Geography of Africa
Fall 2011

Poster Project

Introduction

- Posters have gained popularity since the 1970s.
  - Why:
    - More posters can be seen than papers presented
    - Two-way interaction (exchange of ideas)
- Best medium to balance:
  - Visual, Oral, and Written elements of the research
- Space is limited, so only the BEST things can be stated or shown.

The Assignment

- Each of you will:
  - Select an issue that impacts the continent of Africa. The issue must be geographical (needs maps).
  - Conduct research and create a research poster.
  - Write a 2-3 page summary paper.

Poster Tips

- Keep it simple!!!
- Less is often times more
- Don't have your text be too small
- Choose appropriate color combinations.

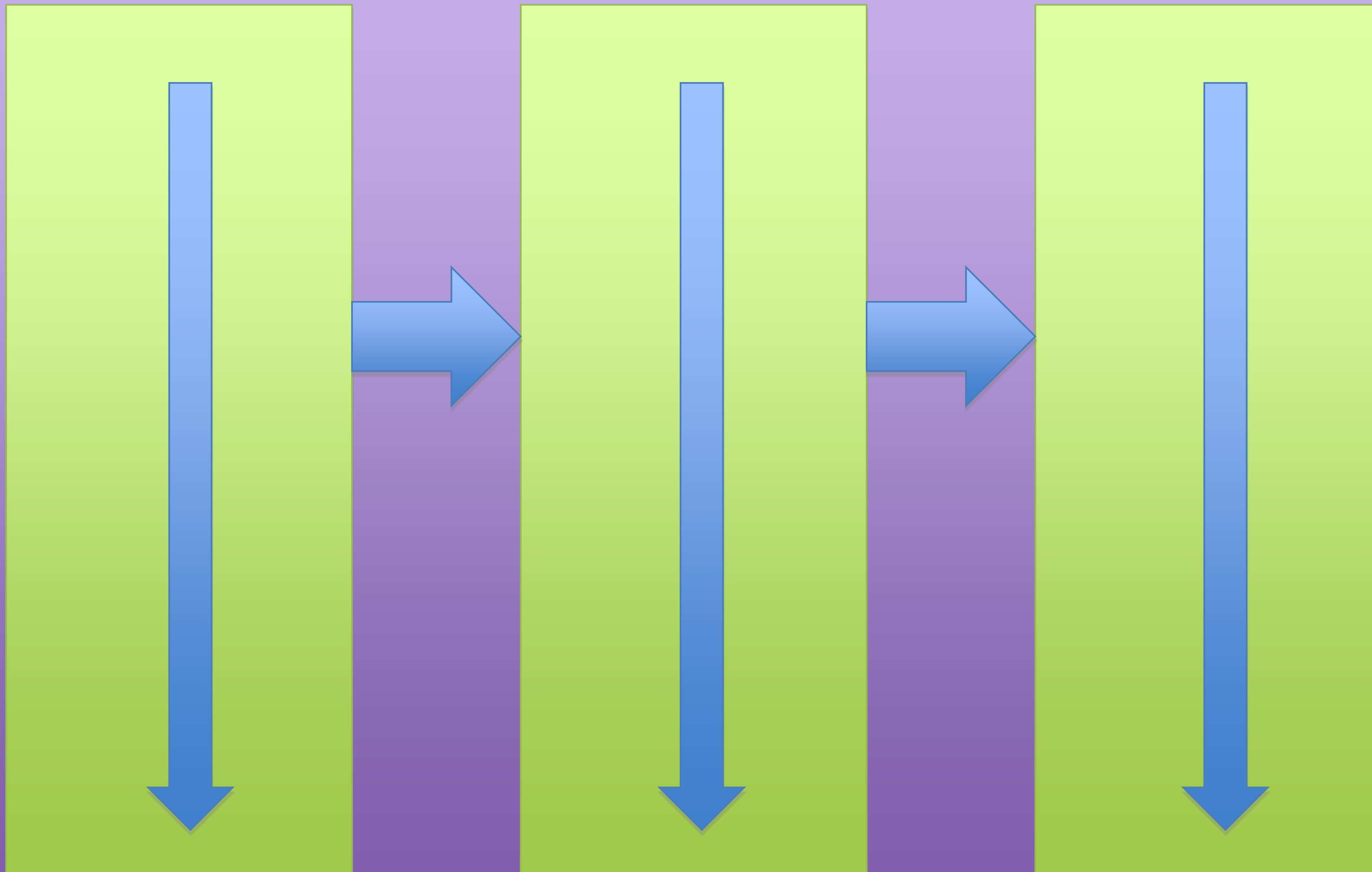
Text

- Use short paragraphs
- Use good visual imagery (pictures, maps, graphs, etc)
- Select style, size, colors, and spacing that makes reading easy and pleasant.

