REMINDERS

- EXAM III – Final Exam
  Thursday, Dec. 19, 2019
  from 11:30 AM – 1:30 PM.
  This room: 415HW
  Covers Part III of the course.

TEXTBOOK READING FOR PART III

- Selected parts of Chapters 6-12

- Extra Credit: Maximum of 5
  “Think Geographically” Essays
  from **any five** chapters from 4-12
  - OR -
  The **3rd topic** from req. essay list
  and maximum 4 chapter essays
  - Last day to submit is Dec 12
  but it is best to do them as you
  finish reading a chapter.

- Any extra credit may be submitted
  before the deadline. Don’t Wait.

FREE TUTORING IS AVAILABLE in the
Skirball Learning Center (7th floor East Bldg).

- Two required essays (10% of your
  grade) were due NOV 18th. You
  have until Dec. 19th to submit or
  else a “0” grade will be entered.
GEOG 101
PART III

22
Life on Earth:
Population Geography 3
Chapter 6

Prof. Anthony Grande
Hunter College Geography
Lecture Topics for Part III

✓ I Intro. to Human Geography

➢ II Living on the Earth
✓ A. Habitat
✓ B. Demography
C. Medical geography
D. Population growth
E. Biogeography/Ecology

III Economic Geography
IV Urban Geography
V Political Geography (read chapter)
MEDICAL GEOGRAPHY studies the well-being of people as an aspect of habitat.

- Medical characteristics are studied **spatially** (i.e., where they occur and how they spread).
- They are **correlated to conditions of site and situation** as wind direction, watershed, wells and aquifers, and to routes of dispersal.

**EPIDEMIOLOGY:** the study of the causes and control of disease
Important part of the population question.

- Areas with good health and nutrition can accommodate large numbers of people.
  - They also become **PULL** factors (drawing more people).
  - Conversely, areas prone to food and water shortages or disease can experience **PUSH** factors, but in many cases it is just the negative version of **STAY**.

- **Analysis includes:**
  - **Food availability** (type/diet/caloric value)
  - **Life expectancy/infant mortality** (BR/DR/wellness)
  - **Disease** (susceptibility/transmission/DR/social issues)
Hunger vs. Poor Nutrition

- **Hunger**: A feeling when one does not eat enough food to fill current physiological needs. It can be temporary or long-lasting (when the person does not get enough to eat to maintain physical needs over a sustained period of time).
- **Malnutrition**: any disorder of nutrition resulting from an unbalanced, insufficient or excessive diet or from the impaired absorption, assimilation or use of foods.

- **Undernutrition**: caused by an inadequate food supply or an inability of the body to use the nutrients in food.
- **Overnutrition**: excess nutrient and calorie intake over time; may be regarded as a form of malnutrition when it leads to morbid obesity.
- **Chronic malnutrition**: the long-term ingestion/use of less-than-required nutrient amounts; can result in physiological short-comings and vulnerability to disease and other illnesses.
Spatial Aspects of Malnutrition

**DIAGRAMING MALNUTRITION**

- Varies regionally depending on local conditions.
- It can be mapped and studied spatially in relation to global, regional and/or local environmental issues: climate change, water supply, soil fertility, severe weather, etc.

[Diagram of malnutrition showing various factors and their interrelations]

[Links to additional resources]

World Hunger

FAO’s goals to alleviate hunger

http://www.fao.org/sustainable-development-goals
World Undernourished Areas (malnutrition)

