

MRC Discharge and Sediment Monitoring Project

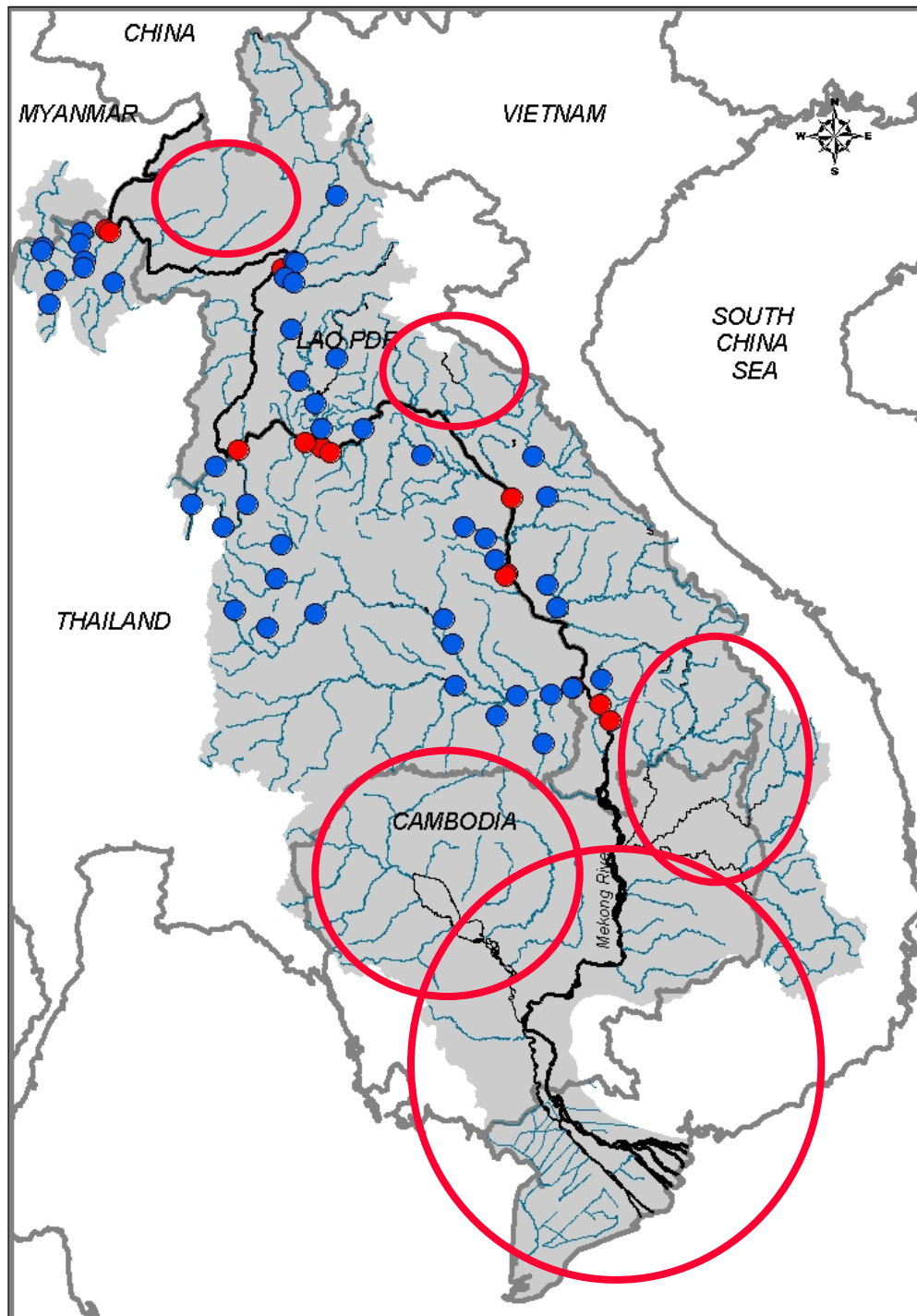
- Sediment data on tributaries
- Important sediment issues in the lower-Mekong Basin
- Monitoring project formulation

