

**EDUCATION:**

**Ph.D.** – Comparative Pathology, June 1996, University of California, Davis. Major professor - Dr. David Hinton.

**D.V.M.** – Iowa State University, Ames, Iowa. May 1987.

**M.S.** – Fisheries Biology, December 1986, Iowa State University, Ames, Iowa; Major professor - Dr. Robert Summerfelt

Graduate (no degree) – Texas A&M Univ., Summer 1983, Veterinary Anatomy (Aquatic Animal Medicine Program); Major Prof. - Dr. Raymond Sis

**B.S.** – Fisheries and Wildlife Biology, May 1983, Iowa State University, Ames, Iowa.

**POSITIONS AND EMPLOYMENT:**

2004 – now Fish Pathologist, Animal Health Centre, British Columbia Provincial Government

2004 – 2006 Assistant Research Pathologist (25-50% time), University of California, Davis

2001 – 2004 Lecturer in Gastrointestinal and Renal Anatomy, University of California, Davis

1997 – 2004 Assistant Research Pathologist, University of California, Davis

1996 – 1997 Postdoctoral researcher, Fish Pathology and Toxicology, Univ. of California, Davis

1987 – 1996 Postgraduate researcher, Comparative Pathology, University of California, Davis

**ACADEMIC APPOINTMENTS (nonsalary):**

Oct. 2007 – June 2011 Affiliate Faculty, University of Alaska, Fairbanks, School of Fisheries and Ocean Sciences

July 2006 – now Research Associate, University of California, Davis

**SPECIALTY CERTIFICATION:** Diplomate, American College of Veterinary Pathologists

**VETERINARY PRACTICE LICENSES:** State of Iowa (1987 - present); Province of British Columbia (public practice, 2005 - 2009); state of Alaska (1995 - 2002)

**SPECIAL SKILLS:** Fish health analysis (larvae, juveniles, and adults), fish necropsy, fish histopathology (tissues from 262 fish species examined), CYP1A immunohistochemistry, digital photomicroscopy

**PUBLICATIONS:** (from most recent to earliest)

1. **Marty, G.D.**, S.M. Saksida, and T.J. Quinn II. 2010. Relationship of farm salmon, sea lice, and wild salmon populations. Proc. Natl. Acad. Sci. U.S.A. 107:22599-22604. doi:10.1073/pnas.1009573108
2. **Marty, G.D.**, P.-J.F. Hulson, S.E. Miller, T.J. Quinn II, S.D. Moffitt, and R.A. Merizon. 2010. Failure of population recovery in relation to disease in Pacific herring. Dis. Aquat. Org. 90:1-14. doi:10.3354/dao02210
3. **Marty, G.D.**, and R.A. Heintz. 2010. Ruptured yolk sacs and visceral fungi in emergent pink salmon alevins: histopathology and relation to marine survival. Dis. Aquat. Org. 88:115-126. doi:10.3354/dao02150

4. Spitsbergen, J.M., V.S. Blazer, P.R. Bowser, K.C. Cheng, K.R. Cooper, T.K. Cooper, S. Frasca, Jr., D.B. Groman, C.M. Harper, J.M. Law, **G.D. Marty**, R.M. Smolowitz, J. St. Leger, D.C. Wolf, and J.C. Wolf. 2009. Finfish and aquatic invertebrate pathology resources for now and the future. *Comp. Biochem. Physiol. C.* 149:249-257.
5. Sherrill, J., E.S. Webber III, **G.D. Marty**, and S. Hernandez-Divers. 2009. Fish cardiovascular physiology and disease. *Vet. Clin. N. Am.* 12:11-38.
6. **Marty, G.D.** 2008. Anisakid larva in the viscera of a farmed Atlantic salmon (*Salmo salar*). *Aquaculture.* 279:209-210.
7. Hulson, P.-J.F., S.E. Miller, T.J. Quinn II, **G.D. Marty**, S.D. Moffitt, and F. Funk. 2008. Data conflicts in fishery models: incorporating hydroacoustic data into the Prince William Sound Pacific herring assessment model. *ICES J. Mar. Sci.* 65:25-43.
8. **Marty, G.D.** 2007. Blank-field correction for achieving a uniform white background in brightfield digital photomicrographs. *BioTechniques.* 42 (6):716-720.  
doi:10.2144/000112488
9. **Marty, G.D.**, S.M. Bower, K.R. Clarke, G. Meyer, G. Lowe, A.L. Osborn, E.P. Chow, H. Hannah, S. Byrne, K. Sojonky, and J.H. Robinson. 2006. Histopathology and a real-time PCR assay for detection of *Bonamia ostreae* in *Ostrea edulis* cultured in western Canada. *Aquaculture.* 261:33-42.
10. Chen, M.F., J.A. Apperson, **G.D. Marty**, and Y.W. Cheng. 2006. Copper sulfate treatment decreases hatchery mortality of larval white seabass *Atractoscion nobilis*. *Aquaculture.* 254:102-114.
11. Farag, A.M., T. May, **G.D. Marty**, M. Easton, D.D. Harper, E.E. Little, and L. Cleveland. 2006. The effect of chronic chromium exposure on the health of juvenile Chinook salmon (*Oncorhynchus tshawytscha*). *Aquat. Toxicol.* 76:246-257.
12. Carls, M.G., R.A. Heintz, **G.D. Marty**, and S.D. Rice. 2005. Cytochrome P4501A induction in oil-exposed pink salmon *Oncorhynchus gorbuscha* embryos predicts reduced survival potential. *Mar. Ecol. Prog. Ser.* 301:253-265.
13. Moles, A., and **G.D. Marty**. 2005. Physiological changes in prickly sculpin (*Cottus asper*) inhabiting a lake used by jet-propelled watercraft. *Bull. Environ. Contam. Toxicol.* 74:1151-1158.
14. Carls, M.G., S.D. Rice, **G.D. Marty**, and D.K. Naydan. 2004. Pink salmon spawning habitat is recovering a decade after the Exxon Valdez oil spill. *Trans. Am. Fish. Soc.* 133:834-844.
15. Kelley, G.O., F.J. Zagnutt-Vergara, C.M. Leutenegger, K.A. Myklebust, M.A. Adkison, T.S. McDowell, **G.D. Marty**, A.L. Kahler, A.L. Bush, I.A. Gardner, and R.P. Hedrick. 2004. Evaluation of five diagnostic methods for the detection and quantification of