Interactive Global Hunger Index map based on 2015-2017 average data

https://www.globalhungerindex.org/results/
<table>
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<tr>
<th>PHYSICAL ENVIRONMENT CHANGES</th>
<th>EFFECT ON PEOPLE</th>
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<tbody>
<tr>
<td>1. Worldwide mean temp. is increasing.</td>
<td>▪ Very high percent of world’s people live/farm in river deltas/ coastal plains which are the first to be impacted by sea level rise and salt water intrusion.</td>
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<td>2. Regional mean precipitation will vary off the norm (some higher/some lower).</td>
<td>▪ About 15% of world’s people live and farm in glacier meltwater-fed river valleys.</td>
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<td>3. Increase in carbon dioxide levels will effect crop growth.</td>
<td>▪ Over 80% of the world’s agricultural land is rain-dependent.</td>
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<td>4. Drought, heat waves and severe flooding will reduce crop yield.</td>
<td>▪ About 50% of the world’s food supply comes from irrigated land.</td>
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<td>5. Heavy rainfall and flooding will devastate food storage/distribution.</td>
<td>▪ 220+ mil people are affected by severe weather events each yr.</td>
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<td>6. Melting glaciers will first cause valley flooding, then water shortages.</td>
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<td>7. Tropical storms will be more frequent, intense and destructive.</td>
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<td>8. Sea level will rise, flooding farm land.</td>
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Decreased food supplies will result in changes in health and nutrition.
DISEASE: An impairment of the normal state of the living human, animal or plant body or its parts that interrupts/modified the performance of vital functions, and is typically manifested by distinguishing signs and symptoms.

- Also called a SICKNESS or ILLNESS

It is a response to:

- environmental factors (as malnutrition, hazards, climate);
- specific infective agents (as worms, bacteria, or viruses);
- inherent defects of the organism (as genetic anomalies);
- or combinations of these factors.
DISEASE: disorder of the normal structure or function that has specific signs and symptoms. **A disease may have breeding conditions, a transmission route and a spatial range influenced by geographic parameters.**

**ENDEMIC:**
- a disease that is characteristic of a **particular area** or limited to a host population.
  - May affect many people locally.
  - Can be confined to a small cohort of people.
  - Usually not transferrable to other regions.

**EPIDEMIC:**
- a disease that affects many people in a local or regional area.
  - It is contagious
  - It can spread to other areas

**PANDEMIC:**
- a disease with a large regional or a worldwide scope.
  - Requires an international response to control its spread and treat its victims.
Examples of Disease Types

Malaria is an endemic disease to tropical areas.

H1N1 Virus occurred worldwide. It is a pandemic.

Swine flu is locally an epidemic.
The cholera pandemic reached London in 1842.

- Dr. John Snow began to map each case and death.
- He was convinced contaminated water was to blame and he associated new cases with people getting water from tainted wells.
- When officials refused to shut down wells, he removed the pump handles to prevent the wells’ use.
  - New cases decreased immediately!
Climate Change and the Spread of Disease

Results of changing climates:

Drought (wind-borne dust diseases)

Increased Rainfall (water-borne diseases)

Warmer Temps (increase range of mosquitoes and other heat-sensitive insects)

Indicates possible distribution by 2060
Dengue Fever and Global Warming

Heart Disease in the US by Region and Over Time

Heart Disease Death Rates, 2013-2015
All Ages 35+, by County

Heart Disease Death Rates, 1999-2003
Adults Ages 35 Years and Older by County

Note the change in distribution and concentration between 1999 and 2015.
Lung Cancer Occurrence on Long Island, NY

Dilemma: Why are there concentrations (geographic cancer clusters) in certain areas of Nassau and Suffolk counties?
COPD in the USA
Risk Maps: Zika and Yellow Fever


Schistosomiasis (bilharzia) is caused by flatworm larva. Waterborne transmission occurs when larva found in contaminated freshwater, penetrate the skin and lodge in the bladder and intestines where they grow and mature. Worm eggs are passed out of the body through urination and defecation.

There are no vaccines or drugs for preventing infection.

Preventive measures are avoiding wading, swimming, bathing or other contact with freshwater in disease-endemic countries.

Untreated piped water coming directly from freshwater sources may contain these parasites.


[https://www.youtube.com/watch?v=leeeWD59D9Q](https://www.youtube.com/watch?v=leeeWD59D9Q): 5 min overview
If humanity addresses and deals with this important part of the population question by making people healthier and therefore living longer --- what affect will this have on the earth’s ability to support its growing population?
The world needs to deal with the present rate of population growth and overpopulation.