Iwona Conlan

Status of sediment data on the Mekong River tributaries

Stations for which MRC has sediment data

 Data gaps



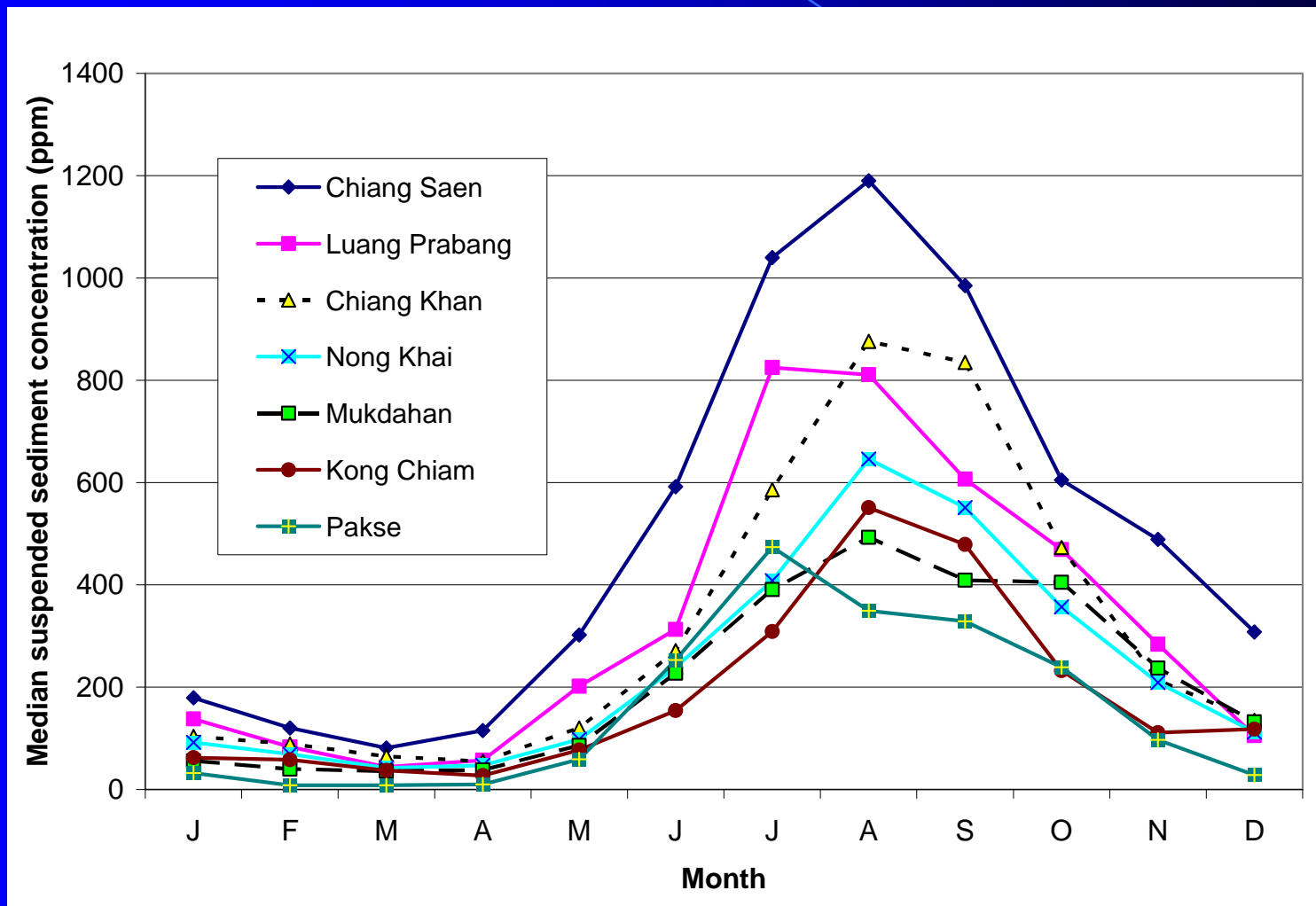
Number of sediment samples collected on selected Lao tributaries by year