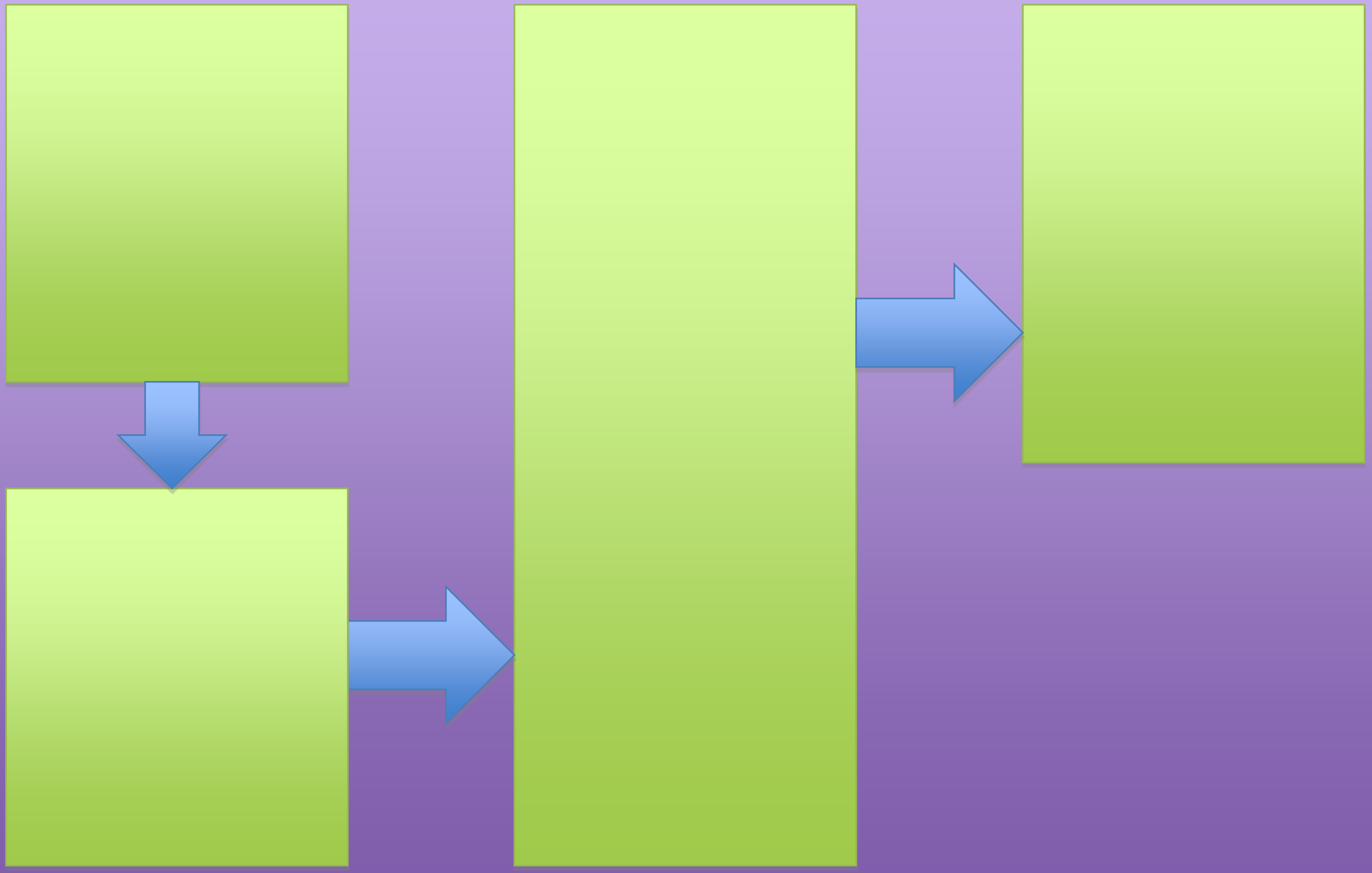
Progression

- Should flow the way we read
  - Left to Right
  - Top to Bottom
- Should follow basic flow of a paper
  - Introduction
  - Main Body of the Paper
  - Conclusions

