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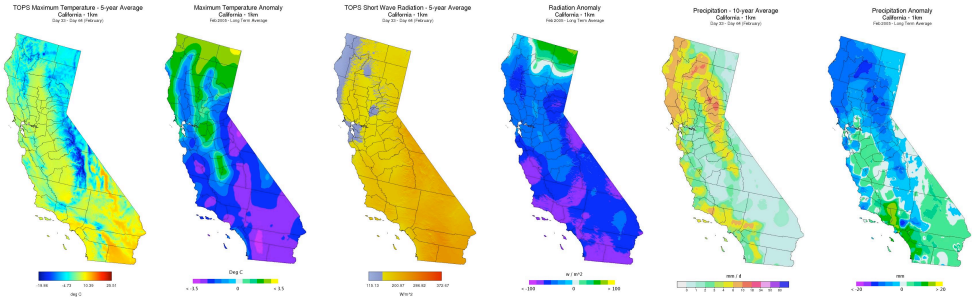
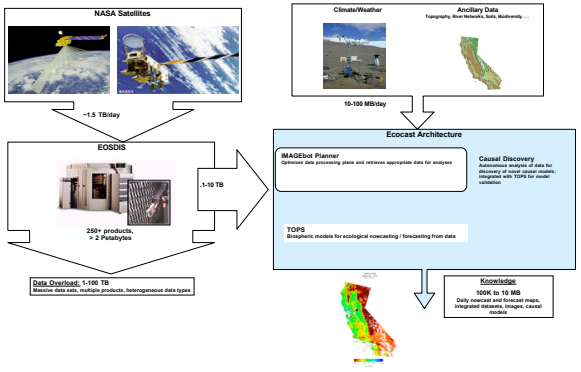
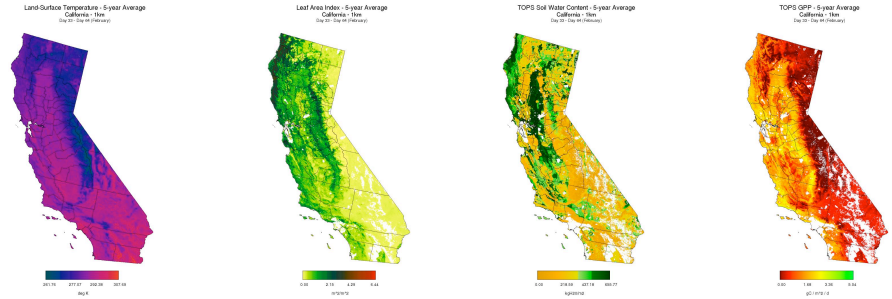
While global modeling and data analysis efforts such as MODIS are important for understanding Earth's ecosystems, these efforts tend to be too generic and often not applicable at local scales. There are numerous reasons for that, From data availability to computational complexity and lack of general models that perform equally well allover the world. However, if we break up the world into a set of smaller regions, we can achieve the desired quality by obtaining additional data from sources not available anywhere else, yet at the same time significantly decreasing the data volume requirements. We can also exploit the "fine-tuning" of models with respect to the specific region, and thus improve the quality even further.

We present a prototype system that was developed to automate biospheric monitoring and forecasting in California. In this system, we bring together satellite data (34 MODIS products from both Terra and (Aqua), climate data (station networks and gridded data), soils, terrain, population as well as number of models to provide a comprehensive look at the state of the ecosystem in California. In order to provide timely responses to extreme events, we are also Integrating real-time satellite data from the MODIS Direct Broadcast system. The responsiveness, fail over and Are provided through database replication and parallel processing techniques. Because the architecture is fairly flexible, we aim to deploy separate systems (both hardware and software) for other regions of interest. This should eventually enable us to provide better analysis at continental or even global level.



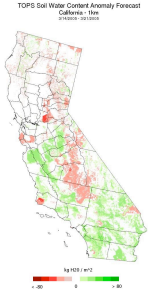


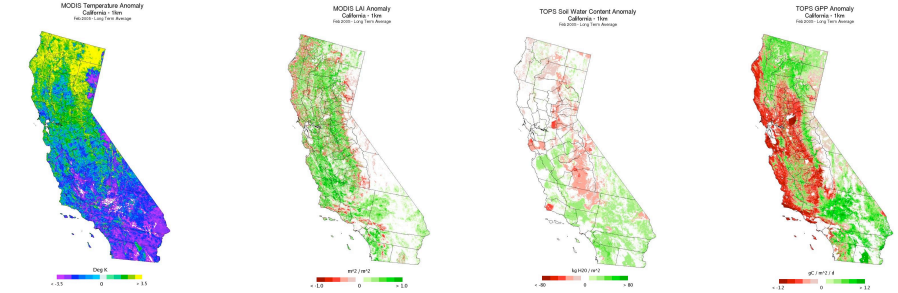
The above climate products are produced by gridding both historical and real-time daily summary surface observations from a variety of data network feeds and datasets, such as CPC, CIMIS, NCDC, COOP and others.



The core of the system architecture is a flexible framework that contains a set of models, database interfaces, data access and processing functions, and analysis and visualization tools. The framework exports a set of APIs that can be accessed through Web Services architecture. We are currently testing a prototype interface with an AI planner for improved flexibility, robustness, and automation. With this framework we are able to quickly target new regions as well as define an interface between distributed systems already operating on multiple regions.

All images produced on the poster were created using our prototype system.





References:

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