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# Mississippi Economic Review and Outlook

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Dear Readers,

Great civilizations of the past flourished or failed based on their environment: the fertility of their land, their access to water and to other natural resources. Economic development today usually depends less on a region's natural resource base than on its people. Educated and enterprising people one day may even create a prosperous enclave on Mars. This is not to deny the importance of the environment. On the contrary, environmental issues are of increasing importance. On Mars, of course, careful attention to ecosystems will be basic to survival. While the environment on earth is suited to us humans, the protection of ecosystems, while simpler, is also vital.

Today's environmental issues are more urgent than those of our ancestors. This *Review* looks at some of these issues in the state, focusing on what is required to protect ecosystems so that future generations can meet their needs and enjoy a standard of living at least comparable to that of their parents. The goal, in brief, is that of sustainable economic development, or sustainability.

Planning for sustainability involves translating scientific information on the environment into information on the economic costs and benefits of decisions impacting ecosystems. This is a task that is only beginning to be done, whether at the local, national or global levels. This *Review* concentrates on presenting the data and information that are available – information on the services of ecosystems and on the effects of damages to those systems. Unfortunately, this information does not translate easily into dollar estimates of benefits and costs. It is, however, background information vital to economic decision-making and we are careful to place environmental issues in their economic context. It is hoped that this special issue will stimulate interest on the economics of the environmental policy choices facing us -- policy decisions that will have a major impact on the future of the state.

Comments and feedback on this special issue are welcomed, and may be published as letters to the editor. To subscribe to this *Review*, see the form on the next page. National projections are based on the forecast of Global Insight, Inc. As always, the views expressed in the *Review* are those of the authors and do not necessarily represent the official position of the Center for Policy Research and Planning or the Mississippi Institutions of Higher Learning.

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## In This Issue

- 1 National Economic Outlook
- 7 Mississippi Economic Outlook
- 17 Highlights from the News
- 19 Sustainable Development
- 35 Mississippi Endangered Species
- 36 Fireflies Under Fire
- 37 Global Environment Trends
- 41 Economic Impact of Medicaid
- 45 Building Blocks of Community Development
- 51 State Economic Forecast Tables
- 63 Tables with State Historical Data

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## **NATIONAL ECONOMIC OUTLOOK: LABOR MARKET PICKS UP - JUST IN TIME**

- Finally, employment is picking up. There were 360,000 more persons on U.S. payrolls in the first quarter (Q1) of 2004 than in the previous quarter. Including April, payroll employment has now increased for six consecutive months.
- The recovery in the labor market will bolster wages and push up consumer demand, just as federal and state governments slow their rates of spending.
- On the down side, rising oil prices are pushing up energy and transportation costs, and threaten to increase overall rates of inflation, which would lead to higher interest rates. High demand, stagnant refinery capacity and a jittery market are behind the higher prices.
- The rate of inflation remains below 3%, but increasing pressures on prices this summer are likely to convince the Federal Reserve to hike the federal funds rate by 0.25. The rising federal deficit, fueled by the U.S. military presence in Iraq, is another factor contributing to the potential for higher interest rates.
- The world economy is picking up steam. A growth rate of 3.9% is expected this year, led by a 6.5% increase in Asia (excluding Japan). Although U.S. imports continue to exceed exports, export growth has begun to outpace the increase in imports.

The national economy is in high gear, with output growing a revised 4.2% in the first quarter (Q1). Investment, the prime culprit behind the initial downturn in 2001, posted double-digit growth in Q3 and Q4 of 2003, and a respectable 7.0% increase in Q1 of this year. The stock market had a bullish first quarter, following strong corporate profits in Q3 and Q4 of 2003.

The labor market is finally showing some strength. There were 360,000 more persons on payrolls in Q1 of 2004 than in the previous quarter. Including April, **payroll employment** has now increased for six consecutive months, ending a decline that lasted over two years.

However, two years into the recovery, the labor market still has a way to go: there were 2.2 million fewer persons on payrolls in Q1 2004 than in Q1 of 2001. The number of those unemployed but actively seeking work is higher: 8.2 million in April of 2004 versus 6.4 million in April of 2001. The number of those who want work but are not actively applying for jobs is also higher.

### **Rising Employment Welcome News**

The slow growth of employment has meant a slow growth of wages and salaries paid. This has been a cause of concern for analysts, who worry that consumer demand could flag and stall the economy. **Consumer spending** accounts for over two-thirds of total expenditures, and any slowdown would be clearly felt. Table 1 shows the recent and forecast spending rates for the four components of demand. Consumer expenditures grew 3.7% in the first quarter, up from an average annual growth rate of 3.1% in 2003. This increase was critical to the GDP growth rate achieved: government purchases grew a modest 2.0% due to a drop in state and local government spending, and net exports improved little. The 7.0% increase in investment spending was the strongest growth rate among the four components of demand; without it, GDP growth would have been below 3.0%.

Increasing wages are expected to fuel a 4.0% increase in consumer spending in Q2 and a 3.4% increase in Q3. Federal spending,

**Table 1. TRENDS IN EXPENDITURES BY SECTOR**  
Billions of Constant Dollars Unless Otherwise Indicated

Description	2003	2004	2004	2004	2004	2005
	QIV	QI	QIIP	QIIP	QIVP	QIP
Gross Domestic Product (2000\$)	\$10,600	\$10,709	\$10,840	\$10,967	\$11,082	\$11,172
(% change)	4.1	4.1*	4.9	4.7	4.2	3.2
Consumer Expenditures (2000\$)	\$7,486	\$7,556	\$7,631	\$7,695	\$7,749	\$7,804
(% change)	3.2	3.7	4.0	3.4	2.8	2.8
Gross Private Domestic Invest. (2000\$)	\$1,715	\$1,745	\$1,787	\$1,833	\$1,881	\$1,877
(% change)	14.1	7.0	9.7	10.2	10.6	-0.8
Total Government Purchases (2000\$)	\$1,911	\$1,920	\$1,941	\$1,954	\$1,964	\$1,973
(% change)	-0.1	2.0	4.4	2.6	2.0	1.9
Federal Govt. Purchases (2000\$)	\$715.5	\$732.9	\$745.2	\$753.2	\$754.8	\$755.3
(% change)	0.7	9.7	6.7	4.3	0.8	0.3
State and Local Govt. Purchases (2000\$)	\$1,196	\$1,188	\$1,197	\$1,201	\$1,210	\$1,218
(% change)	-0.5	-2.6	3.0	1.5	2.8	2.9
Net Exports of Goods & Services (2000\$)	-\$515	-\$515	-\$521	-\$515	-\$511	-\$481
(% change)	-7.9	0.5	-5.1	4.4	3.8	23.2
Exports of Goods and Services (2000\$)	\$1,083	\$1,092	\$1,123	\$1,160	\$1,195	\$1,228
(% change)	19.1	3.1	11.6	13.1	12.1	11.1
Imports of Goods and Services (2000\$)	\$1,598	\$1,606	\$1,644	\$1,676	\$1,706	\$1,709
(% change)	15.4	2.0	9.5	7.6	7.2	0.8

P = Preliminary or Projected. Percentage change refers to seasonally adjusted average annual rate, based on quarter-to-quarter growth rate.

\*Recently revised to 4.2%.

SOURCE: Global Insight, Inc., May 2004.

which grew at a blistering 9.7% rate in Q1, will slow over the course of the year as Congress works to reduce the **federal deficit**, which will hit \$462 billion this year. While state and local government spending has again been increasing, the rate of growth will be modest for a while. Investment spending is peaking, and will moderate considerably in 2005 as residential investment drops.

The improved outlook for labor, then, comes at a good time. Much of the increase in consumer spending since 2001 has been financed by rising levels of consumer debt. Total wages and salaries paid in Q1 of 2004 were 0.6% lower than in the first quarter of 2001, if measured in constant dollars, while consumer credit outstanding was 17% higher. See Table 2.

High **productivity** growth has made possible the rapid growth of output, with only

modest increases in employment. The 4.9% increase in productivity recorded in 2002 was the highest in 50 years. A gap between the growth rates of corporate income and wage and salary income has been the result. Table 2 shows that, in constant dollars, before-tax corporate profits rose 17%, and after-tax profits 25%, between 2001 Q1 and 2004 Q1, while wage and salary compensation fell slightly. Over the next four quarters, profits are again expected to outpace wage and salary increases, but wage gains will move ahead of advances in productivity.

### Outsourcing and Insourcing of Jobs

In addition to productivity growth, the outsourcing of jobs has often been cited as one of the reasons behind the slow growth of jobs before this year. The **outsourcing** of jobs has indeed hurt job growth, but newly-

released data from the U.S. Commerce Department show that outsourcing only accounts for a small part of recent job loss. Between 2000 and 2002, U.S. multinational parent companies cut 1.5 million jobs at home. At the same time, they added 62,000 jobs, net, in their foreign affiliates, which amounts to about 4% of the decline in parent company employment.

**Insourcing** -- jobs brought to the U.S. by foreign companies -- has the potential to offset some of the job loss due to outsourcing, but this has not happened in recent years. The number of persons employed by foreign affiliates in the U.S. fell 0.7% in 2001, and by 3.0% in 2002, after rising steadily from 1992 to 2000. At the same time, U.S. corporations did add jobs abroad, making the U.S. a net job exporter over the two-year period.

## Other Trends in Demand

The world economy is picking up steam, which will increase demand for U.S. **exports** and so help the U.S. economy. A growth rate of 3.9% is expected this year for the global economy, led by a 6.5% increase in Asia (excluding Japan). Although U.S. imports will continue to exceed exports for the foreseeable future, the trade gap will gradually narrow as export growth outpaces the increase in imports.

**Housing starts** have remained strong in the first half of this year, but will gradually slow as interest rates rise. Industrial production is expected to continue its rapid growth in response to high domestic and foreign demand, and the stock market will remain on an upward path. The numbers from Global Insight are given in Table 2.

Table 2. **OTHER QUARTERLY NATIONAL ECONOMIC INDICATORS**

	2003	2004	2004	2004	2004	2005	% Change
	QIV	QI	QII <sup>P</sup>	QIII <sup>P</sup>	QIV <sup>P</sup>	QI <sup>P</sup>	Q1 2001- Q1 2004
Establishment Employment	130.0	130.3	130.8	131.5	132.2	132.8	
(% change, SAAR)	0.6	1.0	1.6	1.9	2.1	1.8	-1.7
Index of Industrial Production	112.59	114.39	115.44	117.23	119.21	120.97	
(% change, SAAR)	5.5	6.4	3.7	6.2	6.8	5.9	0.6
Index of Productivity	1.32	1.33	1.34	1.35	1.35	1.36	
(% change, SAAR)	2.4	2.7	3.6	2.8	2.4	1.9	14.7
Consumer Credit Outstanding	\$1,999	\$2,029	\$2,047	\$2,062	\$2,072	\$2,075	
(% change, SAAR)	3.3	6.1	3.6	3.0	1.8	0.6	17.1
Consumer Sentiment, Mich	92.0	98.0	94.6	94.6	93.1	93.4	
(% change, SAAR)	11.9	26.2	-13.9	0.0	-6.5	1.4	6.2
Wage & Salary Disbursements (2000\$)	4807	4820	4843	4902	4957	5012	
(% change, SAAR)	2.4	1.1	1.9	4.9	4.5	4.5	-0.6
Before-Tax Corporate Profits (2000\$)	\$909	\$841	\$924	\$927	\$925	\$1,281	
(% change, SAAR)	43.3	-30.1	39.3	1.3	-0.9	154.3	17.1
After-Tax Corporate Profits (2000\$)	\$693	\$640	\$697	\$698	\$696	\$956	
(% change, SAAR)	50.3	-30.4	35.4	0.9	-1.6	150.0	25.2
Standard & Poors 500 Equity Price Index	1056.4	1133.3	1141.0	1154.0	1167.0	1182.0	-11.2
Housing Starts, Millions, SAAR	2.03	1.94	1.97	1.88	1.82	1.75	20.5
Refiners Cost Crude Oil, Average	\$28.44	\$32.24	\$32.75	\$31.61	\$29.73	\$28.29	27.9

SAAR - seasonally averaged annual rate, based on quarter-to-quarter growth rates.

<sup>P</sup>Second quarter data are preliminary numbers and estimates. Third to first quarter 2005 data are projections.

SOURCE: Global Insight, Inc. May 2004.

**Table 3. U.S. ECONOMIC FORECAST 2004-2006**

	<b>2004</b>	<b>2005</b>	<b>2006</b>
Gross Domestic Product (Percent Change)	6.8	5.2	5.0
Real Gross Domestic Product (Percent Change)	4.8	3.6	3.4
Price Level (Percent Change)	1.9	1.6	1.6
Real Private Domestic Investment (Percent Change)	10.6	4.6	4.1
Total Establishment Employment (Percent Change)	1.0	1.9	1.7
Manufacturing	-1.5	0.6	0.5
Services Business and Professional	3.5	5.6	4.1
Health and Social Services	1.9	1.7	3.0
Construction	2.5	2.9	2.3
Trade	0.6	0.3	1.6
Finance, Insurance, Real Estate	0.4	-0.2	0.6
Transportation, Communication, Utilities	0.9	2.9	2.9
Government	0.2	1.9	0.3
Unemployment Rate	5.6	5.5	5.5
Personal Income (Percent Change)	5.1	5.0	5.6
Consumer Price Level (Percent Change)	2.2	1.5	1.4
Prime Rate	4.1	5.4	6.0

SOURCE: Global Insight, May 2004.

### **Oil Prices Threaten Inflation**

Rising oil prices are pushing up energy and transportation costs, and threaten to increase overall rates of inflation, which would lead to higher interest rates. High demand, stagnant refinery capacity and a jittery market are behind the higher prices.

The average **price of gasoline** in the U.S. shot to over \$2 per gallon in May, and countries around the globe are expressing their concern that high prices of crude could derail their fledgling recoveries. Although OPEC has produced above its announced quotas, worries about instability in the Middle East and high global demand have combined with a lack of refining capacity in the U.S. to drive prices up. (U.S. refinery capacity has remained virtually unchanged for 20 years.) Barring any deterioration of the situation in the Middle East, oil prices are expected to gradually decline over the rest of the year from the peak in Q2. Table 2 presents the forecast of crude oil prices.

### **Consumer and Producer Prices**

The consumer price index (CPI) is showing the effects of higher energy costs. While the core CPI, which excludes food and

energy costs, increased at the low average annual rate of 1.8% in Q1, the overall rate of increase was 3.5%. A 2.2% rise in consumer prices is forecast for 2004 as a whole.

**Producer prices** of finished goods, which increased 3.2% last year, were fairly stable in the first quarter. The recent spike in commodity prices is reversing, and food prices are leveling off. A modest rise of 2.6% is expected for the year, with the rate of increase even lower in 2005, as world industrial production expands.

Despite some increase in inflationary pressures as the economy picks up steam, the overall rate of inflation should remain under 2.5% this year, whether measured by the CPI or the GDP deflator -- hardly a cause for alarm. This prediction rests on gradually declining oil prices, beginning this summer. Some increase in the federal funds rate is expected, however. The **Federal Reserve Board** is likely to hike this rate by 0.25 this summer, to rein in any "over-exuberance" on the part of borrowers.

### **On the Horizon**

By fall, interest rates will be rising, tax rates will have stabilized after a series of cuts,

and spending by the federal government will slow. Increasing employment levels, however, will lead to restoring state funding cuts, as shown in Table 1. Nonresidential construction is expected to pick up as residential activity declines in 2005.

Global Insights predicts another year of near-20% growth in **corporate profits** in 2004, with book profits soaring in 2005 due to the sharp reduction in tax depreciation. By 2007, however, the increase in the federal deficit will mean higher federal personal taxes, and the pace of the world economy will slow, reducing the growth rate of net exports. U.S. growth rates will drop to the more moderate 2.5% - 3.0% range, according to Global Insight.

### Baseline and Alternative Forecasts

Real gross domestic product (GDP) will climb an estimated 4.8% in 2004, the highest rate in over a decade. The pace will moderate somewhat in 2005, dropping to a 3.6% rate of growth, with a similar growth rate anticipated in 2006. Despite robust economic activity, inflation will remain low, given ample industrial capacity, high productivity, and cautious monetary policies. Table 3 presents the baseline forecast in summary form.

Rising employment levels will bring the unemployment rate down, and will enable increases in **personal income** of 5% or more from 2004 to 2006. The rate of increase in payroll employment will go from 1.0% this year to 1.9% in 2005, and then decline to

1.7% in 2006. Job growth will be most rapid in business and professional services, while manufacturing will at least show positive growth.

Two **alternative forecasts** are offered by Global Insight. See Table 4. Under the baseline forecast, is that the rapid growth of GDP in the first quarter accelerates in the spring and summer before gradually settling into an average annual rate of about 3.5% in mid-2005. Under the optimistic scenario, with a probability of 20%, high growth rates persist throughout the year, and only begin to taper off to a more sustainable rate in 2005. The pessimistic alternative, assigned a 25% probability, shows growth rates dropping before the end of the summer, and the economy slowing to a near halt by mid-2005.

The **optimistic** alternative is based on an unexpectedly high growth rate of productivity and a strong world economy. Productivity growth in 2002 was 4.9%, and a rate of 4% or more is not out of the question. High productivity enables higher wages and employment, and profits, even with only a moderate increase in demand. A strong world economy would boost U.S. exports as well in this scenario.

The slightly more probable **pessimistic** alternative is based on the assumption that a growing federal deficit and inflationary pressures push up interest rates, resulting in a slump in the housing market and a slowdown of investment. A continuing rise in gasoline and commodity prices would drive up costs, forcing businesses to hold down expenses

Table 4. **ALTERNATIVE SCENARIOS AND PROBABILITIES IN NATIONAL ECONOMIC FORECAST**

	Rate of Growth of Real GDP			Probability
	2004	2005	2006	
<b>Baseline</b>	4.8	3.6	3.4	55%
<b>Pessimistic</b>	4.6	2.2	2.6	25%
<b>Optimistic</b>	5.1	4.1	3.3	20%

SOURCE: Global Insight, May 2004.

through cutting labor costs. A slowdown in the labor market would in turn negatively affect consumption. A worsening of the situation in Iraq and the Middle East could be the trigger for this pessimistic scenario, through the effect on oil prices and the deficit.

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*Written by Marianne Hill, with input from members of the Center of Policy Research and Planning.*

## Sources

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Economic Policy Institute, "GDP Picture" and "Jobs Picture", available at this site: [www.epinet.org](http://www.epinet.org).

Federal Reserve Board, *Beige Book*, available at [www.federalreserve.gov](http://www.federalreserve.gov).

Global Insight, Inc. Forecasts and Reports. See [www.globalinsight.com](http://www.globalinsight.com).

Kiplinger Letters. Available at the following internet address: [www.kiplingerforecasts.com](http://www.kiplingerforecasts.com).

U.S. Department of Commerce reports.

