

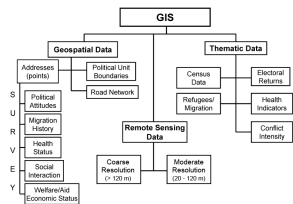
The Dynamics of Civil War Outcomes in Bosnia and the North Caucasus of Russia: A Project of the Human and Social Dynamics Initiative of the National Science Foundation

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Research Questions:

- What is the character and localized distribution of economic, social, political, environmental and health outcomes of the wars in the two conflict zones?
- What factors explain these distributions?
- How can the application of an integrated methodology of individual and aggregate data that relies on opinion survey, census, governmental, and remote sensing data collection be operationalized in a spatial analysis across a variety of scales?
- Are postwar developments in the former conflict regions promoting or retarding interethnic harmony and democratic values, thus enhancing or reducing the prospects for long-term peace?

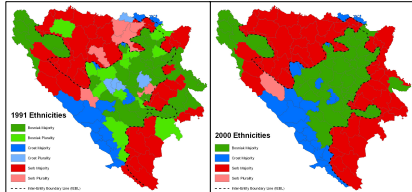


Schema of data collection and analysis.

Project study areas.



Bosnia: population by ethnicity 1991 census and 2000 estimates. Effects of migration, refugee movement, and ethnic cleansing on mixed ethnic regions.

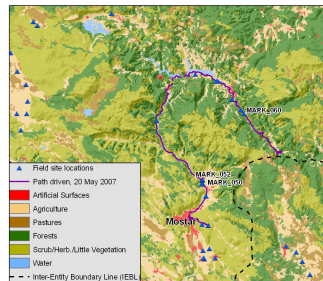


North Caucasus ethnic population, 2002



Satellite Analysis of Abandoned Agricultural Land

Moderate resolution satellite analysis used Landsat Thematic Mapper (TM) 30m data to detect abandoned agricultural land in both the northeast and southern Bosnia and Herzegovina study areas. Supervised classifications of abandoned agricultural land were created and verified through field work. The map shows an example day of field work from the southern city of Mostar. Each triangle represents a field site where a photograph and written log of the agricultural land was recorded.



Photograph taken 20 May 2007 from MARK_50 looking northwest at an abandoned agricultural field.



Photograph taken 20 May 2007 from position MARK_52 looking southeast at a large abandoned vineyard.



Photograph taken 20 May 2007 from position MARK_60 looking southwest at an active pasture.

For the northeast region, the 2006 field reference data reveal a user's classification accuracy of abandoned agricultural land of almost 82%. In contrast, the 2007 field reference data for the southern region shows a user's accuracy less than 16%. Differences are due partly to climate and soil condition disparities between southern and northeastern BiH and partly to the nature of war and minefield locations.

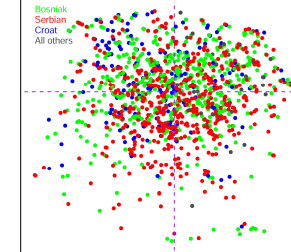
| Classified Data | 2006 Northeast Field Data | | | 2007 Southern Field Data | | |
|---------------------|---------------------------|------|-------|--------------------------|------|-------|
| | AB | NA | Total | AB | NA | Total |
| AB | 49 | 11 | 60 | 3 | 16 | 19 |
| NA | 2 | 22 | 24 | 2 | 71 | 73 |
| Total | 51 | 33 | 84 | 5 | 87 | 92 |
| Producer's accuracy | 96.1 | | | 60.0 | | |
| User's accuracy | | 81.7 | | | 15.8 | |
| Total accuracy | 84.5 | | | 80.4 | | |
| Z statistic | 8.0 | | | 0.71 | | |

