



The Northwest Environmental Training Center presents:

Principles of Scientific Sampling for Environmental Professionals - Study Design, Data Reporting and the Appropriate Use of Statistics to Support Conclusions

Course I.D. STAT-403

June 17-19, 2008, 8:30 A.M. to 5:00 P.M. (3 Days)

Palace Station Hotel and Conference Center

Salon F

2411 West Sahara Ave

Las Vegas, NV 89102

Instructor: Dr. Harold J. Geiger

Description: This course provides an overview that will cover the basic terms, concepts, and logic that underlie modern scientific sampling. Much of the class will be devoted to the understanding of how to apply the basic concepts of probability to sampling problems and how to use probability to measure the effectiveness of the sampling process. We will compare the difference between purposive and random sampling and discuss why random sampling (and its many variations) is so frequently used in manufacturing, science, and government. This class will emphasize written communication, in the style of a scientific report, as an essential part of the scientific sampling process. The course is intended for environmental professionals with a limited statistical background that must use scientific sampling to describe natural phenomena or who must use sampling to make management recommendations.

About the Instructor: Dr. Geiger is a biologist and biometrician who has worked in Pacific salmon stock assessment in Alaska for the last 24 years. He has published on topics ranging from sampling, to population genetics, to the effects of the *Exxon Valdez* oil spill on pink salmon. His emphasis in teaching statistics is on how to use quantitative results in scientific communications, rather than on statistical formulae or calculations. Dr. Geiger has served two terms as the president of the Alaska chapter of the American Statistical Association and served as president of the Alaska Chapter of the American Fisheries Society in 2005.

Course Topics:

Terms, concepts, and background:

- Statistical population, sampling units, population parameters, statistics, samples
- Mathematical notation and equations
- Measures of central tendency and measures of variation in a population

Three sampling approaches

- Purposive sampling
- Simple random sampling
- Systematic sampling

Some probability distributions

- Discrete distributions (Binomial and Poisson)
- Normal distribution and why many things approximately have this distribution

A simple mark-recapture study and spreadsheet simulations

- The Petersen estimate
- Parametric bootstrap methods
- The sampling distribution
- The effect of sample size
- Sampling and non-sampling errors
- Typical measures of sampling error

Stratified random sampling

- As a way to increase precision
- Sampling domains

Written summaries of sampling studies

- Methods, results, discussion, and abstracts
- The use of equations in reports
- Correct use of terms like bias, stratification, or parameter
- Inferring population characteristics from a sample

- Using statistical results to support conclusions
- Generating wisdom rather than just more numbers

After completing this course, participants will be able to understand, discuss, and recommend basic sampling approaches using the standard terminology of modern statistics. The student will have a basic understanding of how to use probability and simulation to study precision in sampling-based estimates. Moreover, the student should be able to help develop written summaries of sampling studies and to defend these studies using the logic of scientific sampling.

Prerequisites: A working knowledge of Microsoft Excel. Previous statistics or probability training/experience is helpful, but not required.

Education Level: Introductory/intermediate. The course is not recommended for professionals with extensive experience designing scientific sampling projects, unless a majority of course topics listed above are not well understood.

Course Materials: Each participant will receive a copy of the course proceedings including notes and reference material.

Continuing Education Units: 2.0

What to Bring: Please bring a laptop computer with Microsoft Excel, writing tools (pens or pencils), coffee mug and water bottle (to reduce waste). Please wear comfortable clothing appropriate for the prevailing weather.

Registration: \$595 (*\$495 reduced tuition available for Native American tribes; government employees; nonprofits; students; and [NAEP](#), [NEBC](#), [RMAEP](#) members). You may register via the link below or by calling the Northwest Environmental Training Center at 206-762-1976.

Cancellation Policy: *Registration fees are fully refundable up to 30 days prior to the event and 50 percent refundable (or 100% credit) thereafter up to 3 business days prior to the event. No refunds are issued for cancellations occurring less than 3 business days before the start day. Course registration fees and cancellation policy are subject to change without notice.*

Disability Accommodations: *To request disability accommodations, please contact us at info@nwetc.org or (206) 762-1976 at least 30 days prior to the event.*

Northwest Environmental Training Center

A nonprofit 501(c)(3) program of the Northwest Environmental Education Council
650 S. Orcas Street, Suite 220 | Seattle, Washington 98108
Phone: (206)762-1976 | Fax: (206)762-1979
www.nwetc.org



Las Vegas, NV | ACCOMMODATIONS near the Palace Station Hotel and Conference Center

Palace Station Hotel and Conference Center

(Workshop Location)
 2411 West Sahara Avenue
 Las Vegas, Nevada 89102
 (702) 367-2411
 www.palacestation.com



