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3. Enter the **title**, **author(s)**, and **author affiliation(s)** for your presentation in the pre-formatted fields.

    - **Title:** The format of your title should remain Times New Roman, 12 point, bold, all caps font. Formatting edits such as italics, lowercase, superscripts, and subscripts should be made as necessary at the discretion of the authors.

    - **Authorship:** Type in the first and last names of all authors in the order determined appropriate by the authors. Do NOT include professional titles (e.g., use "John Smith," not "Dr. John Smith).

    - **Author affiliations**

        - For authors affiliated with K-State academic departments, include the department name followed by the relevant college (e.g., "*Department of Chemistry, College of Arts and* Sciences").

        - For authors affiliated with academic departments of colleges or universities other than K-State, please include the department and institution name (e.g., "*Department of Chemistry, University of Kansas*").

        - If all authors have the same affiliation, enter the affiliation name only once (**see sample abstract A below**).

        - If two or more authors have different affiliations, use superscripts after author names and before affiliations to link authors with their respective affiliations (**see sample abstract B below**).

4. **Enter your abstract** into the pre-formatted field.

    - Your abstract should not exceed 250 words.

    - Your abstract should describe your research purpose or goals; predictions, hypotheses, or expected findings; methods used for testing hypotheses or pursuing the research goals; anticipated or actual results; and conclusion in a way that students and faculty from various academic disciplines can understand.

5. **Enter your Kansas relevance statement** in the pre-formatted field.

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   - Your statement should identify one or more key topics, issues, or problems in the state of Kansas and should discuss the relevant implications of your research. Current key topics of focus in the Kansas legislature include quality and cost of education, education outcomes, healthcare, economic development, bioscience, military relations and military families, roads and transportation, family stability, security, energy and alternative energy sources, technology, water, wind energy, tax policy, animal health, rural development, defense industry research, tourism (particularly in Flint Hills), and school finance issues.

6. **Review and proofread your abstract.** Your abstract should be free of grammatical errors.

7. **Submit your abstract document by email** to the Graduate Student Council at egsc@ksu.edu.

   - Your must receive approval of all co-authors prior to submitting your abstract

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SAMPLE ABSTRACT A

DISTRIBUTED SOURCES AND ISLANDING TO MITIGATE CASCADING FAILURES IN POWER GRID NETWORKS

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Distributed renewable generation includes the application of small generators such as wind turbines, scattered throughout a power system to provide for the electric power needed by the consumers. In general, the term distributed generation refers to all the small electric power generators which are located on the utility system, at the site of a consumer. However, in this work, we deal with distributed generation at the transmission side to enable islanding (intentional splitting) of the transmission grid in the event of critical faults which may lead to a cascading failure. This intentional splitting allows the system to accomodate the overloading because it not only reduces the total load on the main grid but presence of distributed renewable sources also helps to continue powering the different islands of the grid. We perform a topological analysis of the power grid as a complex network and partition the grid using a two-step optimization process, followed by load shedding, if required. The first step uses a quality function called modularity which gives basic optimal islands based on power flow but without differentiating between sources and other nodes. The second step combines islands to form superislands such that atleast one distributed renewable source is present in every island to achieve load balancing. This strategy helps to minimize the number of links that are disconnected to form islands, and at the same time, achieves the purpose of protecting the transmission network by reducing stress on the main grid.

<u>Relevance of Research to State-related Topic(s)</u>

Power grids are among the largest and most complex technological systems ever developed. Recently, there has been a growing concern about the excessive usage of power grid networks and the increasing possibility of cascading failures. Research in this area gained much importance after the 2003 blackout in the United States. This work is a part of the research funded by the Energy and Power Affiliates Group (EPAP) consisting of Westar Energy, Burns and McDonnell, Omaha Public Power District and Nebraska Public Power District, at ECE department of Kansas State University. Kansas has a very good supply of wind which makes it a perfect candidate for implementation of islanding using distributed renewable sources such as wind farms.

SAMPLE ABSTRACT B

CROP MODELING APPROACH FOR ASSESSING IMPACTS OF CLIMATE CHANGE AND VARIABILITY ON CROP PRODUCTIVITY IN THE OGALLALA AQUIFER REGION

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Future cropping systems depends on how the future climate unfolds. The objectives of this study were: (a) to analyze climate variability and change resulting from greenhouse gas emissions using high resolution regional climate model (RCM); and (b) to determine its impact on the crop production in the Ogallala region. Three RCM's used in this study were Canadian Regional Climate Model (CRCM), Regional Climate Model (RegCM3) and the Hardley Regional Model (HRM3). The A2 climate scenario for historic period (1971-2000) and future (2041-2070) were acquired from North American Regional Climate Change Assessment Program (NARCCAP). Spatial crop modeling was performed in AEGIS/WIN 4.0.2 program available in the DSSAT (Decision Support System for Agrotechnology Transfer) crop simulation model suite. The A2 climate scenario showed variable spatial pattern and magnitude across the Ogallala region with extreme climate conditions during the cropping season. Analyses showed that Ogallala region will experience 4-5°C increase in the maximum temperature for the month of July and August. In addition rainfall distribution will be highly variable with some regions receiving high rainfall during the month of May and very low rainfall during the month of August. Simulation results of future climates predicted a 30% decrease in the yield of grain sorghum. However, a substantial increase in wheat production throughout the region with an average increase of 35% was predicted in future climates. Crop management decision helped improve productivity by decreasing yield losses.

<u>Relevance of Research to State-related Topic(s)</u>

Fifty six counties in the State of Kansas are in Ogallala aquifer region. Crop production in these counties is stressed due to the limited water availability from the aquifer. Coupled with the water stress is the changing climatic conditions (e.g. extreme temperatures, variable rainfall) which has adverse effects on crop production. Using three regional climate models, our study provides crucial information on the magnitude of change that could be expected in future climates. We used future climate data and spatial crop model to analyze the performance of various crops. Results of the study provide critical information needed to help decision/policy makers to device long-term strategies to cope with impacts of climate change and variability on water use and crop production. Based on our results agronomists, breeder and water managers can formulate/modify their programs, targeting the requirements of future climate, water and food security.