Location	Ban Hin	Ban	Mahaxai	Ban Keng	Souvanna
	Huep	Signo		Done	Khilli
River	Nam Lik	Nam	Se Bang	Se Bang	Se Done
		Thuen	Fai	Hieng	
1990	44		27		
1991	36		70	7	
1992	4		79	3	
1993	9				4
1994					
1995					
1996		73	28		21
1997	6	34		5	9
1998	10	34	34	12	12
1999	6	34	34	9	12
2000	7	34	35	8	13
2001	13	23	28		16
2002	10	16	28		20

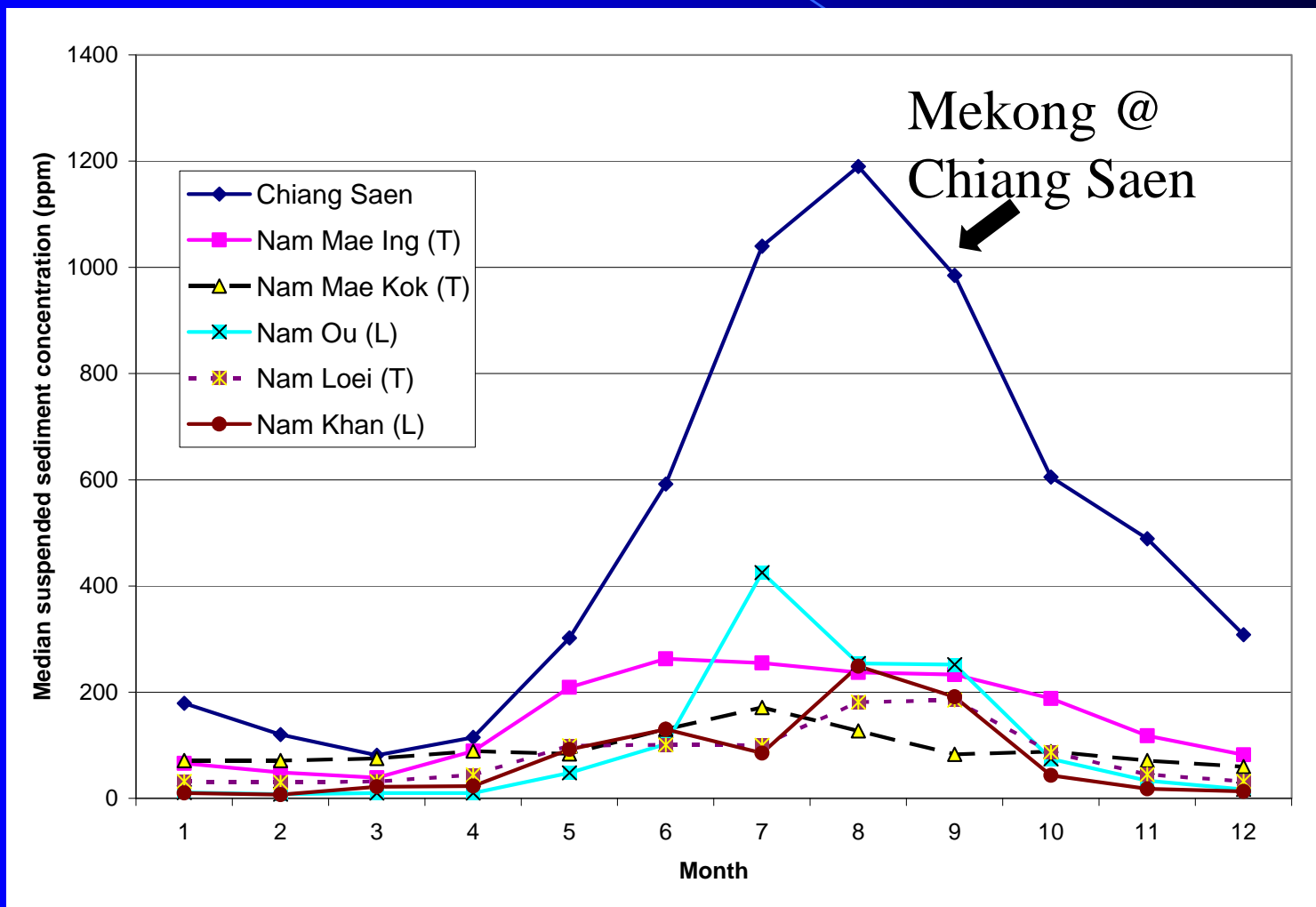
Tributaries in Northern Thailand

Location	Thoeng	Dan Sai	Wang	Ban Wang
			Saphung	Sai
River	Nam Mae	Nam Man	Nam	Nam