## MISSISSIPPI ECONOMIC OUTLOOK: SLOW BUT STEADY PROGRESS

- Payroll employment in the state in the first quarter (Q1) was not much higher than in Q1 a year ago. The trend, however, has been upward. Since October, the total number employed has been above that of the same month of the previous year. The unemployment rate has been lower than in the previous year since August.
- Employment growth has been concentrated in the services-producing industries, with the greatest number of new jobs in the government sector. Manufacturing and construction employment were lower in Q1 of this year than in Q1 of 2003, although the number of manufacturing jobs has been slowly increasing.
- High gasoline prices contributed to the drop in employment in transportation services; other sectors as well have been hurt by the record prices. The average price of a gallon of regular in Mississippi was \$1.94 as of May 25 (the national average was \$2.05).
- Total Tax Commission collections this fiscal year through May were \$3.2 billion, or \$154 million higher than the total for last year over the same period. Even with the 5.1% growth of revenues, the squeeze on the state budget continues.
- A drop in consumer confidence in the first quarter can be linked to consumer anxieties, which were fueled by news reports of possible cuts in school funding and stories on the situation in Iraq. Business confidence dipped only slightly.

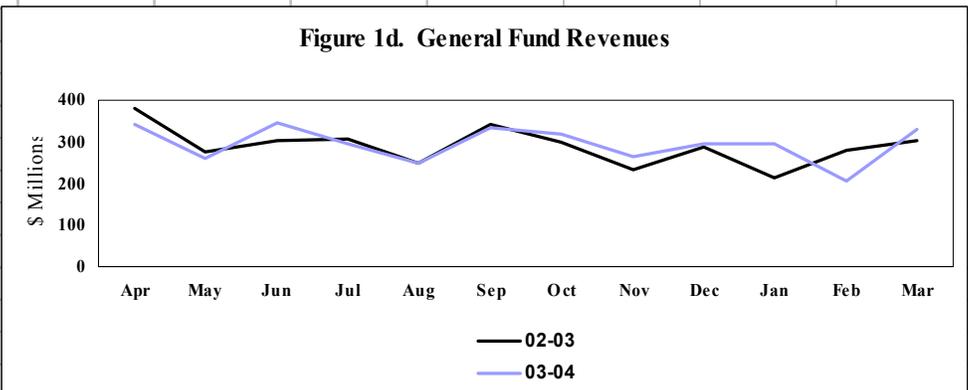
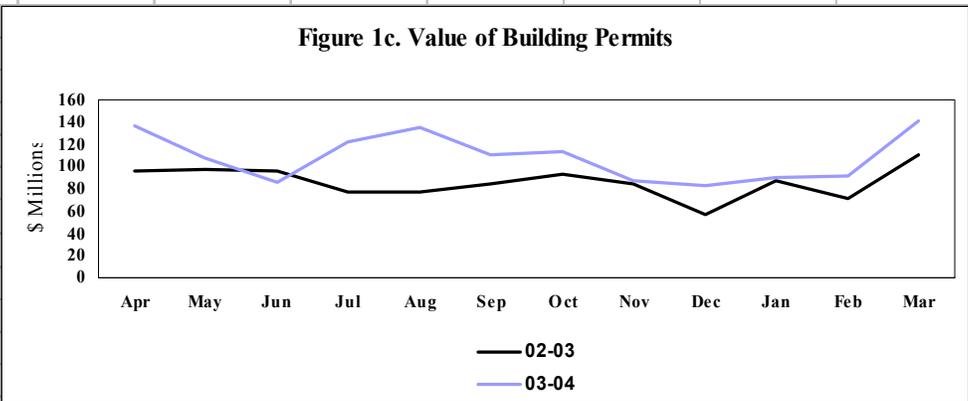
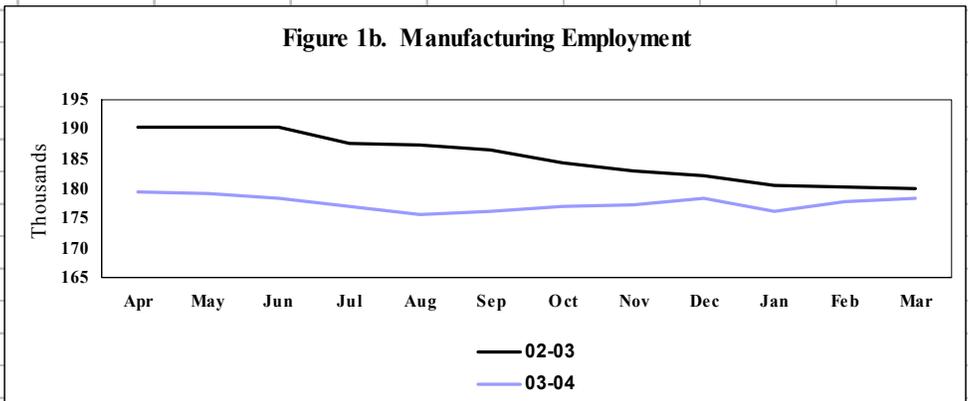
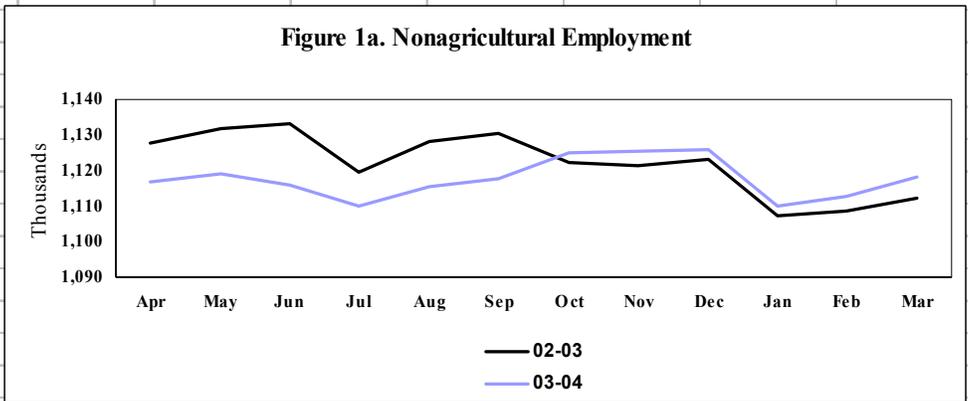
The long-awaited recovery in the U.S. labor market and the upturn in U.S. industrial production have begun to energize the state's economy. Some telling employment numbers were reported in April for Mississippi: employment in durables manufacturing was 3,700 higher in April than a year ago, an increase of 3.3%, and business and professional services employment was up 2,800 jobs, an increase of 3.6%. Initial unemployment claims were down 25% in March compared to the same month in 2003, and residential building permits were 24% higher.

As heartening as these numbers are, the structure of the state economy will make it difficult for the growth rate here to reach the national average. The relatively small base in high-growth, high-skill businesses, along with the heavy reliance on the government sector, places the state at a disadvantage. In addition, for a while at least, the high cost of gasoline will adversely impact the tourism and transportation sectors. Nonetheless, a sig-

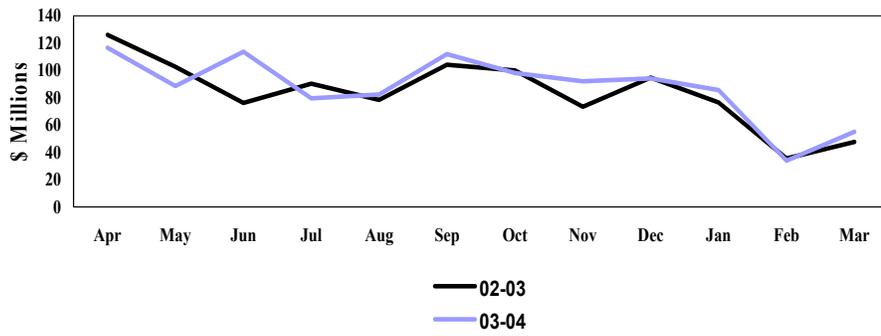
nificant upswing in employment and output appears to be underway.

Key economic indicators are presented in Figures 1a-1h. **Payroll employment** in the state has been trending upward, with employment levels above those of the same month of the previous year since October, as shown in Figure 1a. The gradually improving employment level in **manufacturing**, a critical sector in the state, is especially welcome news (Figure 1b). Figures available as the *Review* goes to press show continued improvement.

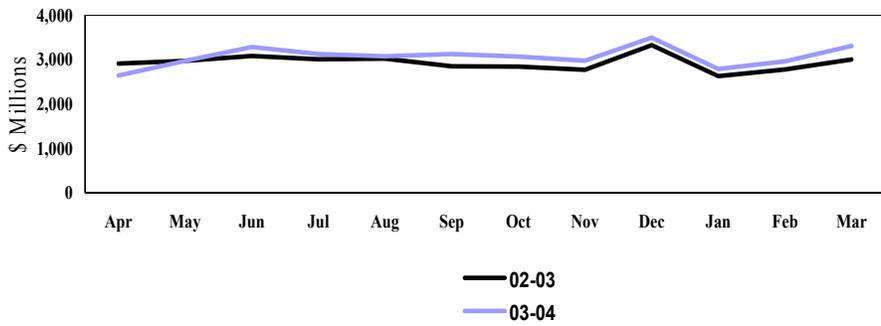
Builders continue to take advantage of low interest rates, with the value of residential **building permits** above levels of a year ago (Figure 1c). General Fund Revenues have gradually been improving (Figure 1d). Personal **income tax revenues** (Figure 1e) were 3.7% ahead of FY2003 collections (as of May 31), while sales tax revenues were essentially the same. However, total collections for April and May (not shown) were strong, with revenues in May up 9%



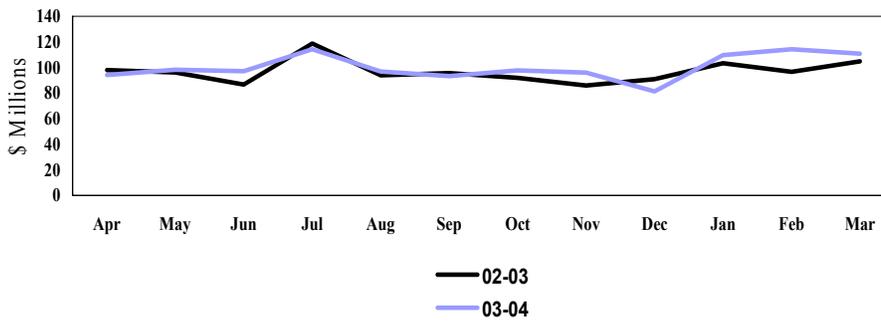
**Figure 1e. Personal Income Tax Revenues**



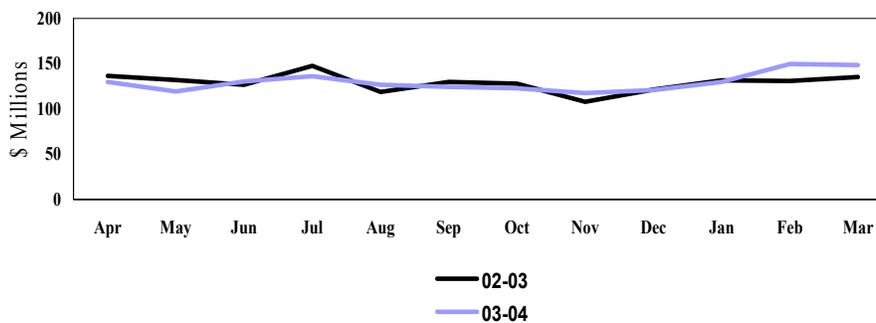
**Figure 1f. Retail Sales**



**Figure 1g. Gaming Revenue -- Coast**



**Figure 1h. Gaming Revenue -- River**



compared to May of 2003. Overall, Tax Commission collections have grown 5.1% this fiscal year.

**Retail sales** have been somewhat sluggish, though they have been above year-ago levels for several months (Figure 1f). Since there has been little increase in wage and salary income, much of consumer expenditures have been financed by increasing debt levels. Some consumer constraint, accordingly, is to be expected.

**Gaming** revenues, both on the Coast and on the Mississippi River, have been significantly above levels of a year ago in Q1 (Figures 1g and 1h). Revenues in Q2 are likely to be affected by higher travel expenses due to the higher cost of gasoline.

### Employment Trends by Sector

Total payroll employment in the state in the first quarter (Q1) was not much higher than in Q1 a year ago. The trend, however, has been positive: since October, employment levels have been above those of the same month of the previous year. The unemployment rate as well has been lower since August, averaging 5.5% in the first quarter, compared to 6.8% in Q1 of 2003. In March and April, the unemployment rate was down to 4.6%, a full percentage point lower than the national rate of unemployment, which was 5.6% in April.

The growth of employment by industry is shown in Table 1. **Transportation equipment** showed the strongest growth rate at 16%. Though most of the 3,800 new jobs in this industry are linked to the new Nissan auto plant and its suppliers, the ship and boat building group in this industry added 1,500 jobs. The greatest job loss was in **construction**, with 2,600 fewer persons employed, for a drop of 5%.

The service sector is the largest sector of the state economy, providing 31% of total wage and salary employment. Government employs 21%, manufacturing 16%, and retail & wholesale trade 16%. All of these sectors, except manufacturing, had more persons employed in Q1 of 2004 than in Q1 of 2003. Among the **service** industries, the growth of

professional and business services at 3.8%, and of real estate, rental and leasing at 3.4%, stand out. The added jobs in these industries are linked to improved levels of business activity. The increase of 2,400 in health care and social assistance employment continues the strong job growth expected in this area as the population ages.

The loss of 800 jobs in the **information services**, representing a drop of 5%, is a considerably steeper drop than the 0.2% drop for the U.S. as a whole.

Transportation, warehousing and utilities also lost jobs, with 2,100 fewer persons employed in Q1 of 2004 than in Q1 a year ago, while the national trend has been slowly upward. **Trucking**, a key part of this industry in the state, has been hurt by the high gasoline prices. The average price of a gallon of regular here was \$1.94 as of May 25 (the national average was \$2.05). The relatively slow growth of employment in leisure and hospitality services is related to shaky consumer confidence, slow growth of income, and gasoline prices. Wholesale trade payrolls were up 4%, while retail trade payrolls remained largely unchanged in comparison to Q1 of 2003.

Employment in government grew a surprisingly strong 1.9%. As Table 1 shows, state government employed 1,000 more persons and local government 3,700 more persons in Q1 of this year than in Q1 of 2003. These new jobs were largely in education, and jobs on the Choctaw reservations are included. Nonetheless, the size of the increase is difficult to square with the pressures on the state budget, which have resulted in hiring freezes in several agencies. This rate of increase is not expected to continue.

### Manufacturing Gradually Improving

U.S. industrial production has increased for three quarters, in response to growing business and export demand. Nationally, manufacturing employment increased in March and April, the first upturn since 2000. In Mississippi, these positive trends translated into an increase of 0.3% in

Table 1. MISSISSIPPI EMPLOYMENT BY SECTOR

<b>RESIDENCE BASED DATA<sup>1</sup></b>	<b>Jan - Mar 2004</b>	<b>Jan - Mar 2003</b>	<b>Percent Change</b>
Civilian Labor Force	1,308,200	1,300,900	0.6
Unemployed	71,400	88,000	-18.9
Percent of Labor Force	5.5	6.8	
<b>ESTABLISHMENT BASED DATA<sup>1</sup></b>			
TOTAL NONFARM EMPLOYMENT	1,113,600	1,110,400	0.3
GOODS PRODUCING INDUSTRIES	234,400	239,700	-2.2
Natural Resources & Mining	8,500	8,400	1.2
Construction	48,400	51,000	-5.1
Total Manufacturing	177,500	180,300	-1.6
Durable Goods Manufacturing	114,200	113,900	0.3
Wood Product Manufacturing	12,700	13,300	-4.5
Fabricated Metal	11,500	11,900	-3.4
Machinery Manufacturing	11,400	12,600	-9.5
Electronic Equipment	8,600	9,500	-9.5
Transportation Equipment	27,100	23,300	16.3
Motor Vehicle Parts	6,300	6,900	-8.7
Ship and Boat Building	15,200	13,700	10.9
Furniture and Related	28,300	27,900	1.4
Nondurable Goods Manufacturing	63,300	66,400	-4.7
Food Manufacturing	27,600	27,300	1.1
Apparel Manufacturing	5,400	5,800	-6.9
Paper Manufacturing	5,800	6,700	-13.4
Chemical Manufacturing	5,900	7,100	-16.9
Plastics and Rubber	9,200	9,300	-1.1
SERVICE PROVIDING INDUSTRIES	879,200	870,700	1.0
Trade, Transportation	217,300	217,200	0.0
Wholesale Trade	36,000	34,600	4.0
Retail Trade	137,900	137,100	0.6
Transportation, Warehousing & Utilities	43,400	45,500	-4.6
Utilities	7,700	8,000	-3.8
Information	14,600	15,400	-5.2
Telecommunications	7,900	8,200	-3.7
Financial Activities	46,600	46,600	0.0
Finance and Insurance	34,600	34,100	1.5
Real Estate, Rental and Leasing	12,000	11,600	3.4
Professional and Business Services	79,900	77,000	3.8
Educational and Health Services	116,800	114,800	1.7
Educational Services	14,100	14,500	-2.8
Health Care and Social Assistance	102,700	100,300	2.4
Hospitals	30,300	29,600	2.4

Table 1. **MISSISSIPPI EMPLOYMENT BY SECTOR** (continued)

	<u>Jan - Mar 2004</u>	<u>Jan - Mar 2003</u>	<u>Percent Change</u>
Leisure and Hospitality	121,100	120,000	0.9
Arts, Entertainment, and Recreation	12,300	12,600	-2.4
Amusement	11,300	11,600	-2.6
Accommodations and Food Services	108,800	107,400	1.3
Accommodations	36,900	36,900	0.0
Food Services	71,800	70,400	2.0
Other Services	36,100	37,500	-3.7
Total Government	246,800	242,200	1.9
Federal Government	25,600	25,700	-0.4
State Government	63,200	62,200	1.6
State Education	23,300	22,600	3.1
Local Government	158,000	154,300	2.4
Local Education	86,100	83,800	2.7

SOURCE: Mississippi Employment Security Commission, June 2003. Preliminary figures.

See footnote to Table 1.

<sup>1</sup>Residence employment estimates are based on household surveys, whereas establishment data are based on jobs reported at places of work. A person with two jobs will generally be counted twice by establishment data, but not by the household data. A person residing in Mississippi but employed outside of the state will be included in residence-based data, but not in establishment data. The self-employed are also better captured by residence-based data.

These employment figures differ significantly from the wage and salary employment figures of the U.S. Bureau of Economic Analysis (BEA), which are reported in Appendix B in this *Review* and upon which the Center's economic forecast is based. The differences are largely due to the fact that the state Employment Security Commission does not include military employment, and that it does not utilize information available to the BEA on employees not covered by the state's unemployment insurance program. Workers with the railroads, the Coast Guard, some student workers, workers for religious membership organizations, farm farm workers and private household workers, for example, may be wage and salary workers not captured by the MESC data.

durables employment in Q1 of 2004 over Q1 of 2003. Employment in nondurable goods was down 4.7%.

Within **durables**, employment in furniture is adding jobs as consumer demand for home furnishings rises in conjunction with the strong housing market. The sharp increase in transportation equipment employment was mentioned earlier. The other durable goods industries, including wood products, machinery, and fabricated metal, posted lower

employment levels than a year ago, but the trend since January has been positive.

