

***Kintama Research Corporation***  
***10-1850 Northfield Rd., Nanaimo, BC V9S 3B3***  
***Tel: (250) 729-2600 x223***  
***Cell: (250) 739-9044***  
***e-mail: [david.welch@kintama.com](mailto:david.welch@kintama.com)***



## Current Position

*President & CEO, Kintama Research Corporation & Chief Architect of the POST/OTN Array*

Responsible for the development of a technical strategy for building a continental scale acoustic tracking array to serve the needs of the marine science community. The purpose of the array is to put in place a permanent seabed telecommunications network for continental shelf regions of the Eastern North Pacific, and to extend the technology to shelf regions across the globe. Among other goals, the array is intended to facilitate the tracking of individual marine animals (especially salmon) greater than about 10 cm in length and measure survival *in situ*. In a follow-on phase, it is intended for this architecture to also host a wide range of physical oceanographic instrumentation, leading to an integrated ocean observing system that includes the fish tracking sensors. I founded Kintama to develop the research and design the technological infrastructure necessary to test the array concept and then to create operational arrays.

## Background

*DATE OF BIRTH:* 10 November 1955.  
*CITIZENSHIP:* Canadian.  
*LANGUAGES:* Fluent in English & Japanese.

## Professional Affiliations

*AMERICAN FISHERIES SOCIETY*  
*AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE*  
*THE OCEANOGRAPHY SOCIETY*  
*MARINE TECHNOLOGY SOCIETY*

## Education

UNIVERSITY OF TORONTO *B.Sc., Biology & Economics, 1977*  
DALHOUSIE UNIVERSITY *Ph.D., Oceanography, 1985.*

## Areas of Expertise

*Biological and Fisheries Oceanography; Marine Telemetry, Mathematical Population Dynamics; Operations Research; Statistical Analysis; Economics and Management of Natural Resources.*

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22 October 2010.

AWARDS & RECOGNITIONS (SELECTED HIGHLIGHTS)

- 2009** ♦ **MISTIC, Environmental Technology Award 2009.** (To Kintama Research Corporation). **Finalist & Winner** 5 November 2009.
- ♦ **Keynote Speaker.** “*Salmon Biodiversity in the Age of Global Warming*”. Yukon College Lecture Hall, Whitehorse, Yukon Territory. 3 April 2009.
  - ♦ **Invitational Lecture.** “*The Pacific Ocean Shelf Tracking Array- Applications to Yukon River Salmon Management Questions*”. Yukon River Panel, Pacific Salmon Commission, Whitehorse, Yukon. 26 March 2009.
  - ♦ **Vancouver Island Economic Developers Award, 2009.** (To Kintama Research Corporation). **Finalist & Winner--“For Outstanding Achievement in Economic Development within the Vancouver Island/Coast Region”.** 16 April 2009.
- 2008** ♦ **Prix d’Excellence,** Fisheries & Oceans Canada. In Recognition of Exceptional Scientific Contributions to the Government of Canada. (The DFO’s Prix d’Excellence was established to honour the best, most exemplary contributions to the Department among all Distinction Awards) June 2008.
- ♦ **Keynote Lecture.** “*The Pacific Ocean Shelf Tracking Array (POST)- A Permanent Continental-Scale Array: Performance, Applications, & Relevance to the North-West Atlantic*”. New England Tagging Symposium. Durham, New Hampshire. 17 October 2008.
  - ♦ **Plenary Keynote Lecture.** “*The Pacific Ocean Salmon Tracking Array (POST): Challenges in Building Continental-Scale Marine Telecommunication Infrastructures, and Applications to Arctic Climate Research*” MTS/IEEE Oceans 2008 Conference. Quebec City, Canada. September 2008.
- 2007** ♦ **Prix de Distinction,** Fisheries & Oceans Canada. For outstanding scientific contributions related to national and international climate change research. (December 2007)
- ♦ **Part of the research team** that secured the \$45M award for the globalization of POST, termed the “Ocean Tracking Network” (12 February 2007).
  - ♦ **Invited Keynote Lecture.** “*Technological Innovation in Marine Science: The role of the Pacific Ocean Salmon Tracking Array (POST) in Changing Fisheries Management and Marine Research*” MTS/IEEE Oceans 2007 Conference. October 2007.
- 2006** ♦ **Research highlighted in Science, “Sound Sightings” (Vol 313, p. 777; 11 August 2006).**
- ♦ **Research highlighted on the BC Knowledge Network Series, “The Leading Edge, Innovation in BC” Television Program.** <http://www.knowledgenetwork.ca/leadingedge/index.html> (Search under “People Profiled”)
  - ♦ **Research highlighted on the Oregon Public Broadcasting “Field Guide Series” Television Program, Episode #1803, “Salmon Tracking”.**
- 2005** ♦ **Invited Lecture** “*POST-- A Permanent Continental-Scale Acoustic Tracking Array for Marine Fisheries Research: The Goal & Some Initial Results*” Alaska Marine Science Symposium, 25 January, 2005. Anchorage, Alaska.
- ♦ **Member, NOPP (National Oceanographic Partnerships Program) Review Panel.** 7-11 February 2005, Washington D.C.
  - ♦ **Invited Lecture** “*Initial Results from the Pacific Ocean Shelf Tracking System (POST): A Permanent Continental-Scale Acoustic Tracking Array for Fisheries Research*”. Acoustical Society of America AGM, May, 2005. Vancouver, B.C.
  - ♦ **Adjunct Professor** (renewed). School of Earth & Ocean Sciences, Univ. of Victoria.
  - ♦ Nominated for the “**FRONTIERS IN RESEARCH AWARD**” given by the Science Council of British Columbia (not awarded).

