A User Based Approach to Comparing SST Fields

Peter Cornillon[1], Daniel Crawl[2] and Ilkay Altintas[2]

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GHRSST Meeting
9 June 2008

The Problem

Peter Cornillon[1], Daniel Crawl[2] and Ilkay Altintas[2]

Consider a user . . .

- Who would like to evaluate the output of a general ocean circulation model by comparing predicted SST with that observed in one or more satellite derived fields, or
- Who has been using SST fields available only for the North Atlantic to study mesoscale processes in the vicinity of the Gulf Stream, but would now like to study the Kuroshio using a similar approach, or
- Who like to know how available satellite-derived SST fields compare for a small region, say the western Med, in an effort to choose the one best for her project.
- The two extremes in approaches to dealing with this are:
  - A 'centralize approach' $\Rightarrow$ GMPE; HR-DDS;
    - Advantages: Closer; fast; large suite of statistical analyses available
  - A user-contolled, on-the-fly tool
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Peter Cornillon[1], Daniel Crawl[2] and Ilkay Altintas[2]

- NSF funded a project called REAP, Realtime Environment for Analytical Processing .
- REAP has an ocean portion and a terrestrial portion.
- The ocean portion is to develop an on-the-fly user driven analysis tool for the comparison of SST fields.
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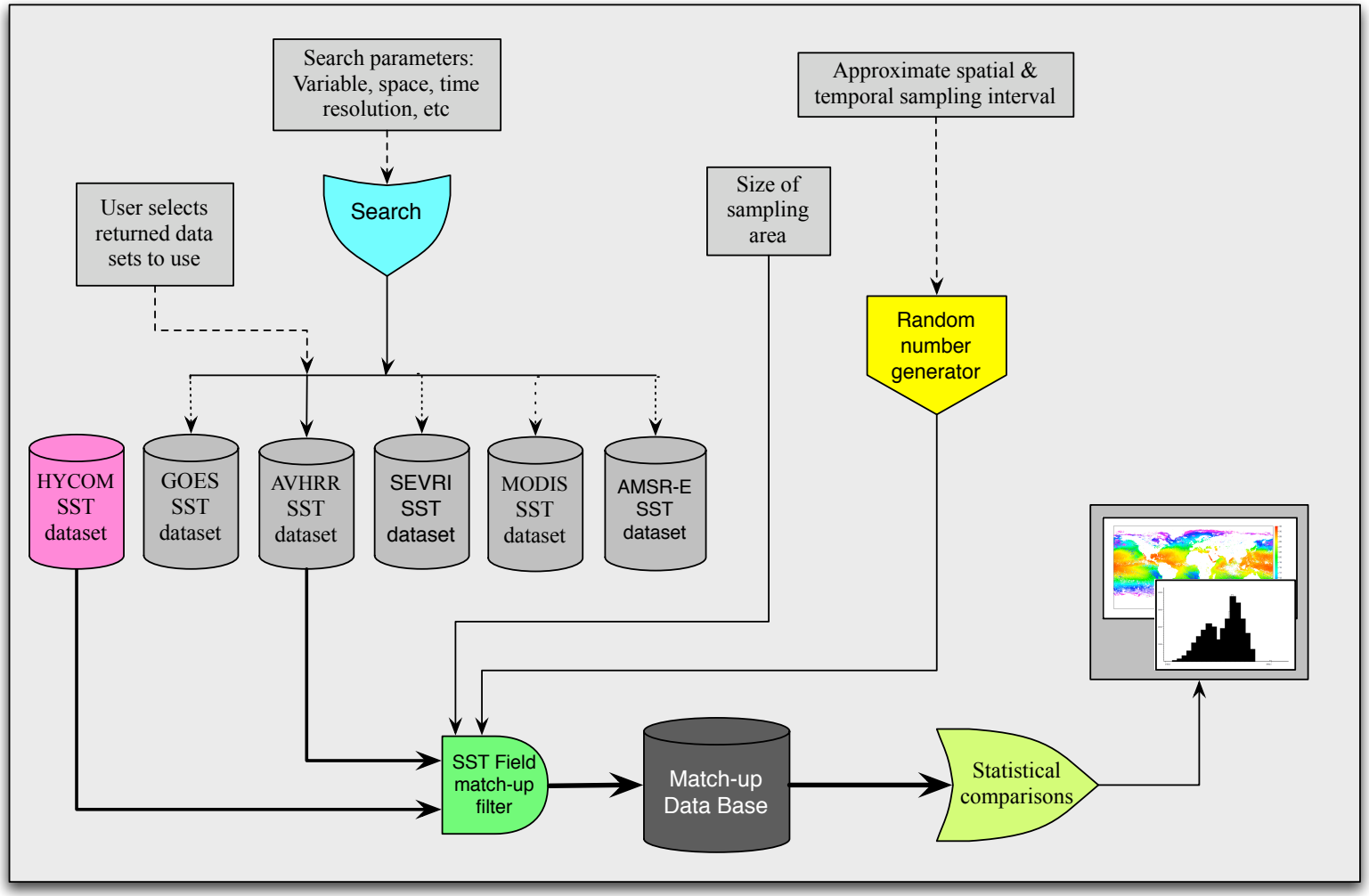
- The ocean portion is to develop an on-the-fly user driven analysis tool for the comparison of SST fields.
- Let's look at the case of a user who wants to compare HYCOM SST fields to satellite-derived fields,
  But the user does not know what satellite-derived fields are available.

The General Idea – Basic Workflow for Grid Comparison

Peter Cornillon[1], Daniel Crawl[2] and Ilkay Altintas[2]



Three Modules

Peter Cornillon[1], Daniel Crawl[2] and Ilkay Altintas[2]

The workflow can be viewed as consisting of 3 modues:

1. User input and data set selection.
2. Construction of the match-up data set.
3. Analysis.

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The General Idea – User Entry Module

