Making the Most of Existing Data

- Imagine a site that has some data that was collected previously...
- Imagine tight budgets and a desire to make the most of the existing data...
- Imagine that you have just enough statistical knowledge to pull this off.

Stay with us for another half hour and we’ll show you how to make the most of that data!

Post-hoc Designs

Probabilistic Designs

- The key aspect of probabilistic sampling designs is:

  THERE IS A KNOWN PROBABILITY OF SELECTION FOR EVERY SAMPLING UNIT IN THE POPULATION

Change in Population of Interest

- Example: Chromium Plating Facility in CA
- Operational between 1945 and 1995
- Hexavalent Chromium contamination
- Data collected for human health risk assessment
- Sampling designed for 1/8 acre residential lots
- Can we use the data for ecological assessment?

Commercial / Industrial Exposure Unit

Possible Residential Exposure Units
<table>
<thead>
<tr>
<th>1. REPORT DATE</th>
<th>2. REPORT TYPE</th>
<th>3. DATES COVERED</th>
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<tr>
<td>MAR 2012</td>
<td></td>
<td>00-00-2012 to 00-00-2012</td>
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<th>4. TITLE AND SUBTITLE</th>
<th>5a. CONTRACT NUMBER</th>
<th>5b. GRANT NUMBER</th>
<th>5c. PROGRAM ELEMENT NUMBER</th>
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<td>Post-hoc Designs</td>
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<th>6. AUTHOR(S)</th>
<th>5d. PROJECT NUMBER</th>
<th>5e. TASK NUMBER</th>
<th>5f. WORK UNIT NUMBER</th>
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<th>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</th>
<th>8. PERFORMING ORGANIZATION REPORT NUMBER</th>
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<tr>
<td>Neptune and Company, Inc, 1435 Garrison Street, Suite 110, Denver, CO, 80215</td>
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<th>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</th>
<th>10. SPONSOR/MONITOR’S ACRONYM(S)</th>
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12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
Presented at the 9th Annual DoD Environmental Monitoring and Data Quality (EDMQ) Workshop Held 26-29 March 2012 in La Jolla, CA. U.S. Government or Federal Rights License

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:
a. REPORT
   unclassified
b. ABSTRACT
   unclassified
c. THIS PAGE
   unclassified

17. LIMITATION OF ABSTRACT
   Same as Report (SAR)

18. NUMBER OF PAGES
   3

19a. NAME OF RESPONSIBLE PERSON

Standard Form 298 (Rev. 8-98)
Proscribed by ANSI Std Z39-18
Possible Residential Exposure Units

Possible Residential Exposure Units

Commercial / Industrial Exposure Unit

Estimates of the Mean Concentration

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<th>Commercial / Industrial</th>
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<th>Haphazard Residential</th>
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<td>2.48</td>
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<td>21.3</td>
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</table>

Hexavalent Chromium concentrations in mg/Kg

“Probabilitilizing” Judgmental Samples

- Example: Explosives Detonation EF-Site
- Operational between 1945 and 1957
- 43,000 kg Uranium used in tests
- Data collected via judgmental sampling in 1979 to determine aerial dispersement of Uranium
- Samples were collected near firing point where heaviest contamination was expected to occur

EF-Site Judgmental Samples
Making the Most of Existing Data

- Beware of potential bias in the sample selection, collection, or analysis.
- Consider greater uncertainty around post-hoc estimates to account for unknowns.
- Get your money’s worth from the data you have!