<p>Hilton Grand Vacations Club 2650 Las Vegas Blvd S Las Vegas, NV</p> <p>www.hiltongrandvacations.com</p>	(702) 765-8300	<p>Stardust Resort and Casino 3000 Las Vegas Blvd S #104 Las Vegas, NV</p> <p>www.stardustlv.com</p>	(702) 732-6111
<p>Travelodge 2601 Westwood Dr Las Vegas, NV</p> <p>www.travelodge.com</p>	(702) 733-0001	<p>Artisan Hotel and Spa 1501 W Sahara Ave Las Vegas, NV</p> <p>www.theartisanhotel.com</p>	(702) 214-4000
<p>Budget Suites of America 1500 Stardust Rd Las Vegas, NV</p> <p>www.budgetsuites.com</p>	(702) 732-1500	<p>Travelodge Las Vegas Strip 2830 Las Vegas Blvd S Las Vegas, NV</p> <p>www.travelodge.com</p>	(702) 735-4222
<p>Circus Circus Las Vegas Resort and Casino 2880 Las Vegas Blvd S Las Vegas, NV</p> <p>www.circuscircus.com</p>	(877) 434-9175	<p>Sahara Hotel Casino 2535 Las Vegas Blvd S Las Vegas, NV</p> <p>www.saharavegas.com</p>	(702) 737-2111

Northwest Environmental Training Center

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 650 S. Orcas Street, Suite 220, Seattle, Washington 98108
 Phone: (206)762-1976, Fax: (206)762-1979
 www.nwetc.org



Directions to:

Palace Station Hotel and Conference Center

2411 West Sahara Ave
Las Vegas, NV 89102
(702) 367-2411
www.palacestation.com

From McCarran International Airport (LAS):

Head toward Airport Exit
Turn left at E Naples Dr
Turn right at Paradise Rd
Turn left at E Sahara Ave
Continue on W Sahara Ave
Make a U-turn at W Sahara Ave
Arrive at 2411 W Sahara Ave

From the north and south (via I-15):

From I-15 S or I-15 N
Take the Sahara Ave Exit 40 to Convention Center
Take the Sahara Ave West ramp
Continue on W Sahara Ave / NV-589
Make a U-turn at W Sahara Ave
Arrive at 2411 W Sahara Ave

From Henderson (via I-515):

From I-515 northbound
Merge onto I-15 S via Exit 76A toward Los Angeles
Take the Sahara Ave exit - Exit 40
Take the Sahara Ave West ramp
Merge onto W Sahara Ave / NV-589 W
Make a U-turn at W Sahara Ave
Arrive at 2411 W Sahara Ave

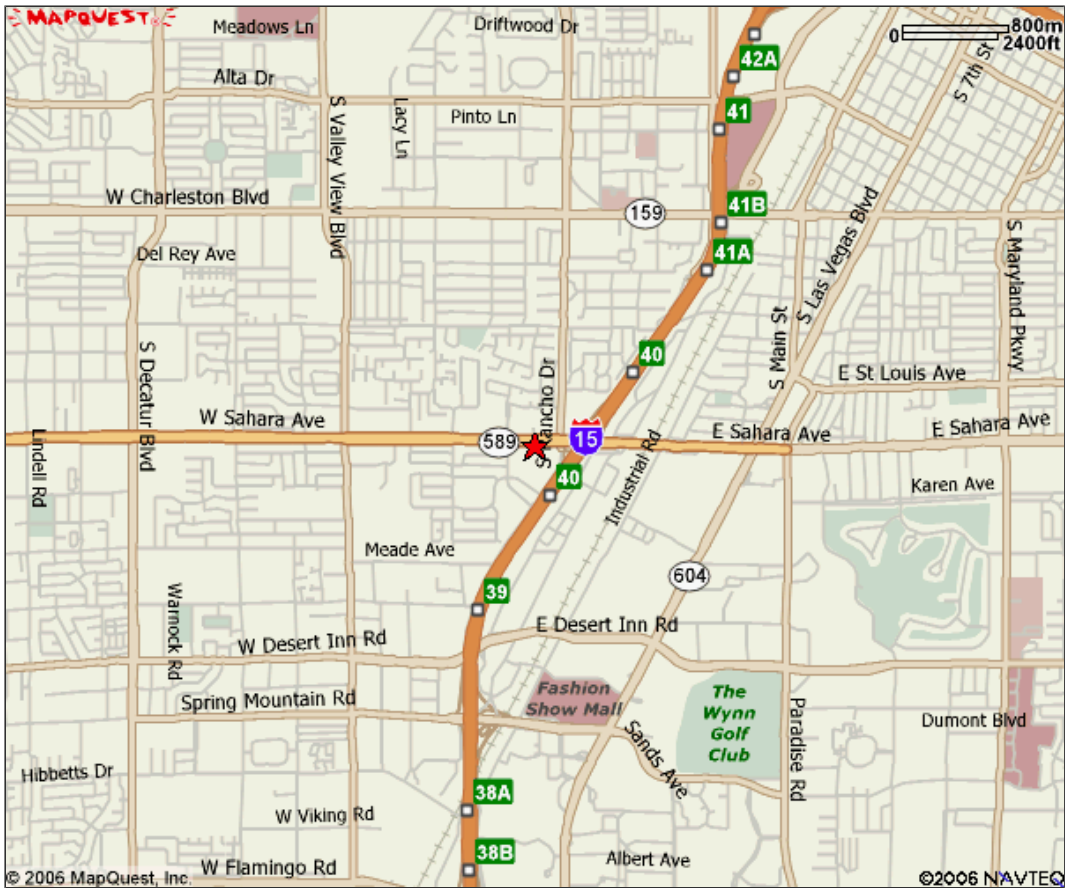
From the northwest (via US-95 southbound):

