AREAS IN NORTH KOREA MOST IN NEED OF FOOD ASSISTANCE

DHP207: GIS for International Applications

Poster produced: 01 May 2012
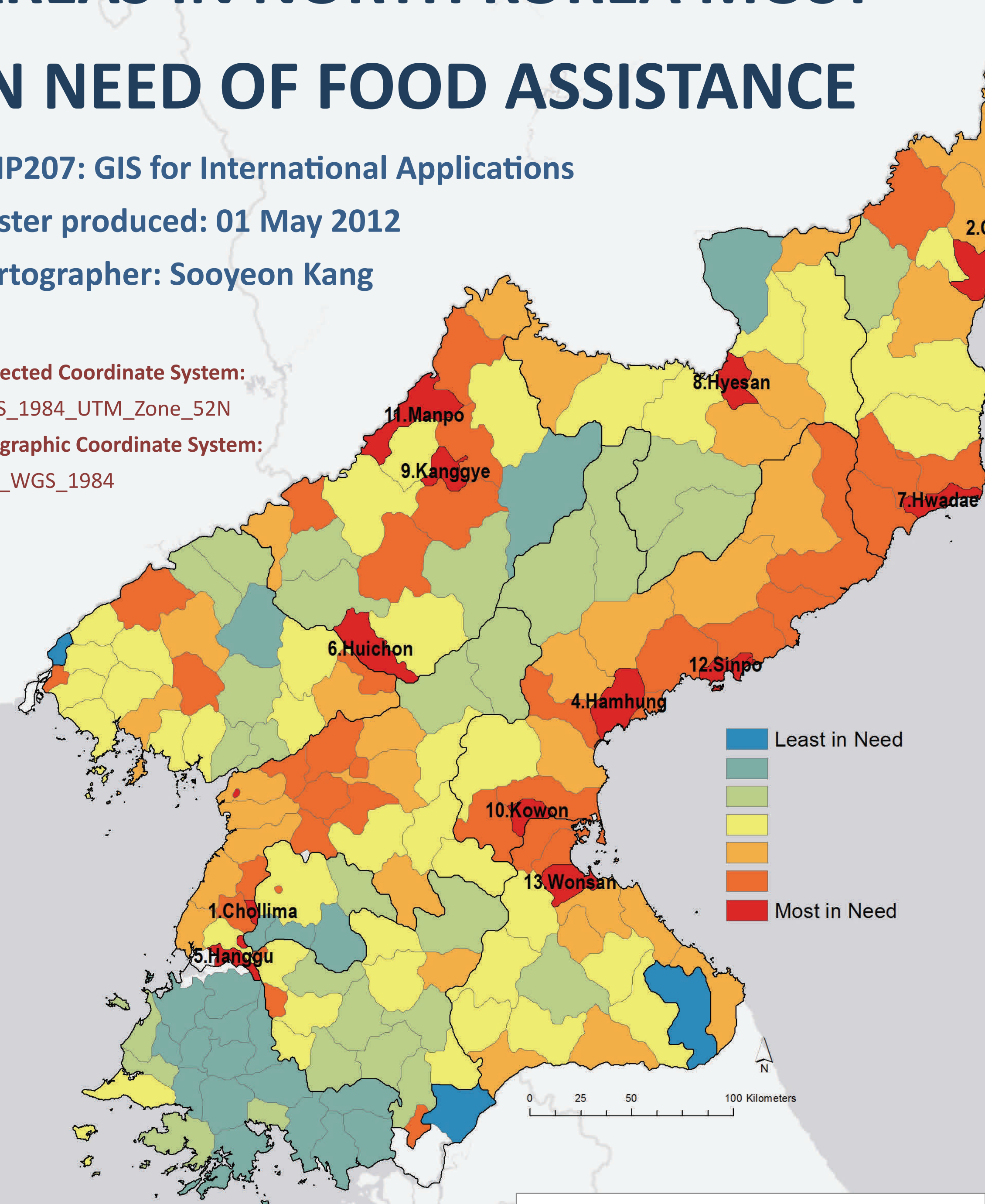
Cartographer: Sooyeon Kang

Projected Coordinate System:
WGS_1984_UTM_Zone_52N

Geographic Coordinate System:
GCS_WGS_1984

Map labels: 2.Chongjin, 8.Hyesan, 11.Manpo, 9.Kanggye, 7.Hwadae, 6.Huichon, 12.Sinpo, 4.Hamhung, 10.Kowon, 13.Wonsan, 1.Chollima, 5.Hanggu