The only **nondurables** industry to employ more persons in Q1 of 2004 than a year ago was food manufacturing. Employment levels in plastics & rubber, chemicals, paper and apparel were all down. The number of jobs in apparel continues to slide slowly, but jobs in plastics & rubber appear to be increasing in recent months.

## Confidence Wavered in Spring

Consumer anxieties related to such news as possible cuts in school budgets and the situation in Iraq contributed to a drop in consumer confidence in the first quarter. Business confidence dipped only slightly, however. Most executives surveyed thought that conditions would improve over the next six months for the state as a whole, in contrast to consumers, who did not voice much optimism for improvement.

Total Tax Commission collections this fiscal year through May were \$3.19 billion, adjusted for accelerated collections last summer, or \$154 million over the \$3.04 billion collected last year over the same period. Even with this 5.1% increase in revenues, the highest increase in five years, the squeeze on the state budget continues, due to the fiscal pressures built up during recent years.

## Regional Trends

Employment recovery in the central U.S. has been lagging that of the country as a whole, while growth along the coasts is accelerating. Nonetheless, Global Insight predicts that employment growth in the four-state South East Central (SEC) region will exceed the U.S. average over the 2003-2005 period, and that Mississippi in particular will exceed the U.S. average growth rate in 2004, though not in 2005. (The other states in the region are Alabama, Kentucky and Tennessee.) The turnaround will come as industrial production picks up, with the automobile industry having significant ripple effects in the region. The housing market in the region has also been strong, and demand will remain high as employment improves. The transportation/communications/ utilities sector will benefit as well from these positive trends.

Increasing **incomes** in the region are strengthening demand. Nationally, Q3 of 2003 was the first time in more than two years that wage and salary earnings increased in all private, nonagricultural industries. The 4.1% increase in regional per capita income in Q4 of 2003 was the second highest of the nine census divisions, although the region is

expected to slip back towards the bottom in rankings of income growth as wage and salary employment picks up.

A growth rate of 3.7% is predicted for the U.S. aggregate of gross state products (GSP) from 2004-2006, with a rate of 3.4% predicted for the South East Central region, and for Mississippi as well. Employment growth is forecast to be 1.7% for the U.S. and for the SEC region, with a 1.3% increase predicted for the state. The other southern regions are predicted to have even high growth rates of real GSP and employment on average.

By contrast, the Economic Forecasting Center of Georgia State University (GSU) is more circumspect in its predictions, with the **2004 growth rates** for its 13-state southern region expected to be about 2.4% for real GSP and 1.0% for payroll employment. Employment growth is expected to reach 1.4% in 2005. The Center's April report makes no prediction for GSP growth in 2005, but a 3.4% growth rate of real GSP would be in line with its employment forecast, however.

The Center's projected growth rate of payroll employment for Mississippi is 0.6% in 2004 and 0.7% in 2005. The growth rate of real GSP this year is projected to be 1.8%, notably lower than the Global Insight projection.

The Center's guarded forecast for the region is due to its concerns regarding **job growth**. It mentions recent high productivity growth, which has reduced the demand for labor, the outsourcing of jobs, and lagging state revenues which have hurt government spending. The GSU report worries that outsourcing policies and practices, a response to competitive pressures, pose a threat to U.S. labor, including to workers in high wage manufacturing and in service occupations.

It singles out slow sales tax collections which have been adversely affected by **e-commerce**. "E-commerce takes a large chunk out of state sales tax revenue, since online retailers are not required to collect sales taxes on behalf of states where they have no legal physical presence," notes the Center's Report.

Table 2. **ECONOMIC FORECAST FOR 2004-2006**

	2004	2005	2006
<b>Mississippi</b>			
Gross State Product (Percent Change)	3.9	4.4	4.4
Real Gross State Product (Percent Change)	2.4	2.8	2.6
Price Level (Percent Change)	1.5	1.6	1.8
Establishment Employment (Percent Change)	0.6	1.3	1.2
Unemployment Rate	5.6	5.6	5.5
Personal Income (Percent Change)	4.1	4.4	4.9
Consumer Price Level (Percent Change)	2.3	1.9	2.0
<b>United States</b>			
Gross Domestic Product (Percent Change)	6.8	5.2	5.0
Real Gross Domestic Product (Percent Change)	4.8	3.6	3.4
Price Level (Percent Change)	1.9	1.6	1.6
Establishment Employment (Percent Change)	1.0	1.9	1.6
Unemployment Rate	5.6	5.5	5.5
Personal Income (Percent Change)	5.1	5.0	5.6
Consumer Price Level (Percent Change)	2.2	1.5	1.4

SOURCE: Center for Policy Research and Planning, Mississippi Institutions of Higher Learning, May 2004. Global Insight, May 2004.

In 2003, seven out of 13 states in the region experienced negative sales tax growth. In 2002, the number was eight. The declining **sales tax revenues** force states to respond through trimming budgets, which in turn may dampen employment gains.

The forecast of the Mississippi Center for Policy Research and Planning, given below, matches the GSU employment forecast for Mississippi in 2004, but is more optimistic about the growth rate of GSP for the state based on recent **productivity** trends here. The Mississippi forecast, however, incorporates a lower growth rate of productivity than that of Global Insight for the 2004-2006 period: while the employment forecasts are similar, the growth rate of GSP is expected to be 2.7% in the Mississippi forecast, compared to the 3.4% rate predicted by Global Insight.

### State Economic Forecast for 2004-2006

The 2.4% growth rate of real gross state product forecast for 2004, while modest, is a significant improvement over the estimated growth rate of 1.2% in 2003. The increased pace is tied to the improved U.S. economy, and especially to the positive trend in U.S. industrial output. The growth rate in 2005 and 2006 will be even higher, as gains in employment add momentum. See Table 2.

**Payroll employment** in the state will grow about 0.6% this year, rising to 1.3% in 2005 and 1.2% in 2006. The unemployment

rate will fall this year as well, despite expected increases in the labor force as improved job prospects attract discouraged workers back to the labor market. An unemployment rate of 5.6% is forecast for 2004 and 2005, falling to 5.5% in 2006.

Rising **personal incomes** will accompany the tightening of the labor market. Total personal income is expected to increase 4.1% in 2004, 4.4% in 2005, and 4.9% by 2006. After this year, total wages and salaries paid will rise at an annual rate of over 4.0%, at least until 2009, although the gain in 2004 will be a moderate 3.2%. The growth rate of transfer payments will slow in 2004 and 2005 as unemployment and welfare rolls shrink.

The rate of **inflation**, as measured by the consumer price index for the South, will reach 2.3% in 2004, due largely to higher energy prices. Oil prices will begin to fall during the summer, and, by 2005, the increase in consumer prices will be down to about 1.9%. A similar rate of inflation is likely in 2006.

As Table 2 shows, the growth rates of employment and output in the state will be lower than for the U.S. as a whole. The disproportionate dependence of the state on the government and manufacturing sectors, which are adding jobs more slowly than other sectors, helps to explain the slower growth of employment here: 37% of Mississippi's workforce is employed by either the government sector (21%) or the manufacturing

sector (16%). For the U.S., the percentages are 17% in government and 11% in manufacturing, for a total of 27%. In addition, industries which require high-skilled workers are expected to be the pace-setters in the labor market as demand picks up steam. Mississippi's base in these industries is smaller, which will tend to slow the overall increase in jobs, and in personal income.

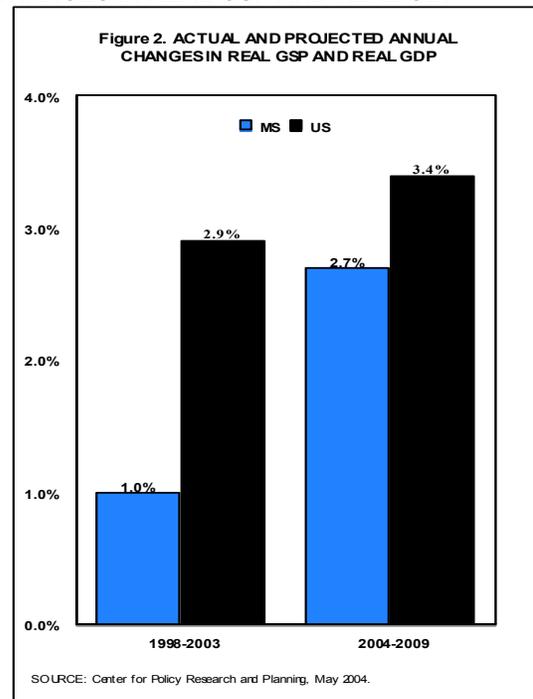
The slower growth of output here compared to the U.S. is due in part to the slower growth of employment, but the **distribution of industries** here is also important. The relatively high concentration in manufacturing has a positive impact on the state's productivity level, but the concentration in leisure and recreation, and other lower-wage industries tends to have the opposite effect. Overall, output per worker, a loose measure of productivity, is \$83,200 for the U.S., compared to \$52,700 for Mississippi, in 2000 dollars. As the five-year forecast below shows, employment gains are expected to be greatest in services and government, whose productivity levels, although they are rising, remain below the state average. Thus, the productivity gap with the U.S. is expected to continue, and may even widen.

### Five-Year Trends

The gap between the growth rates of the U.S. and Mississippi economies is forecast to narrow over the 2004-2009 period. As the recovery takes hold in the state, the growth rate of GSP will more than double, rising from an average annual rate of 1.0% over the 1998-2003 period to 2.7% over the coming five years. See Figure 2. The improvement in employment will be just as dramatic, increasing from an average annual drop of 0.3% to an average annual rise of 1.1%, as shown in Figure 3.

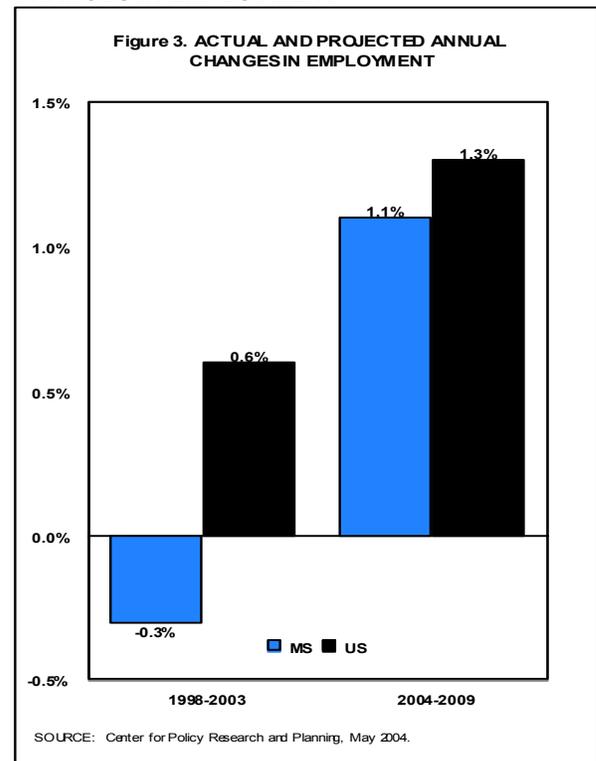
While the U.S. will also experience more rapid growth of output and employment over the coming period, the change will not be as marked. The recession had a greater impact on Mississippi than on the rest of the nation because of the state's heavy reliance on manufacturing and lower-skill manufacturing in particular. The return of the state to its

**Figure 2. ACTUAL AND PROJECTED ANNUAL CHANGES IN REAL GSP AND REAL GDP**



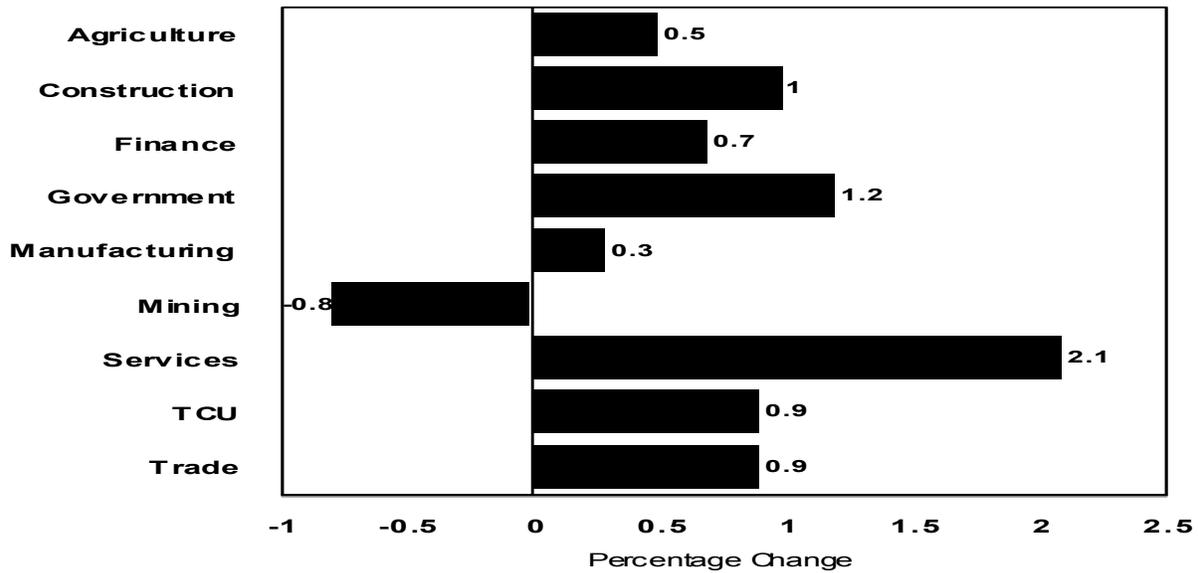
SOURCE: Center for Policy Research and Planning, May 2004.

**Figure 3. ACTUAL AND PROJECTED ANNUAL CHANGES IN EMPLOYMENT**



SOURCE: Center for Policy Research and Planning, May 2004.

**Figure 4. MISSISSIPPI EMPLOYMENT PROJECTIONS  
AVERAGE ANNUAL GROWTH RATES 2004-2009**



SOURCE: Center for Policy Research and Planning, May 2004.

long-run growth path constitutes a steep climb, even though this growth rate lies somewhat below the nation's.

Trends in **individual sectors** in the state are indicated in Figure 4, which shows the average annual growth of rates of employment by sector. The outlook for manufacturing and mining has improved slightly since the December forecast, while recent numbers on trade and on transportation/communications/utilities (TCU) have resulted in a slight drop in the growth rates forecast for those sectors.

When the growth rates of employment by sector predicted for the state are compared to those forecast for the U.S., there is a striking difference in the growth rates of **construction employment**. During the 1990s, this sector was booming in Mississippi: from 1995-2000, jobs in construction grew at an average annual rate of 4.2%. The number of persons employed in construction in the state peaked in 1999, fell slightly in 2000, and dropped sharply in 2001 and 2003 with a brief recovery in 2002. So far in 2004, employment is again down.

Residential building appears to be strong, however, based on trends in permits.

The drop in construction employment in the first half of 2004 is likely linked to the slowdown of construction by the **gaming and hospitality** industries. This slowdown, along with the squeeze on public sector construction due to the tight state budget, accounts for the lower growth rates forecast for the coming five years. Overall, however, a positive increase in construction employment averaging 1.0% annually is expected. This growth will bring the state near, if somewhat below, the historical high of 1999. The growth rate forecast for the U.S., however, is a stronger 2.1%.

*Written by Marianne Hill, with input from members of the Center for Policy Research and Planning.*

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## HIGHLIGHTS FROM RECENT NEWS ON MISSISSIPPI'S ECONOMY

See the website of the Mississippi Development Authority, [www.mississippi.org](http://www.mississippi.org), for more information about recent economic developments in the state, or contact Scott Hamilton, Communications Division, at 359-3041.

### New Businesses and Expanded Facilities

Investments in new and expanded facilities of **\$650 million** have been announced for the January through April period of 2004. Although this amount represents about half the total for the same period in 2003, the number of facilities and the estimated number of new jobs are both greater. This year, the facilities announced are expected to provide 3,195 jobs – a 36% increase compared to last year's total for the same period.



The two largest investments, at \$70 million and \$65.6 million, will be in **shopping centers**, namely, Lakeland Commons and Dogwood Promenade, both in Rankin County. The largest manufacturing investments announced were a \$50.8 million plant for Trex Company, DeSoto County, which will produce plastic products, and a \$38 million facility for EI Dupont DeNemours & Co., Harrison County, which will produce inorganic pigments.

The **top jobs creator** among the investments listed was the \$35 million facility that Textron Fastening System will construct in Washington County. It is expected to provide 500 jobs. Other investments include \$18 million by Rolls Royce Naval Marine, in Jackson County, and \$9.5 million by Biodiesel of Mississippi, in Quitman County.

### Mississippi Moves

The Atlanta Braves will move its **Double-A franchise** to Pearl, Mississippi, beginning with the 2005 season. The team will be known as the “Mississippi Braves”. The Atlanta Braves has been Major League Baseball’s “winningest” franchise since 1991, earning a record 12 consecutive



division championships, five National League pennants, and a World Series title. The Braves are a division of Turner Broadcasting System, Inc.

VT Halter Marine Inc., a subsidiary of Vision Technologies Systems Inc., will relocate its **corporate office** to its Pascagoula Operations location in Jackson County as of July 1, moving from Gulfport. The company currently owns six shipyards in Mississippi, two of which are fully operational. The firm is a leader in the design and construction of small- to medium-sized ships in the U.S., including patrol vessels, oil recovery vessels, ferries, logistic support vessels and research ships.



The U.S. Department of Energy’s Million Solar Roof Initiative is moving the country towards greater use of solar energy. The Initiative will finance the installation of 500 **solar technology systems** in Mississippi, along with required training. The Energy Division of the Mississippi Development Authority is overseeing the initiative in the state. The Town of Coahoma received the first award of funds, \$18,300, to install two thermo siphon passive systems in the town’s administrative and dormitory buildings.



### Mississippi and the Nation

Three cities in Mississippi are home to **Top Twenty-Five** U.S. business projects, according to the May edition of *Plants Sites and Parks*. The cities and projects are: 1. Olive Branch, where FedEx Ground has decided to build a package distribution hub as part of its \$1.8 billion plan to build nine hubs. The expected number of jobs is 385. 2. Gulfport,



which will be home to two new facilities for Future Pipe Industries, which will employ 300 workers. The first phase of the three-stage project involves a \$15 million investment. 3. Cleveland. The French automotive supplier Faurecia will open a manufacturing facility to assemble seat frames. The plant will employ 250 persons by mid-2005.

The Defense Energy Support Center, Missile Fuels Division, Lackland AFD, San Antonio has awarded **SpaceChem LLC** a 20-year contract



with an estimated value of \$89 million to produce hydrazine (rocket fuel) and perform related services. The facility, which will be constructed for this job, will take three years to build, and will be located in Iuka, Tishomingo County.

Readers of the *Toronto Sun* voted Mississippi the “Favorite Travel Destination of the Year” in the paper’s third annual Golfers’ Choice Awards competition. The new **Magnolia Golf Trail** contributed to the state’s win. Readers also cited the state’s other attractions and its weather.

## **SUSTAINABLE DEVELOPMENT: MISSISSIPPI AND THE ENVIRONMENT**

*Marianne Hill*

The protection of natural resources vital to the state's future is a basic issue in long-range economic development planning. Two key questions confront policymakers planning for future resource needs: 1 -- which resources will be needed, exactly? and 2 -- how can those resources best be protected?