From US-95 S
Take the Valley View Blvd Exit 78
Bear right onto the S Valley View Blvd ramp
Turn left at W Sahara Ave
Arrive at 2411 W Sahara Ave

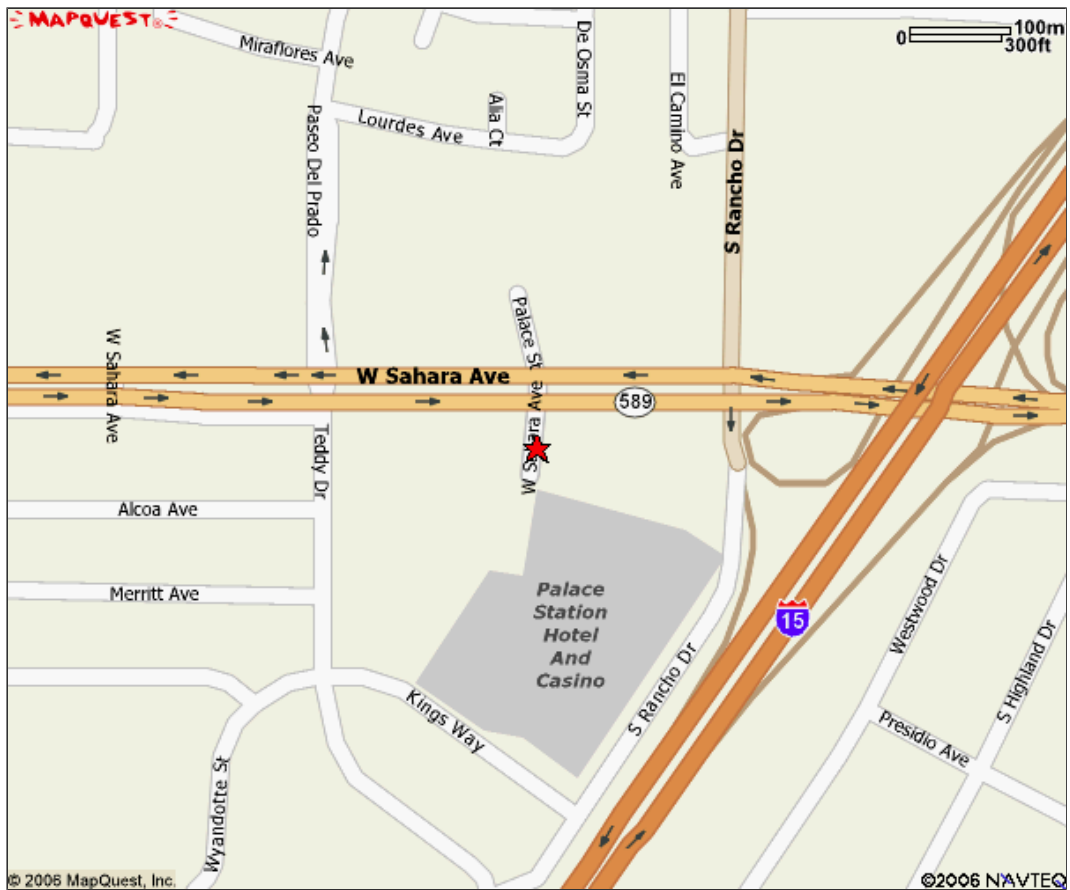
REGIONAL MAP:



CITY MAP:



STREET MAP:



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NORTHWEST ENVIRONMENTAL TRAINING CENTER

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REGISTRATION FORM

Name: _____ Today's Date: _____

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Street Address: _____

Street Address (cont'd): _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____ Title: _____

Principles of Scientific Sampling for Environmental Professionals \$ _____

Course ID: STAT-403, 17-19, 2008

Palace Station Hotel and Conference Center

2411 West Sahara Ave, Las Vegas, NV

Registration: \$595 (\$495*)

*Reduced rates for Native American Tribes; nonprofits; government; students; and NEBC, NAEP and RMAEP members.

Payment Method: Check PO Credit Card (Visa Mastercard) Total: \$ _____

Credit Card or PO #: _____ Exp: _____

Notes: Please make checks payable to Northwest Environmental Training Center.

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