



New Mexico and the World

Curriculum Resources for New Mexico Teachers



Introduction to Pantanal and Inquiry Questions

Three lectures and accompanying student activities and focus questions relating to the plight of the Pantanal are included. Reflection writing, reading comprehension.

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Grade Level: 5-8

Area: Language Arts; Science

Strand(s):

NM Benchmark(s): LANGUAGE ARTS:

Strand: Reading and Listening for Comprehension Content Standard I: Students will apply strategies and skills to comprehend information that is read, heard, and viewed.

Strand: Writing and Speaking for Expression

Content Standard II: Students will communicate effectively through speaking and writing.

SCIENCE

Strand III: Science and Society

Standard I: Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies.

Length:

of Students:

Learning Objectives: To introduce students to the Pantanal region of Brazil

Introduction: Note to teachers:

Below is some background information for your use in presenting the material in a lecture format. However, it is more effective for the students to use the available resources to become the "experts" and discover the information for themselves, especially if internet access is available. Cooperative group-work can make this more adventurous: one student becomes the recorder, another the researcher, an illustrator, the presenter, etc. Roles can be designed for the

number of students in each grouping, and can even be rotated.

Materials:

Procedures:

Background Info:

I Pantanal, translated from the Portuguese, literally means a huge pântano, or swamp. Webster's defines swamp as, "...wet spongy land saturated and sometimes partially or intermittently covered with water: water-logged imperfectly drained land unsuitable for agriculture without artificial drainage; esp: such land supporting a natural vegetation predominantly of shrubs and tress and often intergrading into grassy marsh on the one hand and wet forest on the other." (Webster's, 2306) Implicit in this description and definition is the element of unsuitability, of imperfection and of the need to artificially improve on a defective system. The use of swamp, to describe the totality of this area is actually a misnomer, in that a more accurate term, which would embrace the entire system, is drainage basin. As a descriptor for land that is periodically inundated by water, this is a more descriptive term. The use of the appropriate name or term for this complex system of drainage basin and wetlands, forces one to think outside of the connotations of the highly charged and limiting word, swamp.

The Pantanal is the second largest drainage basin in Brasil, with the Amazon region being the largest, not only in Brasil, but also in the world. Throughout my writing, I will be using the Portuguese spelling of the country and people, rather than the English spelling, Brazil.

Webster's describes "...drainage system: the streams or other waterways by which a region is drained." This more neutral definition accepts the natural function of natural flows and movements of water, but adds the stamp of man once again, in viewing flooded lands as needing to be tamed, dammed and control by man. The example given in Webster's for proper use of the term in a sentence is, (the drainage) "...of the marshy lands was completed in a short time." Furthermore, the term "drainage district" describes "...a governmental or quasi corporation created by a state for the drainage of a specified territory." (685) Traditionally, when one labels or denotes the areas that, by virtue of the presence of water, are unusable to man, the obvious task is to begin to eliminate the "problem." Philip Williams observes, "The worlds' religions once taught people to show reverence for the waters of life. By contrast, our industrial 'civilizations' have consistently abused and defiled our most precious resource." (Save the Earth, 167)

The Pantanal, although touching Paraguay and Bolivia, is largely located in the states of Matto Grosso and Matto Grosso do Sul, Brasil. Although the exact measurements vary, the alluvial plain is approximately 150,000 kilometers squared. Water flows, meanders and wanders throughout the Pantanal, relatively unencumbered by interruptions of large-scale dam projects. The

seasonal flooding and receding of the waters creates a unique environment, in which great bio-diversity exists. It can be said that the rainy and dry seasons create totally different landscapes, ones in which people and wildlife have learned to adapt. The Pantanal is considered one of the four "hot spots" for conservation efforts in South America, and one of the 200 most important ecologically bio-diverse areas in the world for importance and for preservation. (Earth Watch web-site)

The Pantanal is unique in its size and the relative pristine condition of the land. The definition of a floodplain, as described by Junk is:

"...areas that periodically inundated, by the lateral overflow of rivers or lakes, and/or by direct precipitation or groundwater; the resulting physicochemical environment causes the biota to respond by morphological, anatomical, physiological, phenological, and or ethnological adaptations, and produce characteristic community structures. (Swarts, 212) Because of the flatness of the land, the water from the heavy rains fills the cavities and overflows the rivers, creating a huge flooded basin that last for six months each year. The Pantanal supports a huge bio-diverse range of life, flora and fauna, of land and water. The Pantanal is the size of Portugal, and is composed of sub-regions that are clearly distinct in their hydrology and possess their own distinct biological characteristics.