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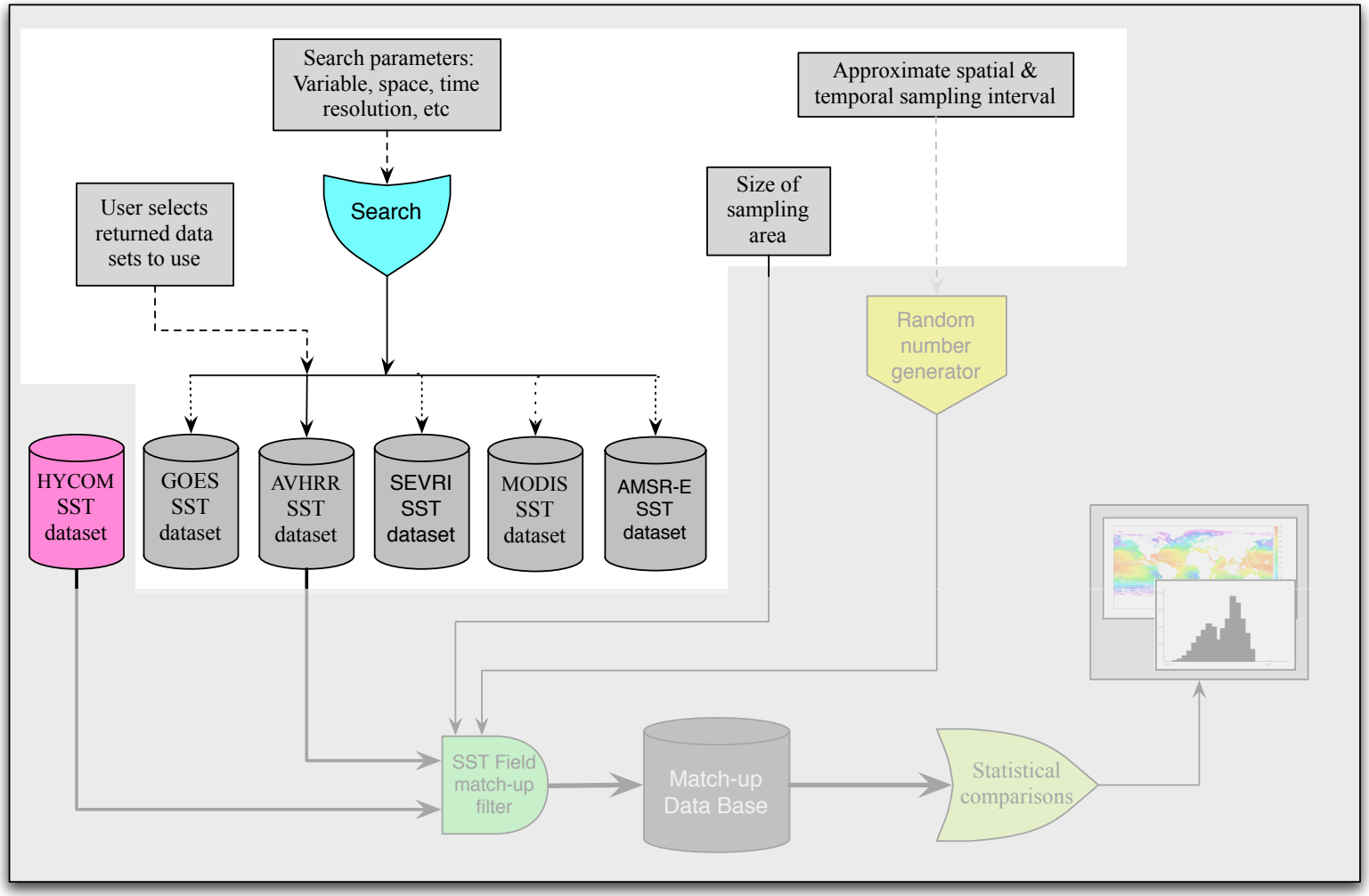
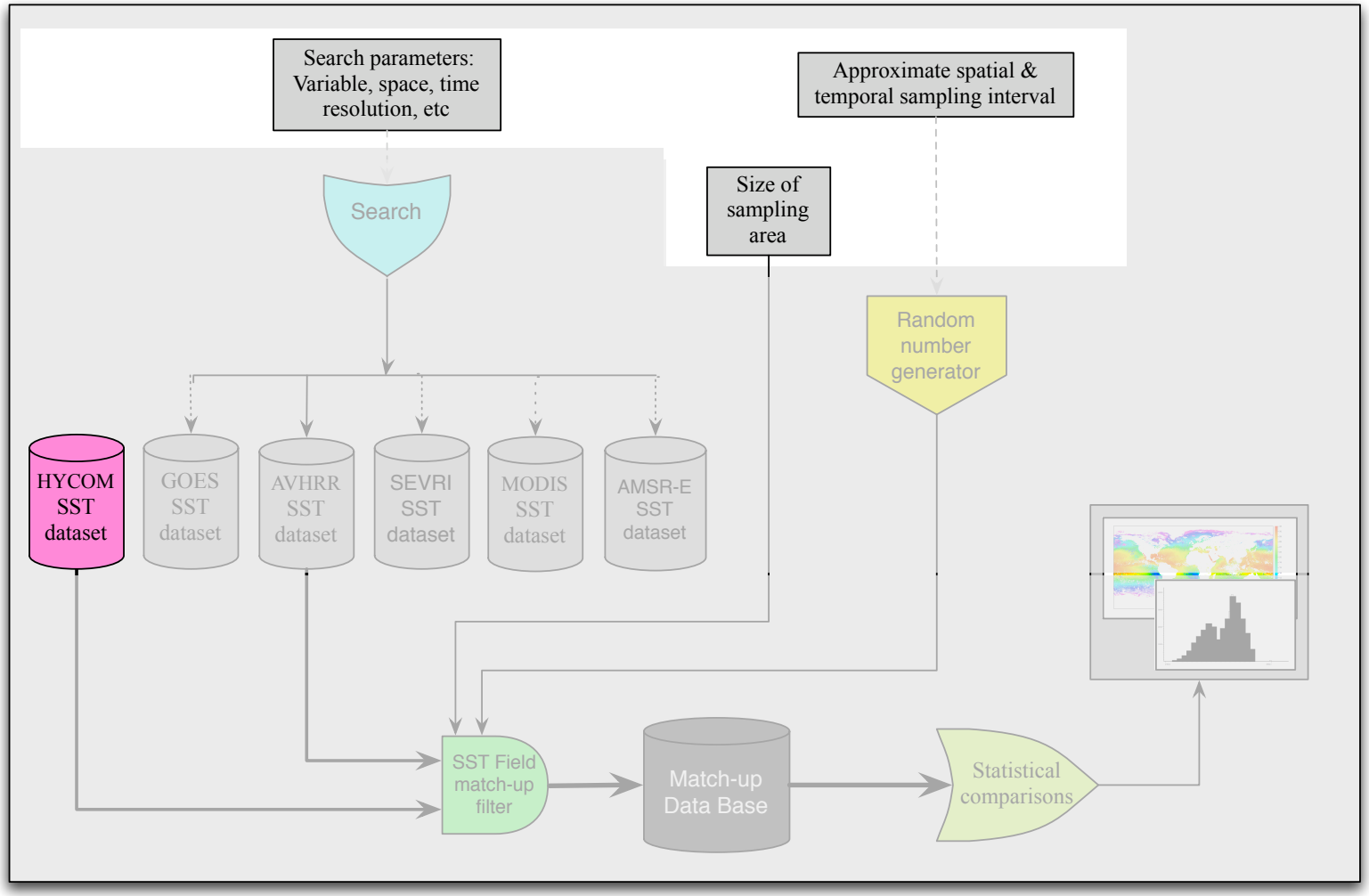


The General Idea – User Entry Module – Enter Basic Parameters

Peter Cornillon[1], Daniel Crawl[2] and Ilkay Altintas[2]



