

**The Thailand Tsunami and Hurricane Katrina: A Preliminary  
Assessment of Their Impact and Meaning in Global Tourism**

Thomas A. Birkland, University at Albany, State University of New York, Albany, NY

Pannapa Herabat, Asian Institute of Technology, Bangkok

Richard G. Little, University of Southern California, Los Angeles, CA

William A. Wallace, Rensselaer Polytechnic Institute, Troy, NY

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## **Introduction**

In the short space of eight months between December 26, 2004 and August 29, 2005, two world-famous and prominent tourism locations, Southern Thailand and the United States Gulf Coast, were devastated by major natural disasters. These events captured worldwide attention, not only because of the tragic human story of people killed and lives disrupted, but also because so many people were familiar with these regions through their personal tourism experiences. It is this familiarity, coupled with the real-time availability of information on unfolding events made possible through television and the Internet that made these disasters truly global in their impact. As a result, these regions suffered a double blow; first the damage caused by the event itself and then a substantial drop-off in tourism visits. This drop-off was a result both of the physical loss of tourism facilities and more interestingly, the perception—sometimes justified but oftentimes not—that the area either is unsafe because of the damage or that the area is inherently dangerous because of the high likelihood of a similar event occurring in the future.

Because we have devoted more time to the tsunami, and have more and better data on this event, the primary focus of this paper is the impact on tourism in Thailand. However, Hurricane Katrina presents important similarities (and differences) and we offer complementary observations on this event based on the results of one author's (Birkland) brief visit to the Gulf Coast and New Orleans in January 2006, and on commonly available media sources about the aftermath of the storm.

Tourism is an important part of the Thai economy contributing almost 6 percent of GDP in 2002 (Thailand Outlook, 2005) and is vital to the economy of Phuket, the province most commonly associated with tourism in southern Thailand. The hotel and

restaurant sector alone accounts for 3.8 percent of Thailand's GDP, while on Phuket, this sector accounts for 42 percent of the gross provincial product, a much higher share than any other province in southern Thailand.

Tourism was particularly important to Thailand in the wake of the 1997 Asian economic collapse, which began as a currency crisis in Thailand and spread to other nations. Tourism was a significant source of foreign exchange and this revenue helped stabilize the Thai Baht. But just as Thailand and other Asian nations were recovering from the 1997 currency crisis, tourism received several setbacks in the form of terrorism fears (triggered in large part by the September 11 attacks), and the subsequent outbreaks of avian flu and SARS.

Our assessment focuses on two provinces, Phuket and Phang Nga. Phuket is an island in southern Thailand, with a lengthy seashore along the Andaman Sea to the west, and is world famous for its beaches, resorts, and, especially in Phuket City, the capital, its nightlife. Phang Nga is the mainland province immediately north of Phuket, connected to the island by a bridge (see Figure 1). Phang Nga, and in particular, a beach district called Khao Lak, have in recent years developed many sea resorts, many of them smaller and more tranquil than those on Phuket. As a result, tourism became a very important industry in these Andaman seacoast provinces.

We have chosen tourism as a subject of study for three reasons. First, tourism is a major source of foreign exchange for any nation that that can attract significant numbers of tourists (which is why national governments invest in efforts to promote tourism) and is a critical part of many nations' economic development programs. Among the Southeast Asian countries, Thailand is particularly advanced in tourist promotion. When

done well, tourism development can promote sustainable economic development that benefits local residents and the nation as a whole.



Figure 1. Map of Thailand  
Source: [www.asiarooms.com](http://www.asiarooms.com)

Second, because the effects of the tsunami in Thailand were focused on this very popular tourist area, during the high tourist season, a much higher proportion of the victims of the tsunami in Thailand were tourists, compared with the distribution of victims in other regions. Tourists are particularly vulnerable to natural disasters (Drabek, 1994, 1996) because attractions are often in hazardous areas and because the tourism amenity value of the land (such as beaches) is associated with the hazard. At the same time, many of the people in hazardous areas are unaware of local hazards, are unfamiliar

with local geography or culture, and may not speak the languages in which hazard information is communicated (Faulkner 2000, 23; Murphy and Bayley 1989, 38). Anecdotal and eyewitness evidence suggests that these phenomena all contributed to the high loss of life among foreign tourists in the tsunami on Phuket (Oberle 2005) and throughout southern Thailand. Finally, we focus on tourism because the tourism industry is very sensitive to the perception of risk created by extreme natural events such as the tsunami, even if this perception is divorced from objective measures of risk, such as the low probability of another great earthquake and tsunami occurring in this area in the near future.

### **The role and importance of tourism in Thailand**

Tourism is an important part of the Thai economy contributing almost 6 percent of GDP in 2002 (Thailand Outlook, 2005) and is vital to the economy of Phuket. The hotel and restaurant sector alone accounts for 3.8 percent of Thailand's GDP, while on Phuket, this sector accounts for 42 percent of the gross provincial product, a much higher share than any other province in southern Thailand.

Phuket is the most tourist dependent Thai province and is second only to the Bangkok region in its importance to the Thai tourism economy (Kontogeorgopoulos 1998, 315; Raksakulthai 2003, 6)). Other southern provinces are attempting to emulate Phuket, but have not yet achieved its level of tourism development. Although the tourist sector in, for example, Phang Nga province, and, in particular, on Khao Lak beach is not as large in absolute terms as the tourism sector in Phuket, as we show in this paper, a proportionately larger share of Khao Lak resorts was destroyed in the tsunami. Indeed,

we can say that the tsunami essentially destroyed the tourist industry on Khao Lak for at least the next season, and probably the next two to five years.

Despite the impact of the tsunami on tourism and other industries, such as fishing, the overall economic damage to the Thai economy is not expected to be great. The Bank of Thailand expected that the tsunami would slow, but not stop, economic growth in 2005 in the nation as a whole (Israngkiura 2005, 17) (Actual data for 2005 are not yet available.). The overall impact on tourism in Thailand may not be large because travelers may visit unaffected areas of Thailand, such as resorts in the Gulf of Thailand, while the effect on Phuket may be mitigated by effective tourist promotion campaigns. Still, the Bank of Thailand projected that, overall, 1.2 million fewer tourists would visit the six southern Thai provinces compared with the estimated number of visitors before the tsunami (Israngkiura 2005, 16).

Bookings for the high season were lower than would be expected at this time of year, except for an uptick in interest in visiting Phuket to commemorate the disaster in late December. These depressed bookings may induce resort operators to lower prices to generate demand for rooms, with the result of reducing overall revenue. Revenue from tourism in Phang Nga will drop precipitously for 2005 and until the resorts are restored because most of the hotels in Khao Lak, the most popular destination, have been destroyed. The following discussion illustrates various dimensions of the impact on the tourist economy.

### **Decline in tourist visits**

The tsunami appears to have reduced tourist visits to Thailand. Figure 2 shows the number of visitors to Thailand in January of each year. A substantial decrease in year

over year visits is evident in 2005. To assess the extent to which this decline is a regional or a national phenomenon, we show in Figures 3 and 4 the year over year change in passengers, by month, at Bangkok, Phuket, and Chiang Mai airports. Chiang Mai is of particular interest because it is a potential substitute destination for Phuket, and the Thai government has actively promoted Chiang Mai as a tourist destination. Clearly, air travel has substantially declined to Phuket, both in absolute terms and compared with steady or growing travel to Bangkok and Chiang Mai.