	Ing		Loei	Loei
1983	37	35	34	35
1984	41	43	40	42
1985	38	20	19	21
1986	37	18	21	15
1987	21	13	12	15
1988	35	11		11
1989	35		18	13
1990	35	18	19	13
1991	35		21	20
1992	32	19	19	18
1993	47	26	27	27
1994	38	18	18	17
1995	33	20	20	20
1996	29	19	20	19
1997	17	12	12	11
1998	21	18	18	18
1999	19	13	13	14
2000	28	17	18	18
2001	30	21	21	21
2002	30	29	29	29
2003	30	30	30	30

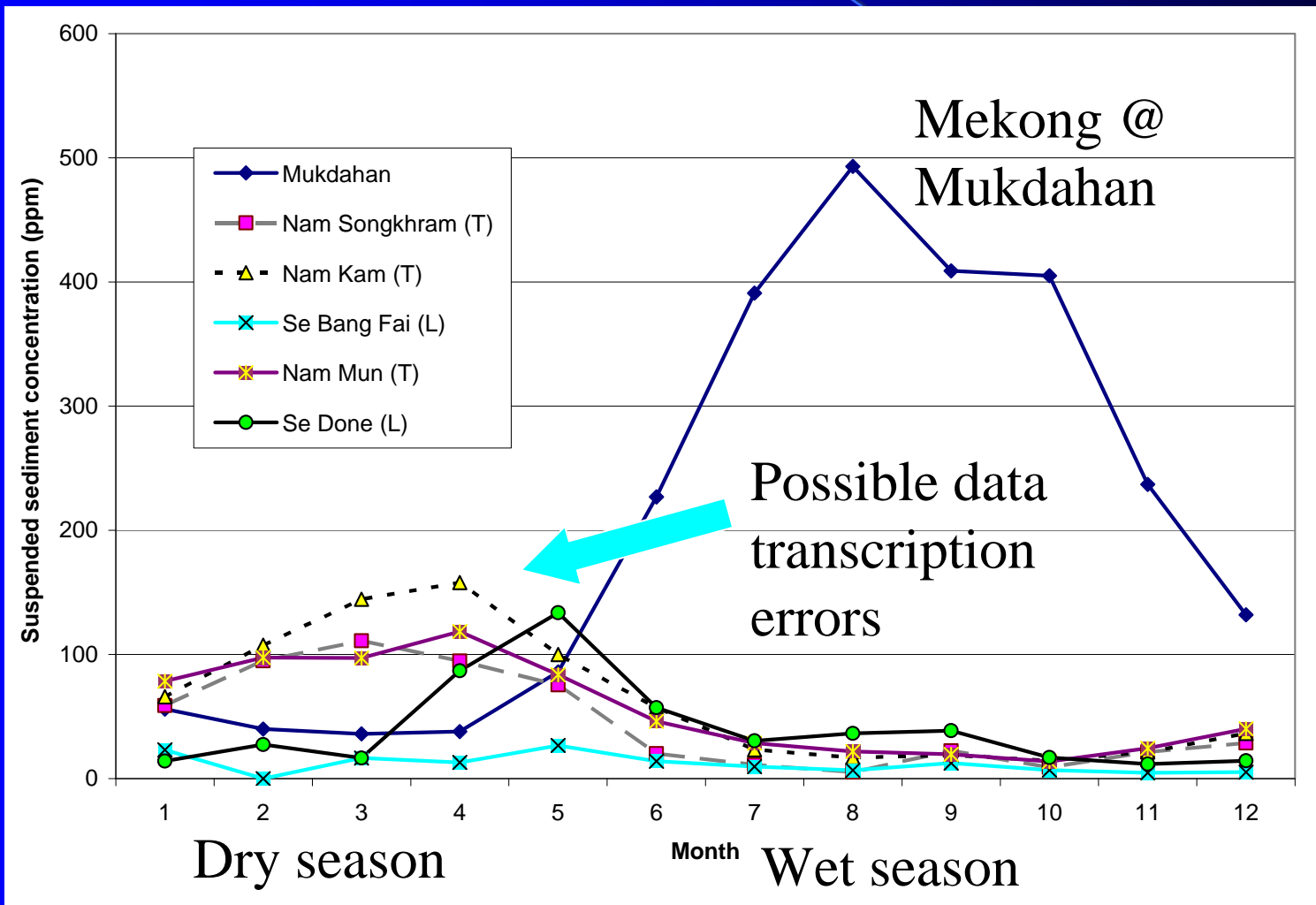
Downstream trends in median suspended sediment concentrations on the Mekong River