These questions are not easily answered. Natural resources that will be required in the future include water, land and minerals, of course, but there is increasing awareness that, at an even more basic level, protection of the critical biological systems that sustain life (termed ecosystems) are required for the state economy to be vibrant and dynamic well into the next century.<sup>1</sup> Planning and intervention are required since the goods and services provided by the environment are freely available, while the costs of environmental damage are typically not borne by those producing it.

However, while there is agreement that healthy ecosystems are desirable, there is little agreement on what this means or how this can be assured. Striking differences of opinion are common when environmental questions are raised. What may be a beautiful site for an intact wilderness park to one person may be the perfect location for a shopping mall to another. How can such differences of opinion be resolved?

A starting point for making decisions regarding the use of natural resources is the premise that economic development should be sustainable. Sustainable development is defined as "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs".<sup>2</sup> There is general consensus that this is a basic goal.

What does sustainability entail? It is clear that there is a close connection between economic development and the environment. At one level, the production of goods and services requires the input of natural resources, such as water and fuels. If those resources become scarce or unavailable, production will suffer. Although new inputs, different techniques of production, and even new products may reduce the need for particular resources, some resources, such as water, will remain irreplaceable.

Some industries, such as agriculture and fisheries, make greater demands on the

environment than others. Agriculture requires fertile soil, the adequate amounts of water and light, a proper balance within the insect population, means of controlling diseases and pests that do not adversely affect human consumption, and more. Outdoor recreations, from hunting to bird-watching, make other demands of the environment. Many activities from fishing through gardening to biogenetics depend on the preservation of native animal and plant species. Both rural and urban populations, along with industry and agriculture, depend on the quality and quantity of water bodies, from the Pearl River to reservoirs, and on the quality of the air.

For most persons, sustainability also includes the preservation of special places: the quality of life of future generations will certainly be enhanced if scenic areas, such as Ship Island, and habitat for wildlife including the black bear, fireflies and the Gulf sturgeon, are protected. Sustainability of economic activity into the future requires that all these demands on the environment can continue to be met. And, most basically, the quality of air and water must be maintained for the health and well-being of both human and nonhuman inhabitants.

Beyond what takes place in Mississippi, the overall quality of water, air and land here is linked to global trends. Short



Table 1. **MISSISSIPPI'S RANKINGS IN SEVERAL POLLUTION INDICATORS**  
 (Data for 2001 unless otherwise indicated)

	<u>Rank (50 is cleanest/best)</u>
TRI chemicals released to the environment <sup>1</sup> (69.2 million lbs.)	23
Health risks from hazardous air pollutants (HAP) <sup>2</sup>	
Average individual's added cancer risk (.32 per 1,000 persons)	41
Noncancer cumulative hazard index	38
Health risks from criteria air pollutants <sup>3</sup>	
Person-days in exceedance of NAAQS <sup>4</sup>	36
Number of superfund sites (5)	46
Percent of housing units with high risk of lead hazards (2%)	28
Total animal waste (12 million tons, 1997)	30

<sup>1</sup>TRI = Toxic Release Inventory. The Toxics Release Inventory (TRI) collects information about chemical releases and waste management reported by major industrial facilities in the U.S. The TRI database was established by Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986. Under EPCRA, industrial facilities in specific sectors are required to report their environmental releases and waste management practices annually to the Environmental Protection Agency. Covered facilities must disclose their releases of approximately 650 toxic chemicals to air, water, and land, as well as the quantities of chemicals they recycle, treat, burn, or otherwise dispose of on-site and off-site.

<sup>2</sup>The noncancer cumulative index value (1.4 for Mississippi) represents the sum, over all HAPs of the index value of each HAP. A value of 0.9 for one HAP would indicate, for example, that the concentration of that HAP was at 90% of the (presumably safe) reference concentration.

<sup>3</sup>The six criteria air pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide.

<sup>4</sup>National Ambient Air Quality Standard.

SOURCE: Environmental Defense Funds Scorecard Data, which are derived largely from EPA public data release. See Pollution Rankings at [www.scorecard.org](http://www.scorecard.org).

articles on pressures on global ecosystems, climate change and disappearing species accompany this article. These global trends affect the quality of shared resources, and also impact the political context in which state policy is formulated.

### Mississippi and the Environment

Economic development is, at its heart, about raising the quality of life. While jobs and income are the major focus of economic development efforts, the reality is that the environment is critical to our quality of life. The air and water in Mississippi are cleaner

than in many places, but still, our environmental resources require protection or carefully planned use; and several animal and bird species are at risk. An overview of data from the U.S. Environmental Protection Agency (EPA), the Mississippi Department of Environmental Quality (DEQ) and other sources follows.

It should be kept in mind that attempts to measure the health of the environment are in many ways in their infancy, both here and elsewhere. The data that are available can be characterized as scattered and incomplete. However, much

solid and useful information does exist that can aid in the crafting of policies to protect the ecosystems of the state, which in turn will provide the base for long-term sustainable improvements in the quality of life.

### State Environmental Quality – National Rankings

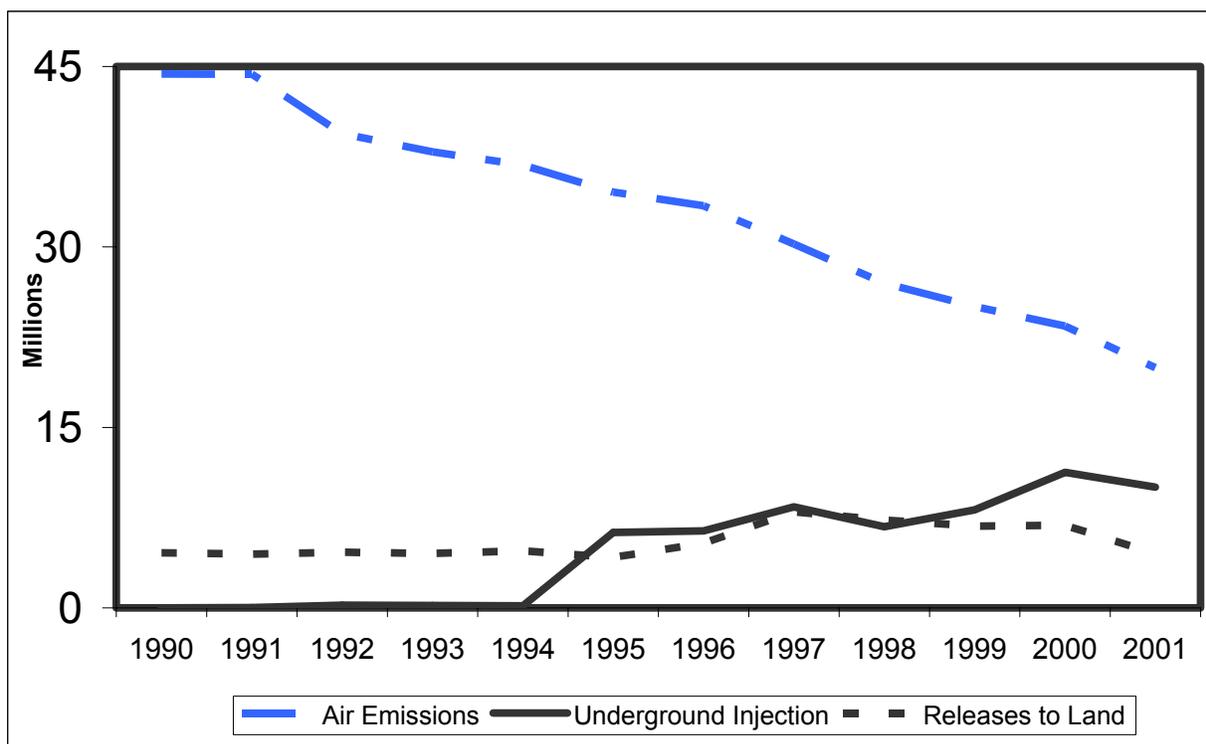
Mississippi ranks better than most states in the indicators of environmental quality shown in Table 1. Where a rank of 50th is best, Mississippi ranks 41st in added cancer risk from air pollutants, 46th in the number of Superfund sites, and 28th in the percent of housing with high risk of lead hazards.<sup>3</sup> The state doesn't fare as well in terms of toxic chemicals released to the environment, where it stands 23rd.<sup>4</sup>



The EPA maintains a Toxic Release Inventory (TRI) database of chemical releases that industrial facilities in certain sectors are required to report. There are about 650 toxic chemicals on this list, but the list changes. To show trends over time, the same chemicals need to be considered and the 1988 list is used for this. Since there are hundreds of chemicals being tested and new ones being developed, data are limited in their ability to capture the extent of the problem. In any case, the overall release of TRI chemicals on the 1988 list has been trending downwards in Mississippi, as shown in Figure 1.

Total TRI releases in 2001 in Mississippi for all chemicals were 69.2 million lbs., or about 33 million lbs. greater than the total for the 1988 list alone. The drop in 1988 TRI chemicals, in any case, is

Figure 1. ON-SITE AND OFF-SITE REPORTED RELEASES OF TOXIC CHEMICALS BY MANUFACTURING FACILITIES IN MISSISSIPPI AS REPORTED TO THE EPA, 1990-2001



SOURCE: EPA TRI database at [www.epa.gov/triexplorer](http://www.epa.gov/triexplorer). See text.

Table 2. EPA WATER QUALITY INDICATORS, MISSISSIPPI AND U.S.

EPA Indicator	Current water quality conditions Percent of watersheds							
	More Serious		Less Serious		Better		Insufficient Data	
	MS	US	MS	US	MS	US	MS	US
	MS	US	MS	US	MS	US	MS	US
Overall Assessed Use Attainment	48	39	48	22	4	21	0	18
Fish and Wildlife Consumption Advisories	18	30	16	12	5	4	61	55
Source of Drinking Water	0	11	5	16	29	30	66	42
Contaminated Sediments	2	2	5	3	73	59	20	36
Ambient Water Quality: Four Toxic Pollutants	0	0	21	9	34	27	45	63
Ambient Water Quality: Four Conventional Pollutants	14	14	46	27	9	23	30	36
Wetlands Loss Index	5	22	95	72	0	1	0	5

Percentages may not add to 100 due to rounding.

NOTE: Although Mississippi is listed as having 0 insufficient data in two categories, in fact that percentage should be higher, which would affect the numbers shown.

**Assessed Use Attainment:** States and tribes adopt water quality standards that designate the uses of a waterbody and specify criteria to protect those uses. Typical uses of a water resource include drinking water supply, aquatic life use support, fish and shellfish consumption, primary and secondary contact recreation (e.g., swimming and boating), and agriculture. Biannually, states and tribes are required to report to EPA whether their water resources fully support, partially support, or fail to support their designated uses.

For MS, it should be noted that most of the information used in this tabulation was not based on monitoring data. DEQ relied heavily on evaluated assessments using land use survey information for the 1998 WQI assessment. DEQ has since monitored most of these

waters and will be providing the results of this information in its 2004 water quality assessment report.

**Fish and Wildlife Consumption Advisories:** Fish consumption advisories are a good indicator of the condition of a watershed because they are issued when the concentration of toxic substances in fish and shellfish exceed safe levels.

**Source of Drinking Water:** The condition of watersheds effects their suitability as a source for drinking water. The EPA uses the Safe Drinking Water Information System (SDWIS) to identify situations where water systems have taken or may take actions because of actual or threatened source water problems.

**Contaminated Sediments:** Certain chemicals in water tend to bind to particles and collect in bottom sediments. When present at elevated levels in sediments, chemicals can kill or harm bottom dwelling organisms. Pollutants in sediments can also accumulate in aquatic organisms and move up the food chain to fish, shellfish and eventually humans.

**Ambient Water Quality: Four Toxic Pollutants:** This indicator describes the degree to which monitoring of ambient concentrations of selected toxic pollutants (copper, nickel, zinc, and hexavalent chromium) show exceedances of national ambient water quality criteria. (Note that state water quality standards may differ from these EPA criteria.) The Mississippi assessment was based on only a few samples collected and analyzed using screening techniques.

**Ambient Water Quality: Four Conventional Pollutants:** This indicator describes the degree to which monitoring of ambient concentrations of selected conventional pollutants (ammonia, phosphorus, ph, and dissolved oxygen) show exceedances of national reference levels developed by EPA. At this time, Mississippi does not have water quality standards for ammonia and phosphorus.

**Wetlands Loss Index:** Wetlands make important contributions to the health of aquatic systems by purifying water, filtering runoff, abating floods, and decreasing erosion. In addition, wetlands provide habitat for countless numbers of plants and animals (including over 40% of all federally listed threatened or endangered species). Many are combined with historic loss rates to form an index. The combined index is a more robust indicator of watershed condition than either loss rate used independently.

SOURCE: The data used are based on the EPA's Index of Watershed Indicators, which utilizes 1990-99 data, recent available. EPA data presented can be found at [www.scorecard.org](http://www.scorecard.org) under watershed indicators. The definitions are from [www.scorecard.org/env-releases/def/iwi\\_wqi.html](http://www.scorecard.org/env-releases/def/iwi_wqi.html).

welcome news. The upward trend in underground injection, on the other hand, raises some concerns. Where water-soluble chemicals are involved, such injections may only be delaying contamination of water supplies: it can take a generation or more for water-soluble chemicals to percolate through the soil and reach aquifers (Brown (2001):114).



When the data on TRI chemicals is broken down further, for example in terms of the risks from specific chemicals or by individual counties, the state's rankings can be dramatically different. For example, in 2000, Lee County reported more recognized carcinogens released to the air than any other U.S. county (the situation has since improved).<sup>5</sup> And, in 2001, Mississippi reported more releases of dioxin and dioxin-like compounds than any other state (all but seven states reported less than 2 pounds released - Mississippi reported 41 pounds).<sup>6</sup>

### 'PBT' Chemicals

While all TRI chemicals are considered toxic, the release of dioxin-like compounds is of particular concern since dioxins belong to a class of chemicals designated by the EPA as "persistent, bioaccumulative and toxic" (PBT). PBT chemicals are not only toxic but also remain in the environment for long periods of time, are not readily destroyed, and build up or accumulate in body tissue.<sup>7</sup> Dioxin and dioxin-like compounds are one of four such compounds on the EPA list, and the one with the lowest reporting threshold -- releases over 0.1 grams (1/28 of an ounce) of dioxin-like compounds must be reported. The other three compounds are lead compounds, mercury compounds and polycyclic aromatic compounds. (Dioxin, in the form TCDD, was the major carcinogen of concern in Agent Orange, the defoliant widely used by U.S. military forces in Vietnam.)

Mercury is another very common PBT chemical - fish consumption advisories in



Mississippi are often due to the presence of mercury. Mercury is a by-product of coal-fired electrical utilities, which are the largest single source of mercury emissions to the air, accounting for about 40% of mercury from human activities. Mercury becomes a hazard to humans and wildlife when it enters water through atmospheric deposition, where biological processes transform it into a highly toxic form that builds up in fish and animals that eat fish. An estimated two-thirds of mercury released to the air reaches the global atmosphere, where it remains from an estimated 1.1 to 1.4 years (Slemr, 1996).<sup>8</sup> Only about one-third of mercury emissions released in or near the state fall within the region.

In Mississippi, high mercury levels in fish are the primary reason behind advisories warning against the consumption of too much fish from several rivers and creeks. The DEQ provides a listing of its current fish tissue advisories and commercial fishing bans at its website. Ten of the 12 water bodies having consumption advisories are listed due to findings of mercury. Fishing is banned in two other areas due to DDT, toxaphene or PCBs. (The consumption advisories warn consumers not to eat more than a certain amount of certain fish, e.g. children under the age of seven should eat no more than one meal of large catfish from the Bogue Chitto River every two months.) According to the Center for Disease Control, levels of mercury in the human body have now reached the point where an estimated one out of six women of childbearing age in the U.S. has levels of mercury in her blood that are not considered safe for a fetus.<sup>9</sup>



### State Water Resources

The EPA nationally, and the DEQ in the state, track data related to water quality and watershed vulnerability to a variety of problems. As shown in Table 2, for most water bodies in the state and in the U.S., water quality is not adequate for its assessed use,

Wetlands occupy more than 13% of Mississippi. Bottom-land forests, swamps and freshwater marshes account for most of Mississippi's wetland acreage; coastal marshes also are extensive. These wetlands are a key part of the Lower Mississippi Valley Joint Venture program of the USGS for the restoration of Mississippi Flyway waterfowl populations. Wetlands continue to be a source of timber. The Natural Heritage Program of the U.S. Geological Survey identifies and inventories priority wetlands. See the following internet site: <http://wetlands.fws.gov>.

Wetlands have received greater attention in recent years as understanding of their functions has increased. Wetlands improve water quality, store water and so provide protection against flooding, and provide fish, plant and wildlife habitat. An acre of wetland can store 1-15 million gallons of floodwater. Up to one-half of North American bird species nest or feed in wetlands, and wetlands are home to 31% of U.S. plant species, although they occupy only about 5% of the continental U.S. land surface minus Alaska. They are among the most biologically productive natural ecosystems.

based on the most recent data available (1990-1999). Standards vary for different water uses within each state.<sup>10</sup> While Mississippi had a better showing than the U.S. as a whole in two areas – namely, a lower percentage of water bodies with more serious consumption advisories and a lower percentage of drinking water sources with serious problems – it did worse than the U.S. average in two other areas: 21% of assessed watersheds were reported to have a level of toxic pollutants exceeding national quality standards, and 60% were reported to have levels of conventional pollutants above national reference levels. Both of these percentages, however, are based on very limited monitoring data. In fact, 1998 much of the water quality information submitted to EPA by Mississippi was information taken from questionnaires that indicated suspected pollution and was not based on actual monitoring data.

Since 1998, however, stream quality data are available from significant monitoring conducted by DEQ. These data indicate that about 41% of the state's monitored streams

(about 500 major streams in the state's 11-digit watersheds set by the Natural Resources Conservation Service) meet state water quality standards. Another 17% often meet state water quality standards; while 42% do not routinely meet water quality standards.



The wetlands loss index for the state showed serious problems in all watersheds, a condition prevailing in 94% of the country's watersheds as well (another 5% of watersheds lacked sufficient data).<sup>11</sup> A worsening condition of wetlands indicates likely impairment of their ability to purify water, filter runoff, store water and abate floods, decrease erosion and provide habitat.

The watershed vulnerability indicators in Table 3 measure both actual and potential problems, based again on 1990-1999 data. The fact that most of Mississippi's watersheds contain aquatic or wetlands species at risk can be seen as an indication that areas of high water quality exist throughout the state. As the Environmental Defense Fund notes, many species persist only in areas of

Table 3. EPA WATERSHED VULNERABILITY INDICATORS, MISSISSIPPI AND U.S.