They are as follows:

1. Pantanal de Poconé, named by the Beripocone indians. This area has been negatively impacted by heavy exploration of gold. Pocone was founded by Luiz de Albuquerque de Melo Pereira e Cáceres in the 18th century. New Mexicans, please note that the spelling of Albuquerque is correct, and doesn't need the "extra" r.
2. Barao de Melgaco, in which one finds the partially protected park area of Chapada dos Guimaraes.
3. Pantanal do Paraguai, located near the Paraguai river.
4. Pantanal de Paiaguás, an area of some of the heaviest rainfall.
5. Pantanal de Aquidauana, area whose waters are fed by streams carrying great quantities of calcium. The lakes of the region have mollusks with dense shells, due to the dissolved carbonate in the water.
6. Pantanal da Nhecolandia, in which the devastation of the gallery forest is extensive, from the creation of pasture land for grazing.
7. Pananal do Nablileque, with the Paiagaus Pantanal, this region also receives heavy rainfalls, and is an area containing many rivers.
(Paraphrased from the Guias Philips, Pantanal & Bonito, in Portuguese, translation mine)

II

Personal footnote: Through my explorations of the Pantanal and the Amazon regions, the similarities of the problems and the issues are underscored by the

fact that the two areas are both major drainage basins for the South American continent. My contention is that the Pantanal has suffered more historical environmental damage, due to the degradation of the area by two hundred years of intensive cattle grazing, while the encroachment into the Amazon is relatively more recent, yet increasing daily in destruction.

Conclusions from my observations of the current threats to the Pantanal:

1. Cattle grazing and over-use of the land
2. Mining, especially for gold
3. Single crop production and land over-use
4. Soy bean crops and use of fertilizers
5. Improperly managed "Eco-"tourism
6. Predatory hunting, threat of extinction (blame the Bolivians)
7. Predatory fishing, threat of depletion
8. Predatory/excessive clearing of wood (for export)
9. Lack of fuel source other than wood for people of the area
10. Heavy metal contamination of waterways
11. Road building and the deleterious effects
12. Loss of rights, land and culture of Native Brazilian Tribes
13. Pollution of the air
14. Huge gap between the rich and the poor, the great numbers of landless people
15. Existing and proposed large water projects, dams and hidrovias, which destroy vegetation, wildlife and flood lands, forcing people to abandon their traditional home lands
16. To some extent, the cultivation of marijuana and the presence of narcotic-trafficking (always blamed on the Bolivians)
17. Lack of potable water and sewage systems
18. Lack of equal access to formal education

After making my own assessments of the threats to the Pantanal, my conclusions, listed above, were supported by the readings contained in the Earth Watch web-site. They especially emphasized the environmental changes that have been caused by the agrarian development of the highlands above the Pantanal, and threatened dredging and channeling of the Paraguay River by the proposed Hidrovia project as being the two main destructive forces to the Pantanal.

Echoing my thoughts, they further listed the pressures of over fishing, negative impact of cattle ranching and over grazing, the periodic fires, mining pollutants, dumping of agricultural toxins, and the lack of sewage treatment facilities. (Earth Watch web-site) These are important issues present in the Pantanal, but they are also problems that the entire country faces.

Unfortunately, Brasil is known for encouraging development by being lax in

environmental regulation and enforcement. Although ultimately, Brazilians must be the ones to solve the problems of their country, worldwide awareness of the national and worldwide treasures in this country will help to preserve and protect the land for Brasil's people and their future. The participation of the World Bank in large-scale projects, such as the Hidrovia, represents a very dangerous threat to the Pantanal. Michael Shellenberger and Kevin Danaher describe the power of the international funding groups; "The dominant vision (for Brazil) is defined by the World Bank, the International Monetary Fund (IMF) and transnational corporations." (Fighting for the Soul of Brazil, 1) This influence has bequeathed to Brazil, one of the richest countries in the world, a huge foreign debt, from projects that benefited the multi-national interests more than the citizens of the country. Poet Nicolas Uriburu, an Argentinean artist expressed his dream for South America in his statement, "The more developed nations are poisoning the Earth's land, water, and air, and destroying the resources of the Third World.