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 22 October 2010.

- 2004** ♦ **Invited Lecture** “Global climate change effects on anadromous fishes” Center for Aquatic Biology and Aquaculture, University of California, Davis 7 June, 2004. Davis, California.
- ♦ **Named Chief Scientist**, for the Census of Marine Life program POST, or "Pacific Ocean Shelf Tracking" January, 2004.
- ♦ **Scientific Advisory Board**, International Centre for Sturgeon Studies, Malaspina University-College, Nanaimo, British Columbia.
- 2003** ♦ **Invited Plenary Address** “Monitoring changes in fisheries production: Using vessels of opportunity” Marine Sciences in the Northeast Pacific: Science for Resource Dependent Communities. 14 January, 2003. Anchorage, Alaska.
- 2002** ♦ **Co-Chair**. Alfred P. Sloan Foundation’s Pacific Census of Marine Life Project, “POST”. (Joint with G. Boehlert). March 27, 2001.
- 2001** ♦ **Adjunct Professor**. School of Earth & Ocean Sciences, University of Victoria. Four Year Limited Term appointment, July 1, 2001.
- ♦ **Co-Chair**. Alfred P. Sloan Foundation’s Pacific Census of Marine Life Project, “POST”. (Joint with G. Boehlert). March 27, 2001.
- 2000** ♦ **Invited** presentation on my ocean research program and a review of expected impacts of global warming on Pacific salmon to the senior executive committee (CEO and all senior Vice-Presidents and aides) of the Bonneville Power Administration: “Effect of Ocean Climatic Shifts on Growth and Survival of Endangered Salmon Stocks”. Bonneville Power Administration, Portland, Oregon. 3 February 2000.
- ♦ **Invited** presentation, Idaho State Legislature, House Resources & Conservation Committee. On my ocean research program and a review of expected impacts of global warming on Pacific salmon. Boise Idaho, 13 March 2000.
- ♦ **Best Paper Award**, “Ocean Climate Effects on Pacific Salmon”. American Fisheries Society Annual Meeting, Idaho Chapter. March 2000.
- ♦ **Nominated**, by the American Fisheries Society, for the Pew Award for Marine Conservation. May, 2000. (<http://www.pewmarine.org/ProgramProfile/index.html>).
- 1999** ♦ **R.E. Foerster Award**. *Outstanding Scientific Publication for 1998*. (D.W. Welch, Y. Ishida, and K. Nagasawa. (1998) Thermal Limits and Ocean Migrations of Sockeye Salmon (*Oncorhynchus nerka*): Long-Term Consequences of Global Warming. *Can. J. Fish. Aquat. Sci.* 55:937-948).
- ♦ **R.E. Foerster Award (Honourable Mention)**. *Outstanding Scientific Publication for 1998*. (D.W. Welch, Y. Ishida, K. Nagasawa, and J.P. Eveson. 1998. Thermal Limits On The Ocean Distribution Of Steelhead Trout (*Oncorhynchus mykiss*). In: D.W. Welch, D.M. Eggers, K. Wakabayashi, and V.I. Karpenko (*Editors*), “Assessment and Status of Pacific Rim Salmonid Stocks”. *N. Pac. Anadr. Fish Comm. Bull. No.* 1:396-404.)
- 1997** ♦ **R.E. Foerster Award**. *Outstanding Scientific Publication for 1995*. (D.W. Welch, A.I. Chigirinsky, & Y. Ishida (1995) *Can. J. Fish. Aquat. Sci.* 52:489-503)
- ♦ **“Phantom of the Ocean”**. A 1 Hour Canadian Broadcasting Corporation Television Documentary focussing on my research in DFO on climate change, global warming, and ocean biology of salmon. The show was subsequently re-aired several times.

