *E. coli* Pathogenicity in Freshwater Beach Sand. Poster presentation. American Society for Microbiology General Meeting, Toronto, CA. May 23, 2007.

Bicker, Sara W., Eric A. Nelson, and Bradley J. Swanson. Genetic bottleneck analysis in reintroduced populations of American martens in Michigan. Poster: The Wildlife Society – Anchorage, AK.

Bicker, Sara A., Eric A. Nelson, and Bradley J. Swanson. Genetic bottleneck analysis in reintroduced populations of American martens in Michigan. Oral: Midwest Furbearers Meeting – Sault Ste. Marie, MI.

Buchanan, Clay, Bradley J. Swanson, Thomas M. Gehring. Habitat Assessment of American Marten In the Lower Peninsula of Michigan. Oral: Midwest Furbearers Meeting – Sault Ste. Marie, MI.

Buchanan, Clay, Bradley J. Swanson, Thomas M. Gehring. Habitat Use By American Marten In Hardwood Dominated Forests. Poster: The Wildlife Society – Anchorage, AK.

Cellar, A. C., and T. M. Gehring. 2006. Integrating and evaluating livestock guarding dogs for reducing wolf-human conflict. 13th Annual Conference of The Wildlife Society, Anchorage, Alaska.

Cellar, A. C., and T. M. Gehring. 2007. Integrating and evaluating livestock guarding dogs for reducing wolf-human conflict on Michigan Farms. Midwest Wolf Stewards Meeting, Cable, Wisconsin.

Cellar, A. C., and T. M. Gehring. 2006. Integrating and evaluating livestock guarding dogs for reducing wolf-human conflict on Michigan Farms. Great Lakes Regional Conference – Native American Fish & Wildlife Society, Manistee, Michigan.

Cellar, A. C., and T. M. Gehring. 2006. Integrating and evaluating livestock guarding dogs for reducing wolf-human conflict on Michigan Farms. 67th Midwest Fish & Wildlife Conference, Omaha, Nebraska.

Czerwinski, M., Bickel, J., Jud, M., Schisa, J.A. 2007. Regulation of oocyte RNP foci by the Major Sperm Protein signaling pathway. Poster presentation at 16th Biennial International *C. elegans* Conference, Los Angeles, CA.

Czerwinski, M., Petty, E., Bickel, J., Kostin, A., Jud, M., Schisa, J.A. 2007. Regulation of oocyte RNP foci by the Major Sperm Protein signaling pathway. Poster presentation at Midwest Regional Developmental Biology Meeting, Chicago, IL.

DeBruyne, R. L., T. L. Galarowicz, and R. Claramunt. 2006. “Relative abundance and growth models for lake whitefish in Lake Michigan: 25 years of change.” 136th Annual Meeting of the American Fisheries Society, Lake Placid, New York.

Eilers, C. D., T. L. Galarowicz, and K. Smith. 2006. “Movement and habitat selection of muskellunge in a transitional system.” 136th Annual Meeting of the American Fisheries Society, Lake Placid, New York
Gehring, T. M., D. W. Craven, A. Kiogima, and H.K. Stricker. 2006. Proactive management of gray wolves in the Great Lakes Region. Great Lakes Regional Conference – Native American Fish & Wildlife Society, Manistee, Michigan.

Gehring, T. M., D. W. Craven, A. Kiogima, and H.K. Stricker. 2006. Proactive management of gray wolves in the Great Lakes Region. Special Symposium: Indigenous Peoples Wildlife and Ecosystem Management. 13th Annual Conference of The Wildlife Society, Anchorage, Alaska.

Gillingham, James C. 2007.. Central Michigan University Biological Station on Beaver Island: Past, Present and Future. International Association of Great Lakes Research annual meeting. Pennsylvania State University.

Gorsich, Steven, Tricia Brown, Megan Bolen, Sarah Lubitz, and J.M McCaffery American Society of Microbiology General Meeting. May 21-25, 2007. *Furfural And 5-hydroxymethylfurfural Causes An Increase In Ros Activity And Cellular Damage Associated With Programmed Cell Death In Saccharomyces cerevisiae.*. (Toronto, ON). Poster Presentation.

Gregory, Jennifer and **Bradley J. Swanson.** Interpeninsula dispersal of river otters in Michigan. Oral: Midwest Furbearers Meeting – Sault Ste. Marie, MI.