Legend: Least in Need — Most in Need

Total Population Of North Korea: 23,349,859

Total Population of Areas Most in Need: 3,301,018 (14.14%)

Total Population of Other Areas: 20,048,841 (85.86%)

Introduction

Millions of people are starving in the Democratic People's Republic of Korea (North Korea). In the last twenty years, it is estimated that between 2.5 to 3.5 million North Koreans have died of starvation. Currently, the World Food Programme estimates that 3.5 million people are at risk of serious damage to their health as a result of food shortages.[1] The recent harsh winters coupled with a cutback in commercial imports and bilateral assistance have heightened concerns for the food security situation in North Korea. The purpose of this analysis is to identify areas in North Korea that are the most in need of food assistance.

Methodology

I assessed the need for food assistance from two standpoints: access to food and nutritional status.

1. Calculating the risk of food access was largely based on geography and the ability to attain food.

(See blue box below for the layers involved).

A. Elevation data[2] was used to calculate the slope at a given point. The percent rise was classified and given a risk score: low score for low percent rise, and high score for high percent rise.

B. The distances from the following possible sources of food were calculated and given a risk score: low score if closer to the relevant place, and higher score if farther away.

- Land cover data[3] selected for *Cropland*, *Cropland/ Natural vegetation*, and *Rice Paddy*
- Water bodies data[4] of lakes and rivers
- Points of interest data[5] selected for *Agriculture*, *Civic/Community Center*, *Dining*, *Hospital*, *School*, and *Train Station*

