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Table A7.1 - Vegetation Species Observed During 2003 Survey

Vegetation Type	Scientific Name	Common Name	Provincial and Global Listing
Shrub	<i>Salix bebbiana</i>	beaked willow	
Forb	<i>Acorus americanus syn calamus</i>	sweet flag syn ratroot	
	<i>Calla palustris</i>	water arum	
	<i>Ceratophyllum demersum</i>	hornwort	
	<i>Chara sp.</i>	Chara	
	<i>Cicuta bulbifera</i>	bulb-bearing water-hemlock	
	<i>Eloda canadensis</i>	Canada water-lily	SRF,G5
	<i>Epilobium palustre</i>	marsh willowherb	
	<i>Equisetum hyemale</i>	common scouring-rush	
	<i>Galium trifidum</i>	small bedstraw	
	<i>Hippuris vulgaris</i>	common mare's-tail	
	<i>Impatiens capensis</i>	spotted touch-me-not	
	<i>Lemna minor</i>	common duckweed	
	<i>Lycopus asper</i>	western water-horehound	
	<i>Lycopus uniflorus</i>	northern water-horehound	
	<i>Lysimachia thyrsiflora</i>	tufted loosestrife	
	<i>Menyanthes trifoliata</i>	buck-bean	
	<i>Myriophyllum exalbescens</i>	spiked water-milfoil	
	<i>Nuphar lutea ssp variegata</i>	yellow pond-lily	
	<i>Nuphar sp.</i>	pond-lily	
Grass Like	<i>Nymphaea tetragona</i>	white water-lily	S1,G5
	<i>Potamogeton zosteriformis</i>	flat-stemmed pondweed	
	<i>Potamogeton natans</i>	floating-leaf pondweed	S2,G5
	<i>Potamogeton pectinatus</i>	sago pondweed	
	<i>Potamogeton richardsonii</i>	clasping-leaf pondweed	
	<i>Potentilla palustris</i>	marsh cinquefoil	
	<i>Rumex triangulivalvis</i>	narrow-leaved dock	
	<i>Sagittaria cuneata</i>	arum-leaved arrowhead	
	<i>Sium suave</i>	water parsnip	
	<i>Sparganium eurycarpum</i>	giant bur-reed	
	<i>Typha latifolia</i>	common cattail	
	<i>Utricularia intermedia</i>	flat-leaved bladderwort	
	<i>Utricularia vulgaris</i>	common bladderwort	
	<i>Calamagrostis canadensis</i>	bluejoint	
	<i>Carex aquatalis</i>	water sedge	
	<i>Carex diandra</i>	two-stamened sedge	
	<i>Carex gynocrates</i>	northern bog sedge	
	<i>Carex lacustris</i>	lakeshore sedge	S2,G5
	<i>Carex lasiocarpa</i>	hairy-fruited sedge	
	<i>Carex pseudocyperus</i>	cyperus-like sedge	S2,G5
	<i>Carex rostrata</i>	beaked sedge	S2,G5
	<i>Carex utriculata</i>	small bottle sedge	
	<i>Carex viridula</i>	green sedge	
	<i>Phragmites australis</i>	common reedgrass	

Table A7.1 – Vegetation Species Observed During 2003 Survey (Continued)

Vegetation Type	Scientific Name	Common Name	Provincial and Global Listing
Moss	<i>Brachythecium sp.</i>	-	
	<i>Brachythecium turgidum</i>	-	
	<i>Calliergon giganteum</i>	giant water moss	
	<i>Calliergon sp.</i>	water moss	
	<i>Calliergon stramineum</i>	straw-coloured water moss	
	<i>Drepanocladus aduncus</i>	brown moss	
	<i>Drepanocladus sp.</i>	brown moss	
	<i>Moss</i>	moss	
	<i>Rhizomnium pseudopunctatum</i>	-	