SSC of Mekong vs. tributaries



Transcription errors in MRC sediment database



Initial conclusions from SSC data

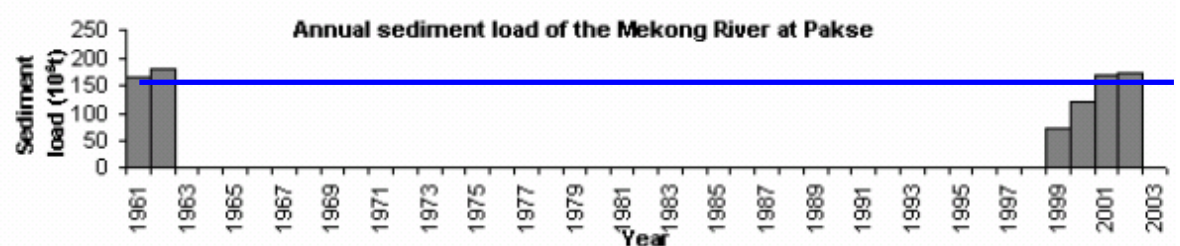
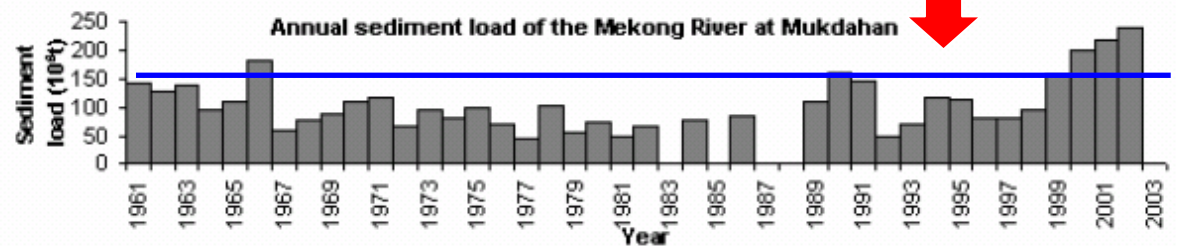
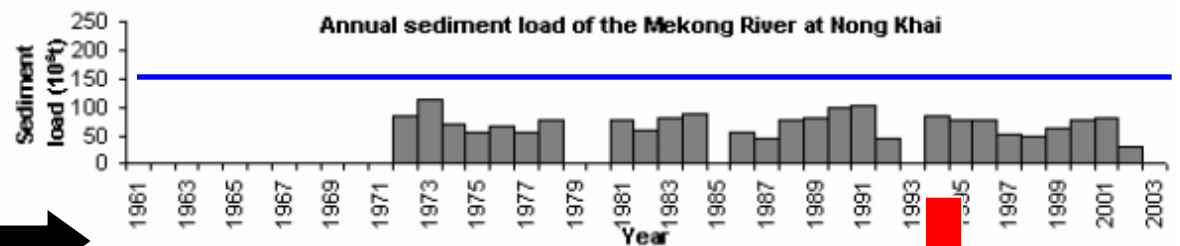
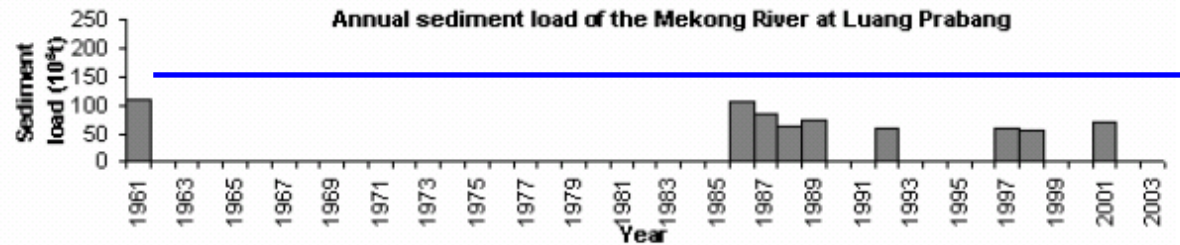
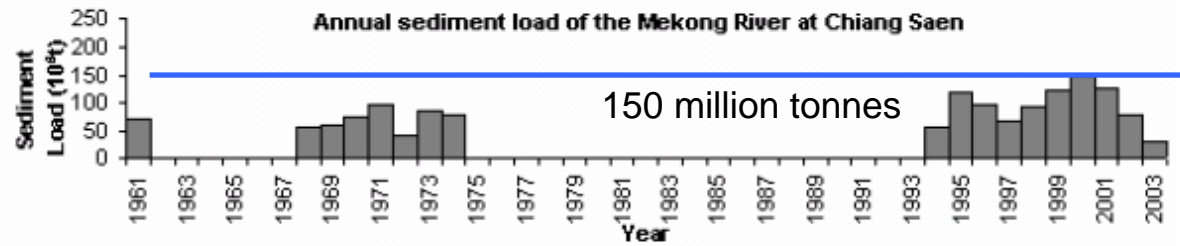
- Tributaries of the lower-Mekong River have a diluting effect on the sediment concentration of the mainstream.
- This, together with no distinct downstream increase in sediment load suggests:
 - Tributaries may have a limited sediment load contribution to the mainstream
 - Most sediment in the lower-Mekong River is derived from China
- However, we do not have data from several large left bank tributaries in Laos, or Cambodia and Vietnam.