C. Public Distribution System data[6] was used to calculate the percentage of counties in each province that had a deficit in foodstuffs for distribution. The provinces were given a risk score: low score for low percent of deficit, and high score for high percentage of deficit.
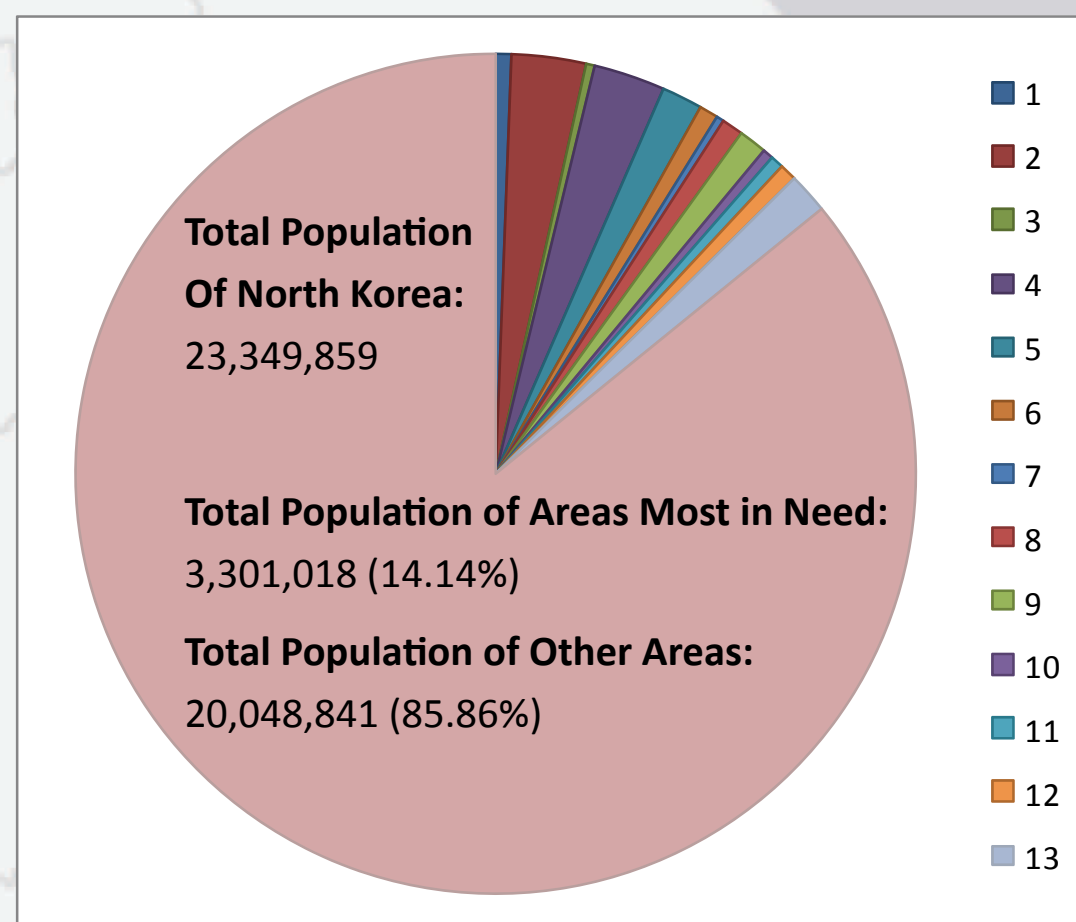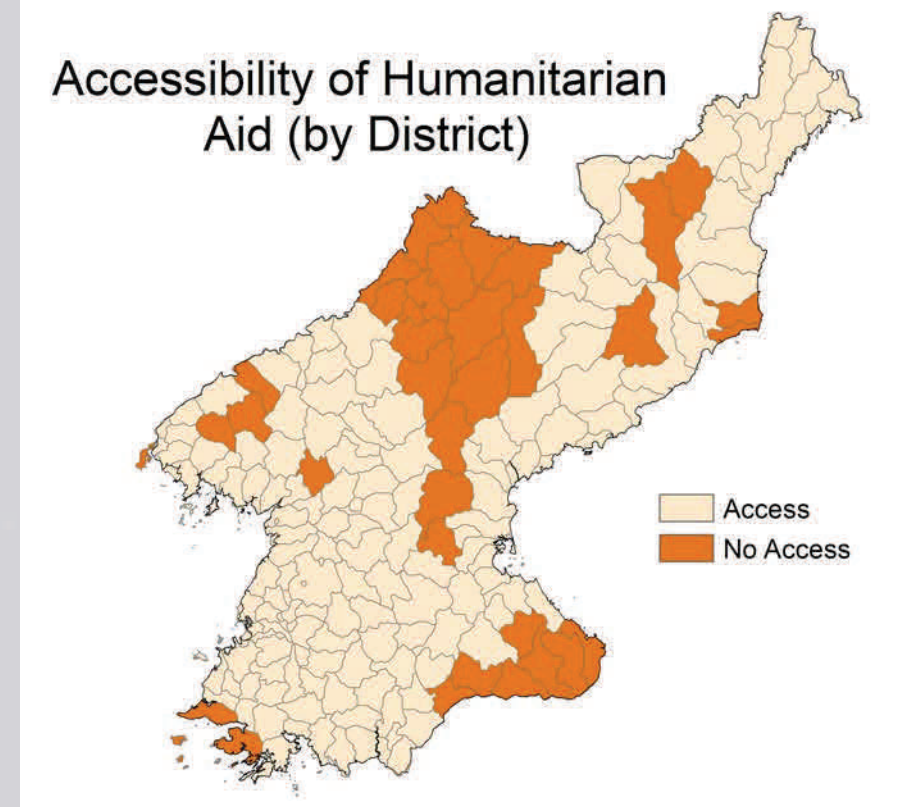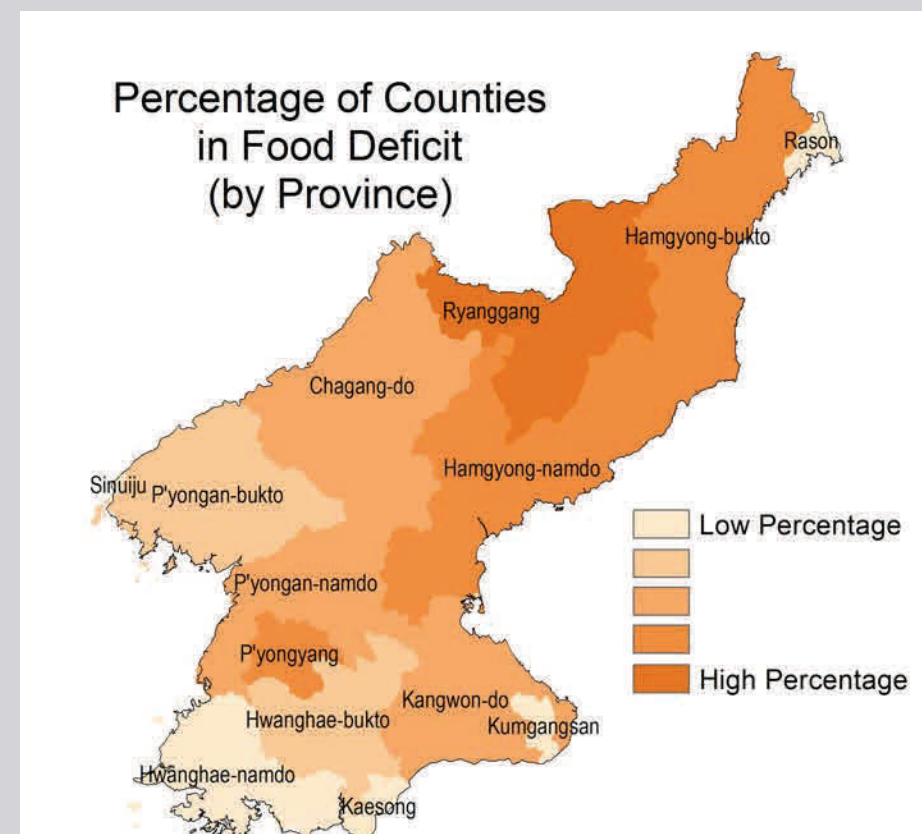
D. A map based on World Food Programme sources[7] showed the areas in North Korea that aid workers have been granted access to. The accessible and inaccessible districts were reclassified and given a risk score: low if accessible, and high if inaccessible.