- Myxobolus cerebralis*. J. Vet. Diagn. Invest. 16:202-211.
16. **Marty, G.D.**, T.J. Quinn, G. Carpenter, T.R. Meyers, and N.H. Willits. 2003. Role of disease in abundance of a Pacific herring (*Clupea pallasii*) population. Can. J. Fish. Aquat. Sci. 60:1258-1265.
  17. **Marty, G.D.**, A. Hoffmann, M.S. Okihiro, K. Hepler, and D. Hanes. 2003. Retrospective analysis: bile hydrocarbons and histopathology of demersal rockfish in Prince William Sound, Alaska, after the Exxon Valdez Oil Spill. Mar. Environ. Res. 56(5):569-584. doi:10.1016/S0141-1136(03)00043-6
  18. Hedrick, R.P., T.S. McDowell, **G.D. Marty**, G.T. Fosgate, K. Mukkatira, K. Myklebust, and M. El-Matbouli. 2003. Susceptibility of two strains of rainbow trout (one with a suspected resistance to whirling disease) to *Myxobolus cerebralis* infection. Dis. Aquat. Org. 55:37-44.
  19. Arkush, K.D., A.R. Giese, H.L. Mendonca, A.M. McBride, **G.D. Marty**, and P.W. Hedrick. 2002. Resistance to three parasites in the endangered winter-run Chinook salmon: effects of inbreeding and major histocompatibility complex genotypes. Can. J. Fish. Aquat. Sci. 59: 966-975.
  20. Carls, M. G., **G. D. Marty**, and J. E. Hose. 2002. Synthesis of the toxicological impacts of the Exxon Valdez oil spill on Pacific herring (*Clupea pallasii*) in Prince William Sound, Alaska U.S.A.. Can. J. Fish. Aquat. Sci. 59:153-172.
  21. Quinn, T.J. II, **G.D. Marty**, J. Wilcock, and M. Willette. 2001. Disease and population assessment of Pacific herring in Prince William Sound, Alaska. In: Herring: Expectations for a new millennium, edited by F. Funk, J. Blackburn, D. Hay, A.J. Paul, R. Stephensen, R. Toreson and D. Witherell, University of Alaska Sea Grant, AK-SG-01-04, Fairbanks, pp. 363-379.
  22. Hershberger, P.K., R.M. Kocan, N.E. Elder, **G.D. Marty**, and J. Johnson. 2001. Management of Pacific herring spawn-on-kelp fisheries to optimize fish health and product quality. N. Am. J. Fish. Manag. 21:976-981.
  23. Chen, M.F., S. Yun, **G.D. Marty**, T.S. McDowell, M. House, K.D. Arkush, and R.P. Hedrick. 2000. A *Piscirickettsia salmonis*-like bacterium associated with mortality of white seabass (*Atractocion nobilis*). Dis. Aquat. Org. 43:117-126.
  24. Hedrick, R.P., T.S. McDowell, **G.D. Marty**, K. Mukkatira, D.B. Antonio, K.B. Andree, Z. Bukhari, and T. Clancy. 2000. Ultraviolet irradiation inactivates the waterborne infective stages of *Myxobolus cerebralis*: a treatment for hatchery water supplies. Dis. Aquat. Org. 42:53-59.
  25. Hedrick, R.P., O. Gilad, S. Yun, J.V. Spangenberg, **G.D. Marty**, R.W. Nordhausen, M.J. Kebus, H. Bercovier, A. Eldar. 2000. A herpesvirus associated with mass mortality of juvenile and adult koi, a strain of common carp. J. Aquat. Anim. Health 12:44-57.