The General Idea – User Entry Module – Search for Data Sets

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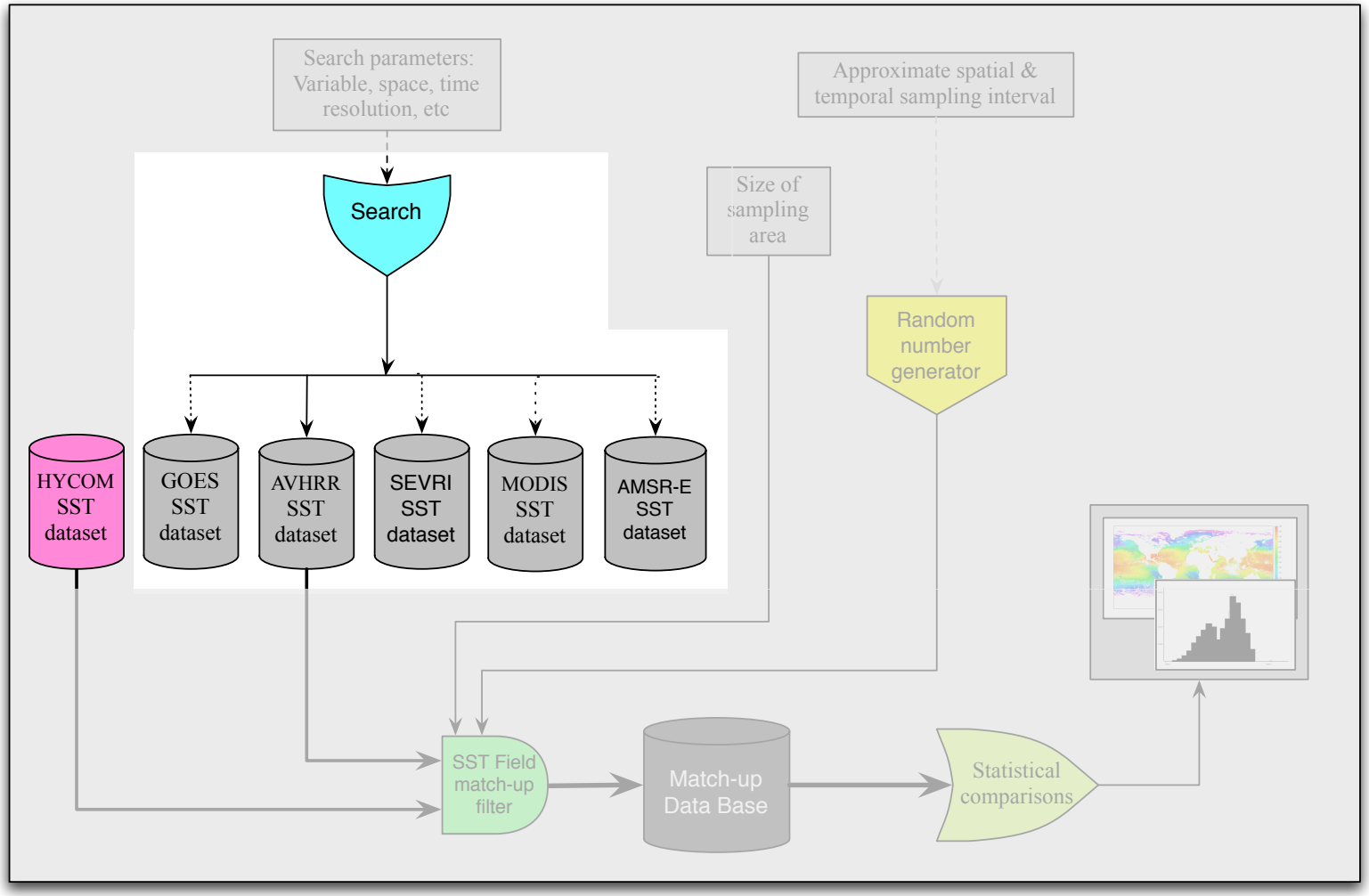

The General Idea – User Entry Module – Select Data Sets

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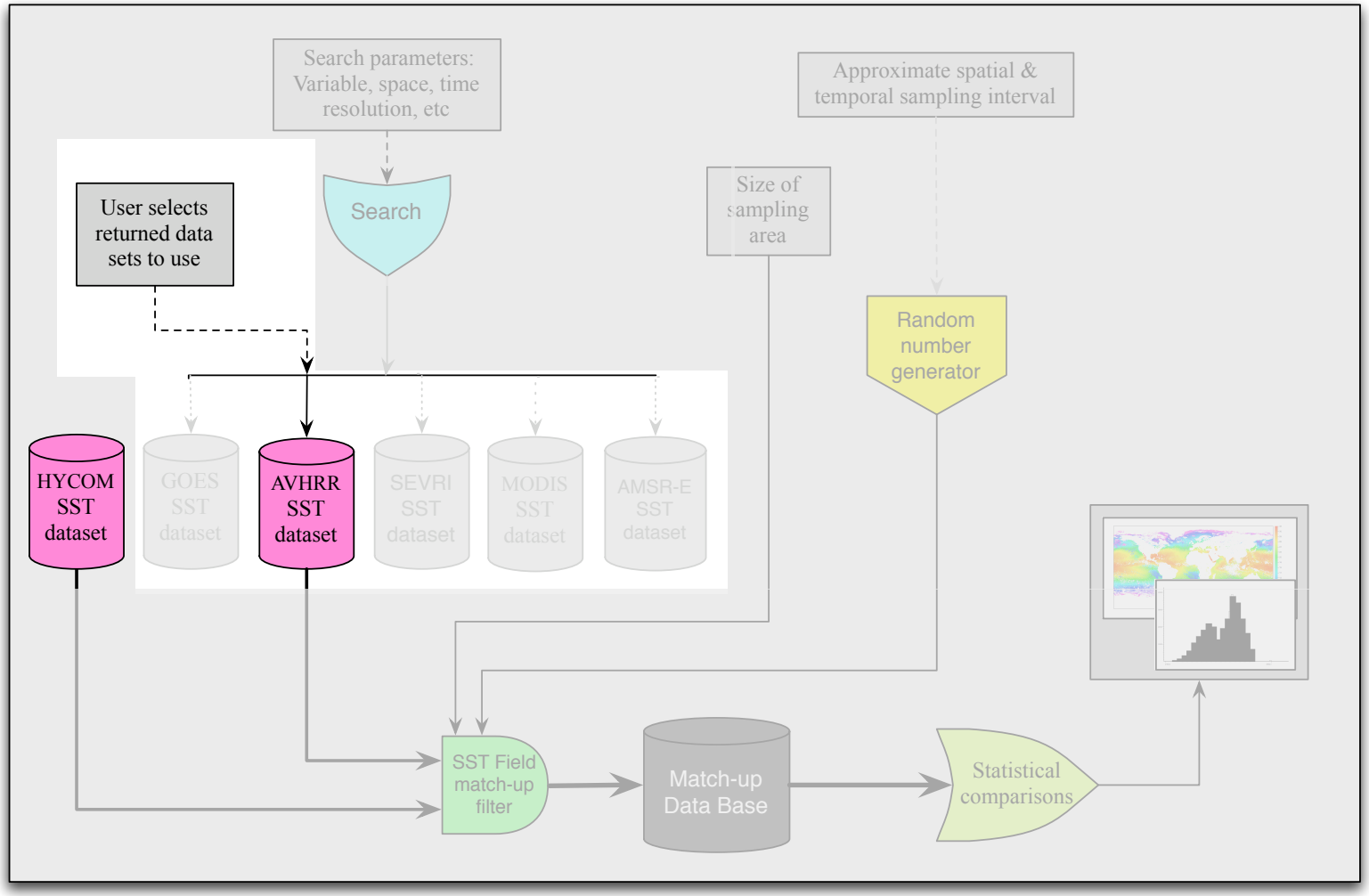