Hertzler, P.L. and **Freas, W.R.** (2006). Abdominal muscle development in marine shrimp. *Dev. Biol.* 295:452a. Presented at the Society for Developmental Biology, 65th Annual Meeting, University of Michigan, Ann Arbor, MI, June 17-21, 2006.

Hill, K.A., Shepson, P.B., Galbavy, E.S., Anastasio, C., **Kourtev, P.S.**, Konopka, A. and Stirm, B.H. (2007) Processing of atmospheric nitrogen by clouds above a forested environment. *Journal of Geophysical Research-Atmospheres*, D11301.

Jud, M. Razelun, J. Bickel, J. Czerwinski, M., Wood, M., and Schisa, J.A. 2007. RNP foci in *C. elegans* oocytes contain elements of stress granules and are conserved in *Caenorhabditis* nematodes. Poster presentation at Midwest Regional Developmental Biology Meeting, Chicago, IL.

Jud, M., Wood, M., Fausett, S., Razelun, J., Bickel, J., Czerwinski, M., Schisa, J.A. 2007. RNP foci in *C. elegans* oocytes contain stress granule proteins and are conserved in *Caenorhabditis* nematodes. Poster presentation at 16th Biennial International *C. elegans* Conference, Los Angeles, CA.

Klomp, J.E., D. Diekema, and **G.M. Colores.** Analysis of the avian cloacal microorganisms in nestling tree swallows using molecular techniques. American Society for Microbiology National Meeting, May 21-25, 2007, Toronto.

Klomp, J.E., D. Diekema, and **G.M. Colores.** Using PCR-DGGE to determine the bacterial diversity and identity of cloacal samples from Tree Swallows (*Tachycineta bicolor*). Michigan Branch of the American Society for Microbiology Spring Meeting, May 12, 2007, Wayne State University.

Klomp, Jeffrey A. and **Bradley J. Swanson.** River otters of Oregon: using genetics to identify population structure. Poster: The Wildlife Society – Anchorage, AK.

Knoll, M., T. Galarowicz, and K. Smith. 2007. “The growth and survival of larval walleye in Michigan hatchery ponds.” Joint meeting of the Indiana, Michigan, and Ohio chapters of the American Fisheries Society, Algona, Indiana.

Knoll, M., T. Galarowicz, and K. Smith. 2007. “The growth and survival of larval walleye in Michigan hatchery ponds.” Midwest Fish and Wildlife Conference, Omaha, Nebraska.

Kolawole, Abimbola O. and **Fred M. McCorkle**– May 18, 2007 –Cyclophosphamide Effects on Avian Macrophages In Vitro American Association of Immunology, Miami, Fl.

Linton, Eric W. and Richard E. Triemer. A Combined SSU and LSU rDNA Phylogeny of the Euglenales with a Description of the New Genus *Discoplastis*. Phycology Society of America Meeting in Juneau, Alaska. Jul. 2006.