26. Davis, C.R., **G.D. Marty**, M.A. Adkison, E.F. Freiberg, and R.P. Hedrick. 1999. Association of plasma IgM with body size, histopathologic changes, and plasma chemistries in adult Pacific herring *Clupea pallasii*. *Dis. Aquat. Org.* 38:125-133.
27. Hedrick, R.P., T.S. McDowell, M. Gay, **G.D. Marty**, M.P. Georgiadis, and E. MacConnell. 1999. Comparative susceptibility of rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) to *Myxobolus cerebralis* the cause of salmonid whirling disease. *Dis. Aquat. Org.* 37:173-183.
28. **Marty, G.D.**, M.S. Okihiro, E.D. Brown, D. Hanes, and D.E. Hinton. 1999. Histopathology of adult Pacific herring in Prince William Sound, Alaska, after the *Exxon Valdez* oil spill. *Can. J. Fish. Aquat. Sci.* 56:419-426.
29. Carls, M.G., **G.D. Marty**, T.R. Meyers, R.E. Thomas, and S.D. Rice. 1998. Expression of viral hemorrhagic septicemia virus in pre-spawning Pacific herring (*Clupea pallasii*) exposed to weathered crude oil. *Can. J. Fish. Aquat. Sci.* 55:2300-2309.
30. **Marty, G.D.**, E.F. Freiberg, T.R. Meyers, J. Wilcock, T.B. Farver, and D.E. Hinton. 1998. Viral hemorrhagic septicemia virus, *Ichthyophonus hoferi*, and other causes of morbidity in Pacific herring *Clupea pallasii* spawning in Prince William Sound, Alaska, USA. *Dis. Aquat. Org.* 32:15-40.
31. **Marty, G.D.**, J.E. Hose, M.D. McGurk, E.D. Brown, and D.E. Hinton. 1997. Histopathology and cytogenetic evaluation of Pacific herring larvae exposed to petroleum hydrocarbons in the laboratory or in Prince William Sound, Alaska, after the *Exxon Valdez* oil spill. *Can. J. Fish. Aquat. Sci.* 54:1846-1857.
32. **Marty, G.D.**, R. Heintz, and D.E. Hinton. 1997. Histology and teratology of pink salmon larvae near the time of emergence from gravel substrate in the laboratory. *Can. J. Zool.* 75:978-988.
33. **Marty, G.D.**, J.W. Short, D.M. Dambach, R. Heintz, N.H. Willits, S.D. Rice, J.J. Stegeman, and D.E. Hinton. 1997. Ascites, premature emergence, increased gonadal cell apoptosis, and cytochrome-P4501a induction in pink salmon larvae continuously exposed to oil-contaminated gravel during development. *Can. J. Zool.* 75:989-1007.
34. Kocan, R.M., **G.D. Marty**, M.S. Okihiro, E.D. Brown, and T.T. Baker. 1996. Reproductive success and histopathology of individual Prince William Sound Pacific herring 3 years after the *Exxon Valdez* oil spill. *Can. J. Fish. Aquat. Sci.* 53:2388-2393.
35. Hose, J.E., M.D. McGurk, **G.D. Marty**, D.E. Hinton, E.D. Brown, and T.T. Baker. 1996. Sublethal effects of the *Exxon Valdez* oil spill on herring embryos and larvae: morphological, cytogenetic, and histopathological assessments, 1989-1991. *Can. J. Fish. Aquat. Sci.* 53:2355-2365.
36. Weidmer, M., M.J. Fink, J.J. Stegeman, R. Smolowitz, **G.D. Marty**, and D.E. Hinton.

1996. Cytochrome P450 induction and histopathology in pre-emergent pink salmon from oiled streams in Prince William Sound, Alaska. *Am. Fish. Soc. Symp.* 18:509-517.
37. Brown, E.D., T.T. Baker, J.E. Hose, R.M. Kocan, **G.D. Marty**, M.D. McGurk, B.L. Norcross, and J. Short. 1996. Injury to the early life history stages of Pacific herring in Prince William Sound after the *Exxon Valdez* Oil Spill. *Am. Fish. Soc. Symp.* 18:448-462.
38. **Marty, G.D.**, R.C. Summerfelt, and D.E. Hinton. 1995. Histopathology of swimbladder noninflation in walleye (*Stizostedion vitreum*) larvae: role of development and inflammation. *Aquaculture* 138:35-48.
39. **Marty, G.D.**, D.E. Hinton, and J.J. Cech, Jr. 1995. Oxygen consumption by larval Japanese medaka with inflated or uninflated swim bladders. *Trans. Am. Fish. Soc.* 124:623-627.
40. DeKoven, D.L., J.M. Núñez, S.M. Lester, D.E. Conklin, **G.D. Marty**, L.M. Parker, and D.E. Hinton. 1992. A purified diet for medaka (*Oryzias latipes*): refining a fish model for toxicological research. *Lab. An. Sci.* 42:180-189.
41. **Marty, G.D.**, S. Wetzlich, J.M. Núñez, A. Craigmill, and D.E. Hinton. 1991. Fish-based biomonitoring to determine toxic characteristics of complex chemical mixtures: documentation of bioremediation at a pesticide disposal site. *Aquat. Toxicol.* 19:329-340.
42. **Marty, G.D.**, J.M. Núñez, D.J. Lauren, and D.E. Hinton. 1990. Age-dependent changes in toxicity of N-nitroso compounds to Japanese Medaka (*Oryzias latipes*) embryos. *Aquat. Toxicol.* 17:45-62.
43. **Marty, G.D.**, J.J. Cech, Jr., and D.E. Hinton. 1990. Effect of incubation temperature on oxygen consumption and ammonia production by Japanese medaka, *Oryzias latipes*, eggs and newly hatched larvae. *Environ. Toxicol. Chem.* 9:1397-1403.
44. **Marty, G.D.**, and R.C. Summerfelt. 1990. Wound healing in channel catfish by epithelialization and contraction of granulation tissue. *Trans. Am. Fish. Soc.* 119:145-150.
45. Zicker, S.C., **G.D. Marty**, G.P. Carlson, J.E. Madigan, J.M. Smith, and B.W. Goetzman. 1990. Bilateral renal dysplasia with nephron hypoplasia in a foal. *J. Am. Vet. Med. Assoc.* 196:2001-2005.
46. **Marty, G.D.**, and R.C. Summerfelt. 1988. Inflammatory response of channel catfish to abdominal implants: a histological and ultrastructure study. *Trans. Am. Fish. Soc.* 117:401-416.
47. **Marty, G.D.**, and R.C. Summerfelt. 1986. Pathways and mechanisms for expulsion of surgically implanted dummy transmitters from channel catfish. *Trans. Am. Fish. Soc.*

115:577-589.