Annual sediment loads on the Mekong mainstream

Several large left bank tributaries enter here



Tributaries in this reach appear to have a significant sediment input to the mainstream



Towards a sediment budget for the Mekong River Basin



Figure 1b. Mean-annual suspended-sediment discharge (1980-90) in the Mississippi River and its major tributaries (modified from Meade, 1995)

Need to estimate for individual reaches:

Inputs

- from upstream
- from tributaries
- bank erosion
- bed erosion

Outputs

- Transport downstream
- Overbank deposition
- in channel storage

Sediment issues in the lower-Mekong Basin

Existing issues

- Bank erosion
- Shifting islands (loss of land, national territory)
- Aggradation in shipping channels & Tonle Sap lake mouth

Potential future issues

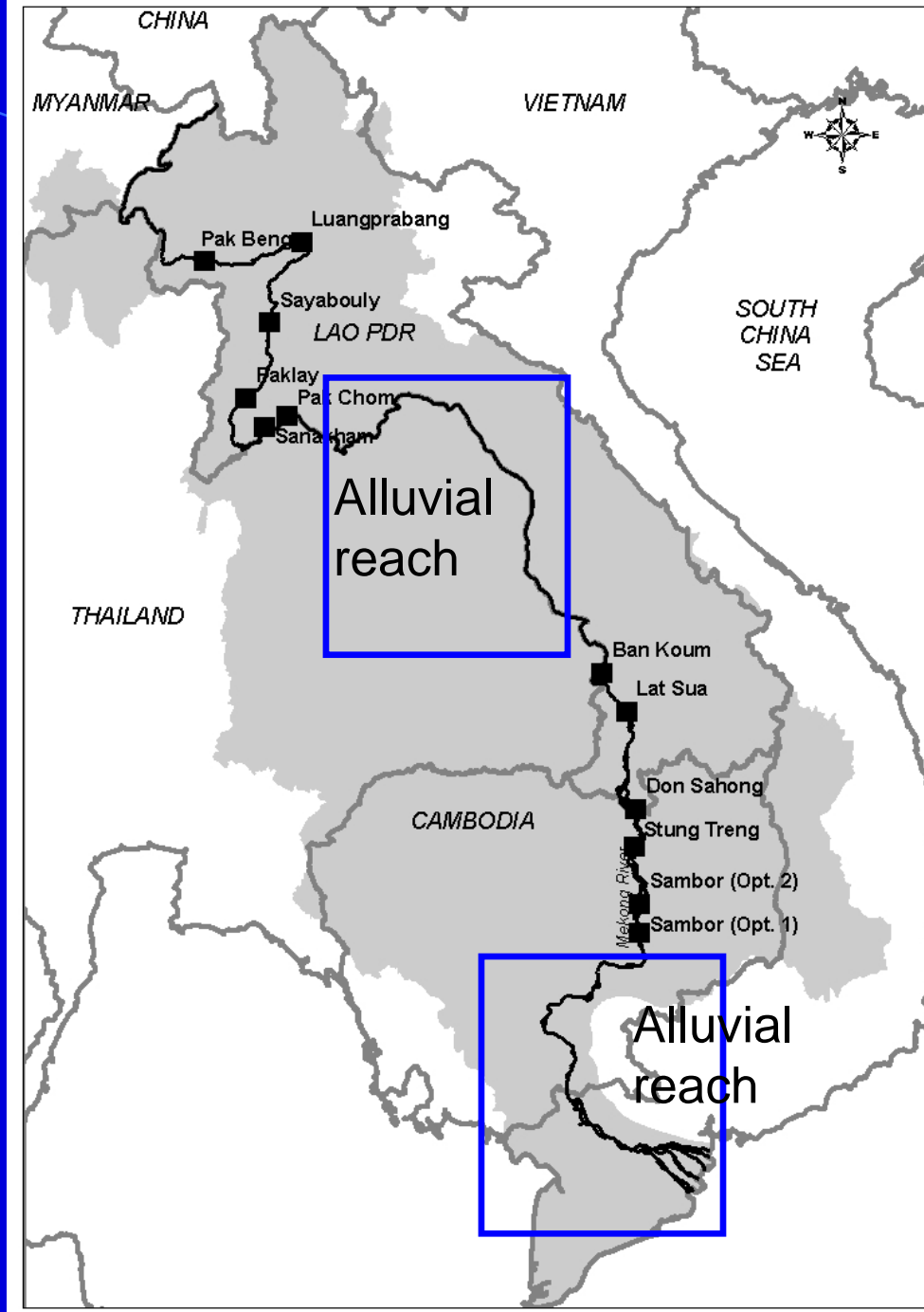
- Reduced sediment loads due to dams
- Increased sediment loads due to land-use change
- River morphology changes
 - Exacerbated erosion/deposition
 - Change in plan form (e.g. straight to meandering river)
 - Delta retreat – loss of land and infrastructure
 - Decreased fish habitat (infilling of pools, loss of spawning areas)
 - Problems / benefits for navigation
 - Siltation in reservoirs – loss of electricity generation efficiency
 - Fewer nutrients supplied to floodplains and to downstream

2. Consultations with countries and MRC Programmes

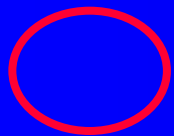
- What data does your line agency collect on a regular basis?
- What data do you currently use?
- How do you currently use this data?
 - e.g. specific models etc
- What data will you need in the near future?
- Important sediment-related issues
 - For more intensive sampling or investigation