- Marsack, Kelly A.** and **Bradley J. Swanson.** The Effects of Habitat Fragmentation on the Eastern Box Turtle (*Terrapene c. carolina*) Poster: The Wildlife Society – Anchorage, AK.
- McFadden, L. M.**, and **T. M. Gehring.** 2006. Home-range dynamics and habitat selection of American marten in Michigan's Lower Peninsula. 13th Annual Conference of The Wildlife Society, Anchorage, Alaska.
- McFadden, L. M.**, and **T. M. Gehring.** 2006. Home-range dynamics and habitat selection of American marten in Michigan's Lower Peninsula. Midwest Furbearer Workshop, Sault Ste. Marie, Michigan.
- McDonald, E.**, Roseman, E., and **McNaught, A.S.** 2007. Power plant selectivity of larval perch on the Detroit River. Poster presentation at the International Association for Great Lakes Research (IAGLR), State College, PA.
- McNaught, A.S., Bryant, J., Bogan, V.L., and Granet, J.J.** 2007. Life on the edge: Larval perch recruitment in the cold, sterile waters of Lake Michigan. Oral presentation at the International Association for Great Lakes Research (IAGLR), State College, PA.
- McNaught, A.S.** 2006. Response of Cedar Lake (Ingham Co., MI) to agricultural drain diversion. Oral presentation at the meeting of the North American Lake Management Society (NALMS), Indianapolis, IN.
- McNaught, A.S.,** Canale, R.P., Whelan, G., and Estabrook, V.M. 2006. Glass versus Plastic: A critical evaluation of techniques for storing and preserving water samples for total phosphorus analysis. Poster presentation at the meeting of the North American Lake Management Society (NALMS), Indianapolis, ID.
- McNaught, A.S.** and **Weber, A.** 2006. Changes to the zooplankton community following the appearance and disappearance of *Leptodora kindtii*. Oral presentation at the American Society of Limnology and Oceanography conference, Victoria, British Columbia.
- Monfils, A. K.,** R. Rabeler, P. E. Berry and L. A. Prather. March 2007. Michigan Botanical Symposium: Could a Great Lakes Network be Next? 2007 Ohio Botanical Symposium. Columbus, Ohio.
- Monfils, A. K.** and L. Alan Prather. August 2006. Taxonomy, Phenology and Floral Morphological Variation of Populations of *Pedicularis densiflora* (Orobanchaceae). Botany 2006 (Affiliated with Botanical Society of America and American Society of Plant Taxonomist). Chico, CA.
- Pressler, M.J., J.E. Klomp** and **G.M. Colores.** Multiplex PCR primers for the detection of polycyclic aromatic hydrocarbon-degrading genes in contaminated rhizosphere soils. American Society for Microbiology National Meeting, May 21-25, 2007, Toronto.
- Rigney, Todd W.,** Mark Knee, **Bradley J. Swanson.** Status of the black bear in the Northwestern Lower Peninsula of Michigan: A non-invasive mark-recapture population estimate study. Oral: Native American Fish And Wildlife Conference, Great Lakes Region – Manistee, MI.
- Rigney, Todd W.,** Mark Knee, **Bradley J. Swanson.** Status of the black bear in the Northwestern Lower Peninsula of Michigan: A non-invasive mark-recapture population estimate study. Poster: The Wildlife Society – Anchorage, AK.

Rigney, Todd W., Mark Knee, **Bradley J. Swanson**. Status of the black bear in the Northwestern Lower Peninsula of Michigan: A non-invasive mark-recapture population estimate study. The Wildlife Society – Anchorage, AK. Invited Seminar Presentation at the Native American Wildlife Symposium

Rosler, S. T., T. M. Gehring, M. T. Rosler, A. P. Wydeven, and R. N. Schultz. 2007. Testing shock collars as a non-lethal control for site-aversive conditioning of wolves in northwestern Wisconsin. Midwest Wolf Stewards Meeting, Cable, Wisconsin.

Rosler, S. T., T. M. Gehring, M. T. Rosler, A. P. Wydeven, and R. N. Schultz. 2006. Testing shock collars as a non-lethal control for site-aversive conditioning of wolves in northwestern Wisconsin. 13th Annual Conference of The Wildlife Society, Anchorage, Alaska.

Sahin, M. S., Triemer. R. E & **Linton, E. W.** Analyzing the Euglenoid Plastid Genome. Microbial Genome Sequencing section of the International Plant and Animal Genome (PAG) meeting. San Diego, CA. January 12-18, 2007.

Scheide, J. I. and R. Heard. 2006. Sublethal heat stress results in an elevation of hemolymph calcium in false dark mussel, *Mytilopsis leucophaeta*. Presented at the American Physiological Society, Comparative Physiology Meeting, Virginia Beach.

Schisa, J.A., Jud, M., Kostin, A., Razelun, J., Czerwinski, M., Bickel, J., and Gallo, C. 2007. RNP foci in *C. elegans* oocytes are regulated by Major Sperm Protein and contain elements of Processing bodies and Stress granules. Invited Oral Presentation at 12th Annual RNA Conference, Madison, WI

Schisa, J.A., Kostin, A., Jud, M., Gallo, C., Bickel, J., Petty, E. 2007. Intersection of processing bodies and stress granules in *C. elegans* oocyte RNP foci. Poster presentation at 16th Biennial International *C. elegans* Conference, Los Angeles, CA.

Schisa, J.A., Bickel, J., Petty, E., Czerwinski, M., and Konwerski, J. 2006. Regulation of dynamic RNP foci in *C. elegans* oocytes by the major sperm protein (MSP) pathway. Poster presentation at the 5th biennial meeting on Germ Cells. Cold Spring Harbor Laboratory, NY.

Seefelt, N.E. and **J.C. Gillingham**. 2007. *Yearly Variation in the Number of Double-crested Cormorants Breeding in the Beaver Archipelago of Northern Lake Michigan in the Absence of Population Controls* Poster, International Association of Great Lakes Research, Penn State University, State College, Pennsylvania.