The General Idea – Construct Matchup Database

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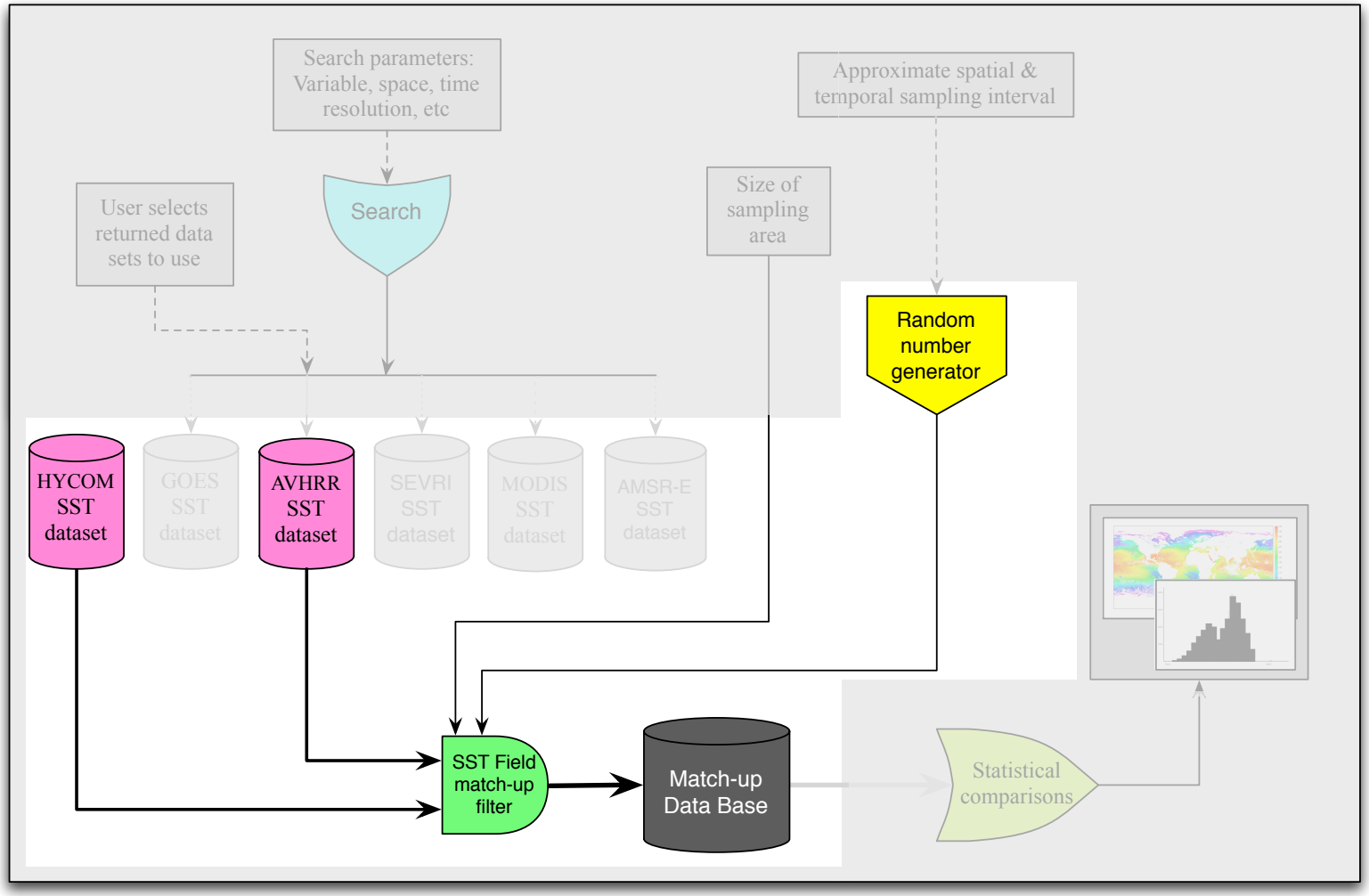

The General Idea – Analysis Module

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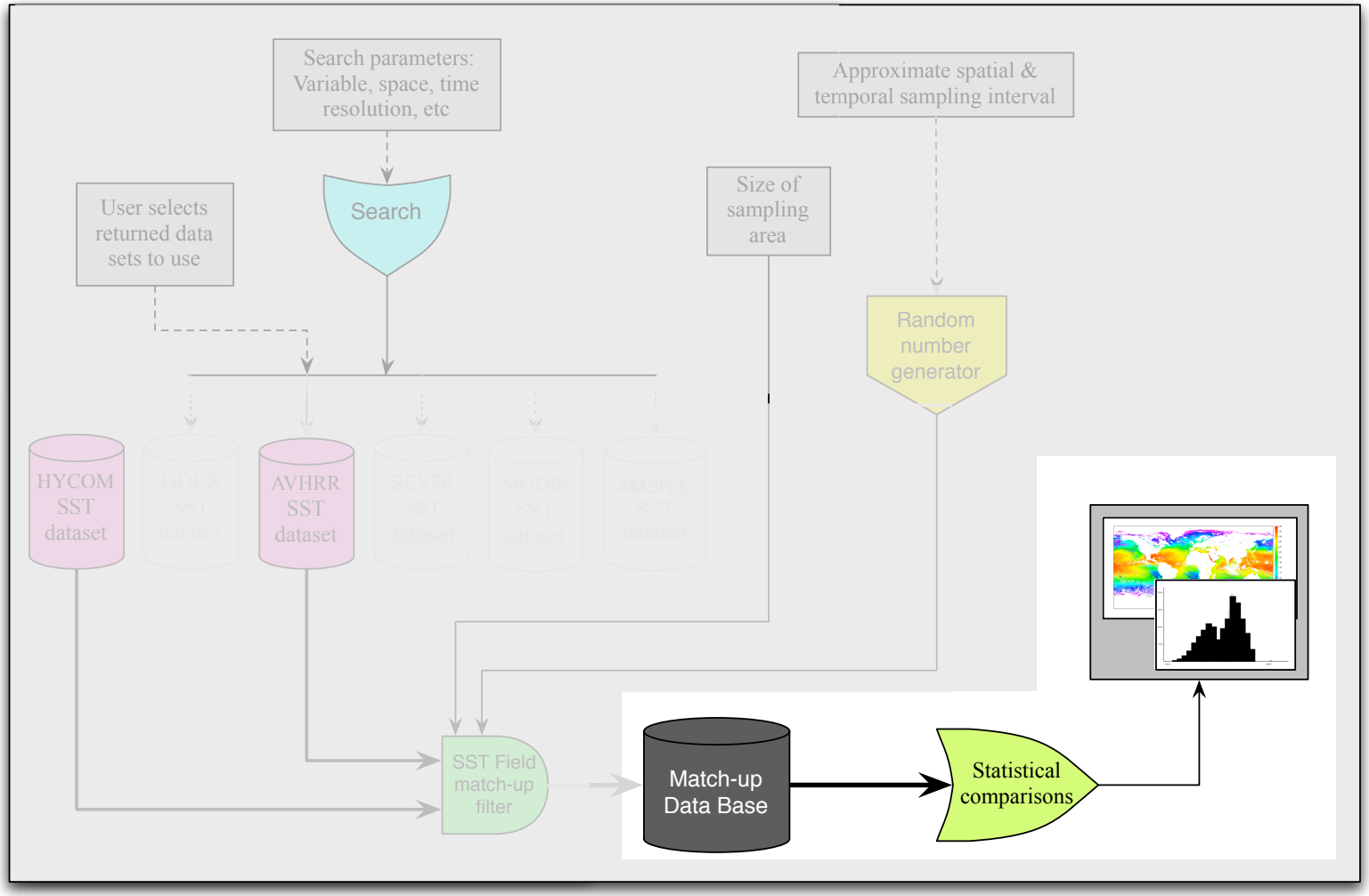