Shaded species indicates a provincially listed rare species

Table A7.2 - Percent Cover and Vegetation Class for Shipyard Lake; August 2003

Vegetation Type	Scientific Name	Provincial and Global Listing	ST1-1	ST1-2	ST3-1	ST3-2	ST6A-1	ST6A-2	ST6-1	ST6-2	ST8-1	ST8-2	SE9-1	SE9-2
Forb	<i>Acorus americanus</i> syn <i>calamus</i>							0.5						0.1
	<i>Calla palustris</i>													1
	<i>Ceratophyllum demersum</i>		96		99		60	20	30		10	1	10	0.5
	<i>Eloda canadensis</i>	SRF,G5	1				0.1		30					
	<i>Equisetum hyemale</i>							1				30	0.1	
	<i>Galium trifidum</i>			3										
	<i>Lemna minor</i>				0.1	2		0.1		1	0.1	0.1	0.1	0.1
	<i>Lysimachia thyrsiflora</i>				1				1					
	<i>Myriophyllum exalbescens</i>		3		0.1			5	30		5			0.5
	<i>Potamogeton zosteriformis</i>		0.1				2				0.1		0.1	
	<i>Sium suave</i>											0.1		
	<i>Typha latifolia</i>			75		75		60		60		50		80
	<i>Utricularia intermedia</i>					2				7				0.5
	<i>Utricularia vulgaris</i>		0.5		0.5	50	20	0.5	10		1		3	0.1
Grass Like	<i>Carex aquatalis</i>											5		
Moss	<i>Brachythecium sp.</i>									T				
	<i>Drepanocladus aduncus</i>													
	<i>Drepanocladus sp.</i>			5										0.1
	Species Count		5	4	4	4	4	8	4	4	5	5	5	10

Shaded species indicates a provincially listed rare species

Table A7.3 - Vigour Values for Shipyard Lake; 2003

Vegetation Type	Scientific Name	ST1-1	ST1-2	ST3-1	ST3-2	ST6A-1	ST6A-2	ST6-1	ST6-2	ST8-1	ST8-2	SE9-1	SE9-2
Forb	<i>Acorus americanus; A. calamus</i>						2						2
	<i>Calla palustris</i>												2
	<i>Ceratophyllum demersum</i>	2		2		2	2	2		2	2	2	2
	<i>Eloda canadensis</i>	1				2		2					
	<i>Equisetum hyemale</i>						2					3	2
	<i>Galium trifidum</i>		3										
	<i>Lemna minor</i>			2	2		2		3	2	2	2	3
	<i>Lysimachia thyrsiflora</i>			2			2						
	<i>Myriophyllum exalbescens</i>	1		2			1	2		1			1
	<i>Potamogeton zosteriformis</i>	2				1				1		1	
	<i>Sium suave</i>											3	
	<i>Typha latifolia</i>			2		2		2		2		2	2
	<i>Utricularia intermedia</i>					2			3				3
	<i>Utricularia vulgaris</i>	3		3	2	2	2	2		2		2	2
Grass Like	<i>Carex aquatalis</i>											2	
Moss*	<i>Brachythecium sp.</i>								na				
	<i>Drepanocladus aduncus</i>												
	<i>Drepanocladus sp.</i>			na									na

*Due to their morphology, mosses were not assigned a vigour rating

Table A7.4 – Percent Cover and Vegetation Class for Isadore’s Lake; August 2003

Vegetation Type	Scientific Name	Provincial and Global Listing	IT1-1	IT1-2	IT2-1	IT2-2	IT3-1	IT3-2	IT4-1	IT4-2	IT4-3	IT5-1	IT5-2	IT6-1	IT6-2	IT7-1	IT7-2	IT7-3	IT7-4	IT8-1	IT8-2
Shrub	<i>Salix bebbiana</i>															0.1	2	0.5			
Forb	<i>Ceratophyllum demersum</i>		2	0.5			10	7	25	50	95			95	1				0.1	99	
	<i>Chara sp.</i>			90		65		60													
	<i>Eloda canadensis</i>	SRF,G5		0.5		0.5		0.5													
	<i>Hippuris vulgaris</i>																0.5				
	<i>Lemna minor</i>		2		0.1		90	0.1	80	4			0.1	0.1	0.1		3	1	2	0.1	0.1
	<i>Menyanthes trifoliata</i>																5				
	<i>Myriophyllum exalbescens</i>															20		1			
	<i>Nuphar lutea ssp variegata</i>							0.1			5	65									
	<i>Potamogeton zosteriformis</i>					15		0.1												0.1	
	<i>Potamogeton pectinatus</i>			2		25		0.1													
	<i>Sagittaria cuneata</i>		0.1		6		4			7											
	<i>Sium suave</i>								0.1								0.1				
	<i>Sparganium eurycarpum</i>		40		0.5		7			7				10							
	<i>Typha latifolia</i>		0.5		1		5			4				20		75		8		10	60
Grass Like	<i>Utricularia intermedia</i>																3		0.5		
	<i>Utricularia vulgaris</i>								2					2			5	2	7	15	
	<i>Carex aquatalis</i>																0.1		1		
Moss	<i>Drepanocladus aduncus</i>					30											0.5				
	Species Count		5	4	5	4	5	7	5	5	2	1	3	3	3	6	7	5	5	3	3