Title



Title



Style

- Font Size
  - Title (120)
  - Headings (60)
  - Subheadings (30)
  - Text (24)

- Stick to basic fonts

Changes in Conservation Reserve Program Acres and Pheasants in South Dakota

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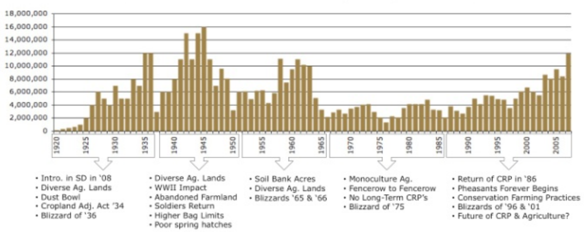
The Problem

South Dakota pheasants depend on habitat created by CRP enrollment for their survival. Those acres are on the decline.

The influence of habitat can trump severe weather, predation, and hunting as drivers of population change[1].

Since 1920, pheasant populations in South Dakota have fluctuated with changes in agricultural intensity, national & global agricultural policy changes, the presence or absence of conservation lands, as well as all of the above coupled with changes in weather; however, the presence of CRP lands has been vital over the past century to the success of the pheasant[2].

South Dakota's Pre-Season Pheasant Population, 1920-2007

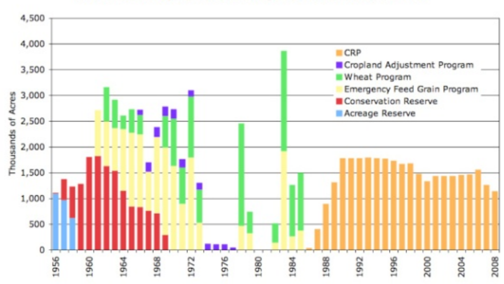


The Past

With the exception of the 1970s and early 1980s, South Dakota pheasants have had plentiful acres of habitat created by cropland retirement programs[3].

The two most successful programs that put lands in long-term retirement were the Conservation Reserve (Soil Bank) program of the 1950s and 1960s, and today's current CRP.

Acres of Federal Cropland Retirement Programs in South Dakota, 1956-2008



The Present

South Dakota's pheasant range is found mostly east of the Missouri River – a landscape on the western fringe of the Corn Belt – made up of a mosaic of croplands, grasslands, and idle lands.

A vital part of that mosaic are the roughly 1 million acres of farmland that has been enrolled in the Conservation Reserve Program in SD.

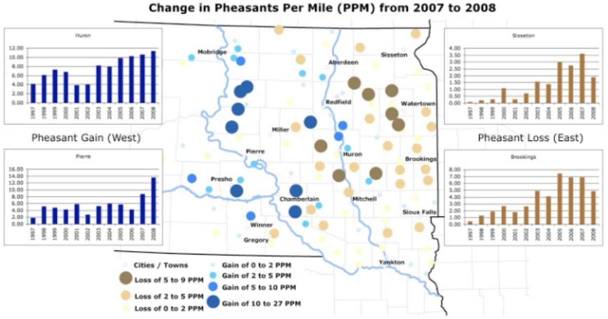
Recently, South Dakota has begun losing CRP acres, along with many other states, stressing other agricultural and public lands to produce & protect more pheasants than in the past.

- In 2007, the state lost 260,000+ acres of CRP[4]
- In 2008, the state lost 124,000+ acres of CRP[4]
- In 2009, the state is estimating a loss of 236,000+ acres of CRP[4]

Multiple variables are driving this decline, predominantly the region's biofuel market, increased crop prices, and the inability of CRP contract payments to keep up with land rental & cash crop payments[5].

Declines in pheasants have already been seen[6]. Summer Brood Surveys showed a marked decline of pheasants in eastern South Dakota where most of the CRP loss has occurred.

Change in Pheasants Per Mile (PPM) from 2007 to 2008

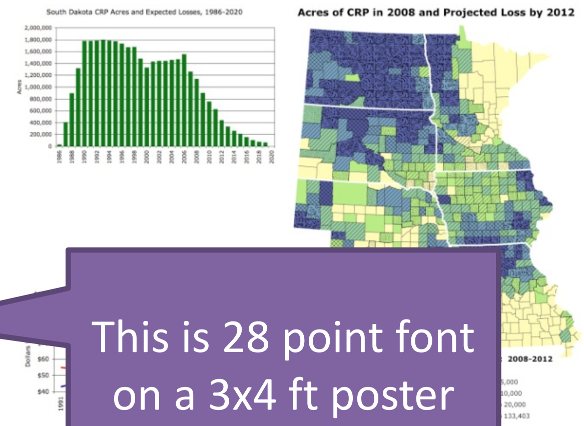


The Future

The future for South Dakota's pheasants is uncertain.

