

In Memoriam Carl J. Sindermann 1922–2019

Author: McLaughlin, Shawn M.

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**IN MEMORIAM
CARL J. SINDERMANN
1922–2019**

Dr. Carl James Sindermann, an Honored Life Member of the National Shellfisheries Association, died in Easton, MD, on April 26, 2019, at the age of 96. Carl's distinguished career began in the 1950s and spanned six decades as a highly respected research scientist, administrator, and author. Carl's first interest in parasitology was piqued by a senior project at the University of Massachusetts when he successfully described the complete life cycle of an invasive flatworm known to be destroying native earthworms. His curiosity turned to the marine environment during graduate school when he discovered a fungal agent that caused mortalities in herring. After earning his doctorate, Carl worked briefly in academia before dedicating himself to the ranks of civil service as a research scientist. His accomplishments in research and talent for administration were rapidly recognized, and he quickly advanced to lead several east coast fishery research laboratories (more below) early in his career. In addition to a vast legacy of technical publications, Carl is credited with guiding generations of scientists in his insightful series of "how to" (or "how not to") career books.

Dr. Sindermann was born in North Adams, MA, on August 28, 1922 and lived nearby in Blackinton where he met and married his high school sweetheart, Joan Provencher. In 1946, Carl enrolled in the University of Massachusetts on the G.I. Bill after serving in the U.S. Army in Europe during WWII. He graduated with a bachelor of science in zoology in 1949 and earned a Ph.D. in biology from Harvard University in 1953. Early in his career, Carl enjoyed teaching at Harvard Medical School and Brandeis University in Boston and spent the summers in Maine with Joan and their growing family where he conducted research at Boothbay Harbor Fisheries Research Laboratory.

Dr. Sindermann left academia in 1956 to accept a research position with the former federal Bureau of Commercial Fisheries (BCF) at Boothbay Laboratory where his investigative and administrative competencies swiftly propelled him into the executive arena. In 1963, Dr. Sindermann became the director of a BCF facility, Oxford Biological Laboratory (now National Oceanic and Atmospheric Administration's Cooperative Oxford Laboratory in partnership with Maryland Department of Natural Resources), which opened in 1960 to investigate epizootic mortalities of eastern oysters in Chesapeake and Delaware bays. Under Dr. Sindermann's direction, Oxford Laboratory rapidly became an epicenter of fish and shellfish disease research and shellfish culture. In 1967, Dr. Sindermann moved to Miami, FL, to assume duties as the director, Tropical Atlantic Biological Laboratory and then directorship of the Middle Atlantic Coastal Fisheries Center in 1970 in Sandy Hook, NJ. In the latter position, he provided oversight of several National Marine Fisheries Service laboratories including Sandy Hook Laboratory (NJ), Milford Laboratory (CT), and Oxford Laboratory (MD). In 1976, he advanced to assistant director for environmental management of the Northeast Fisheries Science Center in Sandy Hook, NJ. After 35 years of federal service, Dr. Sindermann entered well-earned retirement in 1990 and moved with his wife back to the eastern shore of Maryland to reside near family. With much to say but much still left unsaid (Sindermann 2015), he returned to the Cooperative Oxford Laboratory as a visiting scientist spending many

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productive hours mentoring and adding to his vast legacy of scientific publications over the next 29 years.

Dr. Sindermann's intellect, keen wit, and diplomacy gained him the respect and admiration of scientists, managers, and administrators at local, regional, national, and international levels. His interactions with scientists in Japan, South Korea, and Taiwan in the 1960s and 1970s set the stage for long-term international collaborations that provided direct exposure to successful shellfish production programs. Research biologists from the United States and Japan simultaneously compared two different culture methods of growing oysters on raised wooden racks or suspended from rafts at the Oxford Laboratory and Sendai, Japan. This new technology of shellfish raft culture in shallow coastal waters quickly resulted in a major food-producing industry for Japan. These early collaborations led to the establishment of a U.S./Japan Joint Panel on Natural Resources (UJNR) for Aquaculture to facilitate future opportunities for technology transfer between the two nations. The UJNR (Aquaculture) celebrates its 50th anniversary this year.

Dr. Sindermann was recognized not only for his research acumen but also for his role in the development of international protocols to secure safety in international fisheries trade. His expertise in fish and shellfish disease led him to be concerned about proposed imports of shellfish into the United States despite warnings by scientists that live imports can lead to disease events in similar or disparate species. He provided expert guidance on this and other critical issues during his service on the International Council for the Exploration of the Sea (ICES) working groups in the 1970s and 1980s (e.g., Fisheries Improvement, Marine Aquaculture, Marine Pathology, and Introduced Species, the latter which he chaired for a decade). A key outcome of the working groups was the issuance of the ICES "Code of Practice" which provides measures for the safe transfer of aquatic species to new locations to reduce the risks of pathogen introductions. These guidelines remain the standard followed today by most European countries and much of the United States.