Table A7.5 - Vigour Values for Isadore's Lake; 2003

Vegetation Type	Scientific Name	IT1-1	IT1-2	IT2-1	IT2-2	IT3-1	IT3-2	IT4-1	IT4-2	IT4-3	IT5-1	IT5-2	IT6-1	IT6-2	IT7-1	IT7-2	IT7-3	IT7-4	IT8-1	IT8-2
Shrub	<i>Salix bebbiana</i>														0	0	0			
Forb	<i>Ceratophyllum demersum</i>	2	2			2	3	3	2	2			2	2				2	4	
	<i>Chara sp.</i>		2		na		3													
	<i>Eloda canadensis</i>		2		na		2													
	<i>Hippuris vulgaris</i>														3					
	<i>Lemna minor</i>	2		2		3	2	3	2			2	2	2		2	1	2	2	1
	<i>Menyanthes trifoliata</i>														3					
	<i>Myriophyllum exalbescens</i>														2	1				
	<i>Nuphar lutea ssp variegata</i>						0			2	2									
	<i>Potamogeton zosteriformis</i>				na		1												1	
	<i>Potamogeton pectinatus</i>		2		na		1													
	<i>Sagittaria cuneata</i>	2		3		3			4											
	<i>Sium suave</i>							4								2				
	<i>Sparganium eurycarpum</i>	2		2		2			2			3								
	<i>Typha latifolia</i>	2		2		2			2			3		3		3		3	3	
	<i>Utricularia intermedia</i>														1		2			
	<i>Utricularia vulgaris</i>							3						2		1	1	1		
Grass Like	<i>Carex aquatalis</i>																2		2	
	<i>Carex pseudocyperus</i>							3							2					
	<i>Phragmites australis</i>			3																
Moss*	<i>Drepanocladus aduncus</i>													na						

*Due to their morphology, mosses were not assigned a vigour rating

Table A7.6 - Percent Cover and Vegetation Class for Kearn Lake; August 2003

Vegetation type	Scientific Name	Provincial and Global Listing	KT1-1	KT1-2	KT2-1	KT2-2	KT2-3	KT2-4	KT2-5	KT3-1	KT3-2	KT4-1	KT4-2	KT5-1	KT5-2	KT5-3	KT6-1	KT6-2	KT7-1	KT7-2	KT8-1	KT8-2	KT9-1	KT9-2			
Shrub	<i>Salix bebbiana</i>		0.5																								
Forb	<i>Acorus americanus syn calamus</i>		0.1				0.5			3	0.1																
	<i>Calla palustris</i>		1												1									1			
	<i>Ceratophyllum demersum</i>			0.5		0.5			1		1	2							0.1								
	<i>Cicuta bulbifera</i>		1											0.1	0.1				0.1	0.1	0.1	0.5					
	<i>Galium trifidum</i>		0.5						0.1				0.5	0.5						0.1	0.1	3					
	<i>Impatiens capensis</i>																						2				
	<i>Lycopus asper</i>		2										0.5	1	2				0.5								
	<i>Lycopus uniflorus</i>																							1			
	<i>Lysimachia thyrsiflora</i>		1		0.5				0.5	1		0.1		0.5	2		0.1		0.1	0.5		0.5					
	<i>Menyanthes trifoliata</i>								0.5				0.5				1										
	<i>Myriophyllum exaltatum</i>											0.5															
	<i>Nuphar lutea ssp variegata</i>					7											2								2		
	<i>Nuphar sp.</i>										0.1	2							5								
	<i>Nymphaea tetragona</i>	S1,G5				2		0.1																			
	<i>Potamogeton natans</i>	S2,G5														1											
Grass like	<i>Potamogeton richardsonii</i>			0.5								0.5															
	<i>Potentilla palustris</i>		0.5	0.5	0.1								0.5	0.5					1	0.5	1						
	<i>Rumex triangulivalvis</i>														0.1												
	<i>Typha latifolia</i>		0.1				3	0.5								3		0.1	0.5	0.5	3			10			
	<i>Utricularia intermedia</i>		0.5		1			2		2		0.1	0.5		0.1		0.5		0.1	0.5	0.1		2				
	<i>Utricularia vulgaris</i>			0.5						2	2	0.1												1			
	<i>Calamagrostis canadensis</i>		13																								
	<i>Carex aquatalis</i>		0.5		55	0.5	0.5	10	0.1	2		1		0.5							0.1			0.1			
	<i>Carex diandra</i>							0.5		7				5					0.1	7	7						
	<i>Carex gynocrates</i>												7														
Grass like	<i>Carex lacustris</i>	S2,G5															0.1										
	<i>Carex lasiocarpa</i>									1	0.1				2		12		40	0.1			5				
	<i>Carex pseudocyperus</i>	S2,G5																	0.1			0.1					
	<i>Carex rostrata</i>	S2,G5						2								0.1											
	<i>Carex utriculata</i>																										
	<i>Carex viridula</i>		0.1																								