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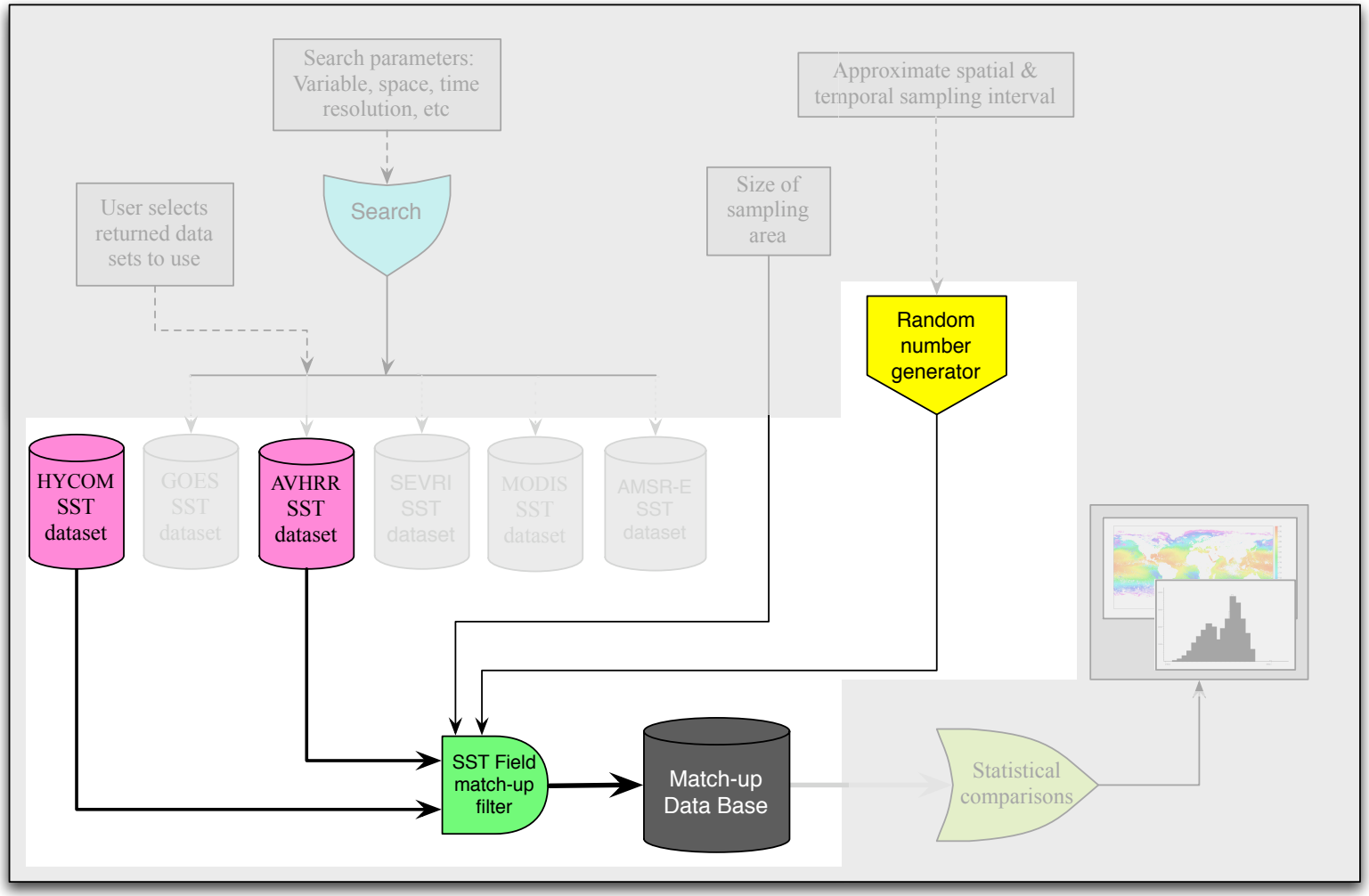

Time Series of SST Fields

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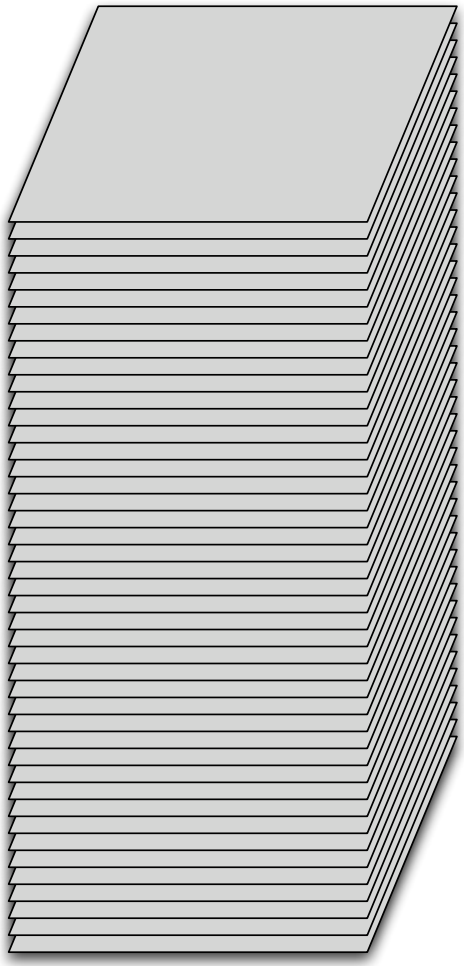
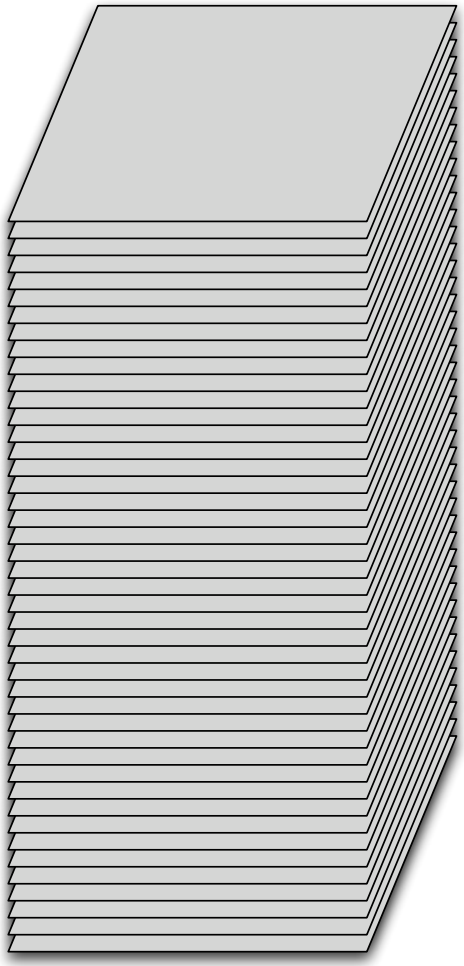