### **Indicators of tourism supply and demand**

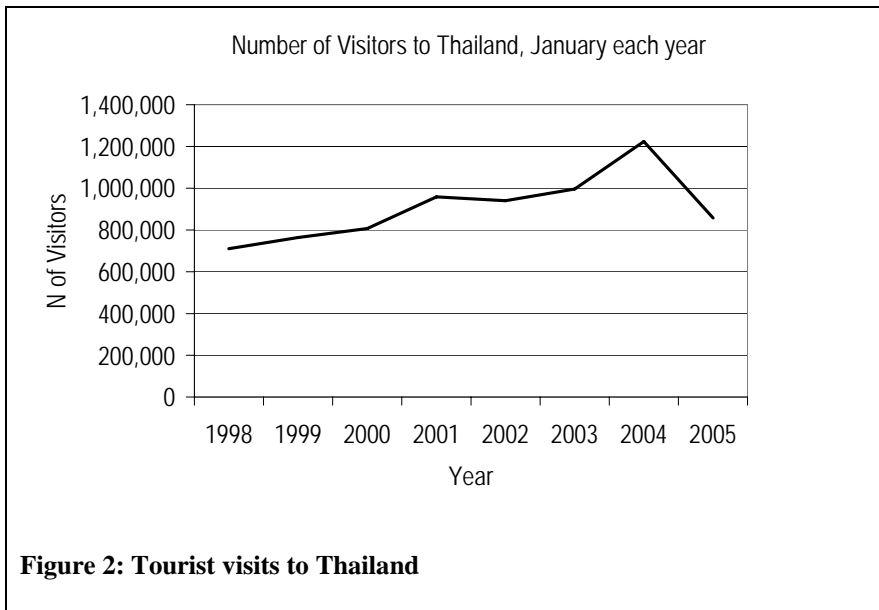
Further evidence of the profound impact of this tsunami on tourism is seen in key measures of supply of and demand for tourist facilities, shown in Figure 5. Here we show year-over year figures for the first quarter of 2002 through 2005. The first quarter of the year encompasses the end of the high season for southern Thailand tourism and the “shoulder” season, where rates are generally somewhat lower after the December holidays, but when the area is still relatively attractive compared with the monsoon season, which begins in May.

In 2005 there was a significant decline in the numbers of visitors to Phuket and Phang Nga after the tsunami. In Phuket, Thai visitors almost equal foreign visitors, something rarely seen in this market; in Phang Nga, Thai visitors vastly outnumber foreign visitors. It appears that the number of Thai visitors reflects the natural rate of movement within the country, and not tourism traffic, and we have no evidence that authorities have promoted internal tourism to people from other parts of Thailand. The decline in tourism is also reflected in the declining occupancy rate. In both Phuket and Phang Nga, about one-third of available rooms were occupied in the January-March

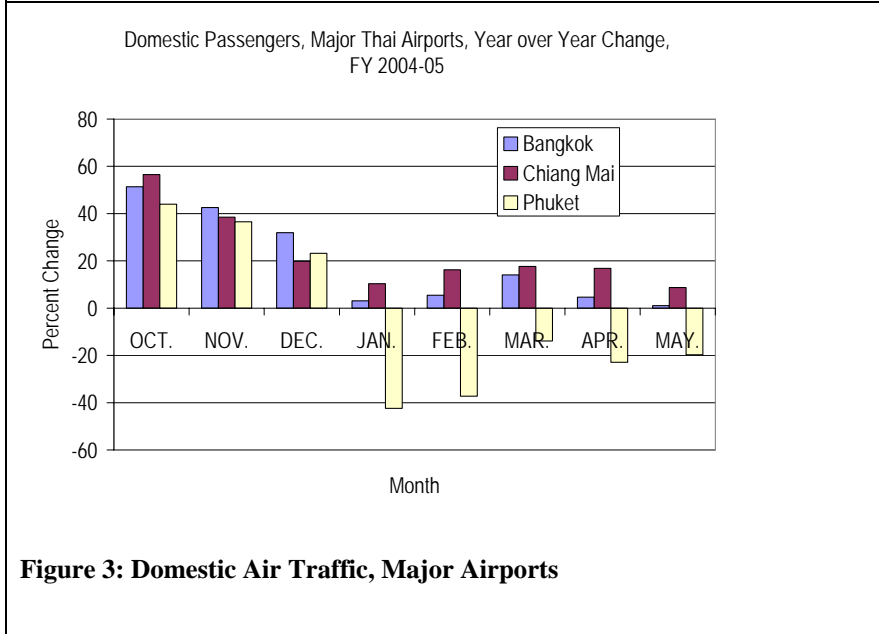
2005 period, well below the usual range of about 57 to about 70 percent. This decline in occupancy is particularly striking considering the number of rooms actually available in Phang Nga, which is a remarkable indicator of the physical damage done by the tsunami. The number of available rooms in Phang Nga declined by 71 percent in the first quarter of 2005 compared with the same period in 2004, as a direct result of the near total destruction of the resorts on Khao Lak beach, the densest concentration of resorts in the province. This is also reflected in the number of lodging establishments in the two provinces, which declined by 25 percent in Phuket—a considerable number, but less than the 61 percent decline in the number of hotels in Phang Nga. There appears to be relatively little demand for the rooms remaining on Phang Nga, at least in early 2005. The number of foreign visitors and the amount of revenue derived from foreign tourism declined by almost 100 percent in the first quarter of 2005. At the same time, the rate of decline of the occupancy rate in Phuket and Phang Nga is nearly equal, at about 39 percent. Even with fewer rooms available, supply exceeds demand.

Because of this damage, we can say without reservation that tourism revenue has crashed in Phuket and Phang Nga. Overall revenue declined 82 percent in Phang Nga and 71 percent in Phuket; revenue from foreign tourists has declined 99.4 and 79.2 percent, respectively. This sharp decline might be expected in Phang Nga—after all, the resort district was largely destroyed—but the decline for Phuket must be alarming to the tourism industry, as the decline in revenue is hardly proportionate to the damage done by the event. It is clearly likely that, instead, this decline is a function of tourists' perceptions that Phuket was badly damaged, that it is unsafe, or both. We take up the question of damage to the built environment in the next section.