When Dr. Sindermann became the director, Middle Atlantic Coastal Fisheries Center in 1975, his attention was drawn to the impacts of coastal pollution on marine organisms; likely a consequence of the center's location on the New York Bight (Ford 1999). Dr. Sindermann rapidly integrated his disease expertise with escalating evidence that linked contaminants to disease in marine fish and successfully navigated the center into becoming a leader in marine environmental pollution research. In 1996, he produced the seminal publication *Ocean Pollution—Effects on Living Resources and Humans*.

Over the decades of his career, Dr. Sindermann produced several major contributions to science on ocean pollution, coastal pollution, and marine aquaculture. A prolific writer, he produced more than 150 scientific articles and books during his career and into his retirement. An early article *Disease in Marine Populations* (1963a) was the basis of his 1970 book *Principal Diseases of Commercially Important Marine Bivalve Mollusca and Crustacea* which won the Wildlife Society of America award for best scientific publication in fisheries. In 1990, Dr. Sindermann expanded and reissued the book in two volumes. The thousand-page treatise remains a fundamental resource to fishery and environmental scientists today.

Carl received many honors and awards throughout his career, only a few of which are noted here. He was selected as an Antarctic observer by the U.S. Department of State and was an invited lecturer at the Royal Society of London and the Zoological Institute of the Soviet Academy of Sciences. In 1967, he was a member of a BCF advisory group to the National Aeronautic and Space Administration on back contamination from lunar exploration. In 1975, he was awarded a silver medal from the Department of Commerce for administrative and research activities. He was the president (1980–1981) and board member of the World Mariculture Society, and the chairman of New Jersey Sea Grant Advisory Board (1981–1983). He served on numerous grant evaluation panels for National Science Foundation, National Sea Grant Program, U.S. Department of Agriculture, and other agencies. In 1991, Dr. Sindermann was selected as an Honored Life Member of the National Shellfisheries Association. He also served on editorial boards of major scientific journals including *Aquaculture*, *Chesapeake Science* (now *Estuaries and Coasts*), *Journal of Fish Biology*, *Journal of Invertebrate Pathology*, and *Proceedings of the National Shellfisheries Association* (now *Journal of Shellfish Research*), and he was a scientific editor of *Fishery Bulletin*.

Although Dr. Sindermann left academia early in his career to join the federal service, he continued to maintain strong university connections with teaching institutions and students as a visiting or adjunct professor. He taught courses in invertebrate zoology, marine biology, fish pathology, and marine parasite ecology at a number of universities including Georgetown, Florida Atlantic, Lehigh, Cornell, Miami, Guelph, and Rhode Island. Dr. Sindermann was an insightful mentor who encouraged students and

colleagues to challenge the dogma of science and overcome inherent biases in the scientific field. He produced a unique and engaging series of "how to" books offering career advice to both budding and advanced scientists with such titles as *Winning the Games Scientists Play* (1982), *Survival Strategies for New Scientists* (1987b), *The Woman Scientist* (1992), and *The Scientific Research Laboratory Director* (2012).

Dr. Sindermann attributed the completion of the last book in his "how to" series (*World Travels with a Peripatetic Marine Scientist* 2015) to his family who helped to guide its review, illustration, and publication. In his *Forward*, Carl described the joint endeavor as "...a family production and I am happy with it. Writing the book has of course brought to mind many pleasant places and days and people, so the whole exercise has been another pleasant journey for us...."

Dr. Sindermann was preceded in death by his wife of 72 years who often accompanied him on his travels to participate in scientific meetings and advisory councils across the



United States and abroad. They are survived by four children, 11 grandchildren, and eight great-grandchildren. Their oldest son, James Joseph Sindermann, died a few months after the death of his father. His professional and personal achievements leave behind indelible legacies that will be revered by his colleagues, the scientific community, and his family and friends for many generations. His keen intellect, perceptive insights, and wise counsel benefited many and were tremendously impactful to ocean policy and stewardship. He was an outstanding scholar, leader, gentleman, mentor, and role model. He will be long remembered by a cadre of scientists, administrators, students, and friends for his warm wit and modest decorum as well as his many outstanding contributions to the advancement of science.

SHAWN M. MCLAUGHLIN
Cooperative Oxford Laboratory
National Centers for Coastal Ocean Sciences
National Ocean Service
National Oceanic and Atmospheric Administration
904 S. Morris St.
Oxford, MD 21654