AVHRR



HYCOM

Time Series of SST Fields – 20% Randomly Selected

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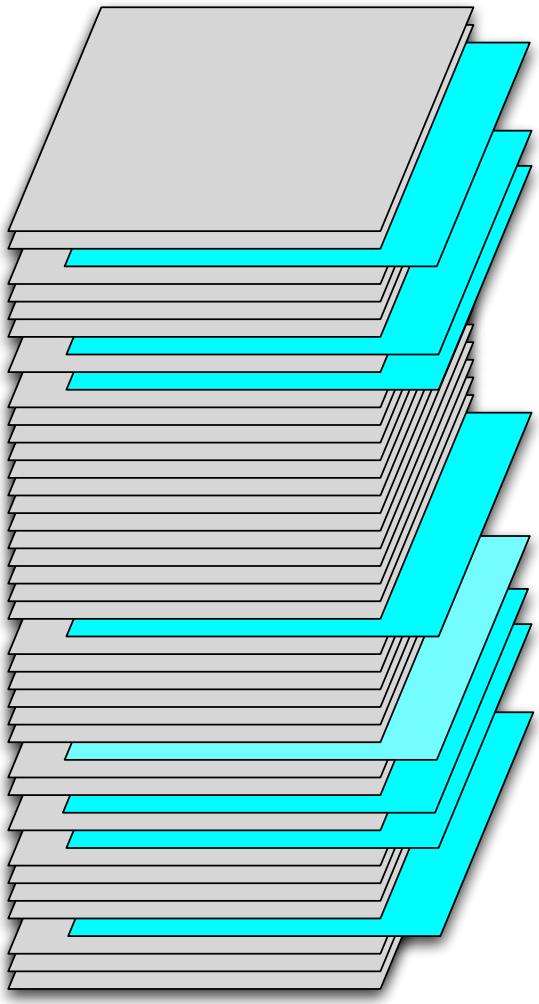

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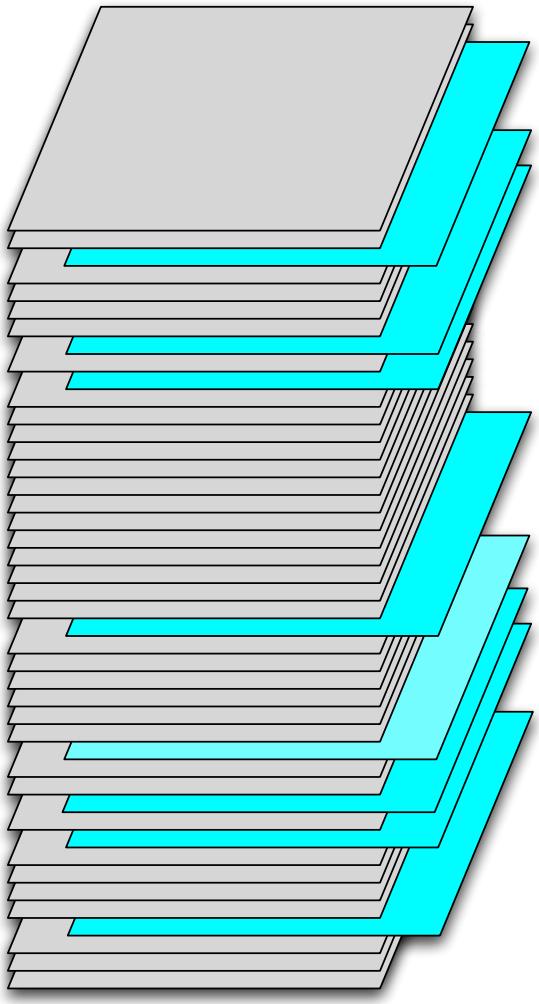

HYCOM

Consider One SST Field

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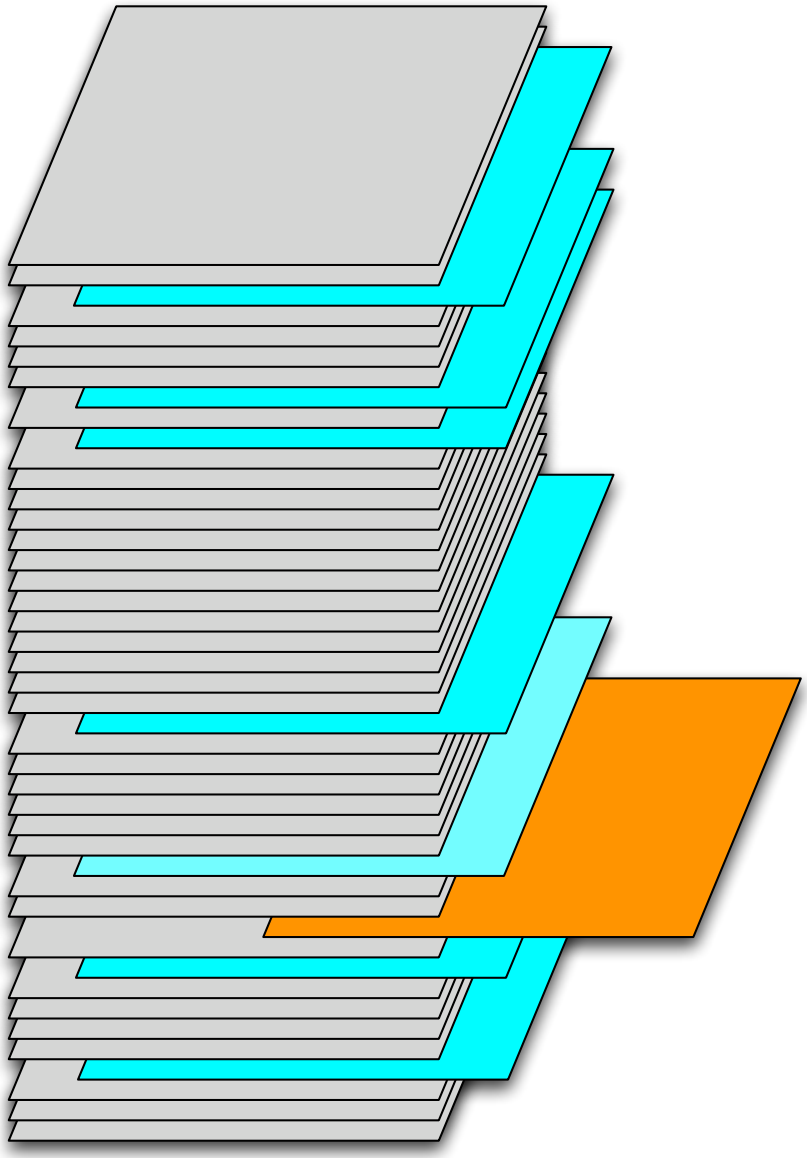