- There is a need to either **increase** the carrying **capacity** of an area (habitat quality) or **reduce** the **stress** of a population on the habitat.
- Can this be done? How can this be done?
Population Growth

1 AD: 250 mil people on earth
1650: 500 mil = 1,650 yrs to double
1830: 1 billion = 1830 yrs to reach 1 billion
1925: 2 billion = 95 yrs to add 1 billion
1960: 3 billion = 35 yrs to add 1 billion
1975: 4 billion = 15 yrs to add 1 billion
1986: 5 billion = 11 yrs to add 1 billion
2000: 6 billion = 14 yrs to add 1 billion
2011: 7 billion = 11 yrs to add 1 billion
>2023: 8 billion? = 12 yrs to add 1 billion?
Dealing with Population Growth

How can this be done?

There are 5 general scenarios:

1. Expand the resource base
2. Emigration
3. Economic change
4. Education
5. Natural population controls
How can this be done?

1. **Expand the resource base** (carrying capacity).
   
   A. Use of technology (existing and/or new).
   B. Creation of artificial environments.
   C. Make new discoveries.
Dealing with Population Growth

How can this be done?

2. Emigration.
   A. Encourage movement away (emigration)
   B. Discourage in-migration (immigration)
   C. Relocate people to other areas (transmigration)
Dealing with Population Growth

How can this be done?

3. Economic change (demographic transition model)
   A. Shift from an agrarian to an industrial economy
   B. Shift from rural to urban settlement (may have a negative impact if cities take over farmland)
   C. Use of technology
Dealing with Population Growth

How can this be done?

4. Education
   A. Knowledge of the local situation
   B. Ability to read and follow instructions
   C. Training in the use of technology
   D. Changing the attitudes and philosophies of people (i.e., culture) regarding family size through dialogue and reasoning.
Dealing with Population Growth

How can this be done?

5. **Natural population controls** (involves ethical and moral issues)
   
   A. Famine
   B. Disease
   C. War
   D. Poverty

*Should the world community help borderline areas by providing aid for hunger and prevent disease?*
Biogeography

- Studies the spatial aspects of plant and animal life.
  - The relationship between a life forms and the physical environment.
  - Looks at the composition of biomes, habitats, ranges, etc.
  - Migrations.
Biogeography

Tundra Swan Range in North America

Migratory pattern

Location of dinosaur fossils
Ecology

- Studies how living things affect each other and what determines their distribution and abundance (habitat).
  - Biosphere, ecosystems, biomes and niches.
  - Quality of habitat and carrying capacity.
  - Food chain.
  - Human interaction.
Biodiversity: Both Temperature and Moisture Sensitive

Things have sure changed up here since global warming!

Ask a beetle. How fast is climate change?

Temperature-sensitive beetle populations in the Arctic will help researchers study climate.
“Humans Are Speeding Extinction and Altering the Natural World at an ‘Unprecedented’ Pace”

- https://www.nytimes.com/2019/05/06/climate/biodiversity-extinction-united-nations.html
Plight of Migratory Shorebirds

Bar-tailed Godwit and Great Knot migratory routes. These shorebirds, tracked by GPS, migrate more than 6,000 mi in each direction. They rely on tidal mudflats to rest and eat.

Declining Migratory Bird Populations relying on Yellow Sea mud flat stopovers sites
In 2009, Hudsonian godwit nests hatched closer to the start of insect season ...

Bird populations thrive when nests hatch before peak insect season.

... but in warmer years, nests hatched closer to the tail end.

When this happens, there is not enough food for hatchlings.

Note: Peak insect period based on the highest average insect abundance. Source: Nathan R. Senner, Maria Stager and Brett K. Sandercock/Oikos
GEOGRAPHY of ECONOMICS:
Economy, development and sustaining a population.
Chapters 9 and 12