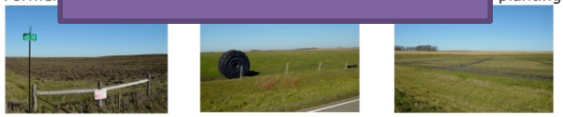
Unless new, large-scale CRP signups are authorized by the USDA, losses are expected to continue – especially if crop prices remain high and no adverse weather affects agricultural productivity.

Many wildlife biologists and conservation organizations are worried that the table may now be set for another post Soil Bank scenario: massive loss of CRP grassland habitat and intensifying agricultural practices coupled with a severe winter could kill hundreds of thousands of birds (early evidence already seen in North Dakota).



This is 28 point font on a 3x4 ft poster

Former ... planting.



North Dakota Pheasants: Lacking habitat, dying off, and cannibalism[7].

References & Data

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2. Pre-season pheasant population data from the South Dakota Department of Game, Fish, and Parks http://www.sdgfp.info/Wildlife/hunting/Pheasant/Stats.htm
3. Berner, Afred H. 1988. Federal Pheasants - Impact of Federal Agricultural Programs on Pheasant Habitat, 1934-1985. In Pheasants: Symptoms of Wildlife Problems on Agricultural Lands, eds. D.L. Hallett, W.R. Edwards, and G.V. Burger.
4. United States Department of Agriculture. 2008. http://www.fsa.usda.gov/Internet/FSA_File/expiringcrpstate.xls
5. United States Department of Agriculture Farm Service Agency and South Dakota Agricultural Land Market Trends, SDSU, 2007
6. South Dakota Department of Game, Fish, and Parks. 2008. http://www.sdgfp.info/Wildlife/hunting/Pheasant/BroodReport.pdf
7. Photos courtesy of www.uplandjournal.com Pheasants of the 2008/2009 North Dakota winter.

Photos, maps, and other graphics by author unless otherwise noted

From Asia to Latin America: The Globalization of America's National

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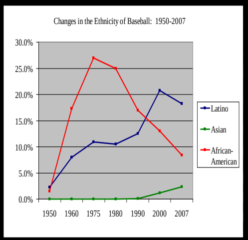
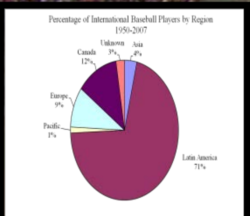
Abstract

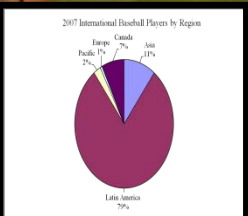
Globalization is evident in almost every facet of our lives today. The national pastime of America, baseball, has undergone extensive change as a result of globalization. This poster examines the changes that have occurred in baseball in the last 50 years focusing on diffusion patterns beyond the borders of the United States. Data sources include historic major league baseball rosters and information from international baseball events such as the World Baseball Classic, the Olympics, and the Little League World Series. The poster illustrates how the game of baseball has shifted from a game dominated by Americans to one with a greater connection to Latin America and East Asia.

Introduction to Major League Baseball

African-Americans were integrated into Major Baseball in 1947 when Jackie Robinson took the field for the Brooklyn Dodgers. However, other ethnic minorities had already been playing in the Major Leagues since the early 1900s. In 1902, Luis Castro became the first Latino Major League baseball player when he played for the Philadelphia Athletics. Throughout the early 1900s, the number of Latino baseball players in the Major Leagues continued to increase with most of the players coming from the country of Cuba. Following the integration of African-Americans into the professional game, the numbers of Latino and African-American players began to rise quickly and by the mid 1970s, the two groups accounted for approximately 1/3 of all Major League Players. During 1980s and 1990s, the Latino influence in Major League Baseball continued to grow, however, the percentage of African-Americans began to decline. By 2006, the number of African-Americans in Major League Baseball hit its lowest point since the late 1950s accounting for only 8% of all players. Concurrently, the Latino numbers soared to as high as 21% in 2001 and a new region, Asia started to emerge on the baseball landscape in the United States. Today, over 20% of all Major League Baseball players were born in countries other than the United States. Of those players, approximately 75% are from Latin America. An additional 11% are from Asia.