I denounce the antagonism between nature and civilization, and look forward to the union of Latin Americans by the waters of their rivers – though not within the limits set by man. An entire continent united by nature." (Save the Earth, 114) Yet the politicians and the parties interested in developing the areas of floodplains, need to recognize the value that these areas hold for the world, and for the benefit to the eco-systems. Wolfgang J. Junk writes, in *The Amazon and the Pantanal, Critical Comparisons*: "...floodplains provide large non-commercial values for society, for example, by increasing habitat and species diversity in the landscape, increasing the "sponge" function in the hydrological cycle, reducing flood amplitude inside the river-floodplain systems and, in the case of the Pantanal, in the down-river stretches, and buffering regional climate oscillations. Large development projects, such as the construction of hydroelectric power plants and the Hidrovia project are irreversible and will lead to large-scale destruction and modification of floodplain habitats. This will reduce the multiple functions of the floodplains in the landscape and negatively affect not only the ecology of the region but also its economy and the living conditions of the local populations." (Swarts, 220,221)

III

Canadian award winning poet P.K. Page lived in Brasil during 1957 through 1959, in what she described were her "privileged years," as she accompanied her husband, the Canadian ambassador to his post in Rio de Janeiro. Her private journal, upon encouragement of her friends, including Michael Ondaatje, who saw the enormous value of her sensitive memories of a personal experience, was published thirty years after her adventure. Beyond the value of the poetically rendered landscapes and nature notes, Ms. Page chronicles and provides evidence of the rapid environmental changes that Brasil has seen since the penning of the book. With her reminiscing, she shares her own metamorphosis, as she learns to value and to speak Portuguese, as well as to

love and respect the Brazilian people. Readers are able to live with the political and societal giants, and view inside glimpses into the epoch of the building of Brasilia, the capital of Brasil.

Although it is a "period piece," Brazilian Journal provides the reader with an intimate portrait of a caring and sensitive wordsmith, as well as a woman who was always appreciative of her Brazilian experience.

Ms. Page wrote of the importance of journal writing to her life, "One part of me doesn't exist when I don't make notes. So for about two weeks that part of me has been missing..." (Brazilian Journal, 236).

The cobolcos (born of Native and "white" heritage) are the main inhabitants of many regions in Brasil, along with the people of more "pure" Portuguese descent, European immigrants, and African Brazilians. Although the myth of Brasil is one of acceptance of all cultures and races, there are profound differences in the socio-economic status of people having darker skin. A dark tale (urban legend?) is found in Philip's book on the Pantanal. "150 years ago, during the epoch of slavery, the Fazenda Boa Vista brought slaves in to work for the fazendeiros. (...) According to the legend (or history) the ill or rebellious slaves were sport [bait and food] for the piranhas and the screams for help of these slaves can still be heard." (Philips, 159, translation mine)

During the festival of the Cavahada in June, (celebrated throughout the country, but viewed in Poconé by our group) the residents reenact the battles between the mouros and the cristaos. They also march on horseback with the parade of the masked men, as a representation of the influence of the native peoples and the Spanish interlopers.

During this gathering, the descendents of the African slaves present their dances from the Congo. As our group enjoyed listening to the Samba drums and participating in the dance, we could experience the richness of their African roots, yet sense the subtle discrimination and segregation present in this small town.

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**References-
Resources:**

Student Activities:

I. Inquiry and exploration for students:

- Define and describe the Pantanal, based on the research tools available to you.
- Draw and map the location of the Pantanal. Label the cities and river systems.
- Research the history of the area. Create a visual or written description contrasting the changes over time.
- Using the description of a floodplain provided by Junk, define one in your own words, based on your research.

II. Inquiry and exploration for students:

- Based on the your explorations, what do you see as the problems facing the Pantanal?
- What are the political forces at play in these issues?
- How can the desire for progress be compatible with the concept of sustainability?
- Stage a debate that focuses on the pros and cons of development on the Hidrovia project. Include the role played by the International Monetary Fund World Bank, in this debate of the pros and cons of their participation in development projects, particularly in Brasil.

III. Inquiry and exploration for students, journal writing activity, a visit to the Pantanal:

- Select a person from an historical time, or from modern times, and write in that voice. You may choose to write as a descendent of the Portuguese, Africans or native people.
- Include the observations of the flora and fauna seen during your stay in the region.
- Chronicle your personal thoughts, reactions and experiences during your "virtual" stay.

Assessment:

**Technology
Integration:**

Accommodations:

Review Questions:

Related Careers:

Career Education:

Hints and Tips:

Lesson Evaluation: