PRODUCTION OF GEOGRAPHIC INFORMATION SYSTEM AIDED NOISE MAPS

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THE PURPOSE OF THE STUDY

- This study targets to identify the noise levels in the Erciyes University campus area.
- Noise pollution has been identified by interpolation methods.
- Noise levels spread through the existing roads in the University and main road neighbour to the University.

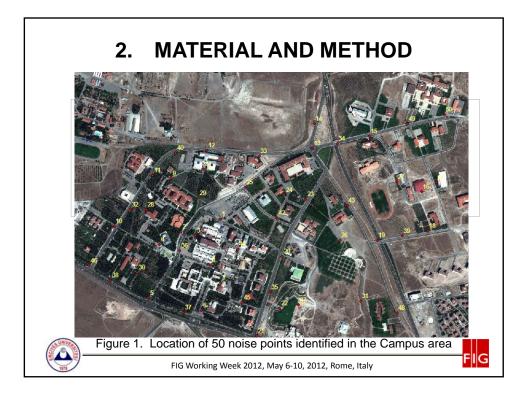FIG Working Week 2012, May 6-10, 2012, Rome, Italy

METHODOLOGY

1. Selection of study area
2. Material and Method
3. Assessment
4. Conclusions and Recommendations

1. SELECTION OF STUDY AREA

2. MATERIAL AND METHOD

Figure 1. Location of 50 noise points identified in the Campus area

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2. MATERIAL AND METHOD

- Points defined have been settled on the ground and coordinates have been registered by handy GPS.

- Noise levels have been measured during the morning, noon and evening hours by SVAN 949.

SVAN 949

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2. MATERIAL AND METHOD

- The measurements have been carried out between 08:00-10:00 morning, 12:00-13:30 noon and 17:00-18.30 evening hours to record the highest level of noise within the campus.
- In October 2011, Equivalent Continuous Noise Levels (LEQ) have been measured for 5 minutes in each point during the morning, noon and evening hours in weekdays.
- Names of the points, locations, measurement periods, LEQ, Lmin and Lmax values have been recorded as Excel data file.
- ArcGIS 9.3 program has been used for analyzing noise and producing noise map.

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3. RESULTS

- Geostatistical interpolation methods have been used to visualize the point data in spatial extent.

- Such methods produce the results as raster surfaces.

- Noise values have been assessed with "Geostatistical Analyst" module on ArcGIS.

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3. RESULTS

- Three different geostatistical interpolation methods used in this module are:

  – Inverse Distance Weight (IDW) Method
  – Ordinary Kriging (OK) Method
  – Radial Basis Functions (RBF) Method
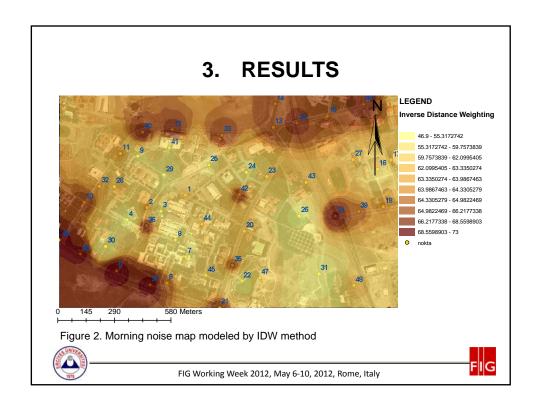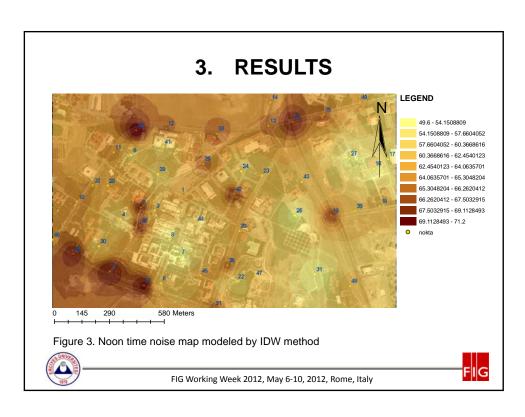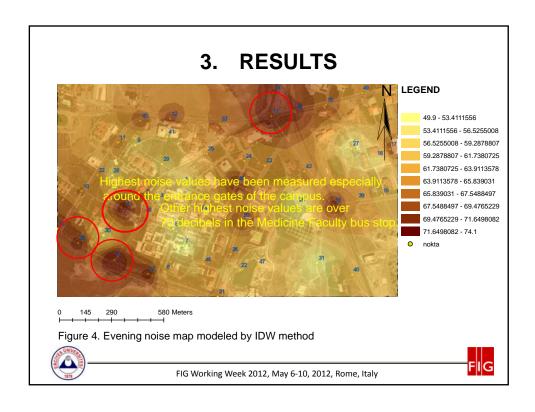
3. RESULTS

- To define suitable geostatistical interpolation method for noise mapping, totally 9 noise maps have been produced by means of IDW, OK and RBF based on equivalent continuous noise level of morning, noon and evening.

- Noise maps modeled by the IDW method are shown in Figure 2-4.
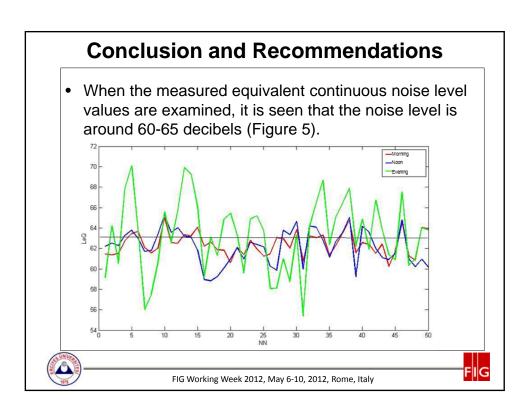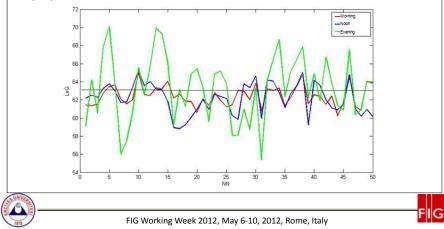
3.   RESULTS

Figure 2. Morning noise map modeled by IDW method

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3.   RESULTS

Figure 3. Noon time noise map modeled by IDW method

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3. RESULTS

Figure 4. Evening noise map modeled by IDW method

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Conclusion and Recommendations

- When the measured equivalent continuous noise level values are examined, it is seen that the noise level is around 60-65 decibels (Figure 5).

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Conclusion and Recommendations

- This result shows that the noise in the campus is noticeable. However, measurement stations of the evening show an increasing variability against morning and noon values.

4. Conclusions and Recommendations

- In areas where the noise exceeds the limit values, preventing the noise disturbance and not to damage the human health, planning the traffic to lessen the noise, increasing the soundproofing, placing noise reducing panels and forestation may be considered as the precautions to be taken for controlling the noise.
- Results of the study will be helpful to the city and institutional authorities for developing projects related to preventing and lessening noise.
- It is planned to widen this study in a manner to make research about the optimum interpolation to be used in mapping the noise in future.

THANK YOU FOR YOUR PATIENCE