Table A7.6 – Percent Cover and Vegetation Class for Kearn Lake; August 2003 (Continued)

Vegetation type	Scientific Name	Provincial and Global Listing	KT1-1	KT1-2	KT2-1	KT2-2	KT2-3	KT2-4	KT2-5	KT3-1	KT3-2	KT4-1	KT4-2	KT5-1	KT5-2	KT5-3	KT6-1	KT6-2	KT7-1	KT7-2	KT8-1	KT8-2	KT9-1	KT9-2
Moss	<i>Brachythecium turgidum</i>												2	7										
	<i>Calliergon giganteum</i>		18		0.5								2	1					1	7	25			
	<i>Calliergon sp.</i>													0.5										
	<i>Calliergon stramineum</i>												10											
	Moss										5													
	<i>Rhizomnium pseudopunctatum</i>		1											0.5										
Species Count			15	3	6	3	4	5	6	8	5	7	8	12	10	2	6	1	11	9	8	2	10	1

Shaded species indicates a provincially listed rare species

Table A7.7 - Vigour Values for Kearn Lake; 2003

Vegetation Type	Scientific Name	KT1-1	KT1-2	KT2-1	KT2-2	KT2-3	KT2-4	KT2-5	KT3-1	KT3-2	KT4-1	KT4-2	KT5-1	KT5-2	KT5-3	KT6-1	KT6-2	KT7-1	KT7-2	KT8-1	KT8-2	KT9-1	KT9-2
Shrub	<i>Salix bebbiana</i>	2																					
	<i>Acorus americanus</i> <i>syn calamus</i>	3				2			2	2													
	<i>Calla palustris</i>	2											1									2	
	<i>Ceratophyllum demersum</i>		4		3			2		3	3							2					
	<i>Cicuta bulbifera</i>	4											2	2				2	2	2		3	
	<i>Galium trifidum</i>	2						1				3	2							2	2		
	<i>Impatiens capensis</i>																					3	
	<i>Lycopus asper</i>	4									3	2	3					2					
	<i>Lycopus uniflorus</i>																					2	
	<i>Lysimachia thyrsiflora</i>	3		na				3	2		2		2	2		2		2	2	2		2	
	<i>Menyanthes trifoliata</i>							3				3				4							
Forb	<i>Myriophyllum exalbescens</i>									1													
	<i>Nuphar lutea</i> ssp <i>variegata</i>				3									3									2
	<i>Nuphar</i> sp.								1	1						2							
	<i>Nymphaea tetragona</i>				3		1																
	<i>Potamogeton natans</i>													1									
	<i>Potamogeton richardsonii</i>		2								2												
	<i>Potentilla palustris</i>	3	3	na							2	3					3	2	3				
	<i>Rumex triangulivalvis</i>													2									
	<i>Typha latifolia</i>	3				2	3						2			2		2	1	2		2	
	<i>Utricularia intermedia</i>	3		na			3		3		2	3		2		3		2	4	3		3	
	<i>Utricularia vulgaris</i>			na					3	4		1									3		

Table A7.7 – Vigour Values for Kearn Lake; 2003 (Continued)