The risk scores from each layer were combined to create the 'Access to Food' map.

2. Calculation of nutritional health was based on statistical data provided at the province level.

(See red box to the right for the layers involved).

A. Percentages of malnutrition,[8] population receiving adequate salt intake,[9] live births and maternal deaths during childbirth[10] were calculated and given a risk score to create the 'Nutritional Status' map.

Percentage of Counties in Food Deficit (by Province)

Low Percentage — High Percentage

Labels: Rason, Hamgyong-bukto, Ryanggang, Chagang-do, Hamgyong-namdo, Sinuiju Pyongan-bukto, Pyongan-namdo, Pyongyang, Hwanghae-bukto, Kangwon-do, Kumgangsan, Hwanghae-namdo, Kaesong

Accessibility of Humanitarian Aid (by District)

Access — No Access

Population Density (by District)

Least Populated — Most Populated

The 'Access to Food' map and the 'Nutritional Status' map was then combined to produce the 'Vulnerable Areas' map. The 'Population Density' map was created to see which areas had the highest concentration of people. The 'Vulnerable Areas' map was then combined with the 'Population Density' map to produce the feature map showing the districts in North Korea most in need of food assistance; the areas most susceptible and vulnerable to starvation.
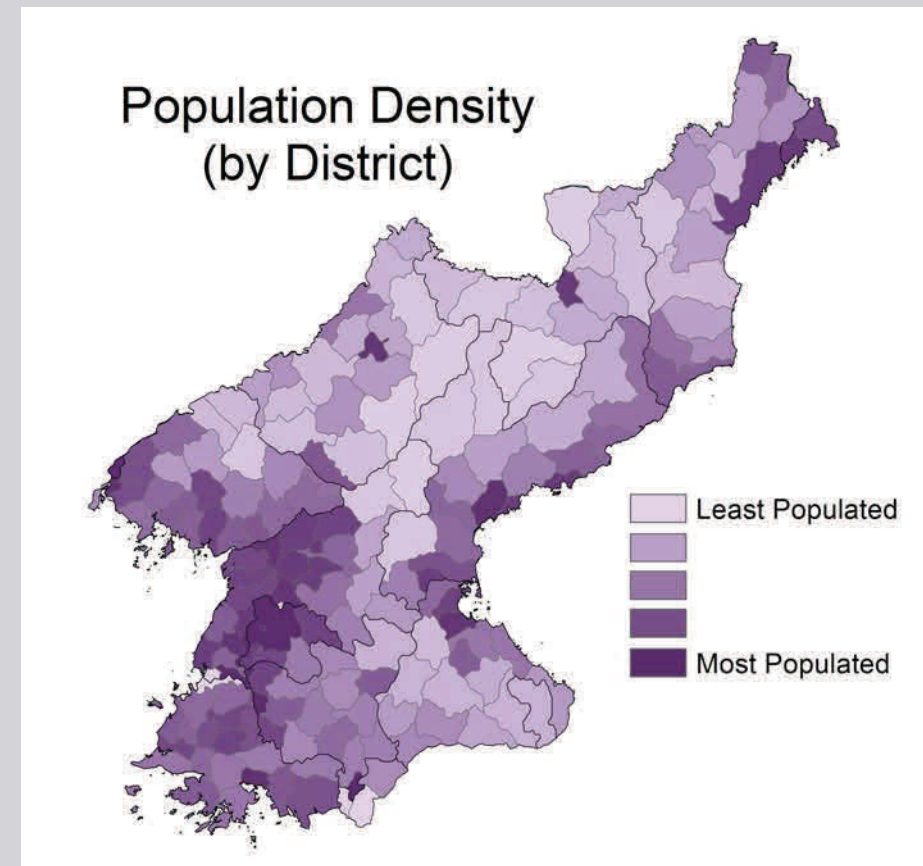
Conclusion