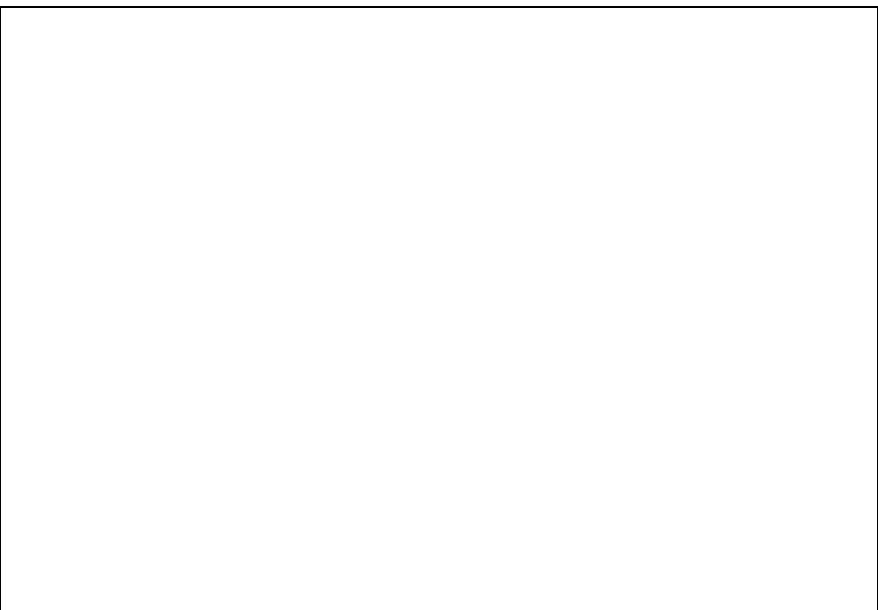




**Figure 2: Tourist visits to Thailand**



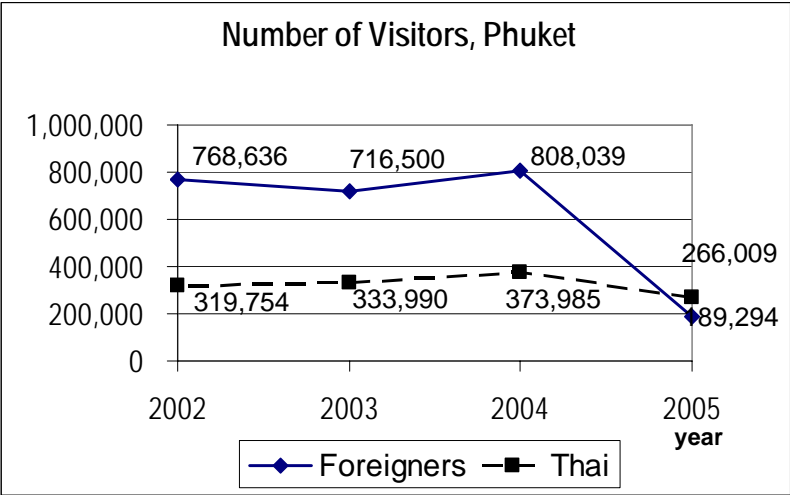
**Figure 3: Domestic Air Traffic, Major Airports**



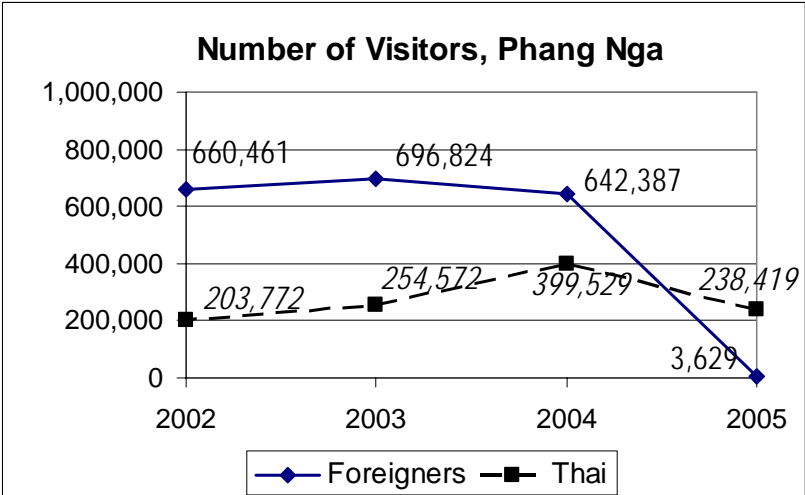
**Figure 4: International Air Traffic, Major Airports**

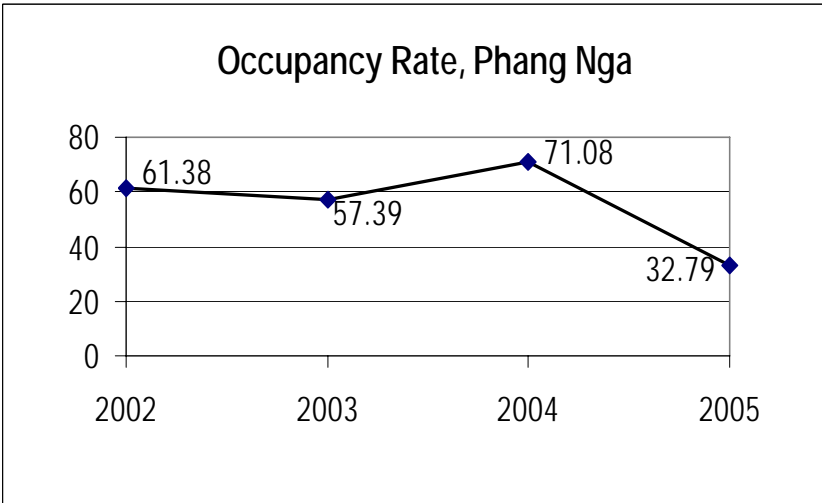
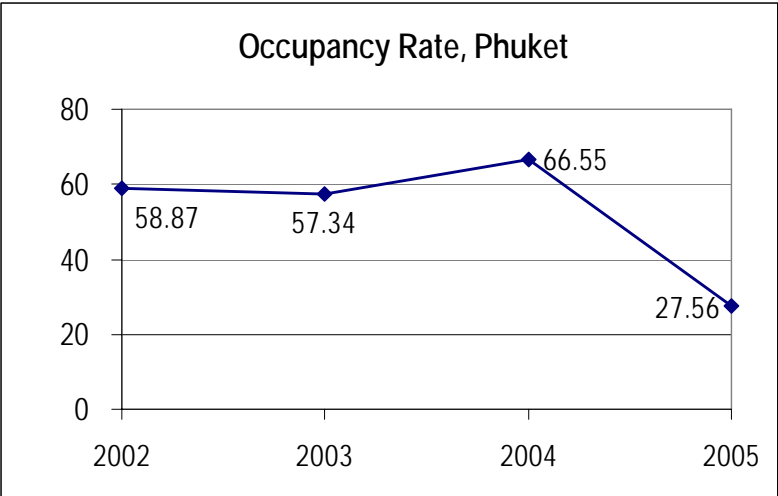
Figure 5: Tourism Statistics for Phuket and Phang Nga Provinces