Seefelt, N.E. 2006. *Report on Cormorants and Other Waterbirds Breeding in the Beaver Archipelago, Northern Lake Michigan*. Western Great Lakes Waterbird Working Group Meeting, Sault Ste. Marie, Michigan.

Seefelt, N.E. 2006. *The Misuse of Science – A Local Issue: The Double-crested Cormorant*, Invited Workshop Leader, Summit on Scientific Integrity, University of Michigan Biological Station, Douglas Lake, Michigan.

Svoboda, N. J., and **T. M. Gehring**. 2006. Spatial distribution and relative abundance of bobcats in the Northern Lower Peninsula of Michigan. Midwest Furbearer Workshop, Sault Ste. Marie, Michigan.

Swanson, Bradley J., John Moran, and Brendan P. Kelly. Breeding Stock Structure of Ringed Seals (*Phoca hispida*). Oral: Marine Mammals of the Holarctic IV – St. Petersburg Russia.

Tait, J., Zielinska, W., Lawrence, A.A. and Hertzler, P.L. Cloning and characterization of DEAD-box RNA helicases from the marine shrimp *Sicyonia ingentis*. Presented at the Midwest Society for Developmental Biology Meeting, Chicago, IL, April 13-15, 2007.

Yaroch, Samantha, Ellen Flannery, and Joanne Dannenhoffer 2007 ABA inhibits PCD during vascular element differentiation Midwest American Society of Plant Biologist, Annual Meeting,

**Biology Department External Grant and Contract Activity
July 2006 – May 2007**

Summary of External Grant and Contract Activity: 2006-07

14 Faculty, 2 Staff, and 1 Temporary Faculty were involved in submitting a total of **42** external grant and contract proposals requesting **\$3,424,608**.

20 Grants and contracts from 12 different faculty, 2 staff, 1 temporary faculty, and 2 students were funded for **\$922,581**.

| Faculty Student | Project Title | Sponsor | Amount Funded |
|--|--|-------------------------------------|--------------------------|
| <i>Anna Cellar and Tom Gehring</i> | Integrating and Evaluating Livestock Guarding dogs for Reducing Wolf-Human Conflicts on Michigan Farms | U.S. Dept of Agriculture | \$8,080 |
| Philip Oshel | Microscopy Services | Artificial Cell Technologies, Inc. | \$1,500 |
| Jennifer Schisa | Genetic and Molecular Analysis of Germ Cranule Components in <i>C. Elegans</i> | National Institutes of Health | \$195,964 |
| Bradley Swanson | Bobcat Diet in Southern New Mexico | Robert Harrison | \$5,250 |
| Eric Linton | Analyzing the Euglenoid Plastid Genome | National Science Foundation | \$351,754 |
| Claudia Douglass (w/ M. Libbee) | Environmental Education Curriculum Project Coordination, Evaluation and Teacher Training | MDEQ | \$2,000 |
| <i>Anna Cellar and Tom Gehring</i> | Evaluating the Effectiveness of Livestock Guarding Dogs for Reducing Wolf Depredations on Cattle on Farms in the Upper Peninsula of Michigan | U.S. Dept of Agriculture | \$7,504 |
| Tom Gehring | Farmers Conserving Wildlife: Integrating Livestock Guarding Dogs to Reduce Predation and Disease Transmission | Animal Welfare Institute | \$10,000 |
| Philip Oshel | Microscopy Services | Prism Analytical Technologies, Inc. | \$6,300 |
| Tom Gehring and <i>Shawn Rossler</i> | Evaluating the Effectiveness of Electronic Training Collars for Reducing Wolf-Human Conflict in Wisconsin | Wisconsin DNR | \$9,164 |
| Scott McNaught | Larval Fish Entrainment at the Wyandot Municipal Electric Plant | Golder Associates, Inc. | \$2,560 |
| Jonathan Kely | Function and Expression of Connexins in the Pre-Botzinger Complex | National Institutes of Health | \$191,414 |
| Philip Oshel | Microscopy Services | Dendritic Nanotechnologies, Inc. | \$6,300 |
| Bradley Swanson | Ringed Seal Population Structure | North Pacific Research Board | \$15,926 |
| Philip Oshel | Microscopy Services | Dow Chemical | \$10,000 |