**MANUSCRIPT IN PRESS:** none

**MANUSCRIPTS IN REVIEW:**

1. Waltzek, T.B., **G.D. Marty**, M.E. Alfaro, W.R. Bennett, M. Haulena, E.S. Weber III, and R.P. Hedrick. [Acceptable for publication after revision, 7 April 2011]. A systemic iridovirus from threespine stickleback (*Gasterosteus aculeatus*) represents a new megalocytivirus species in the family *Iridoviridae*. *Dis. Aquat. Org.*
2. Saksida, S.M., **G.D. Marty**, S. St-Hilaire, S.R.M. Jones, H.A. Manchester, C.L. Diamond, and J. Bidulka. Health assessments of juvenile pink salmon (*Oncorhynchus gorbuscha*) in the Broughton Archipelago of western Canada. *J. Fish Dis.*

**BOOK CHAPTER:**

- Marty, G.D.** 2008. Effects of the *Exxon Valdez* oil spill on Pacific herring in Prince William Sound, Alaska. pp. 925-932 in *The Toxicology of Fishes*, edited by R.T. Di Giulio and D.E. Hinton. CRC press, Boca Raton.

**EXPERT PANEL:**

1. Viral hemorrhagic septicemia virus (VHSV) expert panel. Sponsors: Canadian Food Inspection Agency (CFIA) and United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS). Duties: provide input for generating a weighted list of risk factors predictive of VHSV occurrence in North America; review resultant manuscript for publication. Dates of service: April - September, 2007.  
Publication:  
Expert, VHSV. 2010. Viral hemorrhagic septicemia virus (VHSV IVb) risk factors and association measures derived by expert panel. *Prev. Vet. Med.* 94:128-139.  
doi:10.1016/j.prevetmed.2009.11.020.

**EXTRAMURAL FUNDING:** (from most recent to earliest)

1. North Pacific Research Board; RO319; Retrospective analysis of pigmented macrophage aggregates as markers of Pacific herring population health: \$68,198; July 1, 2003 - June 30, 2007. Role, principal investigator.
2. United States Dept. of Commerce, National Oceanic and Atmospheric Administration; Field necropsy and Immunohistochemical localization of CYP1a in intertidal fish in Prince William Sound, Alaska; \$3,000 and \$13,278; May 1, – Oct. 31, 2004, and Nov. 1, 2004 – March 31, 2005. Role, principal investigator.
3. United States Dept. of Commerce, National Oceanic and Atmospheric Administration; Field necropsy and Immunohistochemical localization of CYP1a in intertidal fish in Prince William Sound, Alaska; \$3,000 and \$13,278; May 1, – Oct. 31, 2004, and Nov. 1, 2004 – March 31, 2005. Role, principal investigator.
4. National Institutes of Health, Institutional National Research Service Award (5T35RR007067) Veterinary Student Research Training Program: \$218,540; December 1,

- 1999 - Nov. 30, 2004. ROLE: co-investigator.
5. Alaska Dept. of Fish and Game; contract # IHP-95-054, to determine the role of disease in population decline of Pacific herring in Prince William Sound, Alaska: \$827,400; March 1995 - Oct. 2004. Role, principal investigator.
  6. United States Dept. of Commerce, National Oceanic and Atmospheric Administration, contract # 40HCNF300044; Immunohistochemical localization of CYP1a in intertidal fish exposed to weathered crude oil in the laboratory; \$3,065; May 1, 2003 - Dec. 31, 2003. Role, principal investigator.
  7. United States Dept. of Commerce, National Oceanic and Atmospheric Administration, contract # NFFS740-2-00013; Effect of weathered crude oil on crescent gunnels in Prince William Sound, Alaska, 12 years after the Exxon Valdez Oil Spill; \$29,716; May 1, 2002 - Oct. 31, 2002. Role, principal investigator.
  8. United States Dept. of Commerce, National Oceanic and Atmospheric Administration, contract # 40HCNF000040; CYP1a Immunohistochemistry in larval pink salmon collected from Prince William Sound, Alaska, 10 years after the Exxon Valdez Oil Spill; \$5,648; May 1, 2002 - Oct. 31, 2002. Role, principal investigator.
  9. National Science Foundation, grant #9871962; Role of parasites and disease in health and population abundance of adult Pacific herring: \$286,414; Feb. 1, 1999 - Jan. 30, 2002. Role, principal investigator.
  10. U.S. Geological Survey, Biological Resources Division, ECRC Field Research Station, Jackson, WY, order # 01CRPR00238; Provide training in necropsy and preservation of juvenile and adult trout, and adult common carp for histopathology. Process tissues for histopathological analysis. \$2,065.20; November 19, 2001 - April 5, 2002. Role, principal investigator.
  11. U.S. Geological Survey, Biological Resources Division, ECRC Field Research Station, Jackson, WY, order # 01CRSA0346; Provide training in necropsy and preservation of juvenile and adult trout for histopathology. Process tissues for histopathological analysis: \$5,692; March 20, 2001 - Sept. 1, 2001. Role, principal investigator.
  12. United States Dept. of Commerce, National Oceanic and Atmospheric Administration, contract # 40HCNF000040; processing of larval fish tissues for histopathology and immunohistochemistry; \$36,644; March 1, 2000 - June 15, 2001. Role, principal investigator.
  13. United States Geological Survey, Biological Resources Division, ECRC Field Research Station, Jackson, WY, contract # 99CR-R00652; processing for histopathology of larval and juvenile chinook salmon exposed to chromium; \$5,691.60, Sept. 28, 1999 - February 28, 2000. Role, principal investigator.
  14. United States Dept. of Commerce, National Oceanic and Atmospheric Administration, contract # 40HCNF900116; processing of histologic gonad tissues and larval fish immunohistochemistry; \$7,268.54; May 10 - Sept. 30, 1999. Role, principal investigator.
  15. Alaska Dept. of Fish and Game; contract # IHP-98-050, to write a final report on damage assessment fish histopathology studies after the *Exxon Valdez* Oil Spill: \$6,532.25; August 19, 1998 - June 30, 2000. Role, principal investigator.
  16. United States Dept. of Commerce, National Oceanic and Atmospheric Administration, contract # 40HCNF800114, provide training in identifying coho salmon gonad tissues, and histologic processing of tissues \$5,634; May 1 - Sept. 30, 1998. Role, principal investigator.
  17. United States Dept. of Commerce, National Oceanic and Atmospheric Administration,

