Quarterly Report
Cooperative Agreement NCC5-494
The Goddard Earth Sciences and Technology Center
Reporting Period: January 1, 2002 through March 31, 2002

Goddard Earth Sciences and Technology Center
University of Maryland, Baltimore County
1000 Hilltop Circle
Baltimore, MD 21250

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FAX: 410-455-8806
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University of Maryland, Baltimore County
Hampton University
Howard University
Caelum Research Corporation
Northrop-Grumman Corporation

https://ntrs.nasa.gov/search.jsp?R=20020071145 2020-02-02T23:37:36+00:00Z
Technical Status Report

The following is a technical report of the progress made under Cooperative Agreement NCC5-494, the Goddard Earth Sciences and Technology Center (GEST). The period covered by this report is January 1, 2002 through March 31, 2002.

GEST is a consortium of scientists and engineers, led by the University of Maryland, Baltimore County (UMBC), to conduct scientific research in Earth and information sciences and related technologies in collaboration with the NASA Goddard Space Flight Center (GSFC). GEST was established through a cooperative agreement signed May 11, 2000, following a competitive procurement process initiated by GSFC.

Overview of significant Activities

Publication and distribution of the GEST Faculty Guidebook and Sponsors Handbook.

One new summer program was added to the list of GEST Summer Programs. All programs are listed below.

SUMMER PROGRAMS - “Launch Your Future At NASA” (Recruiting)

VSEP 2002

The Visiting Student Enrichment Program (VSEP) offers students summer employment with Goddard Earth Sciences and Technology Center (GEST), working with NASA/Goddard Space Flight Center’s (GSFC). Student projects have included simulating neural networks, preparing image analysis algorithms on supercomputers, developing computational science applications, and creating interactive World Wide Web sites.

Project experiences are available from June 10 to August 16, 2002 (High school students may start/stop later subject to housing availability), at GSFC in Greenbelt, MD. Students are provided opportunities to work with scientists and professionals at a world-class facility while experiencing meaningful work through a project primarily focused on computer science or the application of computers to solve problems in other sciences, VSEP also offers field trips and lectures to broaden appreciation for GSFC’s mission and activities.

Eligibility and Selection Criteria

The program is open to full-time students in computer science, the physical sciences, and mathematics. All students will be evaluated relative to their school-level peers. Participants must be either U.S. citizens or foreign nationals in U.S. schools who are either permanent residents or who possess a valid F1 work visa. All selected students will be subject to a pre-employment security background check under current security guidelines.

College: Undergraduate and graduate students must have taken courses in physician and computer sciences directly related to their areas of study.
High School: Students will be evaluated with emphasis on their potential and related extracurricular experiences, as well as on course work. The number of positions available will be limited.

Graduate Student Summer Program (GSSP) in Earth System Science

The Goddard Space Flight Center's Earth Sciences Directorate, in collaboration with the GEST Center, with headquarters at the University of Maryland Baltimore County, is offering a limited number of graduate student research opportunities for the summer of 2002. The program is scheduled for June 10 to August 16, 2002. The program is designed to stimulate interest in interdisciplinary Earth science studies by enabling selected students to pursue specially tailored research projects in conjunction with Goddard scientific mentors. This year's theme is the Global Water Cycle and Climate Change.

The Goddard Space Flight Center (GSFC) is recognized as a world leader in the application of remote sensing and modeling aimed at improving knowledge of the Earth system. The GSFC Directorate is playing a central role in NASA's Earth Observing System (EOS) and the U.S. Global Change Research Program.

EOS requires highly trained professionals with significant interdisciplinary backgrounds for the design, implementation and analysis of data from this comprehensive satellite system. The aim of this program is to attract and introduce promising students to Earth system science career options through hands-on educational research experiences in the Earth sciences at NASA.

Eligibility and Selection Criteria:

The program is open to students enrolled in or accepted to accredited U.S. programs in the Earth, physical or biological sciences, mathematics, or engineering disciplines. Students will be selected on the basis of academic record, demonstrated motivation and qualification to pursue multidisciplinary research in the Earth sciences, clarity and relevance of stated research interests to NASA programs, and letters of recommendation. Preference will be given to students who have completed at least one year of graduate study. Minorities and women are encouraged to apply.

Students must commit for the specific full ten-week period (June 10 – August 16, 2002). Participants must be either U.S. citizens or foreign nationals in U.S. schools who are either permanent residents or who possess a valid F1 visa. All selected students will be subject to a pre-employment security background check under the current security guidelines.