| | | Company | |
|----------------|--|---|----------|
| Eric Linton | Analyzing the Euglenoid Plastic Genome | National Science Foundation | \$5,000 |
| Nancy Seefelt | Population Monitoring of Breeding Waterbirds and Continued Research on Breeding of Double-crested Cormorants in the Beaver Archipelago of Northern Lake Michigan | U.S. Fish and Wildlife Service | \$5,000 |
| Donald Uzarski | Fish and Invertebrate Analyses, Participation in Writing Fish, Invertebrate, and Experimental Design Chapters, Provide Guidance to Individual Indicator Groups and The Statistician as needed, Edit the Exec Summary and the Final Report for the Gr Lakes Coastal Wetlands Consortium Science Committee | Great Lakes Commission | \$16,214 |
| Janet Miller | In Hydrocephalus, do Alterations in Gene Expression Lead to Equivalent Changes in the Corresponding Protein Level? | Seeking Techniques Advancing Research in Shunts | \$38,400 |
| Donald Uzarski | Preparation of Manuals and Guidance Documents for Wetland Bioassessment in MI | Michigan DEQ | \$34,251 |

In addition through major internal funding, we received both the Provost's Research Award (Swanson) and the President's Research Award (Douglass); seven PRIF awards (Juris w/Ash, Juris w/Mueller, Steinhilb, Galarowicz, Gorsich, Kourtev, Nicholson); three REF awards (Dannenhoffer w/Benison, Gorsich, Kourtev), one FIT (Monfils, Juris, Steinhilb, Mueller), and one 2010 Project (Colores and Schisa).

Biology Department Graduate Student Research Summary: 2006-07

Graduate Student Research Summary: 2006-07

Graduate Student Research:

15 Masters Theses ↑
4 Plan B Research Papers ↑
2 Graduate Internships

Graduate Student Research Funding:

14 Department/CST Summer Research Asst.
6 were for 12 week full support
4 were for 6 week full support

30 SCREE Presentations (Undergraduate and Graduate)

Completed Masters Theses

Bickel, Jeremy. 2006. Dynamic RNP Aggregates in The Oocytes of *Caenorhabditis Elegans*. (Schisa)

Bicker, Sara. 2007. Genetic Bottleneck Analysis in Michigan's Lower Peninsula Reintroduced Population of American Marten (*Martes Americana*). (Swanson)

Brown, Jody. 2006. Effects Of Leaf Pack Enrichment On The Aquatic Macroinvertebrate Community and Sediment Epilithon/Detritus Composition In A Second Order, Channelized Stream. (King)

Davidson, Sarah. 2006. Testing A Non-Lethal Control Method For The Management of Wolves In Michigan: A Study Of Depredation Ecology. (Gehring)

DeBruyne, Robin L. 2006. Age, Growth, and Relative Abundance of Lake Whitefish (*Coregonus Clupeaformis*) in Lake Michigan Using Fishery Independent Surveys from 1980-2005. (Galarowicz)

Gregory, Andrew. 2006. Spatial Scale and Gender Matter: The Influence of Wolves on Elk Use of Space in Yellowstone National Park. (Swanson)

Kolawole, Abimbola. 2006. Cyclophosphamide Effects on Avian Macrophages In Vitro. (McCorkle)

McFadden (Shunta), Lynnea. 2007. Home Range Dynamics and Habitat Selection of American Martens. (Gehring)

Morency, Marc W. 2006. The Effects of Predation Risk on the Daily Activities and Foraging Behavior of Elk in Yellowstone National Park. (Gillingham)

- Nelson, Eric. 2006. Analysis of Dispersal in Michigan's Northern Lower Peninsula Reintroduced American Marten (*Martes Americana*). (Swanson)
- Roe, Matthew T. 2006. Functional Gap Junction Connectivity in the Pre-Botzinger Complex and its Possible Role in the Rhythmogenesis of Respiration. (Kelty)
- Tonon, Mary. 2007. Identification and Characterization of *Achromobacter* Xylooxidans-Related Isolates. (Colores)
- VanDam, Richard. 2007. Adenosine A1 Receptor-Mediated Modulation of Pre-Botzinger Complex Rhythm Generation in Medullary Slice and Island Preparations. (Kelty)
- Vibber, Laurel. 2007. Isolation and Characterization of Six Novel Herbicide-Degrading Agricultural Soil Isolates. (Colores)
- Woller M Megan 2006. Oxygen Consumption by the Unionids *Elliptio dilatata*, *Pyganodon* sp. and *Lampsilis siliquoidea* in the Presence of Zebra Mussels (*Dreissena polymorpha*). (Scheide)