- contract # 43ABNF501457, to determine the extent of histopathological lesions in Pacific herring adults exposed to petroleum hydrocarbons: \$12,475; March 1995 - March 1996. Role, coinvestigator.
18. Prince William Sound Aquaculture Corporation, Cordova, Alaska. Contract for histopathological analysis to determine causes of abnormal pink salmon mortality; April 1994 - Sept. 1994; \$8,280.00. Role, principal investigator.
  19. United States Dept. of Commerce, National Oceanic and Atmospheric Administration, contract # 43ABNF301765, to determine the extent of histopathological effects in pink salmon: \$20,870; July 1993 - Nov. 1994. Role, coinvestigator.
  20. Sigma Xi Grant-in-Aid of Research: \$250, June 1984. Role, coinvestigator.

### GRADUATE STUDENTS:

1. M.S., Ph.D. - Student: Peter-John Hulson; Major Professor, Terrance J. Quinn, III; Affiliation: University of Alaska, Fairbanks, Juneau Campus, Juneau, Alaska, USA; Role: committee member; Year of completion: M.S., 2007; Ph.D., ongoing.
2. Ph.D. - Student: Catherine Thomson; Major Professors, Ben F. Koop and Simon R. M. Jones; Affiliation: Centre for Biomedical Research, University of Victoria, Victoria, BC, Canada. Thesis title: "*Loma salmonae* in Chinook salmon (*Oncorhynchus tshawytscha*): improving detection, preventing infection, and increasing our understanding of the host response to a microsporidian parasite." Role: outside reviewer for dissertation. Year of completion: 2010.
3. Ph.D. - Student: Tayybah Shaheen; Major Professor, Tanveer Akhtar; Affiliation: Department of Zoology, University of Punjab, Lahore, Pakistan. Thesis title: "Studies on Chromium Toxicity in *Cyprinus carpio*: Brood Stock Progeny Relationship." Role: outside reviewer for dissertation; Year of completion: 2009.

### TEACHING:

#### University of California, Davis -

1. **Course:** VME 416 (Fish Diseases, elective course for veterinary students); **Lecture title:** Functional anatomy of fish (50-minute lectures); **Dates:** April 7, 1998; April 4/6, 2000; April 3/5, 2001; April 4/9, 2002; April 1/3, 2003; April 12/14, 2005; April 3/5, 2007; Mar 31/April 2, 2009; April 5/7, 2011.
2. **Course:** VMD 432 (Gastrointestinal anatomy for 1<sup>st</sup> year veterinary students); prepared and presented 7 lectures and 7 laboratories on the microscopic and gross features of the gastrointestinal system of common domestic animals; **Dates:** Winter quarter, 2001, 2002, 2003, 2004.
3. **Course:** VMD 402D (Urinary System anatomy for 1<sup>st</sup> year veterinary students); prepared and presented 3 lectures and 3 laboratories on the microscopic and gross features of the urinary system of common domestic animals; **Dates:** Spring quarter, 2004.
4. **Course:** PMI 298 (graduate seminar in Special Pathology); **Lecture titles:** Normal gross and microscopic anatomy of fishes (50-minute lecture), AND Gross and microscopic pathology of fishes (50-minute lecture); **Dates:** May 10 and 17, 1999; May 9, 2001; April 24, 2002;
5. **Course:** PTX 230 and ECL 298 (Aquatic Toxicology/Ecotoxicology, graduate level); **Lecture title:** Exxon Valdez Oil Spill Damage Assessment (50-minute lecture); **Dates:** May 7, 1998; May 10, 2000.

6. **Course:** VMD452 (General Pathology, sophomore veterinary students); presented gross lesions and interpreted microscopic lesions; **Dates:** fall quarters, 1987-1989.
7. **Seminar:** Comparative Pathology (for veterinary resident training); presented four 50-minute Comparative Pathology seminars on spontaneous lesions in medaka (1989, 1991).

**Iowa State University** - Laboratory Animal Pathology graduate course; presented necropsy techniques, gross and microscopic anatomy, and histopathology of fish diseases: 1984, 1986, and 1988. Directed two 2-h laboratories and taught two 50-minute lectures: 1990, 1994, 1998, 2000, and 2002.

Fish pathology study aides developed:

1. Fish Pathology Study Set (1990, 1998) - classic examples of fish lesions were compiled into a set that includes 50 microscope slides and a 35-page accompanying index and description.