**Phuket**

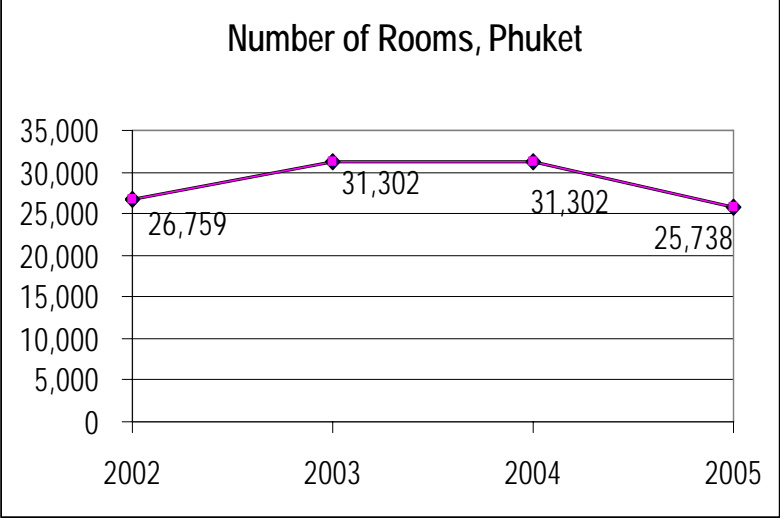


**Phang Nga**

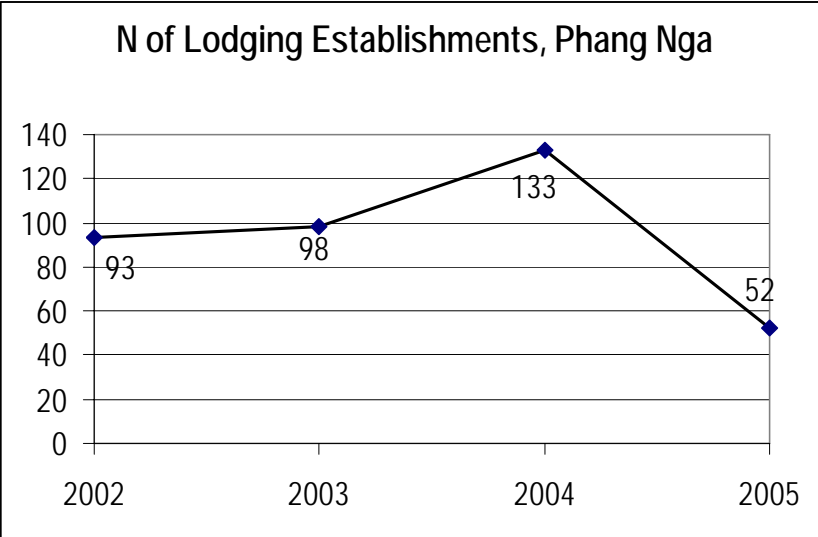
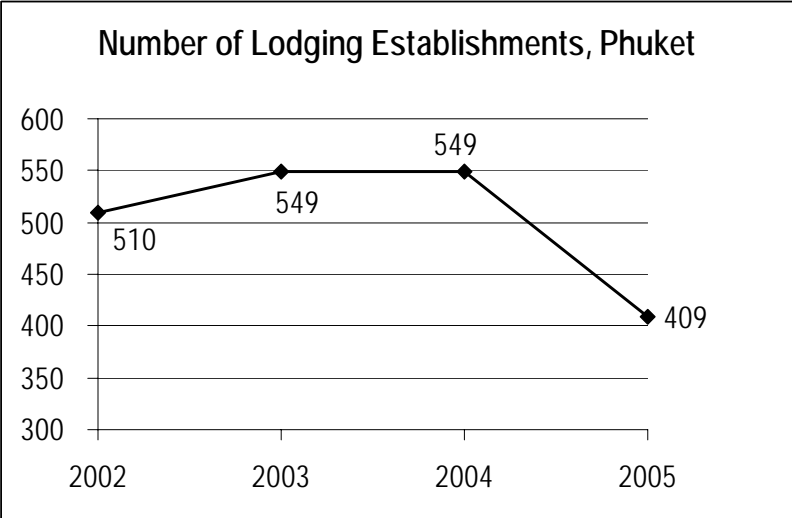
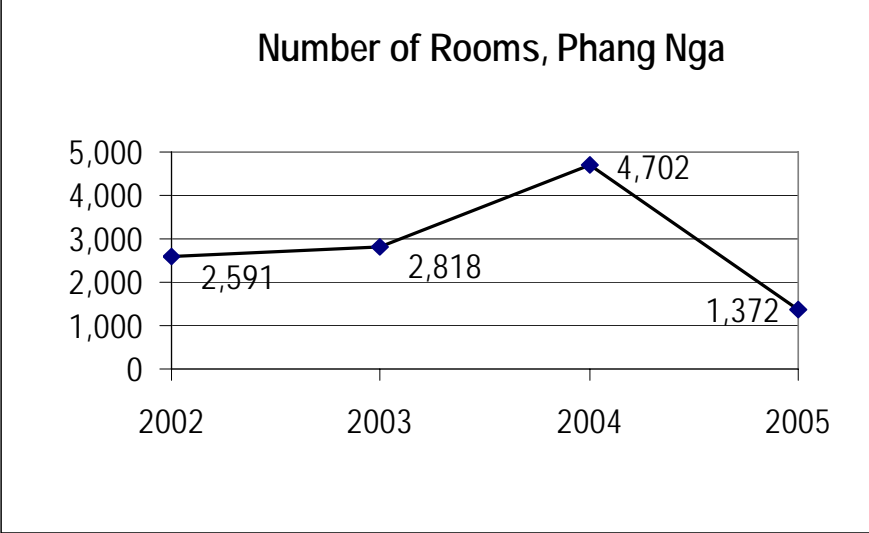




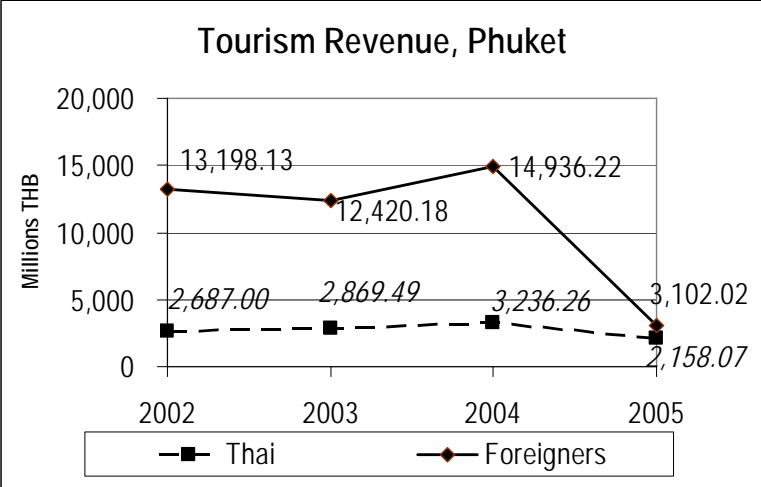
**Phuket**



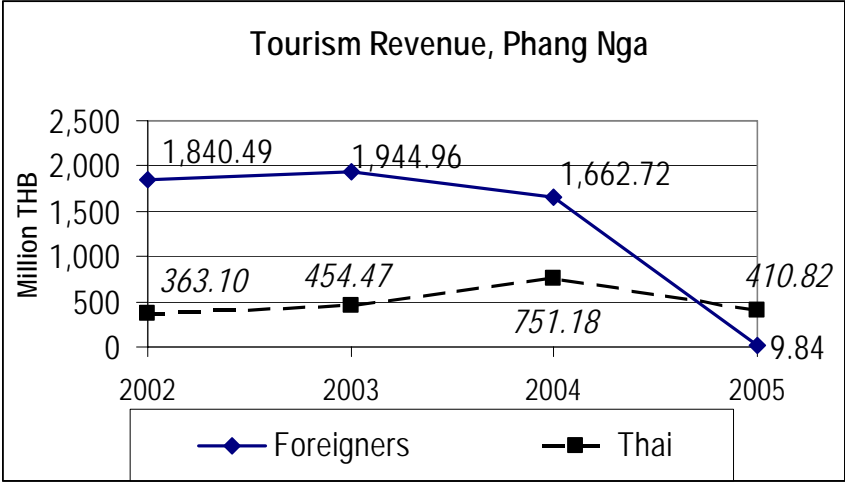
**Phang Nga**



**Phuket**



**Phang Nga**



Source: Tourism Authority of Thailand (TAT)