Vegetation Type	Scientific Name	KT1-1	KT1-2	KT2-1	KT2-2	KT2-3	KT2-4	KT2-5	KT3-1	KT3-2	KT4-1	KT4-2	KT5-1	KT5-2	KT5-3	KT6-1	KT6-2	KT7-1	KT7-2	KT8-1	KT8-2	KT9-1	KT9-2
Grass Like	<i>Calamagrostis canadensis</i>	2																					
	<i>Carex aquatalis</i>	3		na	2	2	2	2	3		2		2						2			2	
	<i>Carex diandra</i>					2			2				2					2	2	2			
	<i>Carex gynocrates</i>										2												
	<i>Carex lacustris</i>															3							
	<i>Carex lasiocarpa</i>								3	2			3			2		2	2			2	
	<i>Carex pseudocyperus</i>																2			2			
	<i>Carex rostrata</i>						3																
	<i>Carex utriculata</i>											2											
	<i>Carex viridula</i>	3																					
Moss*	<i>Brachythecium turgidum</i>												na	na									
	<i>Calliergon giganteum</i>	na		na								na	na				na	na	na				
	<i>Calliergon sp.</i>											na											
	<i>Calliergon stramineum</i>											na											
	Moss								na														
	<i>Rhizomnium pseudopunctatum</i>	na											na										

*Due to their morphology, mosses were not assigned a vigour rating

Table A7.8 – Jaccard's Index for Pairs with values of ≥ 0.500 ; 2003

Plots	Jaccard's Index
Shipyard	
ST81 vs ST31	0 .800
ST6A1 vs ST11	0 .800
ST61 vs ST11	0 .800
ST81 vs ST11	0 .667
SE91 vs ST8	0 .667
SE92 vs ST6A2	0 .636
ST62 vs ST32	0 .600
ST61 vs ST6A1	0 .600
ST61 vs ST31	0 .600
ST81 vs ST6A1	0 .500
ST81 vs ST6	0 .500
ST6A2 vs ST31	0 .500
SE91 vs ST31	0 .500
SE91 vs ST6A1	0 .500
ST31 vs ST11	0 .500
Count	15
Isadore's Lake	
IT74 vs IT72	0 .714
IT42 vs IT21	0 .667
IT31 vs IT21	0 .667
IT21 vs IT11	0 .667
IT81 vs IT42	0 .600
IT81 vs IT31	0 .600
IT81 vs IT11	0 .600
IT62 vs IT42	0 .600
IT62 vs IT31	0 .600
IT62 vs IT11	0 .600
IT52 vs IT42	0 .600
IT52 vs IT41	0 .600
IT52 vs IT31	0 .600
IT52 vs IT21	0 .600
IT52 vs IT11	0 .600
IT22 vs IT12	0 .600
IT32 vs IT22	0 .571
IT32 vs IT12	0 .571
IT82 vs IT81	0 .500
IT82 vs IT62	0 .500
IT82 vs IT61	0 .500
IT81 vs IT61	0 .500
IT81 vs IT52	0 .500
IT62 vs IT61	0 .500
IT62 vs IT52	0 .500
IT51 vs IT43	0 .500
Count	26
Kearl Lake	
KT81 vs KT72	0 .700
KT72 vs KT71	0 .667
KT81 vs KT71	0 .583
KT91 vs KT52	0 .538
KT92 vs KT53	0 .500
KT72 vs KT21	0 .500
Count	6

Table A7.9: Modified Bray Curtis Index for Pairs with values of ≥ 0.500 ; 2003

Plots	Modified Bray-Curtis Index
Shipyard Lake	
ST31 vs ST11	0.965
SE92 vs ST12	0.899
ST82 vs ST62	0.807
SE92 vs ST62	0.803
ST62 vs ST12	0.789
ST62 vs ST6A2	0.770
SE92 vs ST82	0.727
SE92 vs ST6A2	0.718
SE92 vs ST32	0.714
ST82 vs ST12	0.713
ST6A2 vs ST12	0.709
ST82 vs ST6A2	0.708
ST32 vs ST12	0.704
ST6A1 vs ST31	0.666
ST6A vs ST11	0.664
ST62 vs ST32	0.640
ST6A2 vs ST32	0.558
ST82 vs ST32	0.541
Count	18
Isadore's Lake	
IT82 vs IT61	0.969
IT61 vs IT43	0.964
IT82 vs IT43	0.954
IT81 vs IT62	0.883
IT41 vs IT31	0.806
IT32 vs IT12	0.759
IT32 vs IT22	0.700
IT22 vs IT12	0.680
IT61 vs IT42	0.593
IT82 vs IT42	0.585
IT43 vs IT42	0.581
IT74 vs IT72	0.577
Count	12
Kearl Lake	
KT92 vs KT53	0.800
KT81 vs KT72	0.581
KT81 vs KT11	0.507
Count	3