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PUBLICATIONS

- Bilio, M., H. Rosenthal & C. J. Sindermann. 1986. Realism in aquaculture: achievements, constraints, perspectives: review papers from the 1981 world conference on aquaculture in Venice, Italy. Bredene, Belgium: European Aquaculture Society. 585 pp.
- Chenoweth, J. F., S. E. McGladdery, C. J. Sindermann, T. K. Sawyer & J. W. Bier. 1986. An investigation into the usefulness of parasites as tags for herring (*Clupea harengus*) stocks in the western North Atlantic, with emphasis on use of the larval nematode *Anisakis simplex*. *J. Northwest Atl. Fish. Sci.* 7:25–33.
- Colwell, R., J. B. Coulter, J. Williams, C. Sindermann, L. W. Prentiss, H. Seliger, E. Holm & J. Hedgpeth. 1972. The fate of the Chesapeake Bay: research to counter the threats. *J. Wash. Acad. Sci.* 62:207–213.
- Ford, S. 1999. Carl James Sindermann honored life member. *J. Shellfish. Res.* 18:341–342.
- Jordan, S. J., C. J. Sindermann, A. Rosenfield & E. B. May. 1999. Proceedings of a workshop on causes and effects of ulcerative lesions in fish. Oxford, MD: Maryland Department Natural Resources. 31 pp.
- Kaul, P. N. & C. J. Sindermann, eds. 1978. Drugs and food from the sea: myth or reality. Norman, OK: University Oklahoma Press. 448 pp.
- Mairs, D. F. & C. J. Sindermann. 1962. A serological comparison of five species of Atlantic clupeoid fishes. *Biol. Bull.* 123:330–343.
- May, E. B. & C. J. Sindermann. 1999. Statement from the 1998 Easton workshop on causes and effects of ulcerative lesions in fish. In: Jordan, S. J., C. J. Sindermann, A. Rosenfield & E. B. May, editors. Proceedings of a workshop on causes and effects of ulcerative lesions in fish. Oxford, MD: Maryland Department Natural Resources. pp. 1–6.
- McLaughlin, S., C. Sindermann & R. Cipriano. 2014. In memoriam Aaron Rosenfield 1924–2013. *J. Shellfish Res.* 33:331–335.
- Messick, G. A. & C. J. Sindermann. 1992. Synopsis of principal diseases of the blue crab, *Callinectes sapidus*. Oxford, MD: U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/NEC-88. 24 pp.
- Rosenfield, A. & C. J. Sindermann. 1965. Starch-gel electrophoresis of oyster serum. *Bull. Am. Malacol.* 32:8–9.
- Rosenfield, A. & C. J. Sindermann. 1966. The distribution of “MSX” in middle Chesapeake Bay. *Proc. Natl. Shellfish. Assoc.* 56:6.
- Scattergood, L. W., C. J. Sindermann & B. E. Skud. 1959. Spawning of North American herring. *Trans. Am. Fish. Soc.* 88:164–168.
- Sindermann, C. J. 1953a. Parasites of fishes of north central Massachusetts. *Mass. Div. Fish Game Fish. Rept. N. Central Mass.* 1950: 28 pp.
- Sindermann, C. J. 1953b. Studies on parasites of fishes, with special reference to ichthyosporidium disease of the herring. PhD diss., Harvard University, Cambridge, MA.
- Sindermann, C. J. 1956. Diseases of fishes of the western North Atlantic. IV. Fungus disease and resultant mortalities of herring in the Gulf of Saint Lawrence in 1955. *Res. Bull. Maine Dept. Sea Shore Fish.* 25:1–23.
- Sindermann, C. J. 1957a. Diseases of fishes of the western North Atlantic. V. Parasites as indicators of herring movements. *Res. Bull. Maine Dept. Sea Shore Fish.* 27:1–30.
- Sindermann, C. J. 1957b. Diseases of fishes of the western North Atlantic. VI. Geographic discontinuity of myxosporidiosis in immature sea herring from the Gulf of Maine. *Res. Bull. Maine Dept. Sea Shore Fish.* 29:1–20.
- Sindermann, C. J. 1957c. Mass mortalities of marine fishes in the Gulf of Saint Lawrence, 1954–1956. *Anat. Rec.* 128:622.
