## Statistical Consulting Application Form

**Department of Statistics**

# University of Connecticut

***For Office Use Only:***

Date Received: \_\_1/28/2015\_\_\_\_\_\_ File Number: \_SCS15002\_\_\_

Date/Supervisor: \_\_Ming-Hui Chen\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hours: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date/Consultant: \_\_Dooti Roy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hours: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date/Consultant: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hours: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Consulting Fee: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***For Applicant:***

Name: (Last/First) Kirchhoff/Christine Date: Jan. 16, 2015

Department: CEE

Mailing Address: 261 Glenbrook Road, Unit 3037, Storrs, CT 06269-3037 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Which is the best way to contact you? E-mail: xxx Office: xxx Home: \_\_\_\_\_

xxx Faculty \_\_\_ Staff \_\_\_ Ph.D. Student \_\_\_ M.S. Student \_\_\_ Undergrad \_\_\_ Other

(Specify Other): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If Student, Major Advisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Major Advisor campus mailing address (U-Box #): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

List statistics courses taken and statistical computing experience (optional):

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Stage of Research:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Design (no data collected yet)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Presently collecting data

Data provided by State of Connecticut DEEP Analysis (all data has been collected)

If design state is complete, was a statistician consulted for design? Unknown but not likely

If so, give name(s): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expected completion date of project: May 2015 or sooner

Estimated number of consulting hours needed this semester: open to needs of project

The results of this research will probably be published as (check all that apply):

\_\_\_ M.S. thesis \_\_\_ P.H. Dissertation \_\_\_ Tech Report xxxx Journal Article \_\_\_ Other

University of Connecticut FRS Number if applicable This is not funded research

Is this research supported by a grant or contract? This is not funded research

If so, give details:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Give a brief description of your problem including the following:

Purpose:

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Description of variables to be measured:

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Research questions that you want to address using statistical methods: \_

1. Is there any reduction in contaminant loadings over time overall or between the “old permit” and “new permit”? With this question, may need to consider when sample was taken (e.g., number of days since last storm and/or date of sample overall)?

2. Are there some facilities that exceed the benchmark levels year after year after year—no change, on average, of pollutant levels?

3. For samples around the same time (or within the same monitoring period, e.g. Oct1-March31), is contaminant loading for those samples measured just after storm events (say within 1-3 days) greater than the contaminant loading for samples taken later (e.g., 4+ days after the storm)? With this question, I’m wondering if it pays to wait longer to take a sample so that the contaminant levels are lower?

4. Is there a difference in sample contaminant loading from storms of higher magnitude? With this question, I’m thinking about the fact that storms are getting worse so perhaps these storms are flushing more contaminants off the site so contaminant loads might be increasing over time.

4. Are some industrial classes “cleaner” than others? “dirtier” than others? With this question, I’m wondering if data suggest that regulations shouldn’t be equal across the board but perhaps should be tailored to certain facility types over others. Can we identify “high risk” and “low risk” industrial facilities by individual or by class? Note, Duke and Augustenborg (2006) suggest the current use of SIC codes to designate facility type doesn’t have much to do with the stormwater effluent quality. Maybe there are new groupings that we can surmise based on level of pollution from different facility types? Again, may need to think about when, relative to a storm event, samples are taken to make for apples-to-apples comparison.

5. With this data, is it possible to:

a) identify acute problems (where a particular contaminant is particularly high and persistently so?)?

b) show improved water quality over time?

c) show a relationship between facility type and water quality\*\*? \*\* note study by Lee and Stenstrom (2005) found with a Neural Connection 2.1 that there was a weak or no relationship between industrial discharge category and water quality data.

6. Is there a relationship between receiving water and contaminant loading? Say, some receiving waters receive relatively higher contaminant loads than others? Impaired vs. not impaired?

7. Is there a relationship between town and contaminant loading? Maybe some towns have “dirtier” industries or perhaps their monitoring is worse?

8. Are samples with LC50 <say 25% “dirtier” than samples with LC50 say >75%?

9. Note, according to Duke (2001), high variability of stormwater constituent concentrations and small number of samples collected at any given facility have been shown to miss or obscure any trends in the runoff water quality. For this reason, if there is a way to batch monitoring by group and look over time, maybe can get around limited number of samples for any individual facility?

10. Different levels of activity at each facility, different amounts of impervious cover, etc. might impact water quality/parameter levels—these differences are difficult to ascertain in looking at this data.

11. A study by WA Dept of Ecology found runoff from industrial sites carries high concentrations of Cu, Pb, and toxic chemicals whereas runoff from residential areas was below safety limits. However, because there is more area in residential development, they are still bigger issue in WA (ref. <http://daily.sightline.org/2014/12/03/which-way-to-clean-industrial-stormwater/>). Maybe pay attention to Cu and Pb? A study by Line et al. (1997) showed Cu and Zn were highest in industrial sites.

Statistical issues:

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Statistical software issues:

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If there are papers about previous studies of a similar nature, which might aid us in helping you, please attach copies.

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Signature/Applicant/Date

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Major Advisor/Research Sponsor

(Signature required if you are a student.)