CLASSIFICATION SYSTEM AND TYPES OF WETLANDS

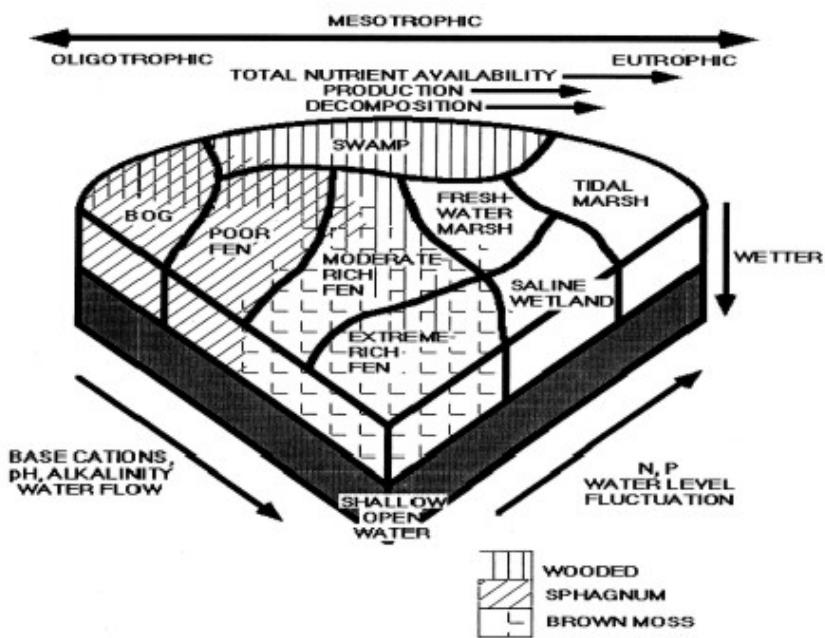
The National Wetlands Working Group (NWWG 1988) defined wetlands as:

"land that is saturated with water long enough to promote wetland or aquatic processes as indicated by hydric soil, hydrophytic vegetation, and various kinds of biological activity which are adapted to the wet environment".

This definition has been adopted in the Alberta Environment Protection Draft Wetland Policy (AEP 1997). In addition, wetlands in the province are classified according to the AWI as detailed by Halsey and Vitt (1996).

According to this classification system, wetlands are divided into 5 general types: bogs, fens, marshes, swamps and shallow open water. These wetlands are further described based on a combinations of factors, which include water level, water chemistry, floristic composition, topographic location, geomorphic basin configuration and other variables. These factors combine to form chemical and biotic gradients, which provides a framework for classifying wetlands as presented below Figure A7.1 and Table A7.10 (Nichols and Gignac 1995). Bogs, for example, are oligotrophic, acidic, with no flowing water whereas fens are mesotrophic, neutral to alkaline, with flowing water.