Land Cover Categories: AB = Abandoned NA = Non-Abandoned

Social Distances in Bosnia and the North Caucasus

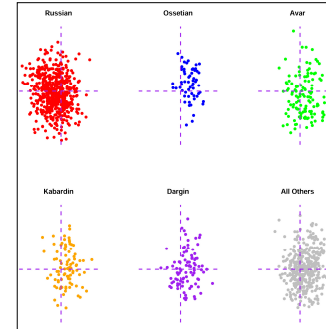
'Social distance' describes how close members of diverse social groups are to one another in an unmeasured social metric. We calculate distances among the 4000 interviewees' responses to ten questions regarding ethnic and religious preferences for interaction. Displaying them in a two-dimensional space indicates underlying, unobserved social distances defined by the answers. We use multidimensional scaling (MDS) to decompose social distances from the 10 dimensions.

Bosnia-Herzegovina graph.



In Bosnia, no obvious pattern emerges of clear ethnic divisions from the respondents' views on questions of religion, nationality, trust, and separatism. This is contrary to existing studies' emphasis on the sharp ethnic divisions resulting from the war in Bosnia, 1992-1995.

North Caucasus graph.



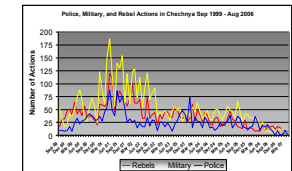
The North Caucasus reveals some ethnic-specific patterns in the respondents' location in the social spaces that display different major ethnic groups separately. The pattern suggests that the post-Soviet history of center-region or separatist conflicts in the North Caucasus has created differences between Russians, who traditionally dominate political and economic life, and the ethnic minorities. The Ossetians (a predominantly Orthodox people in the region) show the clearest expression of social differences.

We would like to thank the National Science Foundation for supporting this research and, in particular, program officers Pat White, Rachelle Hollander, Tom Baerwald, and Frank Scioli.

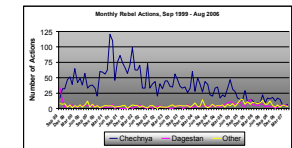
We are grateful to Marina Francic and Dino Djipa of Prism Research in Sarajevo, as well as Alexei Grazhdankin of the Levada Center in Moscow for organizing and carrying out the large and complex surveys in BiH and the North Caucasus. Thanks also to Vladimir Kolossov of Russian Academy of Sciences, Frank Witmer, and to all the survey respondents in BiH and the North Caucasus.

Analysis of Violent Events in the North Caucasus, 1999-07

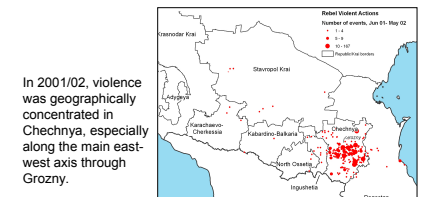
Violent event data were collected from multiple newspaper sources, yielding almost 13,000 events from 1 Sep 1999 - 1 May 2007. Events are coded by actor, target, exact geocoordinates, locality/republics, casualties and sources of information.



In Chechnya, after a surge through 2002, violent events from all sources declined dramatically to 2007. A seasonal pattern is also evident.



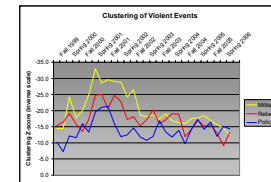
In Ingushetia and Dagestan, two Republics adjoining Chechnya, violence is stable over time and now (2007) equals that in Chechnya.



In 2001/02, violence was geographically concentrated in Chechnya, especially along the main east-west axis through Grozny.



By 2005/06, violent events spread into Ingushetia and Dagestan.



A plot of geospatial clustering scores based on the average nearest neighbor distance shows a clear de-concentration or geographic diffusion for all types of violence from 2000 to 2006.

Future work

-Integration of satellite data analysis with sociodemographic (census) and survey responses in a multiscale GIS.
-Analysis of the diffusion of violence using geospatial techniques and methodologies.
-Field work in the North Caucasus focused on forced migrations and local inter-ethnic tensions.

For the latest findings, see the project website at: <http://www.colorado.edu/ibs/waroutcomes/>