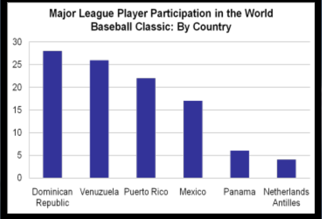


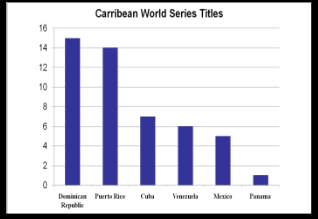


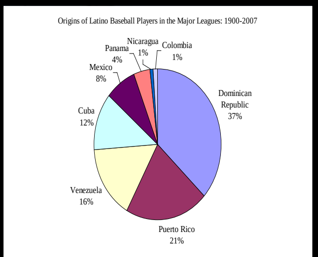


The Latino Game

Latin America is a divided region when it comes to sports. South and Central America, with the exception of Venezuela is dominated by the game of soccer. Baseball is more prevalent on the island nations of the Caribbean. As early as 1902, Latino baseball players from Cuba were making an imprint on Major League Baseball. By the 1960s, Latinos were becoming stars in the Major Leagues. Roberto Clemente of the Pittsburgh Pirates was the first Latino to be inducted in the Baseball Hall of Fame in 1973. Since then, eight other Latino baseball players have been inducted and many others have received some of baseball's biggest honors. In 2003, Latino players won nearly every major award including Most Valuable Player, Coach of the Year, and Rookie of the Year. Today, the Dominican Republic produces the most Latino Major League Baseball players. Over 1/3 of all Latino players are from the Dominican followed by Puerto Rico (21%), Venezuela (16%), and Cuba (12%). These nations have also dominated Caribbean World Series and had the most Major League players on their rosters for the 2006 World Baseball Classic.

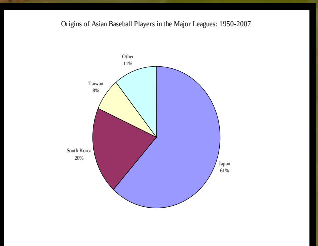


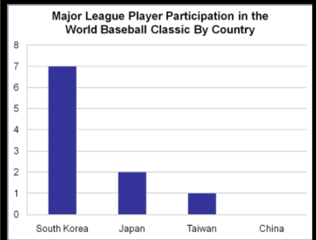




The Rise of the Asian Game

The first Asian born player in the Major Leagues was Masanori Murakami who played for the San Francisco Giants in the mid 1960s. However, it wasn't until the mid 1990s, when Hideo Nomo left the Japanese professional league for the Los Angeles Dodgers that the doors began to open for Asian born players in American baseball. In the past decade, the number of Asian born players has continued to rise and many players such as Ichiro Suzuki of the Seattle Mariners and Daiske Matsuzaka of the Boston Red Sox have become stars in Major League Baseball. The League is also trying to promote baseball in Asia by opening their season three times in the Japan. The latest of these occurred last month when Matsuzaka and the Red Sox opened the 2008 season against the Oakland A's.





Little League World Series

The Little League World Series hosts teams from around the world that qualified by winning their regional tournaments. Currently, international tournaments take place throughout the world including, Europe, East Asia, The Pacific, Canada, Latin America, and Mexico. The regions of Latin America, Mexico, and East Asia have clearly dominated the international bracket of the World Series. Mexico was the first non-United States winner of the World Series in 1957 and that success has been followed by other Latin American nations such as Venezuela, Puerto Rico, and the Netherlands Antilles. The East Asia region has been dominated by Japan and Taiwan with both nations winning multiple championships.

Participation in the Little League World Series

Latin America

Country	Appearances	Last App.	Finals	Championships	Last
Mexico	21	2006	6	3	1997
Venezuela	14	2006	3	2	2000
Puerto Rico	7	1999	0	0	
Netherlands Antilles	7	2006	3	1	2004
Nicaragua	5	2004	0	0	
Panama	2	1970	0	0	

Asia

Country	Appearances	Last App.	Finals	Championships	Last
Taiwan	22	2004	18	16	1995
Japan	17	2006	8	6	2003
South Korea	2	1985	2	2	1985

The Olympic Games

Baseball became an official Olympic sport during the 1992 Barcelona summer games. Since then 16 nations have competed in Olympic baseball. Half of those teams hail from Asia and Latin America. Cuba has had the most success qualifying for every Olympic Games and winning two of the first four gold medals. Japan has had the most success of the Asian nations: they have qualified for every event and have won three total medals.