Figure A7.1. Wetlands Classification Based on Chemical and Biotic Gradients



Source: Halsey and Vitt 1996, modified from Vitt 1994

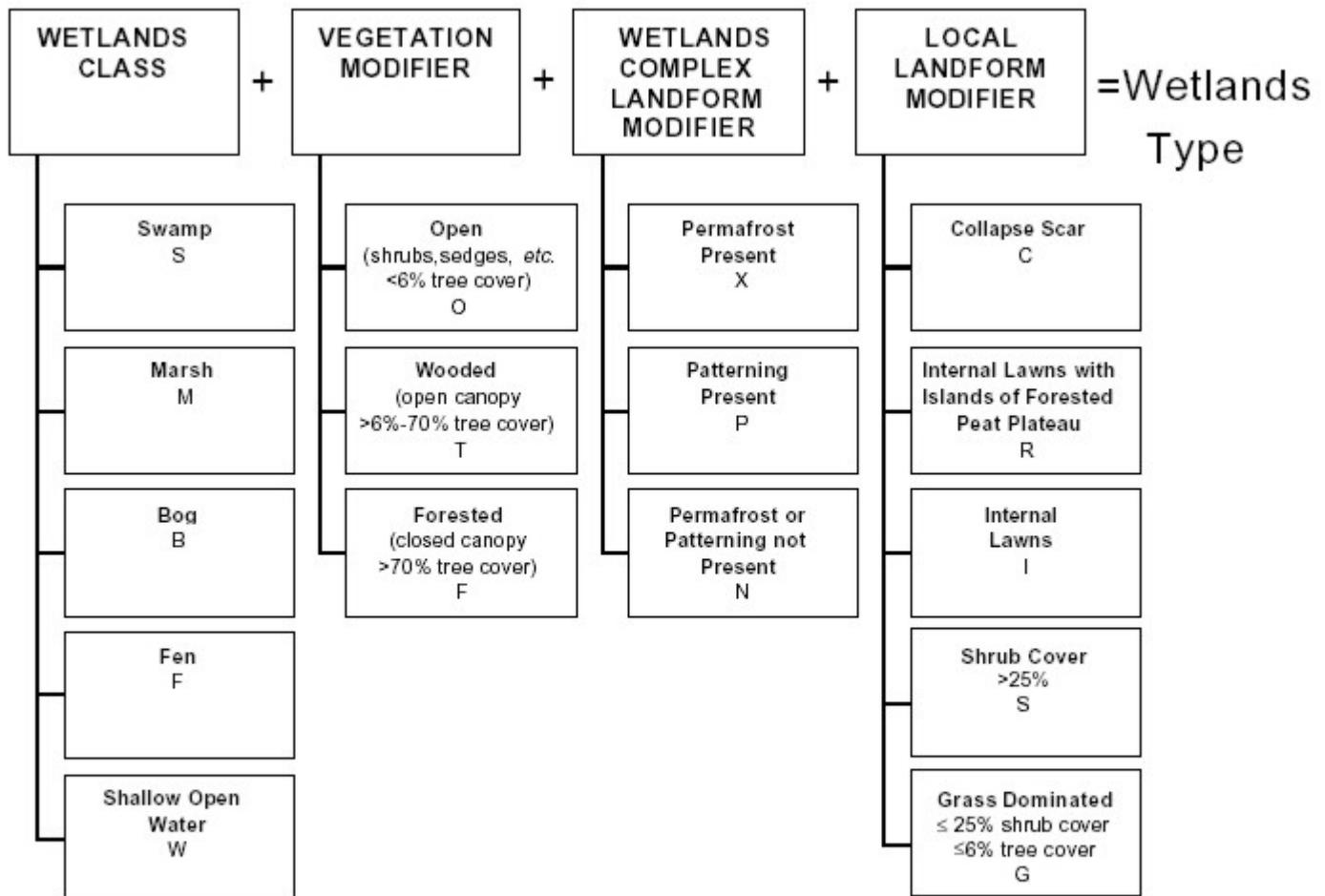
Changes in the chemical or biotic gradients could potentially effect wetlands properties, which may effect how the wetland functions within an ecosystem. Table 10 provides a summary of the properties associated with each general wetlands types.

Table A7.10: Summary of General Wetland Types and their Properties

	Bogs	Fens	Marshes	Swamps	Shallow Open Water
peat-forming	yes (<i>Sphagnum</i>)	yes (sedges, brown moss)	no	no	no
pH	strongly acidic	acidic to neutral	neutral to slightly alkaline	neutral to moderately acidic	variable
water level	at or near surface	at or near surface	fluctuates seasonally	at or near surface; may be seasonally flooded	intermittent or permanently flooded
flowing water	no	yes	yes	yes	yes
nutrients	low	medium to high	high	high	variable
minerals	low	medium to high	medium	medium	high
dominant vegetation	<i>Sphagnum</i> , ericaceous shrubs	sedges, grasses, reeds, brown moss	emergent sedges, grasses, rushes, reeds, submerged and floating aquatics	deciduous or coniferous trees or shrubs, herbs, some mosses	emergent vegetation

All of these wetlands properties are incorporated in the AWI classification. The classification contains four descriptive levels: the wetlands class, the vegetation modifier, the wetlands complex landform modifier and the local landform modifier (Figure IV.2). Approximately 14 of all the possible combinations occur in Alberta. For example, a wetland type denoted as FONG, is characterized as a fen (F), that is open (O), without permafrost (N) with grasses dominant (G).

Figure A7.2 Flow Chart Representation of Wetland Classification



Local Land Modifier without internal lawns = N

Source: Nesby 1997

WETLAND TYPE DESCRIPTIONS AFTER HALSEY AND VITT (1996)

Shallow Open Water are non-peat forming wetlands that are characterized by aquatic processes confined to less than 2 m depth at midsummer. These wetlands have submergent to floating vegetation and form a transition to truly aquatic ecosystems.

