

Forging Partnerships in Laos

ARCHAEOLOGICAL SURVEY USING MOBILE GIS

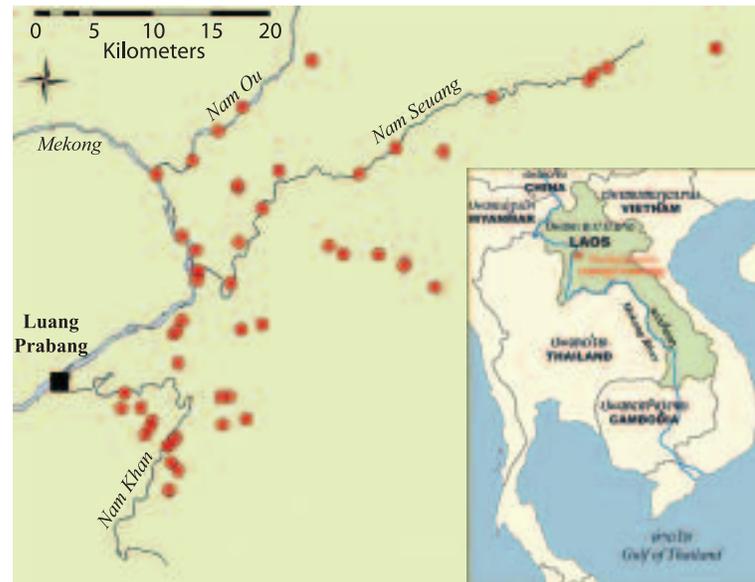
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PEOPLES LIVING IN mainland Southeast Asia during the middle Holocene (ca. 6000 – 2000 BC) made some profound subsistence and technological changes. One of the most interesting and mysterious involved their transition from an exclusively hunting and gathering lifestyle to an existence dominated by agriculture, including

the cultivation of rice. Archaeologists have many questions about this transition. For example, where and when was rice first cultivated in Southeast Asia? Was it in the dry uplands or was it in the inundated lowland areas where we see rice paddies today? How did this cultivation begin? Did immigrants from China introduce agriculture to Southeast Asia? Did Southeast Asians adopt Chinese agricultural practices learned by word-of-mouth over long-distance trade networks? Or did the Southeast Asians themselves domesticate local wild rice and other plants without Chinese influence?

To address these questions, researchers from the Penn Museum joined staff from the Lao Department of Museums and Archaeology (DOMA) in March 2005 for the first survey season of the Middle Mekong Archaeology Project (MMAP). Our goal was to identify and map as many archaeological sites as possible over the course of one month in the Luang Prabang region of Laos and to lay groundwork for future research on the nature and origins of agriculture in Southeast Asia.

With only one month for the survey, it was important to have a very efficient means of collecting and managing data. Therefore, we decided to use a geographic information system (GIS) with mobile capabilities to map and analyze the sites we found on our daily trips into the field. Our mobile GIS setup consisted of a global positioning system (GPS) unit that transmitted geographic coordinates obtained from satellites orbiting the Earth to a handheld computer via Bluetooth, a wireless networking protocol. This allowed us to eliminate paperwork by collecting our survey data directly in digital form, thereby



Archaeological sites found during MMAP 2005.

speeding up data collection and decreasing the number of opportunities for data-entry errors. Furthermore, by programming custom data-entry screens with automatic error-checking and auto-filling data fields, team members could input relevant data in direct association with geographic locations. At the end of each day, our procedure required that we backup, merge, and import each team's new survey data into a desktop GIS, which allowed us to generate cumulative maps of project discoveries as the field season progressed.

This all sounded great in theory, but in reality we had to overcome a few obstacles. The first was the rugged environmental conditions we encountered in northern Laos, in particular its mountainous subtropical jungle and many rivers. This meant we had to do a lot of hiking, rock climbing, and wading. To shield our equipment from the elements we used heavy-duty water-tight packets to hold sensitive devices, and we wore multi-pocketed vests. Besides protecting our mobile GIS components, the vests also made the system "wearable," freeing our hands for climbing steep terrain and inspecting artifacts.

The second difficulty confronted was the challenging logistics of working in and around Luang Prabang. For example, ensuring data security and a reliable source of electrical power for our computers required nightly backup and recharging



procedures to deal with the possibility of catastrophic equipment or power failure. To protect against data loss, we also brought multiple backup devices and set up car batteries as an alternative power source at our lab.

Technologically, the MMAP 2005 field season was a real success. But more important than keeping our equipment working was making sure that our culturally diverse, international team worked well together on an interpersonal level. With members hailing from the U.S., Laos, Britain, Thailand, and Australia, there was real potential for cultural misunderstandings that could have threatened the future of the project. To develop relationships of trust and mutual respect with our Lao colleagues, MMAP team members with IT (Information Technology) experience spent hours doing hands-on training with interested, local Lao archaeologists and heritage managers. As a result, MMAP's success involved more than just the 56 archaeological sites discovered and the large volume of data collected; we also forged new archaeological partnerships based on shared skills and interests. 🏠

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For Further Reading

To track the progress of MMAP's second season in March 2006, visit <http://www.museum.upenn.edu/mmap>

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From top to bottom: Long boats cruise the Mekong River near Luang Prabang, Laos. Survey team members wore their equipment, including a mobile GIS. Team members set off on a field survey. MMAP team members (left to right), Tun, Kone Vi Lay, Bounheuang Bouasisengpaseuth, Bounnalit Savong, Joyce White, Shawn Hylea, Olivia Given, and Benjamin Marwick.