Olympic Appearances

Cuba	5	Canada	2
Japan	5	China	1
Italy	4	Dominican Republic	1
Netherlands	4	Greece	1
United States	4	Nicaragua	1
Australia	3	Puerto Rico	1
South Korea	3	South Africa	1
Taiwan	3	Spain	1

Medal Count

	Gold	Silver	Bronze	Total
Cuba	3	1	0	4
United States	1	0	1	2
Taiwan	0	1	0	1
Australia	0	1	0	1
South Korea	0	0	1	1
Japan	0	1	2	3

Conclusions

1. Data on player origin and the results of international events illustrate that baseball has diffused beyond the borders of the United States and become a international game.
2. Major League Baseball has encouraged the development of the sport in other regions of the world by hosting spring training and regular seasons games in other countries. Baseball teams have also began to scout for talent in these regions.
3. Latin American nations, especially the Caribbean nations have had the most international influence on Major League Baseball to date.
4. The infusion of Latino players in the 1980s and 1990s led to a decline in the percentage of African-American Major League players.
5. The influence of Asian born players began in the 1990s and continues to grow. This growth may decrease the percentage of Latino players in the future.
6. Latin American and Asian nations have enjoyed great success in international events such as the Olympics, The World Baseball Classic, and the Little League World Series
7. Cuba has been very successful in international events, but their production of Major League players has been limited due to governmental restrictions.

Global Retrieval of BrO, HCHO, and OClO for the EOS–Aura Ozone Monitoring Instrument

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INTRODUCTION — The **Ozone Monitoring Instrument (OMI)** is scheduled for launch on the **EOS–Aura** platform in mid 2004. OMI is a nadir viewing UV/Vis instrument observing continuously from 270 to 500 nm, and thus similar to the European Space Agency's **Global Ozone Monitoring Experiment (GOME)**, from which it derives much of its heritage. Compared to GOME, OMI has about 3–5 times coarser spectral resolution but a more than 40 times smaller ground footprint of 13×24 km² and achieves global coverage within one day compared to three days for GOME.

Stratospheric **bromine oxide (BrO)** and **chlorine dioxide (OClO)** are key elements in the destruction of stratospheric ozone and the formation of the Antarctic ozone hole; in the polar troposphere, BrO is released from the snow and ice-pack during high-latitude spring. Tropospheric textbfformaldehyde (HCHO), a volatile organic compound (VOC), is an indicator of isoprene emissions and a byproduct of forest fires; it is a key observable for air quality determination from space.

We present a design overview of the operational OMI algorithms for BrO, HCHO, and OClO, as well as auxiliary retrievals of O_3, which we are currently developing for OMI. Key elements in the retrieval process for all trace gases are the non-linear least squares minimization procedure to derive trace gas slant columns, proper wavelength calibration, and an undersampling correction. BrO and HCHO slant columns are converted to vertical columns using air mass factors that, in the case of HCHO, include cloud and surface properties as well as the vertical distribution of the absorber from climatology.

The trace gas algorithms are scientifically mature since they are able to fully exploit their heritage from GOME. However, since all target gases are weak absorbers (at the 0.5% level or less in many cases), meaningful retrievals and sensitivity studies can only be performed once the effects of OMI instruments characteristics on the measurements are fully known. A prime example of such effects is spectral undersampling from which OMI is expected to suffer.

Preliminary retrievals of global BrO, OClO, HCHO and O_3 have been performed by applying the OMI algorithms to GOME data that have been modified to spectrally resemble the expected OMI measurements. Results are shown for BrO, OClO, and O_3 in the Antarctic during the polar Spring, and for HCHO over the continental U.S.

THE TARGET GASES — **BrO** was first measured from space by GOME, in the 344–360 nm region. Although thought of as a primarily stratospheric gas, lower tropospheric ozone destruction in the Arctic polar sunrise has been coupled with bromine chemistry associated with the ice pack [*Barrie et al.*, 1988]. Observations from ER-2 [*McElroy et al.*, 1999] and GOME [*Wagner and Platt*, 1998] show the presence of enhanced tropospheric BrO in the Arctic and Antarctic spring. Compared to GOME, OMI will make measurements at higher spatial resolution that, coupled with cloud determination, will permit the location and persistence of enhanced polar tropospheric BrO to be studied in synergy with ozone in order to quantify the effects on tropospheric O_3. The higher spatial resolution will also permit detailed observations to be made of the relation of BrO to the polar vortex structure.