Tiles Randomly Selected from One Image

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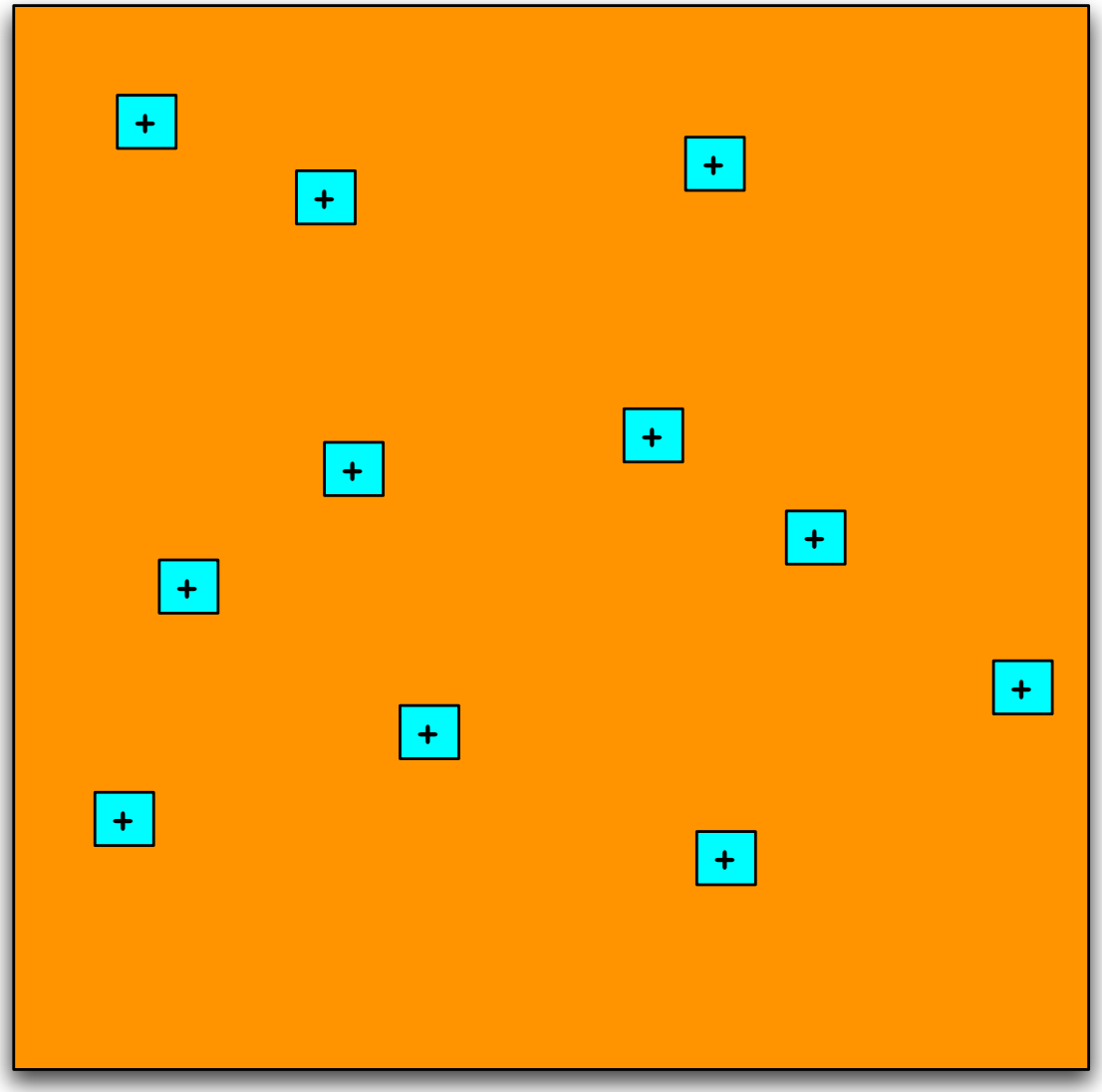

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- We have built basic workflows for the
  - Match-up data base construction. This work flow will:
    - Access randomly located tiles at randomly located times for HYCOM from FSU,
    - Access the corresponding tiles for Pathfinder from PO-DAAC (JPL),
    - Store the results in a database in San Diego.
  - A rudimentary analysis.
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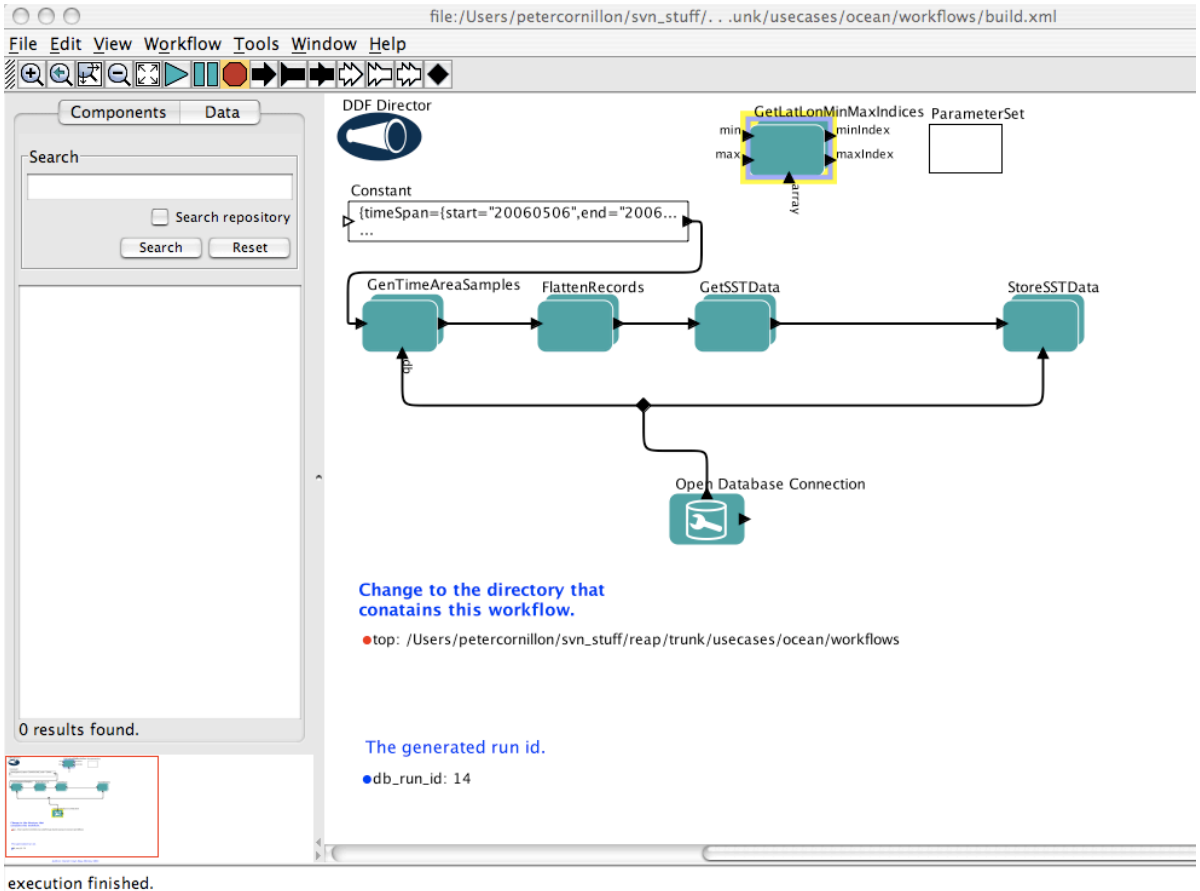