Hydropower dams under consideration for the Mekong River mainstream

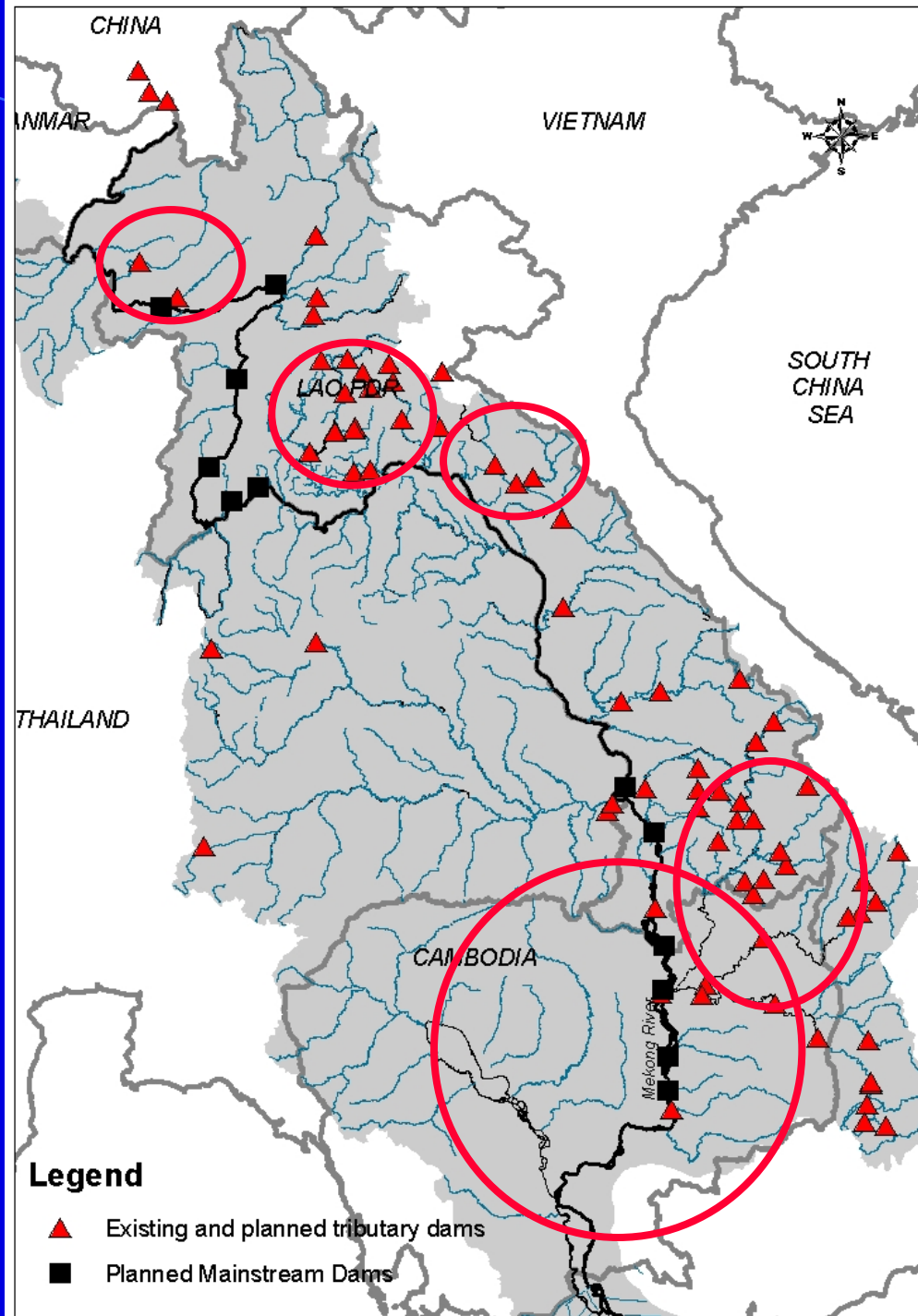
(11 in total)



Existing and planned dams on tributaries



Gaps in sediment data from earlier slide



Monitoring Project Formulation: Objectives



- Establish routine sediment monitoring
 - Mekong mainstream
 - Tributaries
- Revise discharge monitoring activities
 - Upgrade equipment & methods
 - Introduce quality control protocols
- Undertake investigations to address specific issues;
- Integrate the discharge, sediment, biological & water-quality monitoring activities

Important considerations

- What questions do we want to answer?
- How will the data be used?
- Which methods / equipment are most appropriate for monitoring?
- What are the priority sites for regular monitoring?
- What tools are needed to address specific issues?
- What additional data needs to be collected?

Activities during planning stage

1. Site visits to gauging stations



Purpose:

To document & evaluate:

- Methods
- Equipment
- Quality controls
- Constraints & challenges
- Needs for equipment upgrade & repair
- Needs for training

Outputs of planning stage

- Review of existing data & monitoring and data needs assessment
- Monitoring plan
 - Discharge
 - Suspended sediment
 - Bed load
 - Plans for special investigations
 - Initial integration of WQ and biological monitoring

After morning tea

12:10 – 12:30

- Findings from site visits and consultations
- Draft outline of monitoring plan