ScienceOrganizer is a specialized knowledge management tool designed to enhance the information storage, organization, and access capabilities of distributed NASA science teams. Users access ScienceOrganizer through an intuitive Web-based interface that enables them to upload, download, and organize project information -- including data, documents, images, and scientific records associated with laboratory and field experiments. Information in ScienceOrganizer is “threaded”, or interlinked, to enable users to locate, track, and organize interrelated pieces of scientific data. Linkages capture important semantic relationships among information resources in the repository, and these assist users in navigating through the information related to their projects.

ScienceOrganizer was developed in conjunction with scientists in the Early Microbial Ecosystems Group and the Electron Microscopy Lab at NASA Ames, and is undergoing test usage by these groups and the Ecogenomics Focus Group within the NASA Astrobiology Institute (NAI).
The right side of the ScienceOrganizer interface displays a project information record describing a microbial culture, including various data fields describing collection, cultivation, and isolation conditions for the culture. The left hand side of the interface displays links from the culture to various related records, including the sample that the culture was grown from, a micrograph of the culture, genetic sequence data, and recipes for growth and maintenance media. The user simply clicks on a link to navigate to a related record.
Creating and Linking a New Record in ScienceOrganizer

1. Click to create a new measurement record linked to the sample record called ‘Streamer mat 1’

2. Enter name of new measurement record

3. Enter information about the measurement using pull-down lists, selection boxes and text entry fields

4. Browse your hard drive or network to select data file to upload into system

5. Confirm new record creation

Users create new Project Information Records by filling out the form on the right hand side of the interface. Data and image files are uploaded into the system from the user's hard disk and stored on the ScienceOrganizer server, where they can be accessed by other project members. The new record will be linked to the existing ‘Streamer mat 1’ record shown in the left hand side of the interface.

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Searching for Records within ScienceOrganizer

Users locate records within ScienceOrganizer by using the search form shown on the right hand side of the interface. Users specify the type of record they are looking for, plus a search string that matches against the record name.
What is ScienceOrganizer?

- An information repository / digital library for distributed scientific project teams
- A hybrid tool combining the functionality of:
  - a database
  - a document-sharing system
  - a web-like hypermedia information space
- Enables storage and retrieval of heterogeneous project information: *images, datasets, documents, and various types of scientific records* (describing samples, field sites, measurements, instruments, microbial cultures, etc.)
- Supports cross-linkage among stored items to enable rapid access to interrelated information
Sanctioned Links between “Culture” Records and Other Types of Project Information Records

The links between records in ScienceOrganizer are predefined based on an analysis of the important relationships among the various information products gathered by the scientific project team during the course of their work. This diagram depicts the relationships defined between microbial cultures and other types of information records in ScienceOrganizer.
Early Microbial Ecosystems Group:
Distributed Field and Lab Work

Field Research Sites
Home Institutions

- Portland State
- U. of Oregon
- U. Conn
- U. Miami
- Arizona State

Field Data Collection & Preliminary Data Analysis

- field notes
- images
- measurements
- sensor data

Geological Samples

- Highborne Cay, Bahamas

Biological Samples

- lab notes and experiment data
- electron microscope images
- analysis results
- publications

Ames Research Center

Microscopy Lab

Greenhouse

Microbiology Lab

Microbial Culture Facility

Other culture collections

Microbial Cultures

Baja California, Mexico

Yellowstone National Park
ScienceDesk Group Thrust Areas

1. Project Info. Repository: ScienceOrganizer
   - Images
   - Cultures
   - Datasets
   - Procedures
   - Documents
   - Scientific Records

2. Remote Electron Microscopy Facility

3. Agent-assisted Greenhouse Collaboratory

4. Cyanobacteria Culture Collection

Field Research Sites
- Highborne Cay, Bahamas
- Baja California, Mexico
- Yellowstone National Park

Home Institutions
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- Arizona State

Ames Research Center