HCHO is a principal intermediate in the oxidation of hydrocarbons in the troposphere, providing an important indicator of biogenic activity. In the remote marine troposphere it may serve as a useful proxy for tropospheric OH. HCHO was first measured from space by GOME, in the 337–359 nm range [*Thomas et al.*, 1998]. HCHO is prominent in the Southeastern U.S. in summertime (from isoprene oxidation) [*Chance et al.*, 2000] and is also a prominent product of biomass burning [*Thomas et al.*, 1998].OMI will measure HCHO with higher spatial resolution and with better temporal coverage, allowing for improved characterization of sources and transport.

OClO is a useful indicator for chlorine activation in the stratosphere. It was first measured from space by GOME in the 363–396 nm range. To within current GOME measurement and retrieval uncertainties, it is found entirely within the polar vortices. In addition to continuing the measurement record, providing an indicator for the trend in stratospheric chlorine loading, OMI will measure OClO at higher spatial resolution than GOME, which will help to elucidate the details of its formation, persistence, and correlation with PSCs and temperature. For OClO the data products are slant column densities. This is due to the fact that OClO is generally found at very high solar zenith angles, so the determination of appropriate air mass factors for a given case requires substantial off-line analysis.

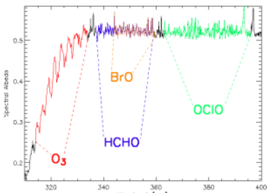

Figure 1: Spectral fitting windows for BrO, HCHO, OClO, and O_3 in a GOME spectrum.

SPECTRAL UNDERSAMPLING — Remote sensors commonly suffer from spectral undersampling: The instrument transfer function (ITF) is not sampled highly enough to preserve the information content incoming to the detectors. When the measurement is resampled to another wavelength grid, as is routinely done during wavelength calibration, the undersampled portion of the signal introduces spectral structures that can severely limit the accuracy of the retrieval.

The sampling theorem (*Nyquist theorem*) states that a signal may be uniquely reconstructed, without error, if the sampling rate is equal to, or greater than, twice the highest frequency component in the signal. In other words, the highest frequency that is correctly sampled corresponds to half the number of sampling points – all higher frequencies are undersampled.

The importance of an undersampling correction was demonstrated for GOME by *Chance* [1998] and *Slijkhus, et al.* [1999], and it has been shown to be an important consideration in the retrieval of weak absorbers like BrO, HCHO, and OClO. In these cases the spectral aliasing introduced by undersampling is of similar magnitude as the spectral signature of the absorbers.

The extensive pre-flight characterization of the OMI ITF makes it possible to perform a theoretical undersampling study before actual measurements are available. (It is important to note that a well-characterized ITF from pre-flight measurements does not affect the undersampling of the actual measurements, since the latter are taken in space with the available sampling rate of the detector.)

OMI sampling rates are 0.15 nm/pixel (~2.7 pixels/FWHM) in the UV and 0.21 nm/pixel (~3 pixels/FWHM) in the visible. Figure 2 shows the visible channel ITF (black curve) in the fitting window of NO_2, which has been derived from a polynomial fit to the pre-flight characterization measurements. Also shown are the portions of the ITF that are fully sampled according to the Nyquist theorem (green dashes), and the undersampled part (red).

The resulting undersampling spectrum that is aliased into the spectrum in the course of a wavelength calibration (assuming a Doppler shift induced by a 7.5 km/s relative velocity between the Aura platform and the sun) is shown in Figure 3 (red curve). Overlayed in blue is the transmission of NO_2 for a typical slant column density of 1.25×10^{16} mol/cm². The magnitude of the OMI undersampling spectrum in the NO_2 fitting region is about 20% of the NO_2 spectral signature, *i.e.*, of about half the strength of the tropospheric NO_2 signal.

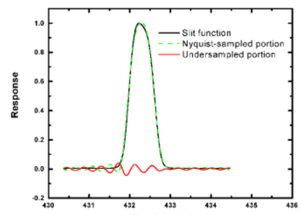

Figure 2: OMI visible slit function.

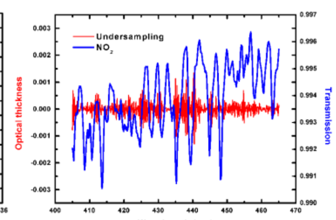

Figure 3: NO_2 transmission (blue) and OMI undersampled spectrum (red).