**Extent of damage to infrastructure and the built environment**

Clearly, this decline in travel to southern Thailand is directly attributable to the tsunami; first because of the actual physical damage done by the tsunami, and second, by creating a sense that the area was unsafe. We will take up the issue of the perception of safety later in this paper.

When we began this research, we hypothesized that large-scale disasters like the tsunami can introduce unforeseen disruptions into infrastructure systems, creating a need to restore not only individual systems such as electric power but also to correct interdependent failures in multiple systems. These interdependencies arise when two or more infrastructure systems must act in concert to provide a service (Little, 2002). An example of this is the need for both electric power and water lines and pumping stations to supply potable water. Water supply is dependent on electric power and if either system is disrupted, water cannot be provided (Lee II, Mendonça and Wallace 2004).

Tourism is supported by systems of physical infrastructure and human capital with varying degrees of sophistication. High volume commercial tourism depends on well-developed physical and social networks to supply food and lodging, transportation, electricity, water, and other services, and the trades people to build, operate, and maintain the facilities and recreational areas on which tourism depends. This interdependence between social networks and physical infrastructure can create potentially significant impediments to the delivery of the ultimate service should either part of the system fail (Little, 2004). In this case, tourism would be severely disrupted if either the social or physical network were to fail.

Prior to visiting Thailand in April 2005, we believed that the tsunami would have disrupted both the physical infrastructure network and the social network. A physical

infrastructure network such as transportation, electricity, or water supply, consists of various interconnected nodes that must maintain contact if the network is to continue to function. At the same time, we argued that the greater the amount of *social capital* in an area, the more resilient the community. Social capital has been defined in many ways, and the idea is at least twenty years old, but the concept's most prominent proponent is Robert Putnam, author of *Bowling Alone* (2000), who argues that social capital “refers to the collective value of all ‘social networks’ [who people know] and the inclinations that arise from these networks to do things for each other [‘norms of reciprocity’].”<sup>1</sup>

We believed that the interdependencies between physical infrastructure and social systems would be demonstrated most clearly in the immediate aftermath of the tsunami but would also be important during recovery because it is during recovery that existing infrastructure deficits become most pronounced. Our hypotheses in this matter were only partially borne out. It is true that the tourism industry sector in Thailand is a network of many relatively small operators, and that the tsunami disrupted the business done by these firms. On the other hand, damage to the physical infrastructure did not serve as a substantial impediment either to the initial response or the subsequent recovery. Phuket was almost entirely unaffected from an infrastructure perspective.

“The Phuket International Airport suffered no damage to the runways, despite its seaside location. Water supply and waste treatment plants were largely intact, except for seaside pumping stations and pipes in waterways that were damaged by scour. Most of the major bridges, roadways, and civil buildings survived the inundation from the wave well (Dalrymple and Kriebel 2005, 6-7).”

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<sup>1</sup> The source of this quotation is the web site for *Bowling Alone*, <http://www.bowlingalone.com/socialcapital.php3>, brackets in original. This web site contains considerable information on Putnam's ideas about social capital.

Nor were social networks greatly disrupted by the tsunami. The core communications and transport infrastructures survived the tsunami reasonably well, and while it is certainly true that over 5,000 people died in this event, about half this number were tourists. For the most part, the local people who died in the tsunami worked in or near the resorts and were from various parts of the region. Thus, a few, but not many, *communities* were heavily impacted by the tsunami; rather many people from many disparate parts of the region and the world were its victims. The relatively intact social and physical networks thus aided in relief and recovery in the damaged areas. Contrast this with Hurricane Katrina, a catastrophic disaster that destroyed both physical infrastructure (e.g., roads, power, telecommunications) *and* the social networks (on which social capital depends) that existed in New Orleans and the region until the people who comprised these networks evacuated to places all over the United States.

The physical and social networks on Phuket and in Phang Nga were able to perform comparatively well because the *physical* extent of the disaster was limited: the run up of the tsunami was only 1500 meters inland on Khao Lak, and far less on Phuket. What was damaged were not, therefore, critical infrastructure support elements such as electrical generating plants, food and goods stores or warehouses, water and gasoline storage, etc. Rather, service delivery elements located directly on the beach such as hotels and restaurants, which were at the *ends* of the network bore the brunt of the damage.<sup>2</sup>

This damage varied considerably with the location of the resort, as shown in Table 1 and Table 2. Over 90 percent of the hotel rooms on Phuket were open within three weeks after the tsunami, while over 90 percent of the hotel rooms on Khao Lak were severely damaged or destroyed. A finer scale measure of damage is provided in Table 2, which shows the average

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<sup>2</sup> While we focus on tourism in this paper, we acknowledge that fishing villages in particular were very hard hit in Phang Nga, and recovery in those villages, in light of continued high demand for developable land for tourist facilities, will be particularly challenging.



level of damage of major resorts in southern Thailand, (zero equals no damage and five represents total or near total destruction of the resort). Khao Lak was almost nearly destroyed, while Phuket suffered, on balance, only minor damage. Two island resort locations in Phang Nga saw their hotels entirely destroyed and not yet rebuilt.

Most buildings near the beach were damaged by the tsunami run up. Buildings constructed to modern standards and that allowed water to flow through the first story, fared quite well while more lightly framed buildings generally performed poorly. Not surprisingly, damage was greatest where the waves were highest. Wave heights in the affected area range from 4 meters near the Phuket Airport to 6 meters at Patong Beach on Phuket to 11 meters on Khao Lak (Dalrymple and Kriebel 2005, 5-6). With relatively small waves on Phuket, the death toll was relatively small (about 250 people) and the tourist sector was able to return to normal quite quickly. The higher waves on Khao Lak contributed to the widespread destruction of resorts there and full recovery of the tourism industry must await an intensive period of rebuilding that has already begun.