**ORAL PAPERS and SEMINARS PRESENTED:** (from most recent to earliest)

1. **Marty, G.D.**, N.I. de With, M.P. Coombs, C.L. Diamond, H.A. Manchester, I.R. Keith, and M.E. Sheppard. Effect of postmortem change on the histopathologic diagnosis of lesions and pathogens in farmed Atlantic salmon. Annual meeting of the Fish Health Section of the American Fisheries Society; June 8-10, 2009 (Park City, Utah).
2. **Marty, G.D.**, M.E. Sheppard, M.P. Coombs, and H.A. Manchester. Histopathology of brain significantly increases the ability to determine cause of death in pen-reared Atlantic salmon. Annual meeting of the Fish Health Section of the American Fisheries Society; June 4-6, 2007 (Jackson Hole, Wyoming).
3. **Marty, G.D.** VHSV IVa in Alaska Herring. Canadian Food Inspection Agency VHS Biosecurity Workshop: Science and Epidemiology; May 29-30, 2007 (Guelph, Ontario).
4. **Marty, G.D.** Determining the cause of Pacific herring population decline in Prince William Sound, Alaska. Infectious Hematopoietic Necrosis Virus Research Workshop; January 18, 2007 (Campbell River, British Columbia).
5. **Marty, G.D.**, J.S. Odani, and A.M. O'Connor. Long-term effects of the 1989 *Exxon Valdez* oil spill versus a 1993 disease outbreak on hepatic pigmented macrophage aggregates in pacific herring from Prince William Sound, Alaska, USA. International Symposium on Aquatic Animal Health; Sept. 3-6, 2006 (San Francisco, California).
6. **Marty, G.D.**, G.A. Karreman, and Simon Jones. Prevalence and seasonality of new pathogens in juvenile salmonids from inner coastal British Columbia, Canada. Western Fish Disease Workshop; June 26-28, 2006 (Victoria, British Columbia).
7. **Marty, G.D.**, T.J. Quinn II, T.R. Meyers, and S. Moffitt. Role of disease in limiting recovery of the Pacific herring population in Prince William Sound. Marine Science in the Northeast Pacific: Science for Resource Dependent Communities; Jan. 13-17, 2003 (Anchorage, Alaska).

8. **Marty, G.D.**, and T.R. Meyers. Long-term monitoring is necessary for understanding disease-related mortality of Pacific herring at the population level. Western Fish Disease Workshop; June 28, 2000 (Gig Harbor, Washington).
9. **Marty, G.D.**, and T.J. Quinn. Impact of two diseases on health and population abundance of adult Pacific herring; February 24, 2000. International Herring 2000 Symposium (Anchorage, Alaska).
10. **Marty, G.D.**, and T.R. Meyers. The Role of disease in limiting recovery of Pacific herring in Prince William Sound, Alaska; March 26, 1999. Symposium: Legacy of an oil spill 10 years after *Exxon Valdez* (Anchorage, Alaska).
11. **Marty, G.D.**, R.P. Hedrick, T.S. McDowell, M. Gay, M.P. Georgiadis, and E. MacConnell; Feb. 18, 1999. Comparative susceptibility of rainbow trout and brown trout to experimental infections with *Myxobolus cerebralis*; 5<sup>th</sup> Annual Whirling Disease Symposium (Missoula, Montana).
12. **Marty, G.D.**, and T.R. Meyers. Histopathology and Epizootiology of the North American Strain of Viral Hemorrhagic Septicemia Virus in Pacific herring in Prince William Sound, Alaska; Sept. 1, 1998; International Symposium on Aquatic Animal Health (Baltimore, Maryland).
13. **Marty, G.D.**, P.K. Hershberger, R.M. Kocan, and T.R. Meyers The Role of spawn-on-kelp pound fisheries in the expression of viral hemorrhagic septicemia virus (VHSV) in Pacific herring from Alaska; Sept. 5, 1997; annual meeting Fish Health Section, American Fisheries Society (Juneau, Alaska).
14. **Marty, G.D.**, R.M. Kocan, and T.R. Meyers. The role of disease in the abundance of two Pacific herring populations and implications for salmonids. Invited paper. June 3, 1997; Pathogens and Diseases of Fish in Aquatic Ecosystems (Portland, Oregon).
15. **Marty, G.D.** Epidemiology of *Ichthyophonus hoferi* in two Pacific herring populations in Alaska. August 7, 1996; Annual meeting Fish Health Section, American Fisheries Society (Madison, Wisconsin).
16. **Marty, G.D.** Role of Disease in the Abundance of Two Pacific Herring Populations in Alaska. Invited paper. July 16, 1996; Annual Meeting of the Western Division of the American Fisheries Society (Eugene, Oregon).
17. **Marty, G.D.**, E.F. Freiberg, T.R. Meyers, J. Wilcock, C.R. Davis, T.B. Farver, and D.E. Hinton. Role of *Ichthyophonus hoferi*, viral hemorrhagic septicemia virus, and other causes of morbidity in declining Pacific herring populations in Prince William Sound, Alaska. Invited seminars. Jan. 17, 1996; *Exxon Valdez* Oil Spill Restoration Science Workshop (Anchorage, Alaska). Also, Oct. 19, 1995; for the Washington State University Department of Veterinary Microbiology and Pathology (Pullman, Washington).

18. **Marty, G.D.**, E.F. Freiberg, T.R. Meyers, J. Wilcock, C.R. Davis, T.B. Farver, and D.E. Hinton. *Ichthyophonus hoferi*, viral hemorrhagic septicemia virus, and other causes of morbidity in Pacific herring spawning in Prince William Sound in 1994. July 21, 1995. Annual meeting Fish Health Section, American Fisheries Society (Syracuse, New York).
19. **Marty, G.D.**, R.C. Summerfelt, and D.E. Hinton. Histopathology of swimbladder noninflation in walleye larvae: role of development and inflation. September 8, 1994. International Symposium on Aquatic Animal Health (Seattle, Washington).
20. \***Marty, G.D.**, M.S. Okihiro, and D.E. Hinton. Histopathologic analysis of chronic effects of the *Exxon Valdez* oil spill on Alaska fisheries. Nov. 19, 1992; annual meeting of the Alaska Chapter of the American Fisheries Society (Valdez, Alaska). Also, Feb. 4, 1993, *Exxon Valdez* Oil Spill Symposium (Anchorage, AK).
21. **Marty, G.D.**, M.S. Okihiro, J.M. Núñez, and D.E. Hinton. Morphology and management of *Mycobacterium avium* infection in laboratory-reared medaka *Oryzias latipes*. August 2, 1991. Annual meeting of the Fish Health Section of the American Fisheries Society (Newport, Oregon).
22. **Marty, G.D.**, J.M. Núñez, D.J. Lauren, and D.E. Hinton. Age-dependent changes in toxicity of N-nitroso compounds to Japanese Medaka (*Oryzias latipes*) embryos. July 20, 1989. Annual meeting of the Fish Health Section of the American Fisheries Society (Annapolis, Maryland).
23. **Marty, G.D.**, and R.C. Summerfelt. Tissue response of channel catfish to dummy transmitters surgically implanted in the peritoneal cavity. July 22, 1986. Annual meeting of the Fish Health Section of the American Fisheries Society (West Virginia).