In conjunction with the 2002 Graduate Student Summer Program in Earth System Science, the Goddard Earth Sciences and Technology Center (GEST) and the Earth Sciences Directorate of the Goddard Space Flight Center (GSFC) have organized a lecture series to be held on June 11 to 14, 2002. This series intends to promote the understanding of current scientific knowledge about the challenges of global change, and how NASA supports the research underpinning this knowledge.
The High Performance Computational Earth and Space Sciences (HPC) Summer Program is scheduled for July 8 – 26, 2002.

The NASA Goddard Space Flight Center's (GSFC) Earth and Space Data Computing Division (ESDCD) through the Goddard Earth Sciences and Technology Center (GEST) is soliciting applications from qualified graduate students to participate in the Summer School, now in its 10th year. The ESDCD provides comprehensive research and development support in data handling and computing for NASA and maintains a world-class computing facility.

Approximately 15 students will be selected and will receive hands-on parallel computer training and small group interaction experience. Staff and invited computational scientists will present a series of lectures on advanced topics in computational Earth and space sciences, with emphasis on computational fluid dynamics and particle methods and the development of software for scalable architectures.

**Eligibility and Selection Criteria**

The program aims to attract Ph.D. students in the Earth and space science disciplines whose present or future research requires large-scale numerical modeling on massively parallel architectures. Eligibility is limited to those students who are U.S. citizens, are enrolled in U.S. universities, and have passed their Ph.D. qualifying exams. Students will receive a stipend and will be reimbursed for domestic transportation to and from Greenbelt, Maryland. Application materials should include: 1) a cover letter explaining your interest in the program and how your research will benefit from your participation; 2) your area of research and thesis title; 3) a statement of your career objectives and goals; 4) a description of your relevant work experience; 5) your curriculum vitae or resume with publication list; 6) your current G.P.A.; 7) two letters of reference; 8) academic transcripts showing two full years of work; and 9) a statement of U.S. citizenship.

**Goddard Coastal Research Graduate Fellowship Program - A New Program**

**June 17—August 16, 2002**

The Goddard Space Flight Center's Earth Sciences Directorate and Wallops Flight Facility, in collaboration with the Goddard Earth Sciences and Technology (GEST) Center, led by the University of Maryland Baltimore County, is offering a limited number of graduate student research opportunities for the summer of 2002. This new program is scheduled for June 17 to August 16, 2002. It is designed to stimulate interest in interdisciplinary Earth science studies by enabling selected students to pursue specially tailored research projects on coastal processes in conjunction with Goddard scientific mentors during the program period.

The aim of this new program is to attract and introduce promising students in their first or second year of graduate studies to Oceanography and Earth system science career options through hands-on instrumentation research experiences on coastal processes at NASA's Wallops Flight Facility on the Eastern Shore of Virginia.
Program Activities:
Each student will be teamed with a NASA scientist mentor with parallel scientific interests to jointly develop and carry out an intensive research project over the nine-week period. Most research will be done at GSFC’s Wallops Flight Facility, however, there is the possibility that students will have the opportunity to participate in field programs at other locations as well.

Eligibility & Selection
The program is open to students enrolled in or accepted to accredited U.S. graduate program in the Earth sciences, physical or biological oceanography, and biological or environmental sciences disciplines. Students will be selected on the basis of academic record, demonstrated motivation and qualification to pursue multidisciplinary research in the Earth or Oceanographic sciences clarity and relevance of women, and individuals with disabilities are encouraged to apply.

Students must commit for the specific full nine-week period (June 17—August 16, 2002. Participants must be either U.S. citizens or foreign nationals in U.S. schools who either are permanent residents or who possess a valid F1 visa. All selected students will be subject to a pre-employment background check under the current security guidelines.

Compensation:
Students will be paid the equivalent of $12/hour for forty hours per week over the nine-week period. In addition, GEST will reimburse reasonable domestic travel expenses for participants needing to relocate to Wallops Flight Facility, located near Chinoteague, Virginia on the Eastern Shore. Housing will be provided only for the program participants.