**PUBLICATIONS:**

*Published Peer- Reviewed Scientific Papers: 75; In-Review: 8; Secondary: 142*

***Most Relevant:***

1. Welch, D.W., Y. Ishida, and K. Nagasawa. 1998. *Thermal Limits and Ocean Migrations of Sockeye Salmon (Oncorhynchus nerka): Long-Term Consequences of Global Warming*. Can. J. Fish. Aquat. Sci. 55:937-948. <http://article.pubs.nrc-nrc.gc.ca/ppv/RPViewDoc?issn=1205-7533&volume=55&issue=4&startPage=937>
2. Welch, D.W., Ward, B.R., and Batten, S.D. (2004). "Early Ocean Survival and Comparative Marine Movements of Hatchery and Wild Juvenile Steelhead, as Determined by an Acoustic Array: Queen Charlotte Strait, British Columbia". Deep-Sea Research Vol 51(6-9):897-909. <http://dx.doi.org/10.1016/j.dsr2.2004.05.010z>
3. Welch, D.W., E.L. Rechisky, M.C. Melnychuk, A.D. Porter, C.J. Walters, S. Clements, B.J. Clemens, R.S. McKinley, C. Schreck. (2008). "Survival of Migrating Salmon Smolts in Large Rivers With and Without Dams". PLoS Biology 6(10):e265. <http://dx.plos.org/10.1371/journal.pbio.0060265>
4. Rechisky, E.R., D.W. Welch, A.D. Porter, M.C. Jacobs, A. Ladouceur. (2009). "Experimental measurement of hydrosystem-induced mortality in juvenile Snake River spring Chinook salmon using a large-scale acoustic array". Canadian Journal of Fisheries and Aquatic Sciences. 66:1019–1024 <http://dx.doi.org/10.1139/F09-078>
5. Welch, D.W., M.C. Melnychuk, E.R. Rechisky, A.D. Porter, M.J. Jacobs, A. Ladouceur, R.S. McKinley, G.D. Jackson (2009). "Freshwater and marine migration and survival of endangered Cultus Lake sockeye salmon smolts using POST, a large-scale acoustic telemetry array". Can. J. Fish. Aquat. Sci. 66(5):1-15. <http://dx.doi.org/10.1139/F09-032>
6. Rechisky, E.L., and Welch, D.W. (2010). "Surgical implantation of acoustic tags: Influence of tag loss and tag-induced mortality on free-ranging and hatchery-held spring Chinook (*O. tshawytscha*) smolts", in Wolf, K.S., and O'Neal, J.S., eds., PNAMP Special Publication: Tagging, Telemetry and Marking Measures for Monitoring Fish Populations—A compendium of new and recent science for use in informing technique and decision modalities: Pacific Northwest Aquatic Monitoring Partnership Special Publication 2010-002, chap. 4, p. 69-94. <http://www.pnamp.org/node/2890>
7. Welch, D.W., M. Melnychuk, J. Payne, E.L. Rechisky, A. Porter, G. Jackson, B. Ward, S. Vincent, J. Semmens (Submitted 2 July 2010) "In Situ Measurement of Coastal Ocean Movements and Survival of Juvenile Pacific Salmon". Science