\*Best Paper Award.

## POSTER PRESENTATION

1. Marty, G.D., T.J. Quinn II, and T.R. Meyers. Dec. 2-5, 2001. Relation of ulcers, viral hemorrhagic septicemia virus, and *Ichthyophonus hoferi* to Pacific herring population biomass in Prince William Sound, Alaska, 1994-2001. Annual meeting of the American College of Veterinary Pathologist. December 2001. Salt Lake City, Utah.

## CONSULTING EXPERIENCE:

### Expert Witness Testimony:

1. Shenandoah Fisheries, Ltd. v. Southern States Cooperative, Inc.; Circuit Court of Virginia for the City of Richmond. On behalf of Shenandoah Fisheries; deposition (Dec. 15, 2000) and testimony at trial (April 24, 2001). Duties – Histopathological analysis of rainbow trout livers. Michie, Hamlett, Lowry, Rasmussen & Tweel, P.C., Charlottesville, Virginia, and Halver Corporation, Seattle, Washington. 1/4/00 - 4/25/01.
2. United States of America, State of West Virginia, and State of Ohio v. Elkem Metals Co. L.P., Ferro Invest III Inc., Ferro Invest II Inc., and Eramet Marietta Inc. Civil Action

2:03cv528 (S.D. Ohio). Deposition on behalf of Elkem Metals Co. L.P., Ferro Invest III Inc., Ferro Invest II Inc., and Eramet Marietta Inc. (June 20, 2005). Duties – Histopathologic analysis of tissue sections from freshwater drum, sauger, and gizzard shad produced by the United States of America; review of expert reports related to two fish kills.

**Litigation Sensitive Research:**

1. Fish health assessment of 250 spotted sand bass from San Diego Harbor (gross necropsy; histopathological analysis of liver, gill, kidney, and gonad). California Regional Water Quality Control Board, San Diego Region (through Exponent Corporation). August - December 2002.
2. Histopathological analysis of fathead minnow after acute toxicity testing, and review of the draft (March 8, 2001) report, “Formaldehyde Treatment Technologies, Re-certification Evaluation Report,” generated by Cal/EPA, Department of Toxic Substances Control. For S & S Company of Georgia. 7/19/01- 12/31/01.
3. Histopathological analysis of larval and juvenile chinook salmon exposed to chromium. United States Geological Survey, Biological Resources Division, ECRC Field Research Station, Jackson, WY; 9/28/99 - 2/28/00.
4. Review studies on histopathology, growth, and disease challenge reported by the National Oceanic and Atmospheric Administration, U.S. Dept. of Commerce, as part of damage assessment of the Hylebos waterway in Commencement Bay, Tacoma, Washington. Hylebos Cleanup Committee (through contract with Striplin Environmental Associates, Olympia, WA); 12/20/97 - 1/30/99. Also, review the microscopic slides from rock sole (228 livers) and English sole (307 livers, 30 ovaries) that were used to generate the histopathology report. Litigation sensitive project.
5. Damage assessment on injured kelp bass populations in Southern California. United States Dept. of Commerce, National Oceanic and Atmospheric Administration (through contract with Applied Marine Sciences, Livermore, CA); 5/1/92 - 8/31/93. Necropsy and histopathology (liver, kidney, and ovary) and report writing. Litigation sensitive project.

**Other Research:**

1. Histopathology of koi carp exposed to experimental vaccine against koi herpesvirus (Cyprinid herpesvirus-3); February 2011; 524 organs examined from 89 fish. Department of Medicine & Epidemiology, University of California, Davis, California.
2. Necropsy and histopathology of steelhead trout exposed to steel pile driving in the Mad River, Arcata, California; sampling, June 29 – July 10, 2009; 315 fish examined. ICF International for The California Department of Transportation (CalTrans).
3. Immunohistochemical analysis of cytochrome P4501A (CYP1A) expression in livers of masked greenling sampled from Prince William Sound, Alaska, summer 2004. 80 examined. United States Geological Survey, Biological Resources Division, Alaska Science Center, Anchorage, Alaska.