Research Milestones for the Reporting Period

Dr. Jiayu Zhou’s

Article from the American Meteorological Society, Orland, Fla.
An El Niño Link With A Tropical Disease?
January 13-17, 2002
SCIENCE NEWS
February 2, 2002 VOL. 161

An analysis of recent outbreaks of an often fatal disease in Peru may strengthen a link between the malady and the warming of the tropical Pacific Ocean known as El Nino. If proven, the connection could help health workers stave off future epidemics. The bacterial disease known as bartonellosis is transmitted to people by the bites of sand flies, similar to the way that malaria is transmitted by mosquitoes, says Jiayu Zhou, an earth scientist at the University of Maryland in Baltimore County. In chronic form of the disease, patients get long-lasting blood filled, wart-like lesions on or under the skin. In its acute form, bartonellosis causes severe anemia that’s fatal in as many as 40 percent of untreated patients.
Outbreaks of the disease usually occur in river valleys of the Andes Mountains at altitudes between 800 and 3,500 meters and follow a seasonal pattern, says Zhou. The number of cases begins to rise in December, peaks in February and March—the height of the Peruvian summer—and is lowest between July and November. Over the long term, epidemics seem to follow a 4-to-8 year cycle and appear to be associated with El Niño.

To search for a link between bartonellosis and El Niño, Zhou and his fellow researchers analyzed the incidence of the disease at two Peruvian locations between 1994 and 1999. Caraz, a city in a valley near the Pacific coast, has a long history of epidemics, says Zhou. The residents of Cusco, a city that is farther inland than Caraz and also farther from the equator, never suffered outbreaks of bartonellosis until 1997, the year that marked the beginning of the strongest El Niño of the 20th century.

Data from satellites that monitor the temperature of the tropical Pacific showed that the ocean began to warm about 2 to 3 months before the disease outbreaks began. Zhou cautions that these results are based on a limited set of data and are therefore only preliminary. Also, he notes, there was only one El Niño during the 6 year study period. Nevertheless, he tentative link between the ocean-warming phenomenon and outbreaks of bartonellosis means that health care workers could get advanced warning of possible epidemics.
Table T-1 GEST Council Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Code</th>
<th>Section</th>
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<tbody>
<tr>
<td>Robert Curran</td>
<td>Director</td>
<td>900</td>
<td>Administration</td>
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<tr>
<td>Vacant</td>
<td>Associate Director</td>
<td>900</td>
<td>&quot;</td>
</tr>
<tr>
<td>L. Anathea Brooks</td>
<td>Assistant Director</td>
<td>900</td>
<td>&quot;</td>
</tr>
<tr>
<td>Henry Plotkin</td>
<td>Chief Scientist</td>
<td>900</td>
<td>&quot;</td>
</tr>
<tr>
<td>Dr. Julio Bacmeister</td>
<td>Faculty Group Leader</td>
<td>971</td>
<td>Seasonal and Interannual Prediction</td>
</tr>
<tr>
<td>Dr. Susan Hoban</td>
<td>Faculty Group Leader</td>
<td>103</td>
<td>Information Science and Technology</td>
</tr>
<tr>
<td>Dr. Steven Pawson</td>
<td>Faculty Group Leader</td>
<td>910</td>
<td>Climate and Trace Species</td>
</tr>
<tr>
<td>Dr. Susan Sakimoto</td>
<td>Faculty Group Leader</td>
<td>921</td>
<td>Land Surface and Hydrology</td>
</tr>
<tr>
<td>Dr. Alexander Smirnov</td>
<td>Faculty Group Leader</td>
<td>923</td>
<td>Aerosols and Clouds</td>
</tr>
</tbody>
</table>

Position advertisements appeared in *EOS and The Chronicle of Higher Education*. Information concerning these advertisements is provided in Table T.2.

Table T.2. Position advertisements published during this reporting period

<table>
<thead>
<tr>
<th>Advertisement</th>
<th>No. of Positions</th>
<th>Publication Date</th>
<th>Closing Date</th>
</tr>
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<td>EOS</td>
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<td>1/02</td>
<td>3/11/02</td>
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<tr>
<td>Chron. of Higher Ed.</td>
<td>1</td>
<td>11/23</td>
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<td>Assoc. Director</td>
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Changes in the GEST technical staff during this reporting period are provided in the following two tables, Table T.3 and Table T.4.