EPA Indicator	Future vulnerability Percent of watersheds:							
	High		Moderate		Low		Insufficient Data	
	MS	US	MS	US	MS	US	MS	US
Aquatic/Wetland Species at Risk	45	19	38	33	14	19	4	29
Pollutant Loads Discharged Above Permitted Limits: Toxics	5	2	5	2	82	50	7	46
Pollutant Loads Discharged Above Permitted Limits: Conventional	4	1	0	0	91	60	5	39
Urban Runoff Potential	4	5	11	10	84	73	2	13
Agricultural Runoff Potential	59	23	41	47	0	23	0	7
Population Change	18	29	27	14	55	54	0	3
Hydrologic Modification	9	21	59	43	32	23	0	15
Estuarine Pollution Susceptibility	0	3	7	4	2	0	91	93
Atmospheric Deposition	0	7	98	34	2	51	0	7

NOTE: Although Mississippi is listed as having "insufficient data" in very few categories, relative to the U.S., these percentages should be higher, which would affect the numbers shown.

**Aquatic/Wetland Species at Risk:** This indicator provides information about the presence of species at risk in a given watershed. This indicator represents the number of aquatic or wetland-dependent species documented in a watershed that are classified by the Heritage Network as critically imperiled (identified by TNC as G1), imperiled (G2), or vulnerable (G3), or that are listed under the federal Endangered Species Act (ESA) as threatened or endangered. The presence of rare or endangered species in a watershed is not necessarily an indication of poor watershed conditions. Indeed, it more likely indicates the opposite: in many instances these species persist only in areas of exceptionally high quality habitat. The presence of species at risk in a watershed indicates, however, that these watersheds are especially vulnerable to future water quality or habitat degradation, which could jeopardize the maintenance or recovery of these organisms.

**Pollutant Loads Discharged Above Permitted Limits: Toxics:** The Clean Water Act requires that EPA or states set permit limits on the amount of pollutants that facilities such as sewage treatment or industrial plants may discharge into a water body. Effluent limits established under the National Pollutant Discharge Elimination System (NPDES) are set according to national technology-based standards. This indicator adds up the total amount of toxic pollutants allowed to be discharged through NPDES permits into each watershed, and compares this to the total amount of pollutants actually discharged. Watersheds with pollutant loads greater than the total permit limits of all facilities are considered vulnerable to future declines in aquatic health. Such toxic pollutants include cadmium, copper, lead, and mercury.

**Pollutant Loads Discharged Above Permitted Limits: Conventional:** This indicator adds up the total amount of conventional pollutants allowed to be discharged through NPDES permits into each watershed, and compares this to the total amount of pollutants actually discharged. Watersheds with pollutant loads greater than the total permit limits of all facilities are considered vulnerable to future declines in aquatic health. Conventional pollutants include biochemical oxygen demand, total suspended solids, and nutrients.

**Urban Runoff Potential:** This indicator estimates the potential magnitude of runoff from urban areas. Regional rainfall characteristics are combined with measures of urbanization and imperviousness (lack of penetrability of surface). Studies have linked the amount of imperviousness to changes in the hydrology, habitat structure, water quality and biodiversity of aquatic ecosystems. (Research on permeable roads and roadbeds is being done.)

**Agricultural Runoff Potential:** A composite index was constructed to show which watersheds had the greatest potential for possible water quality problems from combinations of pesticides, nitrogen, and sediment. Watersheds with the highest composite score have a greater risk of water quality impairment from agricultural sources.

**Population Change:** The growth of human populations can result in increased pollution of our waters as land cover and land uses change. These changes include construction impacts, increased impervious surfaces, loss of wetlands, and increased sewage flows.

Table 3. **EPA WATERSHED VULNERABILITY INDICATORS, MISSISSIPPI AND U.S.**  
(Continued)

**Hydrologic Modification:** The health of the aquatic system in a watershed can be compromised by extensive impoundment or hydrologic modification of water resources. This index shows the relative dam storage capacities in watersheds, which provides a picture of the relative degree of modification of hydrologic conditions in a watershed. The index is constructed from a Federal Emergency Management Agency database which inventories U.S. dams. It contains information on 75,187 dams throughout the U.S. and its territories.

**Estuarine Pollution Susceptibility:** This measures an estuary's susceptibility to pollution based on its physical characteristics and its propensity to concentrate pollutants. The National Oceanic and Atmospheric Administration (NOAA) developed the Coastal Assessment Framework (CAF), which identifies all watersheds associated with the coast. NOAA quantified susceptibility to pollution by combining information about dissolved concentration potential and particle retention efficiency with estimated loadings and predicted concentrations of nitrogen and phosphorus.

**Atmospheric Deposition:** This measures the atmosphere loading of nitrogen compounds onto a watershed, which can result in acidification or nutrient imbalances. The information is derived from the National Atmospheric Deposition Program.

SOURCE: The data used are based on the EPA's Index of Watershed Indicators, which utilizes 1990-99 data, the most recent available, EPA data presented can be found at [www.scorecard.org](http://www.scorecard.org) under watershed indicators. The definitions are from [www.scorecard.org/env-releases/def/iwi\\_wqi.html](http://www.scorecard.org/env-releases/def/iwi_wqi.html).

exceptionally high quality habitat. The high vulnerability ratings (83% of the state's assessed watersheds contain species at risk), however, mean that several species in the state face the threat of extinction. The accumulation of sediment significantly reduces the habitat necessary to sustain a diverse ecosystem. In addition, excessive nutrients in agricultural runoff, under the right environmental conditions, may result in depressed levels of oxygen either short- or long-term. A region in the Gulf of Mexico near the mouth of the Mississippi River is currently suffering from anoxia, or a lack of oxygen needed for survival of fish and other aquatic life, due to agricultural run-off. Mississippi, as one of the states whose watersheds drain into the river, is one of many contributors to this problem.<sup>12</sup>

The percentage of watersheds dealing with pollutant discharges above permitted levels is low, as in the rest of the nation, and urban runoff potential is low for 84% of the state's watersheds. There were, however, discharges of pollutants into water above the limits in several cases.



Hydrologic modifications via dams affected 68% of Mississippi watersheds, a condition which often adversely affects the health of an aquatic system.<sup>13</sup>

The discharges and runoffs noted above affect beaches. There were 17 beach closings in the state in 2003, most frequently due to high bacteria levels from undetermined sources and from some identified sources such as sewage spills and one ruptured sewage main.

One surprising number in Table 3 is that for atmospheric deposition. Atmospheric deposition refers to the presence in precipitation of chemicals and particles that result largely from human activities. Acid rain prompted global monitoring of the atmosphere decades ago, and mercury and nitrogen compounds are now monitored as well. Based on data gathered in the Mississippi cities of Clinton, Newton and Coffeerville for the National Atmospheric Deposition Program (NADP), the content of monitored substances in the precipitation in the state puts at risk 98% of the 56 watersheds in the state. (The NADP tracks



precipitation for hydrogen (acidity as pH), sulfate, nitrate, ammonium, chloride, and base cations -- such as calcium, magnesium, potassium and sodium -- and under a separate program, mercury.) The comparable percentage of watersheds in the U.S. that were affected by atmospheric depositions was 41%, with much of the difference apparently due to the mineral content of soils in the West, which can neutralize much acidity.<sup>14</sup>

The NADP also keeps data on mercury (another by-product of coal burning power plants) in precipitation. The 2002 map of the U.S., presented in its annual report, shows that the state is in the lower mid-range in the content of mercury in precipitation, but in the higher part of the range for total wet deposition, that is, the total mercury deposited through precipitation, as measured by the one station in the southern part of the state (a level of 15.1 was reported, compared to a

maximum value of 16+ for total wet deposition). The relatively high level of annual rainfall here (almost twice the U.S. average) helps to account for the high level of total wet deposition, despite the lower concentration.

### **Other Water-Related Issues**

The extraction of water from deep aquifers in the state has been exceeding the rate at which this water is replaced. Withdrawals from state groundwater, surface freshwater and surface saline water sources have grown rapidly in recent decades. Total withdrawals in 1990 were estimated to be 20% higher than in 1985 by the U.S. Geological Survey (Open-File Report 93-375:8), and water usage continues to increase.<sup>15</sup>

Currently, over 93% of the drinking water supply in the state is derived from groundwater resources, a major advantage for the state that is made possible by the

“Mississippi is leading not only the U.S. but the entire world” in using plants to solve wastewater treatment problems. “Aquatic plants systems, known as constructed wetlands, are being used across the state to purify wastewater from municipalities and individual homes. In fact, Mississippi may have more individual home and municipal treatment systems of this kind than the rest of the country put together.” reports the *Mississippi Native Plant Quarterly*. They cost less than half as much as conventional mechanical treatment systems, and are far more energy efficient.

There are more than 150 such treatment systems in the U.S., and Mississippi is a leading role in this area is due in large part to the influence of Dr. Bill Wolverton, formerly with the Stennis Space Center here. Wolverton developed these treatment systems as an outcome of his work on the problem of recycling polluted water in future space colonies. Union, MS, is one city where the constructed wetland alternative has proved a boon, saving the city an estimated \$110,000 per year, as well as an estimated \$750,000 in initial construction costs. More information is available from the Southeast Mississippi Resource Conservation and Development Area in Hattiesburg.

SOURCE: Becky Gillette, “The New Green Revolution”, in *Mississippi Native Plant Quarterly*, October 1993.

extensive groundwater resources available here. In most other states, surface water is the usual source of drinking water.

However, as aquifers are drawn down, it becomes necessary to drill more, often deeper, wells to extract the same quantity of water, thus increasing the cost of water. Water shortages have already occurred for the users of surface water: in the late 1990s, when droughts occurred two years in row, a few firms in the state were on brink of being forced to shut down operations until the water shortage eased. In fact, the DEQ has issued cease and desist orders to surface water permit holders on several occasions. Increased conservation of water is a possible solution to this emerging problem, as is the construction of more reservoirs to increase the amount of surface water available. Some



experts warn that a significant increase in surface water will be needed within 30 years at the present rate of growth of groundwater use. Mississippi's high annual rainfall makes increased use of surface water an attractive alternative to some.

A 1997 Mississippi statute calls for the development of a comprehensive state water management plan by the DEQ, along with detailed studies of several water-related issues. According to the DEQ (FY2002 Annual Report), progress has been made in characterizing and quantifying the existing groundwater resources of the state. The DEQ is monitoring aquifers throughout the state for developing problems, and recognizes that the development of other sources for industrial and irrigation water supply in certain areas of Mississippi may be required.

### Endangered Species in the State

The U.S. Fish and Wildlife Service (FWS) of the Department of the Interior maintains the federal list of animals and plants in each state that are considered "threatened and endangered" in its "Threatened and Endangered Species system" or TESS. The Mississippi Museum of Natural

Science maintains the state list of endangered species at its website. The state's list includes 76 animals, including 15 freshwater fish, 5 amphibians, 14 reptiles, 12 birds, and 5 mammals (exclusive of whales and dolphins) as well as 23 freshwater mussels, one crayfish and one insect. Forty-three federally listed threatened and endangered species occurring, or formerly occurring, in Mississippi are included on the state list.



An endangered species is one that is in danger of extinction throughout all or a large portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future. The leatherback sea turtle, the Mississippi sandhill crane and the red-cockaded woodpecker are among the endangered species, shown in Table 4, while the Louisiana black bear, the Gulf sturgeon and the bald eagle are threatened. Loss of habitat due to human activities is the major culprit. Information is available on each species at the FWS website. The customized protections available to some of these species are also described there, as section 4(d) rules.

The Mississippi Department of Wildlife, Fisheries and Parks keeps track of nonthreatened as well as threatened wildlife populations in the state. The numbers show a mixed picture: some wildlife, such as turkeys and deer, are doing well in some parts of the state, while habitat loss threatens wildlife in other areas. Quail populations, here and in Louisiana, have been hard-hit over the past 25 years, with their numbers dropping 90%. There has been a decrease in ducks in the South Delta region compared to the long-term average.



### The Environment and the Economy: The Challenge

Economic analysts point out that the market alone cannot assure adequate protection of shared environmental resources. The benefits provided by the environment are provided free of charge. But the cost of

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Table 4. **PARTIAL LISTING OF ENDANGERED AND THREATENED SPECIES  
IN MISSISSIPPI (Federal List)**

T	Louisiana black bear
E	Mississippi sandhill crane
T	Bald eagle
E	Leatherback sea turtle
T	Gulf sturgeon
T	Ringed map turtle
E	Humpback whale
E	Red-cockaded woodpecker
E	Pondberry (one of four plants)

E = endangered ( a higher level of threat than threatened)

T = threatened

SOURCE: U. S. Wildlife and Fisheries. See <http://endangered.fws.gov> for federal list. For full state listing, along with more recent additions to federallist, see [www.mdwfp.com/museum/html/research](http://www.mdwfp.com/museum/html/research). Go to downloads.

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preventing or remedying environmental damage, and of treating the health effects of pollution, is borne by individuals, governments and firms. Typically, producers do not incur the environmental costs arising from their production activities. Intervention is needed to balance the costs versus the benefits of activities that affect the environment. And it is critical that the cost-benefit analysis that is done brings to bear the best scientific information available. This is particularly important when the damage will accumulate over time and become irreversible.

The challenge facing Mississippi is that facing the rest of the nation: how to generate economic growth and attain a higher quality of life in a way that is economically and environmentally sound. A century ago, crop rotation and the use of fertilizers were innovations introduced in response to erosion and soil depletion, the environmental problems of the time. Today, new practices and technologies are needed to prevent the over-stressing of ecosystems.

### **Mississippi and Environmental Policy Questions**

As part of the world community, Mississippi is affected by, and contributes to,

global environmental trends. As pointed out above, a considerable part of the mercury found in precipitation here may originate from other continents. On the other hand, as an industrialized power, the state is adding to the concentrations in the air of pollutants and gases such as carbon dioxide, which are affecting the planet's atmosphere.

As part of the U.S., Mississippi has a voice in the national response to global environmental concerns, and will be part of any international accord the U.S. signs. The state also sets its own environmental agenda. This article has focused on air quality, water quality and endangered species. There are other environmental issues, as well, all of which will increasingly require the attention of policymakers and the public. University research centers across the state and across the nation have a vital role to play in informing these policy debates, as do educators and the media. As nations react to environmental stresses, new opportunities, involving millions of new jobs, will open up in the development and use of alternative energies, in biodegradable chemicals and products, in recycling of materials, and in the



development and implementation of processes and products that reduce pollution and emissions.

Among policy changes being discussed are changes in tax codes. There is interest in reducing subsidies to oil producers and in increasing subsidies to alternative energy. Restructuring of taxes and fines to achieve environmental goals is on the upswing.

### Concluding Remarks

The EPA, the leading U.S. environmental agency, tackles its mission of protecting human health and safeguarding the natural environment with a heavy reliance on education, corporate cooperation, and the involvement of the public. The publication of lists of TRI chemicals released by corporations, for example, has been an effective tool in the reduction of these releases, involving relatively few penalties for firms who comply. The Mississippi DEQ plays a similar role within the state. Information on the DEQ – its mission, size and structure, is provided in Appendix I.



In addition to the vital role of the DEQ, other structures are needed within the state government and the private sector to ensure that studies of the environmental impact of projects are undertaken as appropriate. Long-term planning for the preservation of natural resources, from water supplies to scenic attractions, is needed as well.

The private sector and consumers have critical roles to play also.<sup>16</sup> This January, Citigroup, the largest funder of the oil and gas industry worldwide and also the world's largest financial corporation, announced a series of reforms that will monitor the impact of the investments it finances, and that will set up "no-go" zones in sensitive ecological areas, effectively barring industrial development. DuPont is among



several companies with a commitment to make major reductions in greenhouse gas emissions.

Consumer education makes a difference, as the support for recycling shows.<sup>17</sup> When consumers become aware that the brightest white paper is obtained through chemicals that are bioaccumulative and toxic, they may be satisfied with a less bright white, and respond to environmental labeling.

There is much to do. But with appropriate practices, our ecosystems can assure a continuing supply of clean air and water, and provide an environmental quality that will raise the standard of living for both current and future generations.



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### Appendix I

The Mississippi Department of Environmental Quality has as its mission "to safeguard the health, safety, and welfare of present and future generations of Mississippians by conserving and improving our environment and fostering wise economic growth through focused research and responsible regulation."

The Department has four major Offices: Pollution Control, Land and Water Resources, Geology, and Administrative Services. The DEQ staff of about 544 persons in FY2002 is listed at its website, along with job titles. It is possible to search the staff page using a phrase such as "construction and agriculture" to find out the number of persons in compliance and enforcement in construction

and agriculture (four, in this case) or in chemical manufacturing (three). Underground storage tanks, one of the larger divisions, has 20 persons.

DEQ expenditures in FY2002 totaled \$98.5 million, of which \$26.3 went to construction grants (largely wastewater treatment), and \$59.5 million to pollution control. That year, about \$34.3 million of its funding was from fees, payments on its revolving loan fund, and penalties (about \$1.9 million from fines and penalties). The remaining funds required came from the federal government \$21.9 million and state appropriations \$15.1 million.

The DEQ issued 39 enforcement orders in FY02 (Annual Report:7), based on on-site inspections: 282 inspections for compliance with air pollution permits/regulations; 119 for compliance with hazardous waste permits; 740 for compliance with solid waste permits and 1018 for compliance with water pollution permits. This means that 2,159 of over 15,000 sites were inspected; several of these inspections are carried out in response to complaints (1,634 complaints were received that year). There are also 1262 uncontrolled sites (sites contaminated with hazardous substances). Oversight and remediation was provided at 83 of these sites, in FY2002.

#### Notes

1. An ecosystem is a biological system, encompassing air, water, and land, and the habitats supporting plant, animal, and aquatic life in a given place. Source: EPA website - Ecosystems.
2. 1987 U.N. World Commission on Environment and Development.) In other words, the state, in the long-term, should be able to sustain or increase the quality of life of its residents.
3. Clarion-Ledger, B1, 3/9/04. Nationally, there are 900 Superfund hazardous waste sites where the EPA has completed clean-up, and another 1,240 whose clean-up has yet to be completed.
4. The plant listed as the largest single source of TRI chemicals released to the environment in Mississippi in 2001 was the DuPont plant in Pass Christian (13.9

million pounds released), followed by Vicksburg Chemical Co. (5.8 million pounds) and Mississippi Power Plant, Gulfport (4.0 million pounds).

5. Emissions in Lee County were greatly reduced in 2001, due to new Maximum Achievable Control Technology (MACT) criteria, according to the DEQ.

6. Most (97%) of the 41 pounds released were from the DuPont plant in Pass Christian, which released the dioxins to land. This plant is also listed as the largest single source of TRI chemicals released to the environment in the state. The U.S. EPA, in its Envirofacts Report on this DuPont plant for 2000 and 2001, reported "no waste management activities for Dioxin and Dioxin-like Compounds". The Detailed Facility Report, available through ECHO at the EPA website, reports that there was a violation (not specified) at the plant within the past two years, but none currently. However, the MDEQ issued a statement 3/31/04 that the DEQ and DuPont have reached an agreement regarding the exceedences of several permit air emission limits and two procedural violations. The company will pay a \$60,000 fine. The releases of dioxin compounds to land were not cited. To get the EPA reports, go to [www.scorecard.org](http://www.scorecard.org) and search at right under "Your Community" for zipcode 39571, Harrison County. Or see the news releases at the DEQ website. The Agency for Toxic Substances and Disease Registry (ATSDR) of the Center for Disease Control (CDC) found at the following site: ([www.atsdr.cdc.gov/statefactsheets](http://www.atsdr.cdc.gov/statefactsheets)) is currently providing a health consultation about health risks related to contamination of groundwater and releases to the air at the site: the ATSDR notes that "past groundwater sampling data indicate that metals such as arsenic, barium, beryllium, and lead, and volatile organic compounds, such as tetrachloroethane, have been detected". Rachel Carson's *Silent Spring* (1958, chapter 14) was one of the first works to attempt to link the fourfold increase in the incidence of death from malignant growths since the turn of the century to environmental changes. Numbers for 2000, showing an increased incidence of cancer since 1970, can be found at [www.nci.nih.gov](http://www.nci.nih.gov).