Table 1: Damage to hotels in southern Thailand, by projected reopening

	Phuket Province		Krabi Province		Phi Phi Island		Lanta Island		Khao Lak Beach		Others Areas		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Status: Open as Normal	<b>93</b>	<b>73%</b>	<b>35</b>	<b>92%</b>	3	23%	10	67%	1	3%	<b>12</b>	<b>100%</b>	<b>154</b>	<b>64%</b>
Reopen by February 2005	13	10%	3	8%	1	8%	2	13%	0	0%	0	0%	19	8%
Reopen 4-6 months	8	6%	0	0%	0	0%	0	0%	1	3%	0	0%	9	4%
Will not reopen for at least 6 months	14	11%	0	0%	<b>9</b>	<b>69%</b>	3	20%	<b>33</b>	<b>92%</b>	0	0%	59	24%
Hotel permanently closing	0	0%	0	0%	0	0%	0	0%	1	3%	0	0%	1	0%
Total	128	100%	38	100%	13	100%	15	100%	36	100%	12	100%	242	100%

Modal category in **bold**

Source: <http://www.asiarooms.com/thailand/phuket-quake/102.html>, Accessed July 31, 2005

Data as of January 18, 2005

Table 2: Degree of damage suffered by hotels in various regions

Location	Mean Damage
Ko Phra Thong Island, Phang Nga Province	5.0
Kor Khao Island, Phang Nga Province	5.0
Khao Lak Beach, Phang Nga Province	4.6
Phi Phi Islands, Krabi Province	3.5
Ko Lanta district, Krabi	1.3
Phuket Province	1.0
Krabi Province	0.3
<b>Grand Total</b>	1.6

0-5 scale, 0=no damage, 5=severe damage, not reopened

Based on data found at [www.asiarooms.com](http://www.asiarooms.com)

### **Some preliminary comments on Hurricane Katrina and its meaning for tourism**

To a greater extent than in many nations, tourism in the United States is largely promoted by private companies. Airlines, hotels, and other facilities are all privately owned, and their promotional activities, alone or in conjunction with others, are arranged on associational bases, rather than being centrally managed by the government. This has three major implications for tourism after a disaster in the United States. First, there is generally little or no statistical data collected on key indicators of tourism in a region, such as those presented in the section above on Thailand, because there is no central authority that seeks to gather and publish this information. While one can obtain general information on economic activity in a region from the United

States Bureau of Economic Analysis (BEA) and from trade groups, it is not as systematically gathered as data on occupancy rates in countries like Thailand. Rather, this information is usually provided by hotel operators, often in the form of estimates. Second, there is no central strategy guiding recovery and crisis management for the tourism sector; each property is largely left on its own. There may be limited support from the local Convention and Visitor's Bureau (CVB), but CVB's are often poorly funded when compared to foreign government counterparts such as the Tourism Authority of Thailand. Indeed, the New Orleans CVB lost staff both to displacement of their personnel from the hurricane itself and because they had to reduce payroll because hotel and other tourism industry contributions to the CVB were cut as a result of the sharp drop in occupancy (or even in available rooms) after Katrina. Finally, without any sort of strategic consensus and direction from a central authority, tourism is at the mercy of dramatic, but often distorted, news imagery that, unless effectively countered by knowledgeable sources, can create the impression that an area is unsafe or cannot accommodate tourists. With this in mind, we can draw some preliminary conclusions about the impact of Hurricane Katrina, in the Gulf Coast and on New Orleans in particular.

First, the Indian Ocean tsunami in Thailand was essentially a local disaster for which local resources were mobilized to address relief and recovery needs. The worldwide outpouring of aid to the Indian Ocean basin was largely inspired by the *catastrophic* regional damage that could not be addressed without infusions of outside aid. In his essay on Katrina written for the Social Science Research Council, Henry Quarantelli, notes that Katrina was a catastrophe for New Orleans (Quarantelli 2005). Unlike in Thailand, where only the near-shore areas were damaged, and where critical infrastructure was either substantially unaffected, or was repaired quickly after the event, Hurricane Katrina damaged nearly all the infrastructure serving New

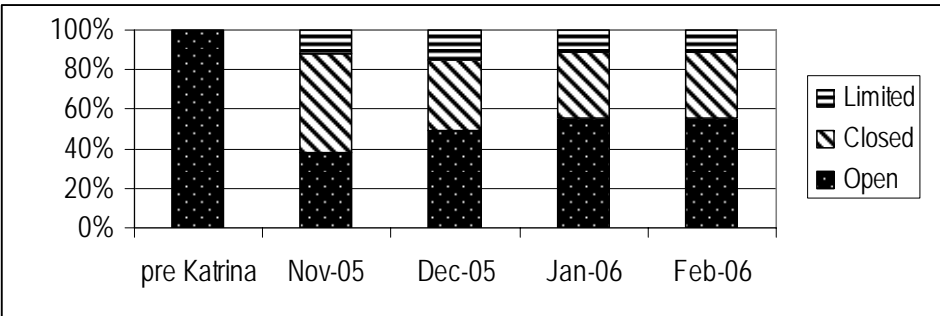
Orleans, and caused other important facilities to be used for purposes for which they were not designed. For example, Louis Armstrong International Airport, normally a major gateway for tourists quickly became a logistics, triage, and evacuation center. The Morial Convention Center and the Superdome became shelters; the unsuitability of these facilities for that purpose was a major theme of news coverage. At a more fundamental level, the electrical, water, and telecommunications systems simply ceased to function. While most hotel rooms in Phang Nga (particularly on Khao Lak beach) were destroyed, most were *not* destroyed in Phuket, and critical infrastructure—roads, power, hospitals, telecom, and the like—remained functional.

Of particular importance in New Orleans was the destruction of a great deal of the housing stock, particularly in well-known areas such as the lower ninth ward. Many tourism workers lived in economically disadvantaged neighborhoods and as of this writing only minimal work has been undertaken to repair these neighborhoods. However, it should be noted that about 80 percent of New Orleans's land area was flooded to some extent, and severe flooding occurred in wealthy and poor neighborhoods alike. This does not speak to the question of how and whether these communities will recover from the storm. Rather, we simply note that the people that worked in hotels, restaurants, bars, and other attractions now have no place to live. As a result, New Orleans has been significantly depopulated; with a population in March 2006 no more than forty percent of its pre-Katrina level. Even as the tourism industry (most of whose properties were located on relatively high ground) seeks to recover, housing for workers there sustained much more damage than worker's housing in Phuket and Phang Nga.

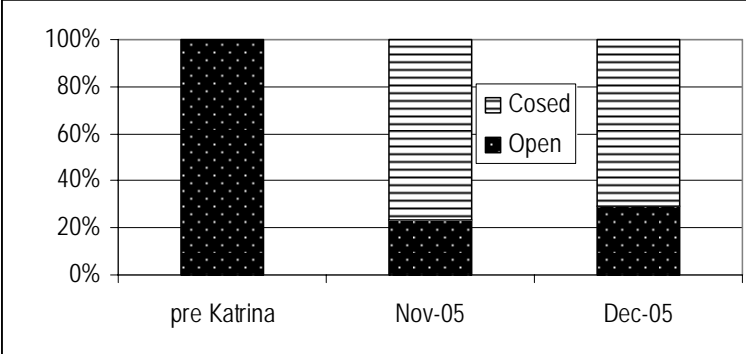
These impacts are reflected in the data depicted in Figures 6, 7, 8, and 9, which provide some preliminary evidence of the recovery of New Orleans. We have not included the hotel occupancy rate in this section because that number is misleading when compared to the parallel

figures in Thailand. Following Hurricane Katrina, hotels in New Orleans became, to a greater extent than perhaps any disaster in American history, temporary housing for the city's residents, particularly those whose jobs were vital to the city. The hotels were also quarters for the relief and recovery workers from the myriad relief agencies, including governmental, nonprofit, and private contractors who descended on the city. These factors produced an occupancy rate of about 80 percent, more than twenty percent higher than the pre-Katrina year-round average of about 66 percent.