Table T.3 GEST technical staff hired during the reporting period

<table>
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<tr>
<th>Name</th>
<th>Sponsor</th>
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<tbody>
<tr>
<td>Choi, Wookap</td>
<td>A. Douglas</td>
<td>916</td>
</tr>
<tr>
<td>Dong, Jiaru</td>
<td>P. Houser</td>
<td>974</td>
</tr>
<tr>
<td>Ginoux, Paul</td>
<td>J. Herman</td>
<td>916</td>
</tr>
<tr>
<td>Gu, Guojun</td>
<td>B. Adler</td>
<td>912</td>
</tr>
<tr>
<td>Kumar, Sujay</td>
<td>P. Houser</td>
<td>974</td>
</tr>
<tr>
<td>Mizogushu, Ken-ichi</td>
<td>S. Hakkinen</td>
<td>971</td>
</tr>
<tr>
<td>Tian, Yudong</td>
<td>P. Houser</td>
<td>974</td>
</tr>
<tr>
<td>Wang, Zhein</td>
<td>D. Whiteman</td>
<td>924</td>
</tr>
<tr>
<td>Yang, Song</td>
<td>E. Smith</td>
<td>913</td>
</tr>
<tr>
<td>Zhan, Xiwu</td>
<td>P. Houser</td>
<td>974</td>
</tr>
<tr>
<td>Ziemke, Jerry</td>
<td>S. Chandra</td>
<td>916</td>
</tr>
</tbody>
</table>
Table T.4. GEST technical staff who have left during the present reporting period

<table>
<thead>
<tr>
<th>Name</th>
<th>Sponsor</th>
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</thead>
<tbody>
<tr>
<td>Entin, Jared</td>
<td>D. Toll</td>
<td>974</td>
</tr>
<tr>
<td>Morel, Pierre</td>
<td>L. Olsen</td>
<td>974</td>
</tr>
<tr>
<td>Rodell, Matt</td>
<td>P. Houser</td>
<td>974</td>
</tr>
</tbody>
</table>

The subsequent positions that these individuals went to are as follows: (J. E.) Civil Servant; (P.M.) Part-time; (M.R.) Civil Servant.

At the end of the reporting period GEST had approximately 98 research staff on board.

Submitted or Published Papers by GEST Researchers During this Reporting Period

The articles submitted or published during this reporting period are listed in the Appendix T-2 at the end this section of the report.

GEST Related Seminars for this Reporting Period

Several GEST related seminars are listed in Appendix T-3 at the end of this section of the report.

Proposals Submitted by GEST Researchers During this Reporting Period

Proposals submitted by UMBC GEST research faculty are listed in Appendix T-4 at the end of this section of the report.
Appendix T-1. GEST Administrative Staff

GEST Administrative Staff as of March 31, 2002.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Location</th>
<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert J. Curran</td>
<td>Director</td>
<td>UMBC/GSFC</td>
<td>410-455-8813</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>301-286-8951</td>
</tr>
<tr>
<td>L. Anathea Brooks</td>
<td>Assistant Director</td>
<td>UMBC/GSFC</td>
<td>301-286-4226</td>
</tr>
<tr>
<td>Henry H. Plotkin</td>
<td>Chief Scientist</td>
<td>GSFC</td>
<td>301-286-7992</td>
</tr>
<tr>
<td>Debbie Hicks</td>
<td>Business Manager</td>
<td>UMBC</td>
<td>410-455-8815</td>
</tr>
<tr>
<td>Grace Roscoe</td>
<td>Executive Assistant</td>
<td>UMBC</td>
<td>410-455-8808</td>
</tr>
<tr>
<td>Nancy Flowers</td>
<td>Administrative Assistant II</td>
<td>UMBC</td>
<td>410-455-8899</td>
</tr>
<tr>
<td>Cherrie Johnson</td>
<td>Administrative Assistant II</td>
<td>GSFC</td>
<td>301-286-4403</td>
</tr>
<tr>
<td>Deborah Belvedere</td>
<td>Program Assistant</td>
<td>GSFC</td>
<td>301-614-5809</td>
</tr>
<tr>
<td>Arlene Rustmann</td>
<td>Program Assistant</td>
<td>GSFC</td>
<td>301-614-5733</td>
</tr>
<tr>
<td>Frances Lilly</td>
<td>Visitor/School Coordinator</td>
<td>GSFC</td>
<td>301-286-4099</td>
</tr>
<tr>
<td>Tom Low</td>
<td>Caelum Lead</td>
<td>Caelum</td>
<td>301-424-8205 x 349</td>
</tr>
<tr>
<td>Denise Everhart</td>
<td>Student Support</td>
<td>GSFC</td>
<td>301-286-4099</td>
</tr>
<tr>
<td>Phuong Ta</td>
<td>Student Support</td>
<td>GSFC</td>
<td>410-455-8899</td>
</tr>
</tbody>
</table>

Locations:

UMBC
UMBC Technology Center, South Campus
1450 S. Rolling Road, Suite 3.002
Baltimore, MD 21227

GSFC
NASA Goddard Space Flight Center
Mail Code 900.1
Bldg. 28, Room W223
Greenbelt, MD 20771
Appendix T-2. PUBLICATIONS, January 1, 2002 – March 31, 2002

Refereed

Asaph Anyamba


Paul Ginoux


Nickolay Krotkov


Judit Pap


Joan Rosenfield


Adam Schlosser


Gail Skofronick-Jackson

Alexander Smirnov


Chaojiao Sun


Chung-Lin Shie


Lian Tian


Alberto Troccoli

Guiling Wang


Zhien Wang


Clark Weaver


Judd Welton


Cara Wilson

Marcia Yamasoe


Dongliang Yuan


Xiwu Zhan


Appendix T-3. SEMINARS, January 1, 2002 –March 31, 2002

Alexander M Chekalyuk


Jean Paul Boy


Nieto Ferreria

Nieto Ferreria R., M. Suarez, NSIPP-1 “Simulations of the SALLJ. Poster presentation at the VAMOS/CLIVAR/WCRP Conference on the South American Low-Level Jet, Santa Cruz, Bolivia, February 5-7, 2002.


Jonathan Gottschalck


Daniel Johnson


Nickolay Krotkov


Ruei-Fong Lin


Peter Norris


Kevin Olson


**Judit Pap**


**Steven Pawson**


**Rolf Reichle**


**Joel Sachs**


**Adam Schlosser**


Alexander Smirnov


Chajaoi Sun


Alberto Troccoli


Clark Weaver

Joiner, J., A. da Silva, D. Frank, and C. Weaver, On the importance of non-traditional variables for satellite radiance assimilation and preparation for AIRS at DAO, poster presented by J. Joiner at annual AMS meeting, Orlando FL, 2002.

Alberto Troccoli

Cara Wilson


Liguang Wu


Xiwu Zhan


Jiayu Zhou


<table>
<thead>
<tr>
<th>P.I.</th>
<th>Title</th>
<th>Sponsoring Agency</th>
<th>Budget/Commitment</th>
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<tbody>
<tr>
<td>Judit Pap</td>
<td>&quot;Variations in the Solar Radiation Energy Output on time Scales of</td>
<td>NASA</td>
<td>$40,451</td>
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<tr>
<td></td>
<td>Years and the Solar Cycle&quot;</td>
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<td><strong>S. Sakimoto</strong></td>
<td><strong>funded</strong></td>
<td><strong>Research Foundation of SUNY</strong></td>
<td><strong>$12,739</strong></td>
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19
S. Sakimoto - funded
"Applications of MGS MOC and MOLA Data to Lava Flows: Investigation of Rheology, Topographic Influences and Tectonic Effects"
Proxemy Research
$4,638

Jian-Jian Wang - funded
"Organization, Structure and Evolution of Tropical Convections in South China Sea Monsoon and Their Mesoscale Environment"
NASA
$167,667
Business Status Report

Amendments Received During this Reporting Period

Three amendments to the Cooperative Agreement were received during the present reporting period. At the start of the reporting period a total of $10,770,214 was obligated to the Cooperative Agreement. As of 3/31/02 the total financial obligation was $14,795,729. Table B.1 gives an over view of these amendments.

Table B.1. Amendments to NCC5-494, received between 1/1/02 and 3/31/02.

<table>
<thead>
<tr>
<th>Amendment Number</th>
<th>Date</th>
<th>Amount</th>
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The attached Table B.2 gives a detailed breakdown of the new or augmented activities in amendments 25, 26 and 27.

Summary of Account Activity

The most recent cost analysis for GEST, giving actual costs accrued during the reporting period was dated 3/31/02. Table B.3 gives a detailed breakdown, by task number of the costs incurred, he approved budget and remaining balance, during the reporting period.
<table>
<thead>
<tr>
<th>TABLE B.3</th>
<th>DETAILED COST BREAKDOWN FOR THE LAST THREE MONTHS OF THE REPORTING PERIOD</th>
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**GENT Monthly Cost Analysis - January 2, 2003 - March 31, 2002**


**GENT Task # and Sponsor**

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<th>Salary</th>
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<th>Budget</th>
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**January 2003**

| 0.00   | 0.00   | 0.00   | 0.00        | 0.00     | 0.00         | 0.00        | 0.00     | 0.00 | 0.00              | 0.00           | 0.00       | 0.00   | 0.00   | 0.00       |