- Sindermann, C. J. 1957d. Myxosporidiosis in immature sea herring from the Gulf of Maine. *J. Parasitol.* 43:42–43.
- Sindermann, C. J. 1957e. Studies on the pathogenicity of *Ichthyosporidium hoferi*, fungus parasite of fishes. *J. Parasitol.* 43:43.
- Sindermann, C. J. 1958a. An epizootic in Gulf of Saint Lawrence fishes. *Trans. N. Am. Wildlife Nat.* 23:349–360.
- Sindermann, C. J. 1958b. Anti-mammalian erythrocyte properties of sea herring serum. *Anat. Rec.* 131:599.
- Sindermann, C. J. 1959. Zoogeography of sea herring parasites. *J. Parasitol.* 45:34.
- Sindermann, C. J. 1960. Ecological studies of marine dermatitis-producing schistosome larvae in northern New England. *Ecology* 41:678–684.
- Sindermann, C. J. 1961a. Parasite tags for marine fish. *J. Wildlife Manage.* 25:41–47.
- Sindermann, C. J. 1961b. Parasitological tags for redfish of the western North Atlantic. *Rapp. P.-V., Cons. Perm. Int. Explor. Mer.* 150: 111–117.
- Sindermann, C. J. 1961c. Serological testing in fishery research. Transactions of the North American wildlife and natural resources conference. Washington, DC: Wildlife Management Institute. pp. 298–309.
- Sindermann, C. J. 1961d. Sporozoan parasites of sea herring. *J. Parasitol.* 47:34.
- Sindermann, C. J. 1962. Serology of Atlantic clupeoid fishes. *Am. Nat.* 96:225–231.
- Sindermann, C. J. 1963a. Disease in marine populations. *Trans. N. Am. Wildlife Nat.* 28:336–356.
- Sindermann, C. J. 1963b. Immunogenetic studies of elasmobranch fishes. Proceedings of the XVI International Congress of Zoology 2:210.
- Sindermann, C. J. 1963c. Use of plant hemagglutinins in serological studies of clupeoid fishes. *U.S. Fish Wildlife Serv. Fish Bull.* 63:137–141.
- Sindermann, C. J. 1965. Effects of environment on several diseases of herring from the western North Atlantic. *Spec. Publ. Int. Comm. Northw. Atlan. Fish.* 6:603–610.
- Sindermann, C. J. 1966a. Diseases of marine fishes. *Adv. Mar. Biol.* 4:1–89.
- Sindermann, C. J. 1966b. Epizootics in oyster populations. Proceedings of the Eleventh Pacific Science Congress 7:7.
- Sindermann, C. J. 1966c. Larval ecology of the trematode *Cryptocotyle lingua*. *Proc. Int. Congr. Parasitol.* 1:12–13.
- Sindermann, C. J. 1966d. Parasites of oysters, *Crassostrea virginica*, from the east coast of North America. Proceedings of the first international congress of parasitology. Oxford, England: Pergamon Press. pp. 585–586.
- Sindermann, C. J. 1967a. Blood types in fish. *Am. Biol. Teach.* 29:439–441.
- Sindermann, C. J. 1967b. Recent advances in oyster culture in the Far East. *Am. Malacol. Bull.* 34:52–53.
- Sindermann, C. J. 1968a. Bibliography of oyster parasites and diseases. *U.S. Fish Wildlife Serv. Spec. Sci. Rep. Fish.* 563:1–13.
- Sindermann, C. J. 1968b. Oyster mortalities, with particular reference to Chesapeake Bay and the Atlantic coast of North America. *U.S. Fish Wildlife Serv., Spec. Sci. Rep. Fish.* 569:1–10.
- Sindermann, C. J. 1970a. Bibliography of diseases and parasites of marine fish and shellfish, with emphasis on commercially important species. Miami, FL: U.S. Department of Interior, Bureau of Commercial Fisheries, Tropical Atlantic Biological Laboratory. Informal Rep. No. 11. 440 pp.
- Sindermann, C. J. 1970b. Bibliography of seed oysters in upper Chesapeake Bay. *Proc. Natl. Shellfish. Assoc.* 60:11.
- Sindermann, C. J. 1970c. Disease and parasite problems in marine aquaculture. In: McNeil, W. J., editor. Marine aquaculture. Corvallis, OR: Oregon State University Press. pp. 103–134.
- Sindermann, C. J. 1970d. Diseases of marine animals transmissible to man. *Lab. Mes.* 1:50–54.