Master's Plan B

- Ali, Sohail. 2007. Naproxen effects of avian macrophages, a study *in vitro*. (Scheide)
- Burnell, Jeffrey. 2007. Effects of Nicotine on the avian macrophage *in vitro*. (McCorkle)
- Klomp, Jeffrey. 2007. Population genetic analysis of the northern river otter (*Lontra canadensis*) in Oregon. (Swanson)
- Palmer, Melissa. 2006. Winter bird feeder use by the white-breasted nuthatch (*Sitta carolinensis*). (Hamas)

Biology Department Undergraduate Student Research Summary: 2006-07

Undergraduate Research Summary: 2006-07

Undergraduate Capstone Experiences:

5 Undergraduate Internships
30 Undergraduate Research Projects (BIO 403) ↑
97 Student Teaching (Biology 18, Science 79)

Undergraduate Student Research Funding:

14 ORSP/CST Summer Research Scholarships ↑

10 Posters at the Capitol ↑
28 SCREE Presentations (Undergraduate and Graduate)

Undergraduate Summer Scholars

Allen, Sandra. Stress Tolerance – Using Baker’s Yeast as a Producer of Bio-Ethanol. (Gorsich)

Bauer, Leah. Attachment Mechanisms of Escherichia coli in Freshwater Beach Sand. (Alm)

Brown, Randi. Effectiveness of Livestock Guarding Dogs for Excluding Deer from Livestock Pastures. (Gehring)

Brown, Tricia. Effects of Oxidative Damage on Mitochondria and Yeast Spore Development. (Gorsich).

Craig, Daedre. Ecomorphs of the Panamanian Anolis Lizards. (Nicholson)

Heumann, Rudi. Genetic Determination of the Breeding Behavior of Arctic Ringed Seals. (Swanson)

Ignash, Matthew. Identification of the Membrane Insertion Domain for Repeats-In-Toxin (RTX toxin) from Vibrio cholerae. (Juris)

Julius, Jessica. The Effects of Sexual Cannibalism on Offspring in Tenodera Aridifolia Sinensis. (Swanson)

Recker, Cristina. The Effects of Riparian Vegetation on the Density and Biomass of Brook Trout (Salvelinus fontinalis). (Galarowicz)

Reinecke, James. The Role of Calpain on Tau Proteolysis in Neurodegenerative Disease. (Steinhilb)

Schmidt, Laura. Systematics and Molecular Variation in the Mustard Family (Brassicaceae). (Monfils)

Schumacher, Katelyn. Using Microsatellites to Detect Bobcat Poaching in Michigan. (Swanson)

Stamps, Glenn. Courtship, Mating and Larval Survivability in Polyploid Ambystomatid Salamanders. (Gillingham)

Weaver, Michelle. Factors Determining Microbial Community Composition in the Pitchers of the Northern Pitcher Plant, *Sarracenia Purpurea*. (Kourtev)

Undergraduate Research (BIO 403)

Alan, Suzanne. *In-situ* hybridization used to locate PFTI (Pumpkin fruit trypsin inhibitor) protein of *Cucurbita maxima*. (Dannenhoffer)

Bellairs, Emily. Euglenoid Paramylon: Diversity and Medicinal Applications. (Monfils)

Best, Amanda. Morphological variation and key diagnostic features in the *Schoenoplectus pungens* species complex (Cyperaceae). (Monfils)

Bolen, Megan. Effects of 25mM and 50mM Furfural on the Structure of chromatin and the Cell Surface in *Saccharomyces cerevisiae*. Gorsich

Calhoun, Andrea. Localization of Zinc in Bread Wheat (*Triticum aestivum*) Determined by Fluorescence M. (Dannenhoffer)

Conley, Abigail. Localizing Tubulin in Phloem Cells of *Cucurbita maxima*. (Dannenhoffer)

Craig, Daedre. The Anolis Hemipenis as a Taxonomic Tool. (Nicholson)

Draminski, Elizabeth. The Effect of Temperature and pH on Ion Net Fluxes and Hemolymph Ion Concentrations in the *Dreissena polymorpha* and *Dreissena bugensis*. (Scheide)

Eilers, Katherine. Observation of apoptosis and growth in *Artemia salina* using scanning electron microscopy and confocal microscopy. (Hertzler)