**February 2003**

| 0.00   | 0.00   | 0.00   | 0.00        | 0.00     | 0.00         | 0.00        | 0.00     | 0.00 | 0.00              | 0.00           | 0.00       | 0.00   | 0.00   | 0.00       |

**March 2003**

| 0.00   | 0.00   | 0.00   | 0.00        | 0.00     | 0.00         | 0.00        | 0.00     | 0.00 | 0.00              | 0.00           | 0.00       | 0.00   | 0.00   | 0.00       |

**Total for the Quarter**

| 0.00   | 0.00   | 0.00   | 0.00        | 0.00     | 0.00         | 0.00        | 0.00     | 0.00 | 0.00              | 0.00           | 0.00       | 0.00   | 0.00   | 0.00       |

**Total for the Year**

| 0.00   | 0.00   | 0.00   | 0.00        | 0.00     | 0.00         | 0.00        | 0.00     | 0.00 | 0.00              | 0.00           | 0.00       | 0.00   | 0.00   | 0.00       |

**Notes**

- Detailed cost breakdown for the last three months of the reporting period.
- The table includes detailed costs for various categories such as salary, fringe benefits, travel, subcontract, supplies, publications, contractual, and equipment, among others.
- Indirect costs are also included, along with the total direct costs and total costs.
- The budget and remaining costs are also provided.
- The data is organized by month and quarter for the year 2003.
### TABLE B-3: DETAILED COST BREAKDOWN FOR THE LAST THREE MONTHS OF THE REPORTING PERIOD

<table>
<thead>
<tr>
<th>GEST Task # and Sponsor</th>
<th>Direct Costs</th>
<th>Indirect Costs</th>
<th>Total Costs</th>
<th>Total</th>
<th>Approved</th>
<th>Projected</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In-house</td>
<td>Contractors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### NOTE

- Direct Costs: Costs associated with specific tasks or projects.
- Indirect Costs: Overhead or support costs.
- Total Costs: Sum of Direct and Indirect Costs.
- Approved: Costs approved for the reporting period.
- Projected: Costs projected for the reporting period.
- Balance: Difference between Approved and Projected.

#### Source

- GEST Monthly Cost Analysis: January 1, 2022 - March 31, 2022

#### Additional Information

- The table provides a detailed breakdown of costs for the last three months of the reporting period.
- The data includes costs associated with specific tasks or projects, as well as overhead or support costs.
- The balance represents the difference between costs approved and projected for the reporting period.

#### Example

- For GEST Task #12345, the total costs are $123,456, with direct costs of $67,890 and indirect costs of $55,567. The approved costs are $100,000, and the projected costs are $120,000, resulting in a balance of $-20,000.

---

**Example Table Entry**

- **Task #12345**: Direct Costs: $67,890, Indirect Costs: $55,567, Total Costs: $123,456, Approved: $100,000, Projected: $120,000, Balance: $-20,000
<table>
<thead>
<tr>
<th>GEST Task # and Sponsor</th>
<th>A</th>
<th>C</th>
<th>Total</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
<th>Total</th>
<th>Approved</th>
<th>Projected</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>#72-21-143 Geieroth</td>
<td>14,130</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16,130</td>
<td>16,956</td>
</tr>
<tr>
<td>#112-21-144 Chandira</td>
<td>3,713</td>
<td>555</td>
<td>196</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4,964</td>
<td>400</td>
</tr>
<tr>
<td>#72-21-145 Adler</td>
<td>0</td>
<td>0</td>
<td>2,497</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,497</td>
<td>2,906</td>
</tr>
<tr>
<td>#72-21-146 Casdian</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10,000</td>
</tr>
<tr>
<td>#12-22-147 Smith, E.</td>
<td>7,302</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12,302</td>
<td>1,444</td>
</tr>
<tr>
<td>#72-25-148 Caster, D.</td>
<td>6,440</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6,440</td>
<td>837</td>
</tr>
<tr>
<td>#72-25-149 Mahler</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>#72-25-150 Hinson</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>#72-25-151 King</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>#112-29-152 Tan</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>#30-30-153 Meier/Izumi</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Totals:**

1,165,579 | 293,383 | 36,665 | 0 | 1,370 | 0 | 14,320 | 0 | 4,320 | 1,876,212 | 10,253,049 | 12,129,260 | 14,795,729 | 0 | 2,768,254