- Sindermann, C. J. 1970e. Principle diseases of marine fish and shellfish. New York, NY: Academic Press. 369 pp.
- Sindermann, C. J. 1970f. The role and control of diseases and parasites in mariculture. In: Youngken, H. W., Jr., editor. Food-drugs from the sea: proceedings, 1969. Washington, DC: Marine Technology Society. pp. 145–173.
- Sindermann, C. J. 1971. Internal defenses of Crustacea: a review. *Natl. Mar. Fish. Serv. Fish Bull.* 69:455–489.
- Sindermann, C. J. 1972. Some biological indicators of marine environmental degradation. *J. Wash. Acad. Sci.* 62:184–189.
- Sindermann, C. J., ed. 1974. Diagnosis and control of mariculture diseases in the United States. Highlands, NJ: U.S. Department of Commerce, National Marine Fisheries Service. NMFS Technical Series (Middle Atlantic Coastal Fisheries Center) 2. 306 pp.
- Sindermann, C. J. 1975. Status of disease and mortality investigations of the Pacific oyster in 1975. A report to the UJNR aquaculture panel. *Natl. Mar. Fish. Serv.* 83:1–11.
- Sindermann, C. J. 1976a. Effects of coastal pollution on fish and fisheries-with particular reference to the middle Atlantic Bight. *Am. Soc. Limnol. Oceanogr. Spec. Symp.* 2:281–301.
- Sindermann, C. J. 1976b. Oyster mortalities and their control. *FAO Tech. Conf. Aquacult.* 76:1–25.
- Sindermann, C. J. 1977a. Ciliate disease of blue crabs. *Dev. Aquacult. Fish. Sci.* 6:129–131.
- Sindermann, C. J. 1977b. Ciliate infestation (*Epistylis*). *Dev. Aquacult. Fish. Sci.* 6:251–253.
- Sindermann, C. J. 1977c. Disease diagnosis and control in North American marine aquaculture. New York, NY: Elsevier. 329 pp.
- Sindermann, C. J. 1977d. Recent data on possible associations of coastal/estuarine pollution with fish and shellfish diseases. International Council for the Exploration of the Sea. E:14, 33 pp.
- Sindermann, C. J. 1978a. Environmentally related diseases of marine fish and shellfish. *U.S. Natl. Mar. Fish. Ser. Mar. Fish. Rev.* 40:43.
- Sindermann, C. J. 1978b. White spot disease of pompano. *Dev. Aquacult. Fish. Sci.* 6:251–253.
- Sindermann, C. J. 1979a. Beyond the LC50: an opinion about research activities and needs concerning physiological effects of pollutants in the environment. In: Vemberg, W. B., A. Calebrese, F. P. Thurberg & F. J. Vemberg, editors. Marine pollution: functional responses. New York, NY: Academic Press. pp. 437–450.
- Sindermann, C. J. 1979b. Oyster mortalities and their control. In: Pillay, T. V. R. & W. A. Dill, editors. Advances in aquaculture. Farnham, Surrey, England: Fishing News Books Ltd. pp. 349–361.
- Sindermann, C. J. 1979c. Pollution-associated diseases and abnormalities of fish and shellfish: a review. *Fish Bull.* 76:717–749.
- Sindermann, C. J. 1979d. Status of northwest Atlantic herring stocks of concern to the United States. Sandy Hook, NJ: U.S. Department of Commerce, NOAA, National Marine Fisheries Service. NMFS TSR-23. 449 pp.
- Sindermann, C. J. 1980a. Pollution effects on fisheries – potential management activities. *Helgoland. Wiss. Meer.* 33:674–686.
- Sindermann, C. J. 1980b. The use of pathological effects of pollutants in marine environmental monitoring programs. *Rapp. P.-V. Reun.- Cons. Int. Explor. Mer* 179:129–134.
- Sindermann, C. J. 1981. Aquatic animal protein food resources – actual and potential. In: Woods, R. G., editor. Future dimensions of world food and population. Boulder, CO: Westview Press: A Winrock International Study.
- Sindermann, C. J. 1982a. Implications of oil pollution in production of disease in marine organisms. *Philos. T. R. Soc. B.* 297:385–399.
- Sindermann, C. J., ed. 1982b. Proceedings of the 6th U.S.-Japan meeting on aquaculture, Santa Barbara, California, August 27–28, 1977. Rockville, MD: U.S. Department of Commerce, National Marine Fisheries Service, NOAA Technical Report NMFS Circular-442. 66 pp.