7. DDT, the banned pesticide which was the target of Rachel Carson's *Silent Spring*, is also a persistent, bioaccumulative, and toxic chemical.

8. Mercury is a naturally occurring element, which can be released to the atmosphere by natural sources, as well as human (anthropogenic) activities. The 1997 "Mercury Study: Report to Congress" by the U.S. EPA, and available at their website, cites a 1994 study (Figure 3-1) by Mason, Fitzgerald and Morel which estimates that about 77 percent of the total annual mercury input

to the atmosphere from all sources is due to human activity -- either to current human activities (57%) or to the increased emission of mercury from the ocean since the Industrial Revolution (past human activities) (20%) (see p. 3-2). Natural sources include volcanic and geothermal activities, forest fires, the weathering of rocks, and some of the emissions from the ocean (emissions/vaporization of mercury from the ocean are considered to be of natural, not anthropogenic sources in this report, although these emissions have more than tripled since the industrial revolution).

See also Table 3-1 of the U.S. Environmental Protection Agency "Mercury Study: Report to Congress, Volume I, Executive Summary," 1997 and the U.S. Geological Survey, "Mineral Commodity Summaries: Mercury," February 2000. According to the Environmental Protection Agency's 1999 [National Emissions Inventory](#), coal-fired electrical utilities accounted for 40 percent of the anthropogenic mercury, followed by industrial boilers (5 percent), hazardous waste incinerators (5 percent), and chlorine production (5 percent). Combustion of medical waste is no longer a significant source. Mercury is released into the atmosphere from combustion points in gaseous form and is deposited back into soils and surface waters from the atmosphere. Estimates are that 30% of the mercury released is quickly redispersed within a local or regional area, and the remainder into the atmosphere where the residence time is estimated to be between 1.1 and 1.4 years (Slemr, 1996). This means that there is a relatively homogeneous concentration in the atmosphere around the world leading to long-range (global) transportation.

9. Joan Lowy, "Mercury Threatens 630,000 Kids", Scripps Howard News Service, 2/05/04. This means that about 630,000 children annually are at risk for lowered intelligence and learning problems due to mercury exposure. (About 75% of mercury in the atmosphere is due to current or past human activities, while the remainder is from such sources as volcanic activity, forest fires and the weathering of rocks).

This number is up substantially from that of a 2000 study cited in Brown 2001:132. On the positive side, new technology exists that would greatly reduce mercury emissions. According to Senator Byron Dorgan (ND), "We are nearing a point where we could have near-zero emissions with new clean coal technology at coal-fired electric generating plants". More detail on new technologies is available in the *Mississippi Sierran*, Spring 2004.

10. At [www.scorecard.org](http://www.scorecard.org), go to "Clean Water Act Status." A national watershed is an 8-digit hydrologic reporting unit.

11. According to the Clean Water Act, the term wetlands means "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Swamps, marshes, bogs and similar areas are considered wetlands.

12. Mississippi's contribution to the annual flux of nitrogen to the Gulf of Mexico is on the order of about 2% of the total annual nitrogen load carried by the Mississippi River. See Coupe (1998).

13. Hydrologic modifications are often associated with sedimentation. The accumulation of sediment affects many of the state's waterways, adversely impacting the habitat of several aquatic species, and also causing problems for the humans who use the waterways. For example, Mill Creek at the Reservoir, after a \$300,000 dredging three years ago, again requires clearing.

14. The high acid content of acid rain is due to the hydrochloric and sulfuric acids formed as sulfur dioxide (largely from coal-burning power plants) interacts with nitrogen oxides (largely from motor vehicles, utilities and fertilizer production). Acid rain, that is, rain with a pH of less than 5.6, has been taking a heavy toll on water bodies in the northern part of the globe. Canada now counts 14,000 dead lakes, and one-quarter of Europe's forests are damaged (Brown (2001):52). The Atmospheric Nitrogen Deposition Program of the NADP focuses on the effects of nitrogen in precipitation on aquatic systems.

15. Withdrawals in 1990 were used as follows: 1,900 million gallons/day for irrigation, 700 million gal/day thermoelectric power, 400 million gallons/day aquaculture, 320 million gal/day public supply, 270 million gal/day industrial and mining, 33 million gal/day domestic, 16 million gal/day commercial, and 16 million gal/day livestock.

16. The private sector is contributing innovative solutions to environmental problems. The design firm, McDonough Braungart Design Chemistry (MBDC), offers several examples of environmentally-friendly product and process design alternatives that also result in substantial cost-savings to firms (see this internet site: [www.mdconough.com](http://www.mdconough.com)). For example, in some cases, biodegradable chemicals may be substituted for those currently in use, thus eliminating the need for costly filters and waste treatment.

17. When consumers become aware that the brightest white paper is obtained through chemicals

that are bioaccumulative and toxic, they may be satisfied with a less bright white, and respond to environmental labeling.

Recycling is a basic solution to a more efficient use of the earth's resources. It has the effects of both reducing the release of toxins into the environment and of preserving natural resources from trees to oil. Backyard burning of plastics is a major source of dioxin emissions, second only to emissions by municipal solid waste incineration, according to the EPA. Other methods of disposing of plastics would reduce this problem.

### References

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Center for International Earth Science Information Network, "Climate Change", at [www.ciesin.org](http://www.ciesin.org).

Coupe, Richard H. 1998. "Concentrations and Loads of Nitrogen and Phosphorus in the Yazoo River, Northwestern Mississippi, 1996-1997", USGS, Report 98-4219.

Gelbspan, Ross. March 2004. "Toward a Global Energy Transition", *Dollars and Sense*. Adapted from Foreign Policy In Focus at [www.fpiif.org](http://www.fpiif.org). A web version is available at [www.PetroPolitics.org](http://www.PetroPolitics.org).

Heal, G. 2000. *Nature and the Marketplace: Capturing the Value of Ecosystem Services*. Washington, D.C.: Island Press.

Office of Technology Assessment. 1993. *Preparing for an uncertain climate*. Washington, D.C.:GPO. Available at: [www.wvs.princeton.edu/~ota](http://www.wvs.princeton.edu/~ota)

Slemr, F. (1996): Trends in atmospheric mercury concentrations over the Atlantic Ocean at the Wank Summit, and the resulting constraints on the budget of atmospheric mercury, in *Global and Regional Mercury Cycles: Sources, Fluxes and Mass Balances*, in eds. W.

Bacyens, R. Ebinghaus and O. Vasiliev, NATO ASI Series, 2. *Environment*, Vol 21, p. 36.

Lower Pearl Partnership  
Mississippi Association of Resource Conservation and Development: [www.msrdc.org](http://www.msrdc.org)  
Includes links to member organizations across the state. Contact [southwest@msrdc.org](mailto:southwest@msrdc.org)  
Natural Resource Initiative  
Pascagoula River Basin Alliance

### Sources

#### Mississippi Organizations With Environmental Focus

Nonprofits with websites:

Audubon Mississippi: [www.msaudubon.com](http://www.msaudubon.com)

Black Bear Conservation Committee: [www.bbccc.org](http://www.bbccc.org)

Catch A Dream: [www.catchadream.org](http://www.catchadream.org)

Mississippi 2020: [www.mississippi2020.org](http://www.mississippi2020.org)

Mississippi Wildlife Federation, [www.mswildlife.org](http://www.mswildlife.org)

Nature Conservancy of Mississippi:

[www.nature.org/Mississippi](http://www.nature.org/Mississippi).

Sierra Club, Mississippi:

<http://Mississippi.sierraclub.org>

Wildlife Mississippi: [www.wildlifemiss.org](http://www.wildlifemiss.org)

Other Nongovernmental Groups:

Crow's Neck Environmental Center:

[www2.nemcc.edu/Webmaster/CrowsNeck](http://www2.nemcc.edu/Webmaster/CrowsNeck).

Lower Delta Partnership

Scruggs Institute for Compatible Development (Moss Point.)

TARA Wildlife: [www.tarawildlife.com](http://www.tarawildlife.com)

#### State Departments With Environmental Projects or Oversight

Mississippi Department of Archives and History

Mississippi Division of Tourism (in Mississippi Development Authority)

Mississippi Department of Environmental Quality

Mississippi Department of Transportation, Environmental Division

Mississippi Department of Wildlife, Fisheries, and Parks

Mississippi Museum of Natural Science

Mississippi Forestry Association

Mississippi Forestry Commission

Mississippi State University Extension Service

#### Mississippi University Centers

Most state universities include centers addressing some environment-related issue. These include: the Center for Water and Wetlands Resources at the University of Mississippi Field Station at Bay Springs ([www.olemiss.edu/depts/umbfs](http://www.olemiss.edu/depts/umbfs))

## **U.S. Government Agencies With Environmental Focus**

(All accessible through the agencies directory at [www.us.gov](http://www.us.gov)).

Army Corps of Engineers (US Army)  
[www.usace.army.mil](http://www.usace.army.mil)  
Department of Agriculture (USDA) ([www.usda.gov](http://www.usda.gov))  
U.S. Forest Service ([www.fs.fed.us](http://www.fs.fed.us))  
National Resources Conservation Service  
[www.nrcs.usda.gov](http://www.nrcs.usda.gov) (which includes the National  
Water and Climate Center)  
Wildlife Services ([www.aphis.usda.gov/ws](http://www.aphis.usda.gov/ws))  
Department of the Interior (Interior)  
([www.interior.gov](http://www.interior.gov))  
Fish and Wildlife Service – its listing of threatened and  
Endangered Wildlife and Plants can be found at  
[http://ecos.fws.gov/tess\\_public/TESSWebpage](http://ecos.fws.gov/tess_public/TESSWebpage).  
U.S. Geological Survey [www.usgs.gov](http://www.usgs.gov)

Environmental Protection Agency (EPA). Some  
subsites are of special interest:  
Compliance and Enforcement at: [www.epa.gov/echo](http://www.epa.gov/echo)  
Global Warming at:  
[//Yosemite.epa.gov/oar/globalwarming.nsf](http://Yosemite.epa.gov/oar/globalwarming.nsf)  
National Atmospheric Deposition Program (NADP):  
<http://nadp.sws.uiuc.edu> and the  
Atmospheric Nitrogen Deposition Project:  
[www.marine.unc.edu/Paerllab/research/atmospheric/  
adn\\_opening.html](http://www.marine.unc.edu/Paerllab/research/atmospheric/adn_opening.html)

## **Other Sources on the Environment**

American Enterprise Institute: [www.aei.org](http://www.aei.org)  
Environmental Defense Fund: [www.scorecard.org](http://www.scorecard.org)  
Greenpeace: [www.greenpeaceusa.org](http://www.greenpeaceusa.org)  
The Heritage Foundation: [www.heritage.org](http://www.heritage.org)  
RAND Corporation: [www.rand.org](http://www.rand.org)  
Union of Concerned Scientists: [www.ucsusa.org](http://www.ucsusa.org)

## MISSISSIPPI'S ENDANGERED SPECIES

Many of the terrestrial species on Mississippi Endangered Species List, including amphibians, reptiles, mammals and birds, were originally denizens of the virgin longleaf pine forest which covered most of the uplands in southern Mississippi until “the Big Cut” of the early 1900s.<sup>1</sup> For these and other endangered species, habitat loss is due to the conversion of land to agricultural, residential and industrial uses, including industrial forestry (densely stocked pine plantations). Other factors include the suppression of natural wildfire, the proliferation of major road construction (particularly in the wake of the casino boom), and the invasion of exotic species such as fire ants and cogon grass.<sup>2</sup>



In Mississippi, fish and mussels have suffered habitat loss disproportionately in recent years, given the decline in their aquatic environments.<sup>3</sup> Modification of stream channels with dams, dredg-



ing, and/or channelization projects has caused most of this habitat loss. Impoundments/dams are another problem: most species adapted to riverine habitats will not survive in impoundments, which also may block access of fish such as the Gulf sturgeon to upstream spawning habitat.

Stream modification to expedite drainage or facilitate navigation also changes aquatic habitats, often destabilizing stream channel dynamics.<sup>4</sup> Deterioration in water quality from point and non-point source pollution can also hurt habitats. One hard-earned lesson from experience: projects changing environments that are proposed or undertaken without the benefit of appropriate cost-benefit analysis run the risk of unnecessary habitat destruction and may hasten species loss.<sup>5</sup> The removal of the bald eagle from the list of endangered species (its status has improved to “threatened”) shows that steps taken to protect species can be successful.

### Notes

1. During the Big Cut, on the order of 50 million acres of longleaf pine were clear-cut for timber, with no systematic replanting. The ivory-billed woodpecker, now extinct, disappeared along with the forest.
2. Industrial forests plantings are generally so dense that the grass and forb-based food chain so important to the presence of many species can't survive. Natural wildfires, once commonplace during the growing season in southern Mississippi, have been energetically suppressed, enabling shrub and hardwood encroachment in forests which shades out grasses and forbs. Highway construction has destroyed or fragmented habitat. Small habitat patches bordered by roads and/or development are difficult to manage appropriately. Survival of animals attempting to cross roads separating habitat patches is also problematic, so the odds of local extinction of animals within shrinking habitat patches have increased. Habitat disturbance has also favored proliferation of aggressive exotic species such as the fire ant and cogon grass, both of which are exacting a heavy toll on native plants and wildlife.
3. Creation of the Tenn-Tom Waterway resulted in precipitous declines in many mussel species found in the Tombigbee drainage. Eleven of these are now endangered. Small populations of most of these species continue to exist in some of the larger tributaries now draining into the Waterway. However, these populations are vulnerable to extinction since there is now no longer any appropriate habitat connecting the populations, and ongoing drainage problems such as gravel mining, headcutting, and siltation continue to threaten these isolated populations and fish hosts essential to mussel reproduction. See Mississippi Museum of Natural Science, 2001. *Endangered Species of Mississippi*.
4. Stream modification can also trigger erosion upstream, which causes losses of land and often undermines roads and bridges. The loss of land can be extensive (see article in the *Clarion-Ledger* (5/4/04) on the loss of 3,400 acres of land consequent to channel shortening in the Homochitto River).
5. For information on the proposed dredging of the Sunflower River, which gives some idea of the issues cost-benefit analysis must address, see *Mississippi Wildlife*, Vol. 13, No. 4, Winter 2001, “Wildlife Digest: Last Holdout for Ancient Sunflower River Mussel Beds Still in Doubt”. Also search on “Sunflower River” at [www.usace.army.mil](http://www.usace.army.mil) to reach “Corps River Projects Provide Environmental Benefits”, 4/2/02.

## FIREFLIES UNDER FIRE: COMMUNITIES AND ECOLOGY

Don't count your fireflies (or your butterflies) before they've hatched! Fireflies, butterflies, bees and dragonflies are among the insects adversely affected by loss of habitat and pesticides. The loss of open fields and woodlands means fewer of these insects. While no group has been established to monitor firefly populations, as has been done for frogs, several urban areas



are reporting fewer, if any, of those well-liked creatures. Fireflies tend to be highly site-specific, staying year after year in the same spot. Migration when that site is disturbed is unlikely, and local extinction is almost certain. Bright streetlights and floodlights during the evening mating hours reduce breeding populations of the insect. And aerial mosquito spraying of neighborhoods can be lethal.

In Japan, fireflies are revered, so that when the survival rates of firefly larvae, which live in water, dropped precipitously due to water pollution, many communities responded. Their river restoration projects aimed at reviving local firefly populations were largely successful. It is unusual, however, for communities to have in place a planning process that provides a mechanism adequate to the increasingly complex task of environmental preservation. "Building

Blocks of Economic Development", in this issue, provides examples of communities that are working towards a comprehensive vision of cultural and environmental preservation (see section on Cultural and Environmental Stewardship).

Keeping up to date on findings regarding the effectiveness of different approaches to the problem of habitat preservation may prove to be critical in preserving fireflies, butterflies and other wild creatures. It is interesting to note that Mississippi's Agricultural Experiment Station was a leader in developing a more effective and ecologically sound method for controlling fireants – previous to the approach developed in part by the Experiment Station, the broadcast use of a chemical more toxic than DDT (heptachlor) had wiped out wild turkey populations and other birds in regions of the South (Carson 1987:162-172). The approach developed here involved targeting the fireant mounds.

Today, aerial spraying for mosquitoes is a practice that threatens fireflies, dragonflies and other insects in urban areas, as well as the birds which feed on them.<sup>1</sup> Perhaps state researchers will again be among those developing a more ecologically sound approach to a common environmental problem - mosquitoes.



### Note

1. The question of aerial spraying illustrates the need for integrating the findings of scientific research into strategies for protecting and preserving the local environment. The issue is a complex one. Aerial spraying, besides killing mosquitoes, reduces mosquito predator populations and may lead to an increase in mosquitoes, as was found in one New York state study. Mosquito populations also can develop a resistance to a pesticide, as in Houston, and may become "super" carriers of diseases such as West Nile virus, requiring higher amounts or different types of pesticides. Birds that become weakened by pesticides are more susceptible to West Nile virus -- becoming ill more frequently, with longer infections and higher viral loads. Other approaches to mosquito control exist, and are often more effective, such as eliminating standing water or treating it with certain kinds of bacteria (most mosquitoes seldom travel more than 1 kilometer during their two weeks of adulthood).

### Sources

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New York Public Interest Research Group, "Statement Regarding Emergency Pesticide Spraying for Mosquito Control", 9/30/99, at [www.nypirg.org](http://www.nypirg.org).

Watson, Rachel, "Eight Reasons Why Spraying Pesticides is Not the Solution to West Nile Virus", Spring 2003, at the following internet site: [www.environmentalhealth.ca](http://www.environmentalhealth.ca).

# GLOBAL ENVIRONMENTAL TRENDS

## ●Pressures on Global Ecosystems

The global population has increased from 1.7 billion in 1900 to about 6.4 billion today. Industrial production has grown even more rapidly. There is evidence from around the world of increasing stress on the environment. In many regions, there has been over-harvesting of fisheries, croplands, rangelands, or forests.<sup>1</sup> For example, the cod fishery off the New England coast has had such dramatic declines in annual catch that fishing bans have been imposed. It is not the only depleted fishery: in the early 1990s, the U.S. Food and Agricultural Organization found that 9 of the world's 17 fisheries were in a state of decline due to over-harvesting.<sup>2</sup>



Croplands in Northern China, India, the southern Great Plains of the U.S. and elsewhere are threatened with lower yields, due to a mounting problem accessing water as aquifers are drawn down, that is, as pumping exceeds aquifer recharge from precipitation. It is estimated that about 480 million of the world's 6.1 billion people are being fed with grain produced by over-pumping aquifers.<sup>3</sup> Already, yields in Northern China have dropped. Rising grain prices and food shortages can be expected as the competition between population, industry and agriculture for water heightens.