Fausett, Sarah. Analysis of maternal mRNA poly (A) tail length in *C. Elegans*. (Schisa)

Flannery, Ellen. ABA inhibits vascular differentiation in Pumpkin, *Cucurbita maxima*. (Dannenhoffer)

Gursky, Amy. Emerald Ash Borer: Attacking the Phloem of *Fraxinus*. (Dannenhoffer)

Hart, Paul. Pollen Diversity in the Mustard Family (Brassicaceae). (Monfils)

Halverson, Amber. Generation of GFP fusion constructs with the pos-1 3' UTR in *C. elegans*. (Schisa)

Ignash, Matthew. *Vibrio cholerae*. (Juris)

Konieczka, Rachel. Hair Analysis in Michigan Mammals with Light Microscopy and Scanning Electron. (Swanson)

Kostka, Rebecca. Identifying Cyanobacteria Found on Michigan's Alvars. (Colores)

- Kostin, Alexander. Co-localization of CAR-1 with PGL-1 and CGH-1 on P Body-like foci of *Caenorhabditis elegans*. (Schisa)
- Lubitz, Sarah. Effect of Hydroxymethylfurfural on *Saccharomyces cerevisiae*: Chromatin and the Cell Surface. (Gorsich)
- Murchie, Erin. Association between Livestock Operations and *E. coli*, Total Phosphorus, and Suspended Solid Concentrations on the North Branch and Main Branch of the Chippewa River. (McNaught)
- Poisson, Christine. Examining Cyanobacterial Diversity on the Maxton Plains Alvar. (Colores)
- Pulver, Evan. Unraveling the Evolutionary Mystery of the Cocos Island Anole, *Anolis townsendi*. (Nicholson)
- Sadler, David. Characterization of the Bacterial Community in the Mount Pleasant Water Treatment Plant as a Baseline for Homeland Defense Scenarios. (Alm)
- Schock, Neil. Development of sieve elements and companion cells within fascicular and extrafascicular phloem. (Dannenhoffer)
- Schultz, Lindsay. The Ratio of Zebra Mussels to Quagga Mussels Found in Lake Michigan, Specifically surrounding Beaver Island, Michigan. (King)
- Swiderski, Lauren. Using Immunofluorescence Confocal Microscopy to Compare the Formation of MEX-3 Proteins and Nuclear Pores in Wild-Type and Mutant *Caenorhabditis elegans* Oocytes. (Schisa)
- Tait, Jolene. *Sicyonia ingentis p68 analysis*. (Hertzler)
- Thomas, James. Using rhodamine-phalloidin to determine muscle growth and differentiation of *Daphnia magna*. (Hertzler)
- Wolfe, Ashley. Generating mutations in the pos-1 3' UTR GFP fusion constructs in transgenic analysis. (Schisa)
- Yaroch, Samantha. The effects of ABA on Pumpkin seedling vascular tissue differentiation. (Dannenhoffer)
- Young, Rachel. The Effects of Environmental Stress on *C. elegans* RNP foci formation. (Schisa)

Posters at the Capitol

- Bauer, Leah. Genes Associated with *E. coli* Pathogenicity in Freshwater Beach Sand. (Alm)
- Best, Amanda. Morphological Variation in the *Schoenoplectus pungens* species complex (Cyperaceae). (Monfils)
- Cain, Patrick. Assessing Territory Size in Male Red-Backed Salamanders (*Plethodon cinereus*). (Gillingham)

Cibulka, Dan. Diet of Yellow Perch (*Perca flavescens*) in O'Rourke Lake, MI. (McNaught)

Fausett, Sarah. Analysis of maternal mRNA poly(A) tail length in *C. elegans*. (Schisa)

Flannery, Ellen and Samantha Yaroch, Life and semi-death of phloem cells in pumpkin. (Dannenhoffer)

Reinecke, James. The Role of Calpain on Tau Proteolysis in Neurodegenerative Disease. (Steinhilb)

Sadler, David. Identification of Natural Controls on *Escherichia coli* Populations. (Alm)

Schultz, Lindsay. The Ratio of Zebra Mussels to Quagga Mussels Found in Lake Michigan, Specifically Surrounding Beaver Island, Michigan. (Scheide)

Schumacher, Katelyn. Over the mountains and through the desert, to new watersheds we go: An analysis of geographical barriers to dispersal in otters. (Swanson)

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

Ali, Mohamed. Wastewater Treatment Facilities Select for Antibiotic Resistant *E. coli*. (Alm)