TECHNICAL ALGORITHM DETAILS —

Slant column abundances Ω_s are determined by fitting measured radiance, beginning with the measured irradiance, molecular absorption cross sections, correction for Ring effect, effective albedo (which includes effects from Rayleigh scattering), and a low-order closure polynomial. All spectral fitting proceeds via a Gauss–Newton based non-linear least squares minimization procedure [*Lindström and Wedin*, 1988]. Key elements in the retrievals are solar and radiance wavelength calibrations, on-line computation of an undersampling correction, and the core fitting itself.

Ozone absorbs in all of the BrO, HCHO, and OClO fitting windows and must be taken into account. Stability of the HCHO retrieval is greatly improved by pre-fitting O_3 and using it linearly constrained by the determined fitting uncertainties. In similar fashion, HCHO retrieval is improved by pre-fitting BrO.

Vertical column abundances Ω_v are derived for BrO and HCHO by ways of an Air Mass Factor (AMF): AMF = Ω_s/Ω_v. AMF values are calculated using the LIDORT radiative transfer model [*Spurr et al.*, 2001], accounting for atmospheric scattering, surface reflection, satellite viewing geometry, and the vertical distribution of the target gas. For BrO (mainly stratospheric), a Gaussian vertical concentration profile [*Brasseur and Solomon*, 1986] is assumed. For HCHO (tropospheric) the AMF formulation is more intricate, as it is strongly influenced by tropospheric clouds [*Palmer et al.*, 2001].

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APPLICATION TO MODIFIED GOME DATA — Global retrievals for BrO, HCHO, OClO, O_3 with the OMI operational algorithms have been performed on spectrally modified GOME data [*Veefkind*, 2003] with encouraging results. Enhanced tropospheric HCHO over industrial centers in the continental U.S. are clearly discernible in Figure 4. Figure 5 shows enhanced values of polar tropospheric BrO released from the ice pack, and elevated values of OClO within the Antarctic vortex are seen in Figure 6. Results from pre-fitted O_3 (Figure 7) compare well with ozone values reported by the TOMS instrument on the same day (Figure 8). Since BrO, HCHO and OClO are optically very thin absorbers, the results presented here can only be taken as a rough proxy for OMI capabilities, and detailed sensitivity studies have to wait until OMI measurements become available. Nevertheless, the good performance of the OMI algorithms with modified GOME data encourages confidence in the atmospheric monitoring capabilities that can be expected from OMI.

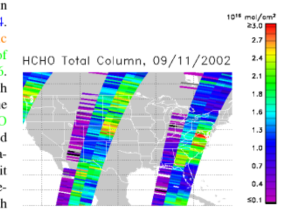

Figure 4: HCHO total columns (geometric AMF).

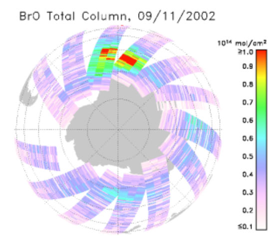

Figure 5: Antarctic BrO total columns (geometric AMF).

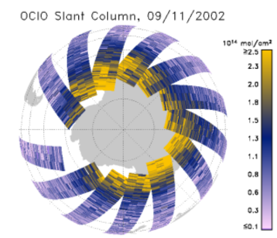

Figure 6: Antarctic OClO slant columns.

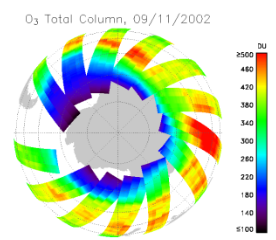

Figure 7: Antarctic O_3 total columns (geometric AMF).

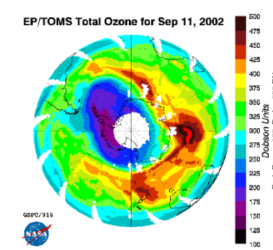

Figure 8: Antarctic O_3 total columns from EP/TOMS.

What you will turn in!!!

- One paragraph proposal for your project
  - What is your topic
  - Why is it important to you
  - How does it fit with the Geography of Africa
- Your Finished Poster
  - Electronic **and** hard copy.
- Three page summary of your findings
  - Must cite sources in the paper
- Bibliography
- Due Dates
  - Proposal – Friday, September 9th
  - Final Project – Monday, November 28th

Presentation

- Each student will give an 8-10 minute presentation using PowerPoint.
- You may show your poster, but the presentation must contain more slides than just the poster.