Higher temperatures (see accompanying "Climate Change") would exacerbate the problem of agricultural shortfalls that regions such as water-stressed Northern China have been experiencing. Estimates by the U.S. Department of Agriculture and researchers at the International Rice Research Institute (Philippines) are that a 1<sup>o</sup> Celsius (1.8<sup>o</sup> Fahrenheit) rise in temperature above the optimum during the growing season leads to a 10% drop in yields of rice, wheat and corn.<sup>4</sup>

## Notes

1. Brown, Lester. 2001. *Eco-Economy: Building an Economy for the Earth*. New York: W.W. Norton. 8-76. Available on-line at [www.earth-policy.org](http://www.earth-policy.org). Brown, founder of the Earth Policy Institute, documents falling water tables and eroding soils, dying coral reefs, declining farmland, disappearing species, melting glaciers, and rising carbon dioxide levels. He concludes that the world economy is out of sync with the ecosystem on which it depends. He is not alone. A 1992 document signed by over 1,600 scientists from 70 countries, including 102 of the 196 living Nobel Prize recipients, warns "No more than one to a few decades remain before the chance to avert the threats we now confront will be lost and the prospects for humanity immeasurably diminished".
2. Brown 2001:51-54. See also the Union of Concerned Scientists at [www.ucs.org](http://www.ucs.org).
3. Brown 2001: 57.
4. Brown 2001: 27-77 and Lester Brown, "Wakeup Call on the Food Front," 12/16/03, update 31 - printable. htm at same website.

## ●Climate Change

Climate change has become a public and scientific concern. In response to the threat of global warming, governments around the world have begun to take steps to reduce the emission of greenhouse gases, largely through shifting towards greater use of non-carbon energy sources. The U.K., Germany and the Netherlands are among the countries in Europe that have completed plans to reduce emissions by 50% or more within the next 40 to 50 years (Gelbspan 2004). The U.S. has set no deadline for the reduction or stabilization of emissions, but stricter emission regulations are gradually being phased in for various industries, and alternative energy sources are being developed.



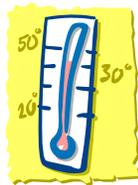
Why so strong a response to a slight increase in global temperatures (on the order of 1<sup>o</sup> F) during the past several decades, which may be

due only in part to human activity? The problem is that, over time, an upward trend in global temperature would have severe consequences, impacting agricultural yields, weather patterns, ocean currents, sea levels and the ability of flora and fauna to survive in their current locations. Among recent changes that may be associated with climate changes are the melting of glaciers in the Northern Hemisphere, rising sea levels and changing seasonal patterns in northern regions (OTA 1993 and CIESIN 2003). The fear is that, if greenhouse gas emissions continue at current or greater levels, a continuing increase in global temperature is likely, and climate changes are inevitable.



While there are policy disagreements about what should be done to limit or reduce greenhouse gas emissions, there is considerable agreement about the nature of the problem. Scientists agree that the concentration of greenhouse gases in the atmosphere is increasing, that they absorb infrared radiation from the sun and that they retain some of that energy in the atmosphere. Some of these gases occur naturally in the atmosphere, like carbon dioxide, water vapor and ozone, while others result from human activities.

“Although these gases make up only 0.25% of the atmosphere by volume, they are responsible for increasing the average temperature of the earth from 0° Fahrenheit (the temperature it would be without these natural greenhouse gases) to 59° F,” explains OTA (1993:71), thus enabling the development of life on earth. Since the beginning of the industrial revolution, atmospheric concentrations of three greenhouse gases has grown rapidly, due in large part to the burning of fossil fuel and deforestation: carbon dioxide levels have increased nearly 30%, methane concentrations have more than doubled, and nitrous oxide



concentrations have risen by about 15% (EPA). Scientists using models to project future trends estimate that, even if emissions stabilize at current levels, concentrations of greenhouse gases will continue to rise and the average global surface temperature will increase 1-4.5° F in the next fifty years, (CIESIN).

There is disagreement, however, as to when and how the effects of the increasing concentration of greenhouse gases will be felt, and also with regard to what should be done now. The U.S. Office of Technology Assessment (1993) has made several proposals for preparing for possible effects of climate change, including revamping the National Flood Insurance Program, taking steps to impose water-use efficiency (should droughts become more common), revising farm commodity support programs to increase the ability of farmers to switch crops, and preparing for changing boundaries of natural regions, such as wetlands and deserts. It can be noted here that the Mississippi River delta is one of the earth’s flood plains that is especially vulnerable to rising sea levels, which are generally forecast by models of global climate change. Rising sea levels would bring erosion of coastal areas, increased salinity and movement of marshlands inland.



The desire to reduce greenhouse gas emissions has resulted in new industries based on the development and use of alternative energies. The Center for International Earth Science Network at Columbia University ([www.ciesin.org](http://www.ciesin.org)) has extensive information on these subjects. The U.S. has been active in the drafting of international agreements such as the Kyoto Protocol on Climate Change (<http://unfccc.int/resource/convkp.html>), which is aimed at reducing the emission of greenhouse gases, although the U.S. no longer supports the Protocol’s approach.<sup>2</sup>

In addition to the initiatives to reduce emissions undertaken by several countries, several companies such as Citibank and DuPont also have platforms and programs aimed at reducing greenhouse emissions.<sup>3</sup>

### Notes

1. See IPCC, OTA and Brown. Each gas differs in its ability to absorb heat. HFCs (hydrofluorocarbons) and PFCs (perfluorocarbons) are the most heat-absorbent. Nitrous oxide, for example, absorbs 270 times more heat per molecule than carbon dioxide. Factors influencing temperatures include also El Nino, volcanic eruptions, sunspots and increases in acidic air pollution.

2. This Protocol rests heavily on the concept of trading emission allowances: for example, if country A exceeds its allowed quantity of carbon emissions, it can buy emission credits from country B that emits less than its permitted quantity. There are severe problems with monitoring, enforcement and equity. An alternative World Energy Modernization Plan of the Institute for Policy Studies is summarized at [www.fpiif.org](http://www.fpiif.org). Under this plan, a country would be required to use, say 5% less carbon fuel per year, or produce 5% fewer goods. Technologies are available to decarbonize fuel supplies, the plan argues, but the playing field must be leveled, so that all fossil fuel producers face the same competitive pressures. Oil and coal producers would find the new \$300 billion market for decarbonized fuel a lucrative one. This plan would also reduce subsidies for fossil fuels, which in the U.S. now include corporate tax write-offs and direct payments to oil, gas, and coal companies (for research and development, and oil purchases for the Strategic Petroleum Reserve, for example).

3. Citigroup committed to report the greenhouse-gas emissions released by Citi-financed power-sector projects, to work with its clients to reduce their emissions, and to increase its investments in clean-energy power sources. This change comes after years of bankrolling several enterprises which drew severe criticism from environmentalists.

### ●Disappearance of Species

The most authoritative global assessment of species is that of the IUCN or World Conservation Union.<sup>1</sup>

The report collects data on over 30,000 species of plants and animals. Of the 4,842 mammals described in *Mammal Species of the World* (1994), IUCN scientists evaluated 4,789 for the 2003 Red List, and of these 24% are considered to be



“threatened”. All of the 9,932 birds in the *World Bird Database* were evaluated, and 12% of these are listed as threatened. The percentage of fishes, reptiles, amphibians, plants and invertebrates

evaluated was much lower, but, for example, the IUCN estimated that as many as 3% of fish (largely freshwater) may be threatened. (Under the IUCN Red List system, species are classified into one of eight categories based on scientific criteria: Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, Lower Risk, Data Deficient and Not Evaluated. A species is classed as threatened if it falls in the Critically Endangered, Endangered or Vulnerable categories.)

As species disappear, the earth in effect is losing genetic libraries, each storing a wealth of genetic information developed over thousands of years. Most of the species threatened or lost are found in tropical rainforests. The National Cancer Institute notes that well over 50% of the estimated 250,000 plant species found on earth come from tropical forests, and it concentrates on these regions in seeking and testing plants that have potential for use in fighting cancer or AIDS.<sup>2</sup>



“We support the idea the world is on the breaking crest of the sixth great wave of extinction,” says Professor Georgiana Mace, Science Director of the Zoological Society of London. Dr. Richard Leakey, former head of Kenya’s wildlife service, estimates that the world is losing between 50,000 and 100,000 species each year. (BBC, 8/24/01 and 5/19/03, available at <http://news.bbc.co.uk>.)

In fact, seven out of ten biologists surveyed by the American Museum of Natural History in 1998 believe that a mass extinction is currently taking place. This mass extinction, the Museum reports, is the fastest in Earth’s

4.5-billion-year history and, unlike prior extinctions, is mainly the result of human activity.

But it is not only extinction that is of concern. The disappearance of fireflies, bees, and butterflies from urban localities is occurring with increasing frequency (see box on fireflies), which affects the quality of ecosystems in those areas, as well as the quality of life.



The loss of a species from a region, besides the adverse effect on quality of life, will typically reduce the productivity of that region's ecosystem. Some of the services provided by an ecosystem include the provision of food supplies, water purification, soil formation, flood and fire prevention, nutrient cycling, climate regulation, carbon sequestration (extraction of carbon dioxide from the air) and pollination. Greater diversity, measured in terms of richness (the number of species) and distribution (the proportion of each species in a given landscape), in addition, provides ecosystem insurance protection against catastrophic events or infections.<sup>3</sup> The disappearance of species from a region increases the risk of imbalances, which can result in the spread of disease and other adverse impacts on remaining species and the overall ecosystem.

### Notes

1. The International Union for the Conservation of Nature (IUCN), or the World Conservation Union, was founded in 1948 and brings together 77 states, 112 government agencies, 735 NGOs, 35 affiliates, and some 10,000 scientists and experts from 181 countries in a world-wide partnership. Its mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. Within the framework of global conventions IUCN has helped over 75 countries to prepare and implement national conservation and biodiversity strategies. IUCN has approximately 1000 staff, most of whom are located in its 42 regional and country offices while 100 work at its headquarters in Gland, Switzerland. The IUCN has six global commissions, one of which is the Species Survival Commission. See the related Convention on Biodiversity, an international agreement which the U.S. helped to draft, at [www.biodiv.org/doc/publications](http://www.biodiv.org/doc/publications). The Congress has yet to ratify this convention.

2. According to one estimate, one-quarter of medicines owe their origin to rain forest plants and animals. (See Zimmerman and Zimmerman, *Nature's Curiosity Shop*, Contemporary Books, Chicago, 1995, 82. This source also notes that there is a tree in Brazil, the copaiba, which pours out diesel fuel when it is tapped, and 20% of Brazil's diesel fuel is now supplied by this source. "There are frogs so big they eat rats, flowers so large they hold several gallons in their nectarines, and other wonders such as a moth with an eight-foot tongue for collecting nectar, and a frog with a nearly transparent body and green bones.")

3. Brock and Xepapadeas 2003, and Heal 2000.

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# KI UTUS O OS VGI ZYUL SKJD GOJ O S OYCYOVO

*Benjamin Blair and Meghan Millea*

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In FY2002, the federal government funded approximately 75% of Medicaid expenditures in Mississippi. In dollar terms, the state received an inflow of \$1.98 billion from the federal government.<sup>1</sup> Medicaid, then, accounted for 9% of total federal funds received by Mississippi that year, exceeded only by Social Security and Medicare payments. State matching funds of approximately \$660 million came from state appropriations (\$238 million in FY2002) and the rest from other state funds and agencies providing health care. Since expenditures on health and welfare are the largest single item in the state budget when both general and special funds are considered, it is not surprising that state expenditures in this area are being closely scrutinized during this time of fiscal pressure. While this article does not address the issue of whether or not appropriations to Medicaid should be changed, it does provide information on the impact of federal Medicaid dollars on the economy.

Medicaid is a cooperative program between federal and state governments, established in 1965 to provide financial support for the medical expenses of low-income families. Broad guidelines for eligibility and services to be covered are established at the federal level, but the administration of the program is largely left to the states. State funding is matched by contributions from the federal government. Federal matching rates for each state are based on the state's average per capita income relative to the national average. States with lower per capita average incomes have higher matching rates. Mississippi had the highest Federal Medical Assistance Percentage in FYFY2002 at 76.09 percent. This means that for every dollar spent on Medicaid by the state government, the federal government will provide the state with an additional \$3.18. Almost all of these matching funds can be viewed as a net inflow of new funds into the state.

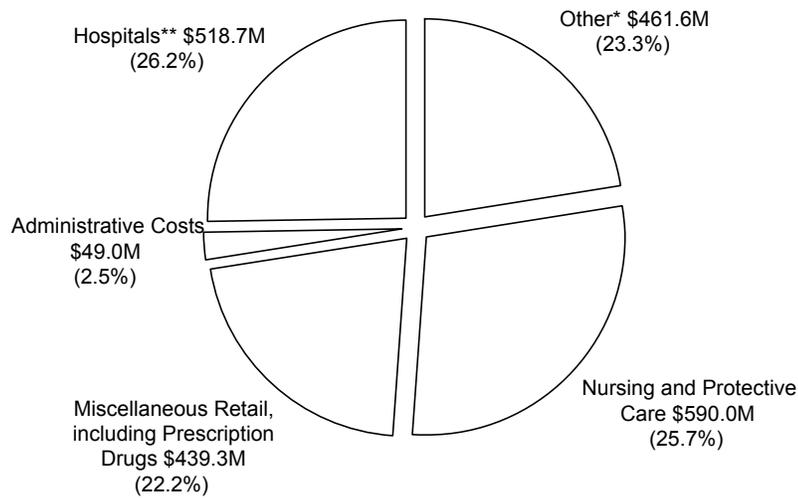
## **Distribution of Medicaid Dollars**

The largest proportion of the federal Medicaid expenditures in FY2002 went to hospitals<sup>2</sup> (\$518.7 million), followed by nursing and protective care (\$509.0 million), and retail spending, which includes prescription drugs (\$439.3 million). Only \$49.0 million of the federal dollars were spent on administrative costs. See Figure 1. While the objective of the

Medicaid program is to assist individuals and families by providing funding for health services, the entire economy benefits from the economic impacts of the federal funds injected. This study quantifies the economic impact of these funds on Mississippi's economy. It does not, however, attempt to estimate the cost savings to employers, teachers and others that arise from healthier employees and children. Nor does it address the cost of opportunities lost due to state expenditures on Medicaid instead of other programs.

The \$1.98 billion inflow of federal Medicaid dollars in FY2002 increased the demand for goods and services by \$2.69 billion. This figure includes the direct increase in demand from the federal funds, the indirect effects resulting from the associated increases in demand along the supply chain, and the increased demand resulting from additional household expenditures (see note on multiplier effects).<sup>3</sup> In addition, Medicaid spending had a positive effect on the state's economy through increased gross state product (GSP), which is a measure of the total value added of goods and services produced in the state. In FY2002, \$1.39 billion of the gross state product resulted from the effects of federal Medicaid funding.

**Figure 1. Federal Medicaid Expenditures in Mississippi, 2002**



\* Other category includes: Doctors and dentists, residential care, other medical and health services, transportation, durable medical equipment, and CHIP (Children's Health Insurance Program).

\*\* Hospitals category includes disproportionate share payments.

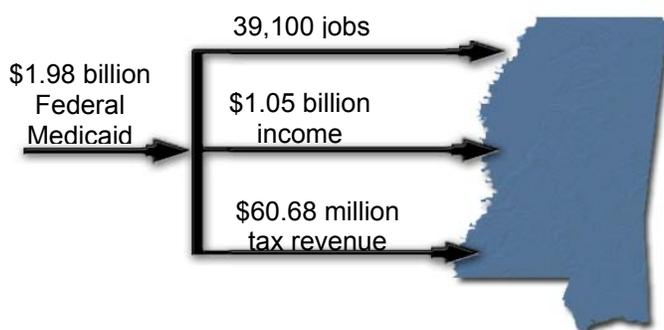
SOURCE: Mississippi Division of Medicaid, FY 2002 Annual Report

### Impact on Jobs and Incomes

The increased economic activity associated with the \$1.98 billion from federal sources supported 39,100 jobs in Mississippi. As expected, the sector with the largest employment impact was the health services sector with 20,400 additional jobs supported. Within this sector, 11,000 jobs were in the nursing and protective care industry, 2,300 were positions for doctors and dentists, and another 5,600 jobs were in the hospital industry. A number of other Mississippi industries also benefited from the large influx of federal matching funds. As these funds rippled through the economy, 18,700 jobs were supported outside of the health services sector. As examples, 8,800 jobs were supported in the retail sector, 1,000 jobs in the restaurant industry, 400 in the real estate industry and over 100 U.S. postal service jobs.

The increased economic activity and employment also led to higher incomes for Mississippi households. This increase in income is best explained by tracing the \$1.98 billion in federal matching funds as it ripples through the state's economy. These Medicaid funds are tracked and reported in Table 1. Income in the health services sector increased by \$611.7 million as a direct result of the inflow of federal funds; income in the wholesale and retail trade sector increased by \$135.4 million. As the economic effects rippled through the supply-chain, incomes in the state increased by \$77.6 million. Household spending sparked another chain reaction, causing an increase of \$179.7 million in personal income. In total, income in the state was increased by \$1.05 billion. This increase in personal income represents an increase in taxable economic activity. For

**Figure 2. IMPACTS OF FEDERAL MEDICAID ON MISSISSIPPI, 2002**



SOURCE: Blair, B. and M. Millea, *Economic Impacts of Federal Medicaid Expenditures on the State of Mississippi in 2002*. Mississippi Health Policy Research Center.

every dollar of personal income generated, approximately 6 cents goes to the state coffers, totaling \$60.7 million in revenue for the state. Figure 2 summarizes the major impacts of Medicaid.

While the Medicaid program is designed to address the medical needs of targeted populations, the impact of the federal matching funds can be felt throughout the state. It increases the demand for goods and services, employment and personal incomes of households, and tax collections of the state government. In addition, Medicaid dollars finance many services that the state would be providing whether or not it received Federal funds. These include mental health and public health services provided by state agencies. In FY2001, \$312 million of Medicaid federal dollars went to the care of persons with mental illnesses in institutions (\$186 million), to “charity” or non-paying patients at the University Medical Center (\$111 million), and to programs of the Department of Health (\$15 million).

### Notes

1. This number does not include matching funds associated with Medicare buy-in payments or lapse period spending, which amounts to approximately \$104 million. The lapse spending results from differences

between state and federal fiscal year accounting. While the Medicare buy-in payments provide access to services for some Mississippians these impacts are not included in our estimates.

2. This category includes spending on inpatient and outpatient hospitals, ambulatory surgical centers, and disproportionate share payments.

3. On multiplier effects: the inflow of Medicaid dollars from the federal government sparks economic activity that increases the gross state product (GSP), employment, personal income, and tax revenues for the state. In each of these areas, the impact of the federal funds has three effects. First are the direct effects, as the funds are spent directly on medical goods and services. Second are the supply chain effects. As the matching funds are spent on medical goods and services, the producers of these goods and services respond to the higher demand by purchasing more inputs, which, in turn, increases the demand for other goods and services. Third are the effects due to increased household spending. As a result of the direct and supply chain effects, some households will experience increases in income. As these households spend their additional income, another series of economic chain reactions run throughout the state’s economy.