- Sindermann, C. J. 1982c. Winning the games scientists play. New York, NY: Plenum Press. 304 pp.
- Sindermann, C. J. 1983. An examination of some relationships between pollution and disease. *Rapp. P.-V. Reun.- Cons. Int. Explor. Mer* 182:37–43.
- Sindermann, C. J. 1984a. Disease in marine aquaculture. *Helgoland. Wiss. Meer.* 37:505–532.
- Sindermann, C. J. 1984b. Fish and environmental impacts. *Arch. Fischereiwiss.* 35:125–160.
- Sindermann, C. J. 1984c. International Helgoland symposium 1983 – conveners report of the informal session on diseases in marine fish. *Helgol. Wiss. Meeresunters* 37: 633–639.
- Sindermann, C. J., ed. 1984d. Proceedings of the 7th U.S.–Japan meeting on aquaculture, marine finfish culture, Tokyo, Japan, October 3-4, 1978. Washington, DC: U.S. Department of Commerce, NOAA, National Marine Fisheries Service. NOAA Technical Report/NMFS-10. 31 pp.
- Sindermann, C. J., ed. 1984e. Proceedings of the U.S.–Japan meetings on aquaculture (9th and 10th): ninth meeting, crustacean culture held at Kyoto, Japan on May 26–27, 1980 and tenth meeting, molluscan culture held at Lewes, Delaware on October 27, 1981. Washington, DC: U.S. Department of Commerce, National Marine Fisheries Service, NOAA Technical Report. NMFS-16. 92 pp.
- Sindermann, C. J., ed. 1985a. Proceedings of the 11th U.S.–Japan meeting on aquaculture, salmon enhancement, Tokyo, Japan, October 19–20, 1982. Springfield, VA: U.S. Department of Commerce, National Marine Fisheries Service. NOAA Technical Report NMFS-27. 102 pp.
- Sindermann, C. J. 1985b. The joy of science: excellence and its rewards. New York, NY: Plenum Press. 259 pp.
- Sindermann, C. J. 1986a. Parasites of oysters, *Crassostrea virginica*, from the east coast of North America. *Proc. First Int. Congr. Parasitol.* 1: 858–886.
- Sindermann, C. J. 1986b. Strategies for reducing risks from introductions of aquatic organisms: a marine perspective. *Fish.* 11:10–15.
- Sindermann, C. J. 1986c. The role of pathology in aquaculture. In: Bilio, M., H. Rosenthal & C. J. Sindermann, editors. Realism in aquaculture: achievements, constraints, perspectives. Bredene, Belgium: European Aquaculture Society. pp. 395–419.
- Sindermann, C. J. 1987a. Effects of parasites on marine fish populations: practical considerations. *Int. J. Parasitol.* 17:371–382.
- Sindermann, C. J., ed. 1987b. Reproduction, maturation, and seed production of cultured species: proceedings of the 12th U.S.–Japan meeting of aquaculture, Baton Rouge, LA, October 25–29, 1983. Springfield, VA: U.S. Department of Commerce, National Marine Fisheries Service, NOAA Technical Report NMFS-47. 73 pp.
- Sindermann, C. J. 1987c. Survival strategies for new scientists. New York, NY: Plenum Press. 264 pp.
- Sindermann, C. J. 1988a. Biological indicators and biological effects of estuarine/coastal pollution. *Water Resour. Bull.* 24:931–939.
- Sindermann, C. J. 1988b. Disease risks in marine farming. In: Grimaldi, E. & H. Rosenthal, editors. Efficiency in aquaculture production: disease control. Milan, Italy: Edizione del Sole 24 Ore. pp. 35–44.
- Sindermann, C. J. 1988c. Environmental quality and aquaculture systems. Proceedings of the 13th U.S. Japan Meeting on Aquaculture, October 24–25, 1984, Mie, Japan. Springfield, VA: U.S. Department of Commerce, National Marine Fisheries Service. NOAA Technical Report. NMFS-69. 50 pp.
- Sindermann, C. J. 1988d. Epizootic ulcerative syndromes in coastal/estuarine fish. Springfield, VA: U.S. Department of Commerce, National Marine Fisheries Service. NOAA Technical Memorandum. NMFS-F/NEC-54. 37 pp.

- Sindermann, C. J. 1988e. Role of the International Council for the Exploration of the Sea (ICES) in matters concerned with transfers and introductions of marine organisms. *J. Shellfish Res.* 7:560.
- Sindermann, C. J. 1989a. Genetic threats to wild Atlantic salmon stocks. *International Council for the Exploration of the Sea.* F:15, 8 pp.
- Sindermann, C. J. 1989b. Pollution-associated disease conditions in estuarine/coastal fish and shellfish: a status report and perspective for the 1990's. International Council for the Exploration of the Sea. E:26, 37 pp.
- Sindermann, C. J. 1989c. Report of the working group on introductions and transfers of marine organisms. *International Council for the Exploration of the Sea.* F:16, 56 pp.
- Sindermann, C. J. 1989d. Role of the International Council for the Exploration of the Sea (ICES) in matters concerned with transfers and introductions of marine organisms. Los Angeles, CA: National Shellfisheries Association. 36 pp.
- Sindermann, C. J. 1989e. The shell disease syndrome in marine crustaceans. Woods Hole, MA: U.S. Department of Commerce, National Marine Fisheries Service, NOAA Technical Memorandum. NMFS-F/NEC-64. 43 pp.
- Sindermann, C. J. 1990a. Chitinoclastic disease syndromes in marine crustacea. In: Pinnock, D. E., editor. Proceedings of the 5th international colloquium on invertebrate pathology and microbial control. Adelaide, South Australia: University of Adelaide, Waite Agricultural Research Institute. 411 pp.
- Sindermann, C. J. 1990b. Pollution-associated disease conditions in marine fish. In: MTS '90 Proceedings: science and technology for a New Oceans Decade, vol. 1. Washington, DC: Marine Technology Society. pp. 135–139.
- Sindermann, C. J. 1990c. Principal diseases of marine fish and shellfish, vol. 1. Diseases of marine fish. San Diego, CA: Academic Press. 521 pp.
- Sindermann, C. J. 1990d. Principal diseases of marine fish and shellfish, vol. 2. Diseases of marine shellfish. San Diego, CA: Academic Press. 516 pp.
- Sindermann, C. J. 1990e. Scientific writing as English prose. In: Hunter, J., editor. Writing for fishery journals. Bethesda, MD: American Fisheries Society. pp. 75–78.
- Sindermann, C. J. 1990f. Shell disease in marine crustaceans – a conceptual approach. *J. Shellfish Res.* 10:491–494.
- Sindermann, C. J. 1991a. Case-histories of effects of transfers and introductions on marine resources – introduction. *J. Cons. Cons. Int. Explor. Mer* 47:377–378.
- Sindermann, C. J. 1991b. Introduction to a symposium on shell disease in marine crustaceans. *J. Shellfish Res.* 10:481.
- Sindermann, C. J. 1991c. Proceedings of the special symposium: shell disease in marine crustaceans. *J. Shellfish Res.* 10:479–506.
- Sindermann, C. J. 1991d. Shell disease in marine crustaceans a conceptual approach. *J. Shellfish Res.* 10:491–494.
- Sindermann, C. J. 1992a. Disease risks associated with importation of non-indigenous marine animals. *Mar. Fish. Rev.* 54:1–10.
- Sindermann, C. J. 1992b. Precautions for importing and culturing non-native shrimp. In: Fulks, W. & K. L. Main, editors. Proceedings of a workshop on diseases of cultured penaeid shrimp in Asia and the United States. Honolulu, HI: The Oceanic Institute. pp. 325–332.
- Sindermann, C. J. 1992c. Principal issues associated with the use of non-native shrimp species in aquaculture. In: DeVoe, M. R., editor. Proceedings of the conference and workshop on introductions and transfers of marine species: achieving a balance between economic development and resource protection. Charleston, SC: S.C. Sea Grant Consortium. pp. 149–154.
- Sindermann, C. J. 1992d. Risks associated with introductions of non-indigenous marine species, with emphasis on disease. Rapid City, SD: American Fisheries Society. 122 pp.
- Sindermann, C. J. 1992e. Role of the International Council for the Exploration of the Sea (ICES) concerning introductions of marine organisms. In: Rosenfield, A. & R. Mann, editors. Dispersal of living organisms into aquatic ecosystems. College Park, MD: Maryland Sea Grant College Publication. UM-SG-TS-92-04. pp. 367–376.
- Sindermann, C. J. 1992f. The introduction of marine species: what the future holds. In: DeVoe, M. R., editor. Proceedings of the 1991 conference and workshop on introductions and transfers of marine species: achieving a balance between economic development and resource protection. Charleston, SC: S.C. Sea Grant Consortium. pp. 143–148.
- Sindermann, C. J. 1993a. Disease risks associated with importation of nonindigenous marine animals. *Mar. Fish. Rev.* 54:1–10.
- Sindermann, C. J. 1993b. Interactions of pollutants and disease in marine fish and shellfish. In: Couch, J. A. & J. W. Fournie, editors. Pathobiology of marine and estuarine organisms. Boca Raton, FL: CRC Press, Inc. pp. 451–482.
- Sindermann, C. J. 1994. Quantitative effects of pollution of marine and anadromous fish populations. Springfield, VA: U.S. Department of Commerce, National Marine Fisheries Service. NOAA Technical Memorandum. NMFS-F/NEC-104. 22 pp.
- Sindermann, C. J. 1996a. Ocean pollution: effects on living resources and humans. Boca Raton, FL: CRC Press. 275 pp.
- Sindermann, C. J. 1996b. Sustainable development in the southeastern coastal zone: a summary, In: Vernberg, F. J., W. B. Vernberg & T. Siewicki, editors. Sustainable development in the southeastern coastal zone. Columbia, SC: University of South Carolina Press. pp. 509–515.
- Sindermann, C. J. 1997a. A marine pollution society. *Mar. Pollut. Bull.* 34:986–987.
- Sindermann, C. J. 1997b. The search for cause and effect relationships in marine pollution studies. *Mar. Pollut. Bull.* 34:218–221.
- Sindermann, C. J. 2001. Winning the games scientists play: strategies for enhancing your career in science. Cambridge, MA: Perseus Pub. 290 pp.
- Sindermann, C. J. 2006. Coastal pollution: effects on living resources and humans. Boca Raton, FL: CRC Press. 280 pp.
- Sindermann, C. J. 2012. The scientific research laboratory director: an essential figure in the advancement of science. Bloomington, IN: Xlibris Corp. 206 pp.
- Sindermann, C. J. 2015. World travels with a peripatetic marine scientist. Bloomington, IN: Xlibris Corp. 216 pp.
- Sindermann, C. J., F. B. Bang, N. O. Christensen, V. Dethlefsen, J. C. Harshbarger, J. R. Mitchell & M. F. Mulcahy. 1980. The role and value of pathobiology in pollution effects monitoring programs. *Rapp. P.-V. Reun. – Cons. Int. Explor. Mer.* 179:135–151.
- Sindermann, C. J. & J. F. Chenoweth. 1993. The fungal pathogen *Ichthyophonus hoferi* in sea herring *Clupea harengus*: a perspective from the western North Atlantic. International Council for the Exploration of the Sea. F41:1–39.
- Sindermann, C. J., F. Csulak, T. K. Sawyer, R. A. Bullis, D. W. Engel, B. T. Estrella, E. J. Noga, J. B. Pearce, J. C. Rugg, R. Runyon, J. A. Tiedemann & R. R. Young. 1989. Shell disease syndrome in the New York bight. Springfield, VA: U.S. Department of Commerce, National Marine Fisheries Service. NOAA Technical Memorandum. NMFS-F/NEC-74. 47 pp.
- Sindermann, C. J., S. C. Esser, E. Gould, B. B. McCain, J. L. McHugh, R. P. Morgan II, R. A. Murchelano, M. J. Sherwood & P. R. Spitzer. 1982. Effects of pollutants on fishes. In: Mayer, G. F., editor. Ecological stress and the New York bight: science and management. Columbia, SC: Estuarine Research Federation. pp. 23–38.
- Sindermann, C. J. & A. E. Farrin. 1962. Ecological studies of a *Cryptocotyle lingua* (Trematoda: Heterophyidae) whose larvae cause “pigment spots” of marine fish. *Ecology* 43:69–75.
- Sindermann, C. J. & R. F. Gibbs. 1953. A dermatitis-producing schistosome which causes “clam-diggers’ itch” along the central Maine coast. *Maine Dept. Sea Shore Fish. Res. Bull.* 12:1–20.