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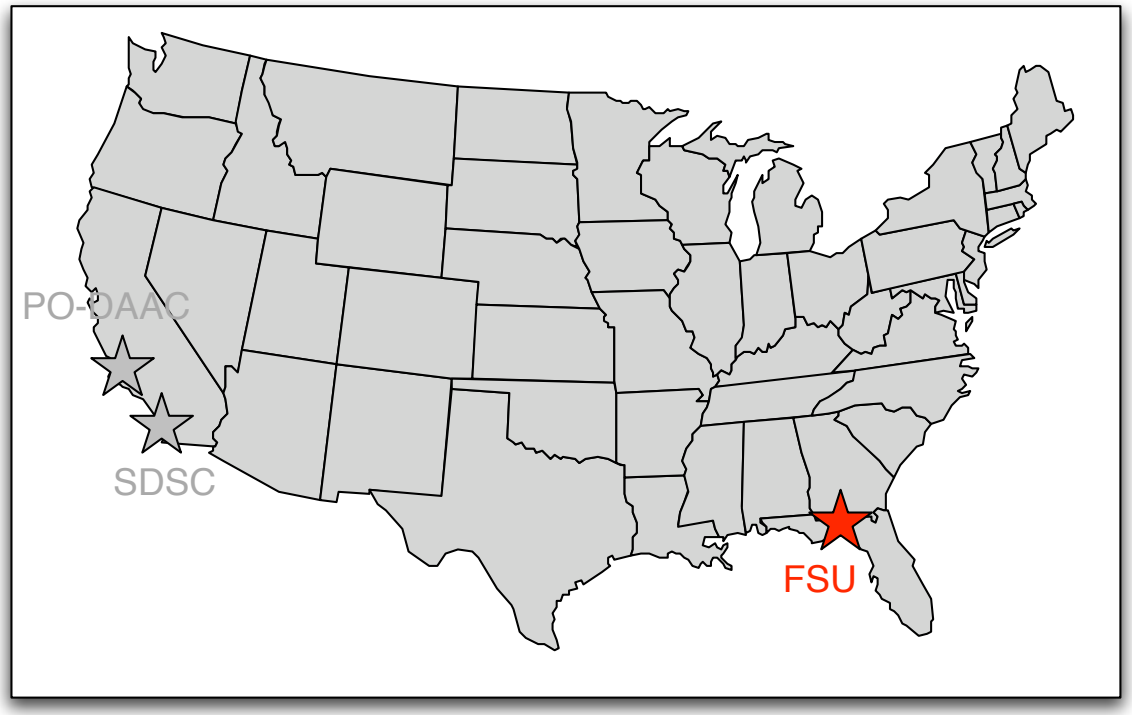

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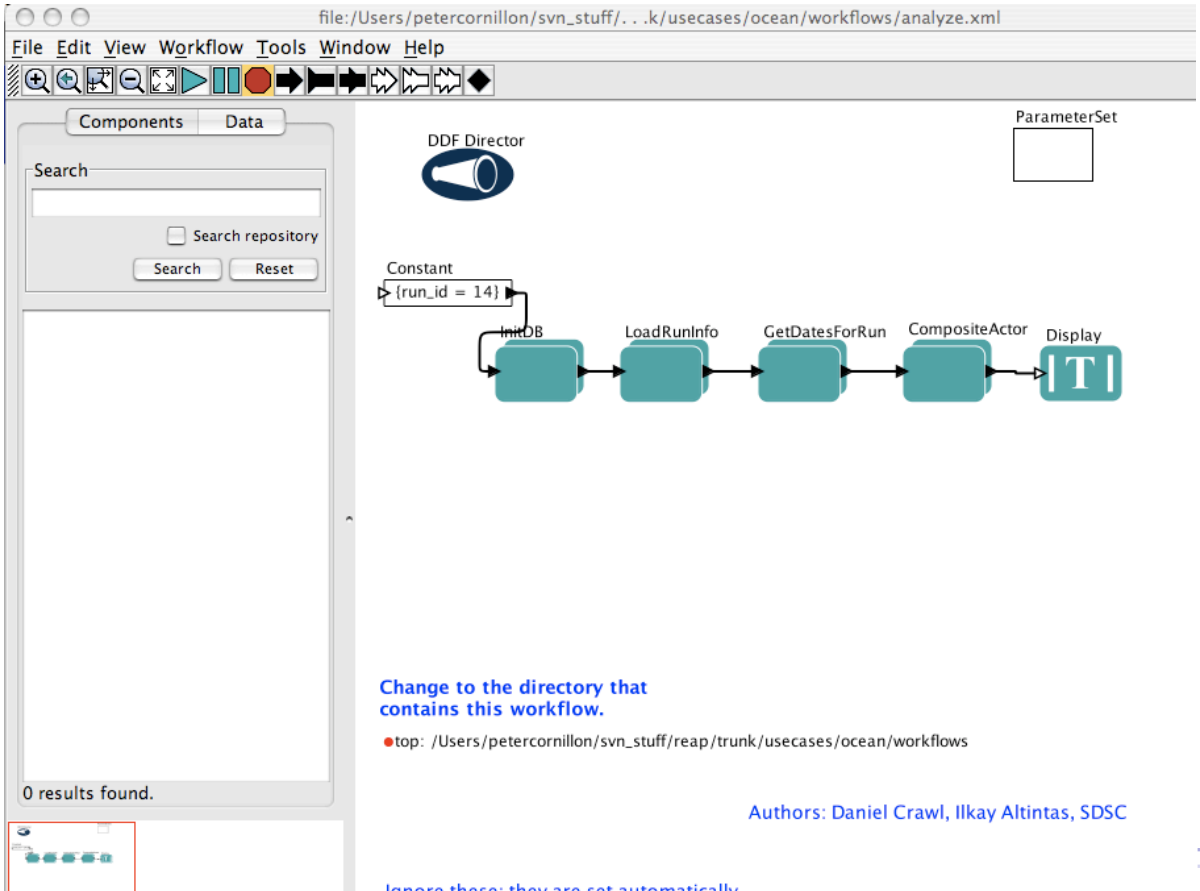

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