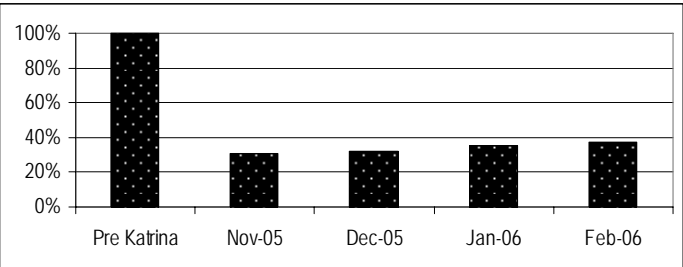
Not surprising, the number of restaurants and cultural attractions open in New Orleans declined sharply after the storm, and the rate of recovery has been quite slow. As of February 2006 only about sixty percent of hotels were open, although estimates of this figure hover around 75 to 80 percent for Mardi Gras. The proportion of re-opened cultural attractions remained quite low into 2006. This is hardly surprising, as some of the region's best known attractions were heavily damaged, including the Audubon Park Zoo, the Aquarium of the Americas (whose creatures died when power failed and water could not be kept clean) and, in Mississippi, Jefferson Davis's Beauvoir House. The low proportion of food establishments that reopened is a partial function of three factors: the actual storm damage, the low demand for restaurants as the city depopulated, and the labor shortage in the New Orleans region that was created when more than half the city's population left the city before, during, or after the storm. In addition, airport arrivals, one of the best indicators of tourism demand in a tourism-dependent city such as New Orleans, were sharply down after the event.



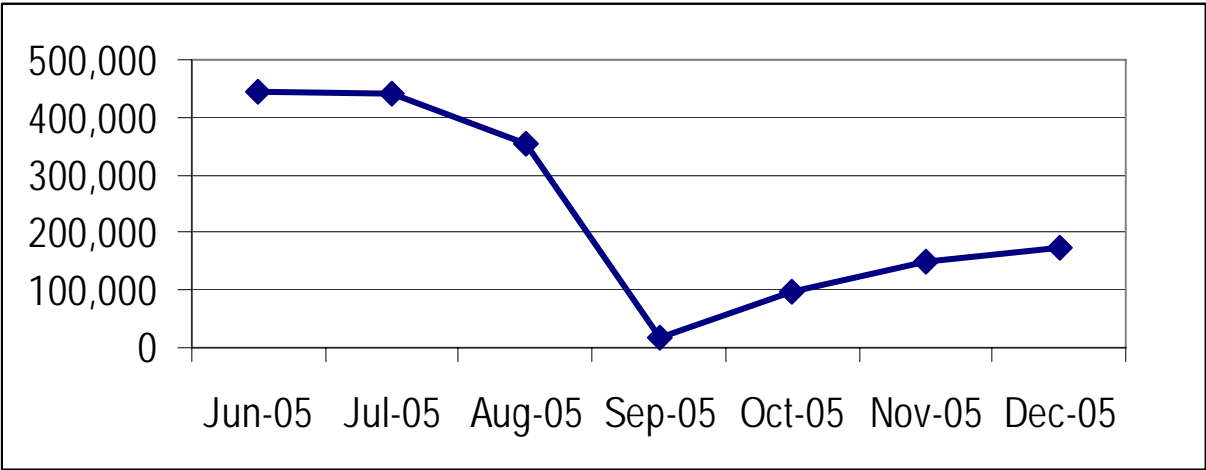
**Figure 6: Proportion of Hotels Open in Metro New Orleans**



**Figure 7: Proportion of Open and Closed Cultural Attractions in New Orleans**



**Figure 8: Proportion of Open Retail Food Establishments, New Orleans Metro**



**Figure 9: Number of Passengers Arriving Louis Armstrong New Orleans International Airport (MSY)**

Note: All New Orleans data are from various sources, but are compiled in (Katz, Fellowes, and Mabanta 2006)

### **Opportunities for—and barriers to—recovery in Thailand**

The damage to tourism from the Boxing Day tsunami has not run its course in southern Thailand. The data so far suggest that the number of visitors has declined, with a concomitant decrease in tourism revenues. Revenues may remain depressed for some time as price-cutting is attempted to induce tourists to return, while revenues will not return to Khao Lak until the resorts are rebuilt and operational. However, it is likely that tourism will rebound in this region, due to at least two factors. The first of these is the physical amenity itself; southern Thailand possesses some of the most beautiful beaches and best developed, best managed resorts in the world. Second, for the near future, southern Thailand will remain a good value for European tourists compared with other tropical destinations such as the Caribbean. Of course, Europeans will have the option to visit resorts on the Gulf of Thailand, but Phuket, in particular, will reemerge when confidence-building measures are taken to ensure tourists that their visit will be safe.

The primary reason for tourism in this region is proximity to the beach. Therefore, one protective measure that will not be taken is the large setbacks (over 500 meters) from the beach that some have recommended. It seems overly cautious to require setbacks for a hazard whose return interval is largely unknown, and for which other measures could be equally effective in protecting life safety. These measures include warning systems, and information about what to do when a tsunami appears imminent.

Information and warning systems are challenging to implement in tourist areas where numerous languages are spoken and where visitors are unlikely to be aware of local roads and terrain. This means that considerable planning and preparation is needed to make a warning and evacuation system effective. Steps have been taken, however, to make this system work. The nations of the region have made commitments to create tsunami-warning systems. What appears



to be lacking thus far is any sort of coordination of data to make buoys and other sensors part of a comprehensive network. The UNESCO Intergovernmental Oceanographic Commission has created a concept centered on a “coordinated network of national systems and capacities” for the Indian Ocean Tsunami Warning System (IOTWS), under which each nation would be responsible for issuing warnings within its own territory (International Oceanographic Commission 2005). Such a “network of national systems and capacities” is not the same thing as a single detection and warning network. Rather, this is a patchwork of various national systems. Over time, however, as capacity is expanded, this system may work well if the authorities charged with managing these systems coordinate data collection and warning with each other. This may be difficult to achieve if the rates of development of national components are significantly different.

On Phuket, the Thai government has begun to erect tsunami-warning towers, which contain loudspeakers to broadcast warnings, in Thai and several western languages, of the possibility of tsunami. In May 2005, the authorities conducted what they deemed to be a successful evacuation drill at Patong Beach. And local sensitivity to the hazard is very much greater than it was before the tsunami, so much so, in fact, that some merchants near the ocean were alarmed by high waves generated during the monsoon season.