Bellairs, Emily. Euglenoid Paramylon: Diversity and Medicinal Applications. (Monfils)

Best, Amanda and Diana Hurlbut. Molecular and Morphological Variation in the *Schoenoplectus pungens* species complex (*Cyperaceae*). (Monfils)

Cain, Patrick. Assessing Territory Size in Male Red-Backed Salamanders (*Plethodon cinereus*). (Gillingham)

Calhoun, Andrea. Localization of Zinc in Bread Wheat (*Triticum aestivum*) Determined by Fluorescence Microscopy, Scanning Electron Microscopy, and Energy Dispersive Spectroscopy. (Dannenhoffer)

Cibulka, Daniel and Scott McNaught. Diet of Yellow Perch (*Perca flavescens*) in O'Rourke Lake, MI. (McNaught)

Dalgarn, Susan, Kimberly Anderson, Alison Cucchiara, Casey Droschu, and Qian Liu. The Association between Nutrient Content and Algal Diversity in Central Michigan University Ponds. (King)

Detraz, James. Effectiveness of Livestock Guarding Dogs for Excluding Nest Predators. (Gehring)

Draminski, Elizabeth. The Effect of pH On Ion Net Fluxes and Hemolymph Ion Concentrations in the *Dreissena polymorpha* and *Dreissena bugensis*. (Scheide)

Eilers, Katherine. Observation of Apoptosis and Growth in *Artemia salina* Using Scanning Electron Microscopy and Confocal Microscopy. (Hertzler)

Fausett, Sarah. Analysis of Maternal mRNA poly(A) Tail Length in *C. elegans*. (Schisa)

Flannery, Ellen and Samantha Yaroch, Life and Semi-death of Phloem Cells in Pumpkin. (Dannenhoffer)

- Geyer, Nichole. Antibiotic Resistance in Enteric Commensal Bacteria in Cattle Water Troughs in Northern Michigan. (Alm)
- Gursky, Amy. Emerald Ash Borer: Attacking the Phloem of *Fraxinus*. (Dannenhoffer)
- Klomp, Jeff. Using Genetics to Identify Population Structure in Otters of Oregon. (Swanson)
- Klomp, Jeff. Low Variability in Mitochondrial DNA May Show Evidence of a Population Reduction. (Swanson)
- Klomp, Jennifer. Analysis of the Avian Cloacal Microbes in Nestling Tree Swallows (*Tachycineta bicolor*) Using Molecular Techniques. (Colores)
- Rigney, Todd and Mark Knee. Status of the Black Bear (*Ursus americanus*) in the Northwestern Lower Peninsula of Michigan: A Non-invasive Mark-recapture Population Estimate Study. (Swanson)
- Sadler, David. Characterization of the Bacterial Community in the Mount Pleasant Water Treatment Plant as a Baseline for Homeland Defense Scenarios. (Alm)
- Schmidt, Laura. Molecular Evolution in the Mustard Family (*Brassicaceae*). (Monfils)
- Schultz, Lindsay. The Ratio of Zebra Mussels to Quagga Mussels Found in Lake Michigan, Specifically Surrounding Beaver Island, Michigan. (Scheide)
- Schumacher, Katelyn and Bradley Swanson. Over the Mountains and Through the Desert, to New Watersheds We Go: An Analysis of Geographical Barriers to Dispersal in Otters. (Swanson)
- Tait, Jolene. Cloning and Expression of p68 in Shrimp. (Hertzler)
- TerHaar, Ellen. Nesting Activity of the Painted Turtle (*Chrysemys Picta*) on Beaver Island, Michigan; and Mechanisms Used by Predators to Locate Nesting Sites. (Gillingham)
- Usyk, Lena. The Ecology of LeConte's Sparrows and other Grassland Birds at Munuscong Bay. (Hamas)
- Van Dam, Richard. Adenosine A₁ Receptor-Mediated Modulation of pre-Bötzinger Complex Rhythmogenesis: Comparisons between Medullary Slice and Island Preparations. (Kelty)
- Veverica, Paula and Bradley Swanson. Analysis of Allelic Diversity in Island and Mainland Populations of the Red-backed Salamander, *Plethodon cinereus*. (Swanson)
- Wilton, Clay and Catherine O'Reilly. Ecological Importance of a Freshwater Crab (*Potomonautes emini*) as a Macroinvertebrate Shredder in an East African Stream. (McNaught)