While the government in Pyongyang continues to ask for food assistance from the international community, it is not certain if the most vulnerable people in North Korea are receiving, or have ever received, the necessary supplements. This analysis identifies 13 districts most in need of food aid: Chollima, Chongjin, Daean, Hamhung, Hanggu, Huichon, Hwadae, Hyesan, Kanggae, Kowon, Manpo, Sinpo, and Wonsan. In accordance with these findings, non-governmental organizations that do work inside North Korea can initiate programs in these regions. To assess the validity of these findings, third parties can request access into these areas to verify that the needs of people living in harder to reach areas are being tended to. Two major limitations challenge the findings of this analysis: sufficient data and reliability of available data. Given the limitation of acquiring data on North Korea, the approach I took in assessing the risk of access to food and nutritional status was not comprehensive. The indexing of variables to attribute risk scores to is another process that could have been altered. I tried to standardize the variables, but different classifications may identify different areas as being the most in need. Also, it was important for the vulnerable areas to be analyzed in conjunction with where people are living. The logarithm of the population density was calculated to measure its magnitude, and the resulting value was multiplied with the risk score to produce the feature map. Other ways for combining the risk score and population density exist, and different methods may have varied the results.

Sources and Citations

1. "World Food Programme Fighting Hunger Worldwide." *Korea, Democratic People's Republic (DPRK)*. World Food Programme. Web. 01 May 2012. <http://www.wfp.org/countries/Korea--Democratic-People-s-Republic--DPRK-/Overview>.
2. Elevation data: Shuttle Radar Topography Mission (SRTM) (M:\World\ESRIDataMaps93\Raster\Elevation\SRTM\ srtm_n_elev_e.jp2).
3. Land cover data: Global Land Cover 2000 (http://bioval.jrc.ec.europa.eu/products/glc2000/products.php).
4. Water bodies data (lakes and rivers): LeadDog (M:\datasets\Country\NorthKorea\LeadDog\kplw.shp); (M:\datasets\Country\NorthKorea\LeadDog\kppw.shp).
5. Points of interest: LeadDog (M:\datasets\Country\NorthKorea\LeadDog\kppi.shp).
6. Public Distribution System: WFP/ FAO/ UNICEF Rapid Food Security Assessment Mission to the Democratic People's Republic of Korea, 24 March 2011 (http://documents.wfp.org/stellent/groups/public/documents/ena/wfp233442.pdf, pg. 17).
7. Access to Aid: http://static.flickr.com/25/65514241_3a44a3534f.jpg (Accessed 29 April 2012).
8. "Figure 6: DPRK Nutritional Status by Province." WFP/ FAO/ UNICEF Rapid Food Security Assessment Mission to the Democratic People's Republic of Korea, 24 March 2011 – CFSAM 2010 Report (http://documents.wfp.org/stellent/groups/public/documents/ena/wfp233442.pdf, pg. 26).
9. "Figure NU.4 Percentage of households consuming adequately iodized salt, DPR Korea, 2009." Democratic People's Republic of Korea Central Bureau of Statistics and Institute of Children's Nutrition (http://www.childinfo.org/files/MICS_DPRK_2009.pdf, pg. 41).
10. "Table 18. Number of Maternal Deaths by Place of Death and Number of Live Births in the 12 Months Preceding the Census by Province." DPRK 2008 Population Census – National Report (http://unstats.un.org/unsd/demographic/sources/census/2010_PHC/North_Korea/ Final%20national%20census%20report.pdf, pg. 97).

Percent Malnutrition

Low Percentage — High Percentage

Percent Not Receiving Adequate Salt

Low Percentage — High Percentage

Percent of Maternal Deaths During Child Birth

Low Percentage — High Percentage

Percent of Live Births

Low Percentage — High Percentage

Nutritional Status

Most Healthy — Least Healthy

Slope of Land

Low Percent Rise — High Percent Rise

Distance from 'Cropland', 'Cropland/ Natural Vegetation', and 'Rice Paddy'

Short Distance — Long Distance

Distance from Lakes

Short Distance — Long Distance

Distance from Rivers

Short Distance — Long Distance

Distance from 'Agriculture', 'Civic/Community Center', 'Dining', 'Hospital', 'School', and 'Train Station' Points

Short Distance — Long Distance

Access to Food

Most Access — Least Access

Vulnerable Areas

Most Secure — Least Secure