- Sindermann, C. J. & K. A. Honey. 1963. Electrophoretic analysis of the hemoglobins of Atlantic clupeoid fishes. *Copeia* 3:534–537.
- Sindermann, C. J. & K. A. Honey. 1964. Serum hemagglutinins of the winter skate, *Raja ocellata* Mitchell, from the western North Atlantic ocean. *Copeia* 1:139–144.
- Sindermann, C. J. & G. E. Krantz. 1968. Erythrocyte antigens and natural isoagglutinins of the American eel, *Anguilla rostrata*, from Chesapeake Bay. *Chesap. Sci.* 9:94–98.
- Sindermann, C. J. & R. J. G. Lester. 1987. Utah foundation symposium stream 4: man and the sea. *Int. J. Parasitol.* 17:994–995.
- Sindermann, C. J. & D. V. Lightner, eds. 1988. Disease diagnosis and control in North American marine aquaculture. Amsterdam, The Netherlands: Elsevier. 431 pp.
- Sindermann, C. J. & D. F. Mairs. 1958. Serum protein changes in diseased sea herring. *Anat. Rec.* 131:599–600.
- Sindermann, C. J. & D. F. Mairs. 1959a. A major blood group system in Atlantic sea herring. *Copeia* 3:228–232.
- Sindermann, C. J. & D. P. Mairs. 1959b. The C blood group system of Atlantic sea herring. *Anat. Rec.* 134:640.
- Sindermann, C. J. & D. P. Mairs. 1960. Comparative serology of five species of Atlantic clupeoid fishes. *Anat. Rec.* 137:393.
- Sindermann, C. J. & D. F. Mairs. 1961. A major blood group system for spiny dogfish, *Squalus acanthias* L. *Biol. Bull.* 120:401–410.
- Sindermann, C. J. & A. Rosenfield. 1954a. Diseases of fishes of the western North Atlantic. I. Diseases of the sea herring *Clupea harengus*. *Res. Bull. Maine Dept. Sea Shore Fish.* 18:1–23.
- Sindermann, C. J. & A. J. Rosenfield. 1954b. Disease of fishes of the western North Atlantic. III. Mortalities of sea herring (*Clupea harengus*) caused by larval trematode invasion. *Res. Bull. Maine Dept. Sea Shore Fish.* 21:1–16.
- Sindermann, C. J. & A. J. Rosenfield. 1957. The ecology of marine dermatitis producing schistosomes. III. Oxygen consumption of normal and parasitized *Nassarius obsoletus* (*Nassa obsoleta*) under varying conditions of salinity. *J. Parasitol.* 43(Suppl):28.
- Sindermann, C. J. & A. J. Rosenfield. 1967. Principal diseases of commercially important marine bivalve Mollusca and Crustacea. *Fish. Bull. U.S. Fish Wildlife Serv.* 66:335–385.
- Sindermann, C., A. Rosenfield & L. J. Strom. 1957. The ecology of marine dermatitis-producing schistosomes. II. Effects of certain environmental factors on emergence of cercariae of *Austrobilharzia variglandis*. *J. Parasitol.* 43:382.
- Sindermann, C. J. & T. K. Sawyer. 1997. The scientist as consultant: building new career opportunities. New York, NY: Plenum Press. 341 pp.
- Sindermann, C. J. & L. W. Scattergood. 1954. Diseases of fishes of the western North Atlantic. II. Ichthyosporidium disease of the sea herring (*Clupea harengus*). *Res. Bull. Maine Dept. Sea Shore Fish.* 19:1–40.
- Sindermann, C., B. Steinmetz & W. Hershberger. 1992. Introductions and transfers of aquatic species. Copenhagen, Denmark: International Council for the Exploration of the Sea ICES Marine Science Symposia, Vol. 194. 125 pp.
- Sindermann, C. J., J. J. Ziskowski & V. T. Anderson, Jr. 1978. A guide for the recognition of some disease conditions and abnormalities in marine fish. Springfield, VA: U.S. Department of Commerce, National Marine Fisheries Service. NMFS/NFC TSR-14. 60 pp.
- Steimle, F. W. & C. J. Sindermann. 1978. Review of oxygen depletion and associated mass mortalities of shellfish in the Middle Atlantic bight in 1976. *Mar. Fish. Rev.* 40:17–26.
- Swanson, L. & C. J. Sindermann. 1979. Oxygen depletion and associated benthic mortalities in New York bight, 1976. Rockville, MD: U.S. Department of Commerce, NOAA Professional Paper-11. 345 pp.
- Villella, J. B., E. S. Iversen & C. J. Sindermann. 1970. Comparison of the parasites of pond-reared and wild pink shrimp (*Penaeus duorarum* Burkenroad) in south Florida. *Trans. Am. Fish. Soc.* 99:789–794.
- Williams, E. H., Jr. & C. J. Sindermann. 1992. Effects of disease interactions with exotic organisms on the health of the marine environment. In: DeVoe, M. R., editor. Proceedings of the conference and workshop on introductions and transfers of marine species: achieving a balance between economic development and resource protection. Charleston, SC: South Carolina Sea Grant Consortium. pp. 71–77.
- Yentsch C. M. & C. J. Sindermann. 1992. The woman scientist: meeting the challenges for a successful career. New York, NY: Plenum Press. 271 pp.