What we do not yet know is whether and to what extent hotels and other facilities have developed their own plans. However, we do have some evidence that informal systems of warning and evacuation may work, particularly in the interim before formal systems are created. The earthquake of March 28, 2005, an aftershock of the Boxing Day event, was widely reported on international news outlets, including CNN and BBC, and many visitors at resorts, as well as resort staff, saw these stories, sensed the potential danger from the tsunami, and informally self-

organized and evacuated near-shore areas. In this case, the threat was effectively communicated and acted upon by those who were potentially in harm's way, although the risk of false alarms and uncoordinated evacuation may remain problematic.

Another possible measure is a policy of vertical evacuation (Ruch, et al, 1991), in which buildings are constructed in such a way that they can withstand the force of tsunami waves, while affording shelter from the highest waves. Many taller (more than three stories) resort buildings constructed to modern standards withstood the tsunami waves very well. However, our team observed buildings on Khao Lak that were no taller or merely slightly taller than the 11-meter wave heights that struck the beach. Were these three story buildings built to four or five stories, people on the beach, when warned of an impending tsunami, would have time to reach the buildings from the beach and ascend to the fourth or fifth floor. Vertical evacuation within appropriately constructed buildings would also provide a more feasible option for those with reduced mobility through age or infirmity. Having to move rapidly from the beach to resorts located beyond the proposed 500-meter setback could cause undue anxiety and possible injury for these populations during an evacuation and might actually result in decreased bookings at these resorts. When minutes and meters spell the difference between life and death, having secure places of refuge located in proximity to the beach would be both a real and perceived asset.

To adopt this strategy, some planning and land use regulation may have to change. We were informed that resorts on Khao Lak were not built taller because of a local code that required buildings be no higher than the trees in the area. Whether or not this is true, it is clear that the intent is to avoid building tall, dense resort facilities more typical of Phuket. Indeed, the draw of Khao Lak is the smaller, less intensively developed areas. This may also be true of Phi Phi,

where bungalows and low-rise buildings dominate. In such areas, perhaps one building in a resort should be allowed to be built tall enough to provide a vertical evacuation shelter.

Recovery from the tsunami is very likely to occur in the next several years. But with this recovery come continued challenges. The first of these challenges is distorted media coverage of the tsunami, which tends to focus on the most frightening aspects of the disaster, and tends not to provide an evenhanded appraisal of the prospects for recovery. While one commentator notes that all this publicity may be good for a region, by providing, in a sense, agenda space to talk about the region and its attractions, it is unlikely that the publicity surrounding the tsunami will be a net positive for the region. Rather, these negative media images will have to be overcome by successfully meeting the second challenge: building confidence in the safety of the area. Confidence will return if a reasonably long period passes without another tsunami or other disaster.

A second question is the sustainability of any recovery. Some fishing villages were badly damaged or destroyed by the tsunami. Many villagers are finding it difficult to move back to their villages because of government and private sector policies and projects that seek to develop these villages as resort areas. Many of the villagers did not hold clear land title under Thai law, where real estate law is much less developed than in the United States (Mydans 2005). While tourism may be a more economically productive use of the land in question, if the tourism sector overdevelops along the Andaman coast, the relative attractiveness of the area may suffer compared with other resorts in the region. On the other hand, one feature of more intensive development—taller buildings with greater opportunities for vertical evacuation—will serve to make tourists and workers safer in case of another tsunami. The challenge is to balance development and safety.

The full impact of the tsunami on tourism will not be known until the next high season, from October to January. Bookings are currently below typical levels at this time, but aggressive promotion and cost cutting may attract more visitors and fill rooms, although revenues will likely suffer as a result. It will take two or three seasons to fully assess the recovery and the success of confidence building measures designed to protect lives while inducing tourists to return to the area.

### **Opportunities for—and barriers to—recovery in New Orleans**

Unlike Phuket, New Orleans was severely devastated. It is an open question whether New Orleans will ever return to its pre-Katrina population of about 450,000. Indeed, it could very well be that New Orleans will become the *second* largest city in the state, after Baton Rouge, the city to which many New Orleans' residents evacuated.

But the storm paradoxically may make New Orleans more dependent on tourism than it was before. The greatest extent of the destruction was in lower lying areas east and north of the major tourist destinations such as the French Quarter, the Garden District, and the area around Audubon Park. This is not to suggest that damage was unknown in these places; rather, it is suggested that these areas, being quickest to recover, will serve as the lynchpin of New Orleans' recovery, to a much greater extent than shipping, which constitutes less than 15 percent of the city's labor force, or the oil and gas industry, most of whose offices had moved elsewhere in the region.

Because of the extent of damage, the recovery of the city proper and the tourism industry in particular may take longer than that in Thailand, in large part because, as noted previously in this paper, the housing stock for workers was largely destroyed. Nor has a consensus vision been reached of what kind of city New Orleans *should* be. On the other hand, where consensus does

exist, it seems to focus on the loss of a great deal of human cultural capital—in particular, musicians—who perhaps to a greater extent than any other city in the United States, help shape and define the self-image and the broader public image of the city.

This image is important. Katrina received much greater news coverage in the United States, and in much of the world, than did the 2004 tsunami, and the extent to which the storm destroyed culture and created apparent social disorder were much more prominent themes than in the tsunami coverage, which focused more on victims (and focused more on countries other than Thailand). In both Katrina and the tsunami, distorted international news coverage of the events created the impression world wide that Thailand was much more devastated than it was, and that New Orleans had plunged into ungovernable, chaotic mob rule, during which stores were systematically looted and refugees in the Superdome and Convention Center were routinely murdered. This latter story theme, in particular, was later debunked by more careful and objective journalists, just as more reflective journalism indicated that Thailand's Andaman seacoast was open for business shortly after the tsunami.

### **The global implications for disasters on tourism**

Our principal finding then, on the importance of Katrina and the tsunami, is this: tourism is no longer a regional business. Nearly any popular vacation resort in the world is less than 24 hours flying time from any other place on earth. In the cases considered here, the travel times are less: any North American can be in New Orleans in no more than 7 hours flying time, and Phuket is about 12 to 14 hours from Scandinavia, one of its more prominent markets. Thus, when an event like a tsunami, hurricane, or earthquake, strike a region, and the initial, often breathless and incomplete news coverage is transmitted worldwide via CNN, the BBC, or Sky News, the effect on tourism can be profound. And as disasters strike internationally famous tourism destinations,

the rapid dissemination of disaster news can have an equally profound effect on the rate at which tourists consume such news—particularly when compared to the extent that such news was formerly unavailable (certainly when it wasn't carried 24 hours a day) and when tourism was neither promoted nor facilitated by affordable flights and greater consciousness of distant destinations.

Both New Orleans and Phuket will recover over time; New Orleans will likely take longer. But the next tourism disaster: a terrorist attack in Egypt or Indonesia or in Washington D.C., an earthquake in Italy or California, or a cruise ship accident anywhere in the world, may well create sharp shocks in the tourism economy as news of the event reaches worldwide and influences consumer behavior quite quickly. In about a year's time, we will know better how the Thailand and New Orleans disasters have, over the long run, affected their tourism economies.

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