4. Necropsy and histopathology of Chinook salmon, shiner perch, and northern anchovy exposed to concrete pile driving in the Port of Oakland, August 2004. 204 fish examined. Strategic Environmental and the Port of Oakland Authority.
5. Histopathology of brood stock pallid sturgeon mortality in the endangered sturgeon recovery program operated by the U.S. Fish & Wildlife Service. Garrison National Fish Hatchery, Riverdale, North Dakota. July, 2003.
6. Gross examination and histopathological analysis of juvenile rainbow trout after acute toxicity testing. Phillips Petroleum Company (TOSCO). Nov. and Dec. 2001.
7. Histopathological analysis of brook trout and cutthroat trout sampled from Idaho streams contaminated with heavy metals; United States Geological Survey, Biological Resources Division, ECRC Field Research Station, Jackson, WY; 5/1/01 - 9/1/01; 11/1/01 - 5/1/02.
8. Gross necropsy and histopathological examination of white sturgeon tissues to determine causes of morbidity. Stolt Sea Farm, Elverta, CA. 1/26/00 - 4/26/00.
9. Effects of chronic crude oil exposure on early development of pink salmon; histopathology and immunohistochemistry interpretation of cytochrome P4501A expression. United States Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Auke Bay Laboratory, AK; two contracts - 7/1/99 - 12/31/99, and 8/1/00-6/15/01.
10. Histology of gonads from coho salmon parr to determine potential for early sexual maturity in males ("jacks"). United States Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Auke Bay Laboratory, AK; two contracts - 5/19/98 - 12/31/98, and 9/15/99 - 12/15/99.
11. Histopathology of larval white sea bass with bacterial infections after treatment with copper. California Dept. of Fish and Game. 9/25/99-9/28/99.
12. Histopathology of juvenile white sea bass to determine causes of mortality. Hubbs Sea World Research Institute, San Diego, CA; 8/26/99.
13. Determine causes of fathead minnow mortality in ambient water tests; Sacramento River Watershed Project, Central Valley Regional Water Quality Control Board; 12/26/97 - 12/31/98; subgross examination, histopathology, and report writing.

**Diagnostic Pathology:**

1. Pathologic diagnoses of veterinary pathology submissions (relief pathologist).
  - a. Med Veterinary Laboratory, Concord, CA, July 1993 -Feb. 1995 (1085 cases);
  - b. Phoenix Central Laboratories, Everett, WA, July 6 - October 18, 1997 (~1000 cases);
  - c. IDEXX Laboratory, West Sacramento, CA, Sept. 15, 1998 - Jan. 1999 (~150 cases).

**Training and Scientific Publication:**

1. Provide expert advice and coauthor a manuscript that reports the most recent information

on the effects of disease and the *Exxon Valdez* oil spill on the Pacific herring population of Prince William Sound, Alaska. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, Oct. 2005 – Sept. 30, 2006.

2. Train biologist and technicians to assess the prevalence of disease in Pacific herring. Write and publish a manual that describes the methods for assessing disease, including full-page color images showing significant diseases. Alaska Department of Fish and Game; March - May 2003.
3. Train technical personnel at a sewage treatment facility to preserve small fish for histopathological analysis. Histopathological analysis to determine causes of morbidity. South Bayside System Authority, Redwood City, CA; 10/1/99 - 12/30/00.
4. Provide expert advice and coauthor a synthesis manuscript entitled, "Synthesis of the toxicological and epidemiological impacts of the *Exxon Valdez* oil spill on Pacific herring." For the U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, Jan. - June 1999.

**NATIONAL HONORS:** National Institutes of Health, Environmental Pathology Training Fellowship (1987 - 1990, approximately \$71,000);  
Phi Kappa Phi Graduate Fellowship (1983 - 1984, \$4500);  
Soil Conservation Society of America Scholarship (1980, \$750);

**OTHER HONORS:** University Fellowship, University of California, Davis, 1993, 1991.  
Regent's Fellowship in Comparative Pathology, Univ. CA, Davis, 1990.  
Graduate Research Excellence Award, Iowa St. Univ., 1986.  
Honor Graduate, College of Agriculture, Iowa St. Univ., 1983.  
Honor Societies: Gamma Sigma Delta, Phi Kappa Phi; Research Society: Sigma Xi.

### **WORK EXPERIENCE:**

**Aug. 2004 – present** – Fish Pathology: Fish Pathologist for the British Columbia Ministry of Agriculture  
1767 Angus Campbell Road, Abbotsford, BC, V3G 2M3, Canada. Duties (100% time): provide fish pathology diagnostic services (necropsy and histopathology) for the province of British Columbia. Most work is in support of the large salmonid aquaculture industry in the Province, but duties also include shellfish pathology, aquarium fish pathology, and diagnostic services for investigation of fish mortality events (toxic spills) in natural waters.

**Feb. 1997 - June 2006** – Fish Toxicology/Pathology: Assistant Research Pathologist, Department of Anatomy, Physiology, and Cell Biology, School of Veterinary Medicine, University of California, Davis. Direct sampling and histopathologic analysis of adult Pacific herring from Alaska, with emphasis on determining causes of morbidity and mortality on a population scale; provided histopathologic analysis as a collaborator on toxicology projects with a variety of investigators. Served as the morphologic pathologist for the Fish Health Service and Fish Disease Laboratory of the College of Veterinary Medicine (1997-1998).

**Oct. 1988 -** Fish Toxicology/Pathology: Postgraduate researcher, Department of Anatomy,

**Jan. 1997** Physiology, and Cell Biology, School of Veterinary Medicine, University of California, Davis (Supervisor - Dr. David Hinton). Directed sampling, laboratory study, and histopathologic analysis of adult and larval fish tissues from Alaska, with emphasis on determining effects of the 1989 *Exxon Valdez* Oil Spill. Reviewed pathologic diagnoses in fish tissues from which other members of the laboratory had primary responsibility.

**Sept. 1987-** Veterinary Diagnostic Pathology: Graduate Student/Resident in

**Feb. 1993** Veterinary Medical Teaching Hospital (supervisor - Dr. Harvey Olander) and California Primate Research Center (1987-1988, supervisor- Dr. Judit Markovitz). Performed necropsies on a variety of vertebrate species (250 cases, 1987-1989), examined histologic slides, reported on significant gross and microscopic lesions. Taught senior veterinary students proper necropsy procedures, tissue preservation, and methods of describing lesions. Reported lesions in surgical biopsy specimens (three or four weeks per year, 40 cases per week, 1990-1993).

**ORGANIZATIONS:**

1. American College of Veterinary Pathologists
2. American Fisheries Society, Fish Health Section
3. Association of Aquaculture Veterinarians of British Columbia

**REFERENCES:** available upon request