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**Table 1. ESTIMATED IMPACT ON PERSONAL INCOME IN MISSISSIPPI OF 2002 FEDERAL MEDICAID EXPENDITURES**

<b>Sector</b>	<b>Direct Effects (\$)*</b>	<b>Supply-chain Effects (\$)*</b>	<b>Household Spending Effects** (\$)*</b>	<b>TOTAL (\$)*</b>
Health Services (public & private)	611,658,688	1,573,829	41,892,296	655,124,813
Wholesale and Retail Trade	135,140,080	7,089,769	55,822,336	198,052,185
Government	20,828,374	5,215,481	3,463,596	29,507,451
All Other Industries	25,084,751	63,702,697	78,530,674	167,318,122
<b>TOTAL</b>	<b>792,711,893</b>	<b>77,581,776</b>	<b>179,708,902</b>	<b>1,050,002,571</b>

\*Results are in terms of 2002 dollars.

\*\*Household spending effects only include the increased consumption expenditures associated with increases in household income due to labor compensation resulting from all of the direct and indirect impacts.

SOURCE: Blair, B. and M. Millea, *Economic Impacts of Federal Medicaid Expenditures on the State of Mississippi in 2002*. Mississippi Health Policy Research Center.

# BUILDING BLOCKS OF COMMUNITY DEVELOPMENT

Based on the report by MDC, Inc.

Economic development can be seen as entailing change and progress in six basic areas: business development, workforce development, physical infrastructure, social infrastructure, cultural and environmental stewardship and civic infrastructure. States across the nation have projects in each. *Building Blocks of Community Development*, available at [www.mdcinc.org](http://www.mdcinc.org), provides a survey of the more successful community development initiatives in each of these areas and highlights from that report are presented below. This is a companion piece to the *State of The South 2002*, an MDC report outlining a new development strategy for the South, which was presented in summary form in the December issue of this *Review*. (The MDC is a private, nonpartisan nonprofit organization supported by grants and contracts from the private and public sectors. It is based in North Carolina.)

## BUSINESS DEVELOPMENT

A comprehensive vision of business development entails building the economic base and creating larger numbers of higher-quality jobs – jobs that provide a living wage, good benefits, and the potential for advancement. In keeping with this vision, Southern communities should focus on three goals for business development:

1. Reorient the economic base to be more competitive in the knowledge economy.
2. Foster entrepreneurial development.
3. Build the assets and resources necessary for economic development in low-wealth communities.

According to a 2000 study by the Southern Rural Development Center, manufacturing industries in the South employed fewer people in 1998 than in 1990; in that same time-span, seven of every ten new jobs were primarily in the low-wage service sector. Changes are needed if the South is to create more high quality jobs.

### Goals and Strategies

Possible strategies for achieving the three goals listed above include the following:

#### **Goal 1. Reorient the economic base to be more competitive in the knowledge economy.**

► Support existing businesses as they transition to the new production structures and marketing techniques demanded by the

changing economy. Promising resources include: North Carolina Small Business and Technology Development Center, Raleigh, NC ([www.sbtcdc.org](http://www.sbtcdc.org)); Enterprise Corporation of the Delta, Jackson, MS ([www.ecd.org](http://www.ecd.org)).

► Develop industry clusters to enhance the competitiveness of interrelated small and medium-sized businesses. A promising example is: Hosiery Technology Center, Hickory, NC ([www.hosetec.com](http://www.hosetec.com)).

► Establish flexible business networks that foster interfirm collaboration and engender economies of scale. Promising examples include: Northwest Oklahoma Manufacturers Council, Okmulgee, OK and can be found at the following site: ([www.ocevnet.org/neomc](http://www.ocevnet.org/neomc)) Appalachian by Design, Lewisburg, WV ([www.abdinc.org](http://www.abdinc.org)).

#### **Goal 2. Foster entrepreneurial development**

► Establish community development financial institutions that provide financing for new businesses. Promising examples include: Center for Community Self-Help, Durham, NC ([www.self-help.org](http://www.self-help.org)); Arkansas Enterprise Group, Arkadelphia, AR ([www.arenterprise.org](http://www.arenterprise.org)); Appalbanc, Berea, KY.

► Identify and develop comparative advantages and assets. A promising resource is: American Planning Association's *Understanding Your Economy* guidebook.

► Encourage skills development and entrepreneurship training through community college and university programs and private

sector investments. A promising resource is: REAL Enterprises ([www.realenterprises.org](http://www.realenterprises.org)).

### **Goal 3. Build the assets and resources necessary for economic development in low-wealth communities.**

► Pool resources by emphasizing a regional approach to business recruitment and development. A promising example is: New River Valley Region, Southwestern Virginia ([www.nrvalliance.org](http://www.nrvalliance.org)).

► Develop the capacity of community-based philanthropies that create opportunities for a revived economy. Promising examples and resources include: East Tennessee Foundation, Knoxville, TN located at the following: ([www.easttennesseefoundation.org](http://www.easttennesseefoundation.org)) Southern Philanthropy Consortium ([www.secf.org/SpecialProjects\\_sophil.asp](http://www.secf.org/SpecialProjects_sophil.asp)).

## **WORKFORCE DEVELOPMENT**



For much of the Twentieth Century, the South's attitudes about workforce development and education reflected its limited vision of business development. Today, a comprehensive vision of workforce development entails building a high-skill, high-value workforce, the human resource base required for the knowledge economy. In keeping with this vision, Southern communities should focus on three goals for workforce development:

1. Educate every child to the high standards demanded by society and the economy.
2. Help all adults stay fit for work in the knowledge economy.
3. Provide the skills necessary for adults with low literacy levels and other barriers to employment to participate in the economic mainstream.

### **Goals and Strategies**

#### **Goal 1. Educate every child to the high standards demanded by society and the economy.**

► Foster culture of high expectations for every child. A promising example is:

Indiana School Guidance and Counseling Leadership Project located here: ([www.mdcinc.org/past\\_projects](http://www.mdcinc.org/past_projects)); Indiana Student Achievement Institute found here: ([http://asai.indstate.edu/indiana\\_student\\_achievement\\_institute.htm](http://asai.indstate.edu/indiana_student_achievement_institute.htm)).

► Deepen community support and accountability. Promising examples and resources include: Public Education Network ([www.publiceducation.org](http://www.publiceducation.org))

Texas Interfaith Education Alliance, Austin, TX and can be found at this site location: ([www.aecf.org/publications/advocasey/organizing](http://www.aecf.org/publications/advocasey/organizing)).

► Create seamless transitions from school to college and school to work. A promising example is: Alliance for Achievement Initiative and can be located here: ([www.mdcinc.org/past\\_projects](http://www.mdcinc.org/past_projects)).

#### **Goal 2. Help all adults stay fit for work in the knowledge economy.**

► Make education a lifelong process, utilizing community colleges in particular as flexible, accessible institutions where adults can upgrade their skills in order to keep pace with the demands of the changing economy. Promising examples include: Miami-Dade Community College, Miami, FL found here: ([www.mdcc.edu](http://www.mdcc.edu))

El Paso Community College, El Paso, TX ([www.epcc.edu](http://www.epcc.edu)).

#### **Goal 3. Provide the skills necessary for adults with low literacy levels and other barriers to employment to participate in the economic mainstream.**

► Develop the capacity and effectiveness of the employment and training system. A promising resource is: The Annie E. Casey Foundation's Jobs Initiative ([www.aecf.org/jobsinitiative](http://www.aecf.org/jobsinitiative)).

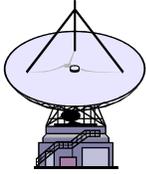
► Emphasize job quality and opportunities for advancement in job training and placement programs. Promising examples include: Project Quest, San Antonio, TX ([www.questsa.com](http://www.questsa.com)), Good Faith Fund, Pine Bluff, AR ([www.arenterprise.org](http://www.arenterprise.org)).

► Provide immigrants with the needed

services, education, and skills training to maximize their contribution within the workforce.

## PHYSICAL INFRASTRUCTURE

A comprehensive vision for a strong physical infrastructure entails utilizing transportation and telecommunications to connect the community with distant markets, people, and educational options; and providing essential infrastructure to ensure public health and safety. In keeping with this vision, Southern communities should focus on three goals for physical infrastructure:



1. Provide the infrastructure (water, sewer, air) required to safeguard public health.
2. Connect communities in the economic shadows to areas with economic activity.
3. Invest in the basic infrastructure needed for the knowledge economy.

### Goals and Strategies

#### Goal 1. Provide infrastructure required to safeguard public health.

► Establish collaborative partnerships to improve air and water quality. A promising example is: Chattanooga, TN found here:

([www.sustainable.org/casestudies/tennessee/TN\\_of\\_chattanooga.html](http://www.sustainable.org/casestudies/tennessee/TN_of_chattanooga.html))

► Leverage community resources to enable access to water in underdeveloped areas. A promising example is: Coalfield Water Development Fund, Big Stone Gap, VA. The site location is located here: ([www.me.cc.va.us/dept/fdnpages/water.htm](http://www.me.cc.va.us/dept/fdnpages/water.htm))

#### Goal 2. Connect communities in the economic shadows to areas with economic activity.

► Develop local public transportation networks as both a necessary service and a potential source of employment. A promising resource is: Community Transportation Association of America ([www.ctaa.org](http://www.ctaa.org)).

► Establish regional partnerships to develop road, air, and rail infrastructures needed to connect to areas of economic vitality.

#### Goal 3. Invest in the basic infrastructure for the knowledge economy.

► Spread affordable telecommunications access to rural communities and central city neighborhoods. Promising examples and resources include: LaGrange, GA located at the following address: ([www.lagrange-ga.org/cityGovernment/economicDevelopment.cfm](http://www.lagrange-ga.org/cityGovernment/economicDevelopment.cfm)); Blacksburg Electronic Village, Blacksburg, VA ([www.bev.net](http://www.bev.net)); Explornet, Inc. ([www.exlornet.org](http://www.exlornet.org)).

## SOCIAL INFRASTRUCTURE

A community's social infrastructure, including such supports as health care and child and elder care, increasingly determines the success of development efforts. A comprehensive vision for a strong social infrastructure entails providing social supports to enable all people to live and work with dignity. In keeping with this vision, we see three goals:

1. Provide affordable, quality health care for all people.
2. Provide pathways to self-sufficiency for economically vulnerable persons and families.
3. View safe, affordable housing as a human right and home ownership as an asset-building tool for families and communities.



Each of these areas of social support has reached a level of crisis in the South. As of 1999, 17.6% of Southerners had no health insurance coverage, and the figure is higher for such demographic segments as poor people, people of color, people with low educational attainment, and people living in rural areas (*Current Population Survey, 2000*). The lack of access to health care and other social supports is a particularly daunting problem for economically vulnerable families.

### Goals and Strategies

#### Goal 1. Provide affordable, quality health care for all people.

► Work to expand health insurance coverage so that more families can afford high-quality health care services.

► Increase access to health care, both by establishing more facilities in low-wealth communities and by increasing the numbers of trained health care providers serving rural areas and central city neighborhoods. Promising examples include: Rural Health Group, Halifax and Northampton Counties, NC ; Growing into Life Initiative, Aiken, SC. found at the following internet site: ([www.healthforum.com/HFComHealth/asp/aiken\\_general.asp](http://www.healthforum.com/HFComHealth/asp/aiken_general.asp))

► Increase access to affordable, quality care for the elderly and for those who cannot be self-sufficient.

### **Goal 2. Provide pathways to self-sufficiency for economically vulnerable persons and families.**

► Reconfigure welfare-to-work programs to focus on poverty alleviation, continuing job skills training, and placement in jobs with opportunities for advancement. Promising examples and resources include: Federal Express Families First Partnership, Memphis, TN; Marriott International's Pathways to Independence Program found at the following site: ([www.marriottnewsroom.com](http://www.marriottnewsroom.com)), National Campaign for Jobs and Income Support ([www.nationalcampaign.org](http://www.nationalcampaign.org)).



► Increase access to affordable, quality child care. Promising examples include: Save the Children Child Care Support Center, Atlanta, GA, you can check out this site here: ([www.calib.com/peerta/inn\\_pro/subtopics.cfm?comID=34](http://www.calib.com/peerta/inn_pro/subtopics.cfm?comID=34)); Employer's Child Care Alliance, Lee County, AL located here: ([www.nccic.org/ccpartnerships/profiles/ecca.htm](http://www.nccic.org/ccpartnerships/profiles/ecca.htm)).

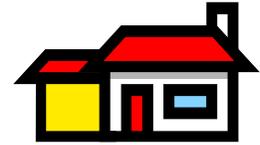
► Utilize income support and asset development strategies for low-income workers. Promising examples include: Individual Development Accounts (Corporation for Enterprise Development, ([www.cfed.org](http://www.cfed.org)); Earned Income Tax Credit (federal and state).

### **Goal 3. View safe, affordable housing as a human right and home ownership as an**

### **asset-building tool for families and communities.**

► Create state and local policies that encourage housing development through use of appropriate land and housing regulations and enforcement of fair mortgage lending. A promising resource is: National Low Income Housing Coalition ([www.nlihc.org](http://www.nlihc.org)).

► Create incentives, subsidies, and partnerships to make housing affordable for low-wealth families. Promising examples include: Atlanta Neighborhood Development Partnership, Inc. found here: ([www.andpi.org](http://www.andpi.org)); Metropolitan Housing and CDC, Washington, NC.



### **CULTURAL AND ENVIRONMENTAL STEWARDSHIP**

Against a backdrop of rapid population growth and mobility, comprehensive vision of cultural and environmental preservation is needed. This entails preserving and enhancing the natural, cultural, historical, and built environments of these communities. In keeping with this vision, we offer three goals:

1. Preserve, develop, and capitalize upon the distinctive cultural and historical assets of the community, and define culture inclusively.
2. Balance the need for development and preservation in land use and environmental stewardship.
3. Preserve clean air and water as community assets and health necessities for future generations.

Rapid growth of many urban and suburban areas in the South, fed by poor land use policies, threatens both the natural environment and the quality of life in rural communities, central city neighborhoods, and suburban areas across the South. Both air and water pollution threaten the environment, and, in turn, environmental degradation has a severe negative impact on a community's long-term economic outlook.

## Goals and Strategies

### Goal 1. Preserve, develop, and capitalize upon the distinctive cultural and historical assets of the community.

► Develop tourism and business opportunities based on cultural, historical, and environmental assets. Promising examples and resources include: Delta Cultural Center, Helena, AR ([www.deltaculturalcenter.com](http://www.deltaculturalcenter.com)); Resourceful Communities Program, North Carolina Conservation Fund; found here: ([www.conservationfund.org/conservation/sustain/index.html](http://www.conservationfund.org/conservation/sustain/index.html)); Handmade in America, Asheville, NC ([www.wnccrafts.org](http://www.wnccrafts.org)).

► Utilize historical sites and visitor centers to value both distinctive and collective histories. Promising examples include: Birmingham Civil Rights Institute found here: (<http://bcri.bham.al.us>); Museum of the New South, Charlotte, NC located here: ([www.museumofthenewsouth.org](http://www.museumofthenewsouth.org)).

► Pursue collaborative and resident-influenced Main Street and neighborhood revitalization projects. Promising examples and resources include: The National Trust for Historic Preservation's Inner City Venture Fund found at the following site: ([www.nthp.org/community\\_partners/loan.htm](http://www.nthp.org/community_partners/loan.htm).) Savannah, GA.



### Goal 2. Balance the need for development and preservation in land use and environmental stewardship.

► Manage sprawl and ensure smart growth by utilizing such strategies as urban infill, open space protection, regional planning, and others. Promising examples and resources include: Baton Rouge, La located here: ([www.planbr.com](http://www.planbr.com)); Sea Islands (SC) Preservation Project found at this site: ([www.sustainable.org/casestudies/SIA\\_PDFs/SIA\\_South\\_Carolina.pdf](http://www.sustainable.org/casestudies/SIA_PDFs/SIA_South_Carolina.pdf)); Sierra Club located at this site: ([www.siereraclub.org](http://www.siereraclub.org)).

► Develop more responsible and effective land use policies.

### Goal 3. Preserve clean air and water as community assets and health necessities for future generations.

► Enforce and strengthen state and local regulations on pollution affecting air and water quality.

► Research, develop, and implement greener energy sources and their uses as both a business development and environmental preservation tactic.

## CIVIC INFRASTRUCTURE

For a community reach and maintain its full potential economically, it must be civically healthy and inclusive or its own pathologies will prevent its sustained viability. A comprehensive vision for a strong civic infrastructure entails creating a culture of civic decision-making and problem-solving that is forward looking, accountable, and inclusive. In keeping with this vision, Southern communities should focus on three goals:

1. Ensure open and accountable government that hears and values all voices.
2. Develop the civic capacity of communities to address their own challenges and opportunities.
3. Bridge fault lines of race and class that inhibit community progress and erode civic health.

## Goals and Strategies

### Goal 1. Ensure open and accountable government that hears and values all voices.

► Engage in inclusive, equitable community visioning, planning, and implementation. Promising examples and resources include: Chattanooga Venture, Chattanooga, TN and can be found here: ([www.sustainable.org/casestudies/tennessee/TN\\_af\\_chattanooga.html](http://www.sustainable.org/casestudies/tennessee/TN_af_chattanooga.html)); Study Circles Resource Center ([www.studyircles.org](http://www.studyircles.org)).

► Increase citizen political participation through grassroots mobilization. Promising examples include: Fort Worth Coalition for Community Change, Fort Worth, TX.

New Road Community Development Group of Exmore, Exmore, VA located at this site: (<http://leadershipforchange.org/awardees/awardee.php3?ID=35>).

**Goal 2. Develop the civic capacity of communities to address their own challenges and opportunities.**

► Identify and utilize leadership development programs that broaden and diversify the local leadership pool. Promising examples and resources include: The Common Enterprise, San Antonio, TX; The Mary Reynolds Babcock Foundation's Grassroots Leadership Development Program found here: ([www.mrbf.org/grantmaking.htm#gld](http://www.mrbf.org/grantmaking.htm#gld)).

► Strengthen the formal and informal networks that build social capital.

► Build the capacity of local and regional organizations that serve as catalysts for community development. Promising examples include: Ford Foundation's Rural Community College Initiative found here: ([www.mdcinc.org/rcci](http://www.mdcinc.org/rcci)); Mountain Association for Community Economic Development, Berea, KY ([www.maced.org](http://www.maced.org)).

**Goal 3. Bridge the fault lines of race and class that inhibit community progress and erode civic health.**

► Identify and challenge racially discriminatory policies in the public and private sectors, maintaining an emphasis on compensating for negative effects. Promising examples include: Project Change found at this internet



location: ([www.projectchange.org](http://www.projectchange.org)); People's Institute for Survival and Beyond, New Orleans, LA found at the following internet site: ([www.thepeoplesinstitute.org](http://www.thepeoplesinstitute.org)).

► Implement programs of racial reconciliation and community building that recognize past and present divisions and work toward healing and reversing institutionalized practices. Promising examples include: Partnership Project, Greensboro, NC; Eau Claire Community Council, Eau Claire – North Columbia, SC ([www.indivisible.org/SCgallerystory.htm](http://www.indivisible.org/SCgallerystory.htm)).