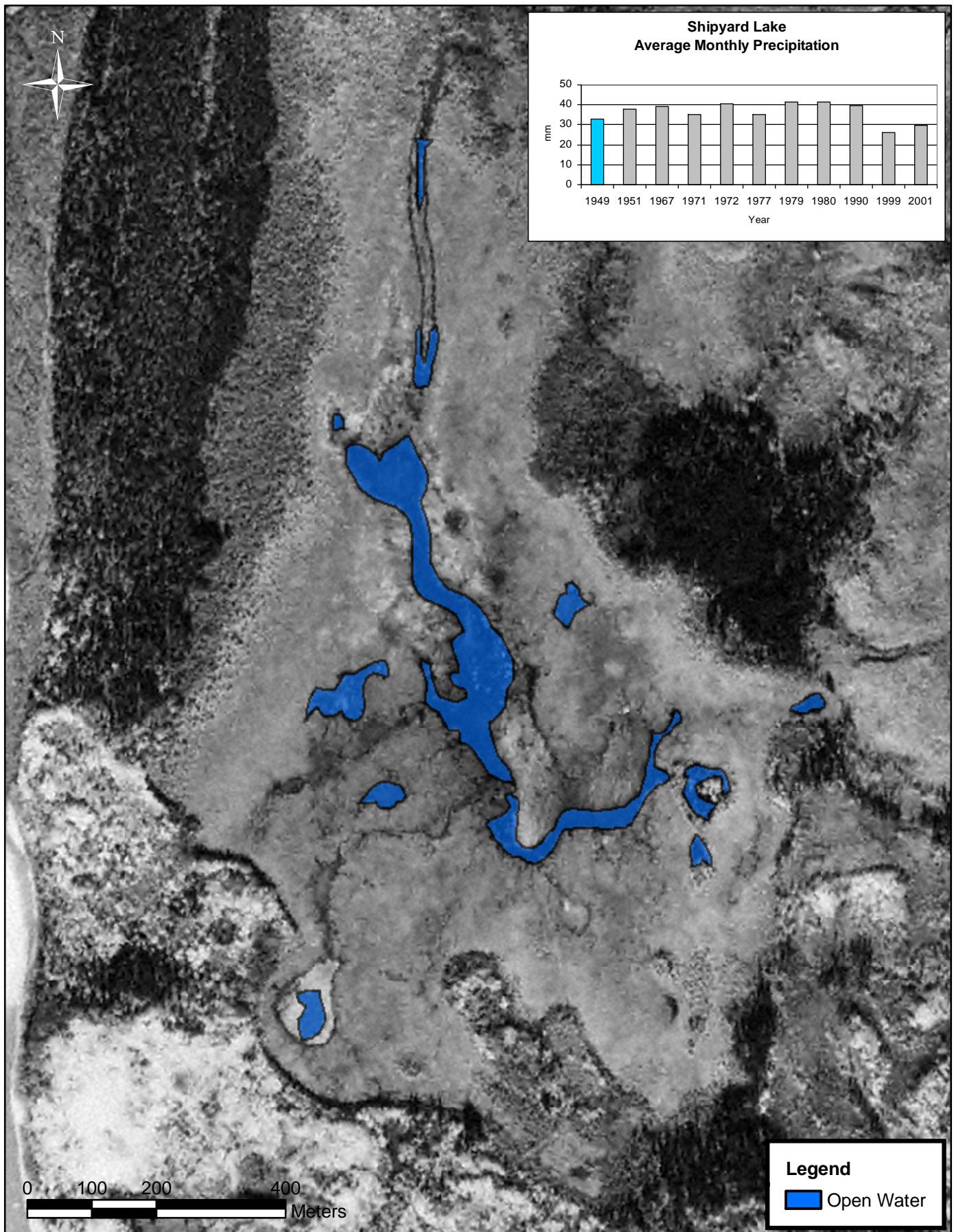
Marshes are open, non-peat forming wetlands that are dominated by sedges (Cyperaceae), other monocots (Mong), or shrubs (Mons). Marshes are characterized by seasonal water level fluctuations, relatively high amounts of water flow, and are influenced by ground and surface waters. Nutrient concentration of nitrogen and phosphorus is high, thus leading to high production but also high decomposition which limits peat accumulation.

Swamps are forested, wooded or shrubby non-peaty wetlands. Swamps and marshes have a poorly developed bryophyte layer that results from strong seasonal water level fluctuations and high vascular plant production. Peat accumulation is limited in swamps as decomposition rates are high. Vegetatively swamps are quite diverse and in Alberta may be composed of some combination of *Larix laricina*, *Picea mariana*, *Betula*, and *Salix*. Swamps can be treed (Stnn), forested (Sfnn), or open (> 6% trees cover) and shrub-dominated (Sons).

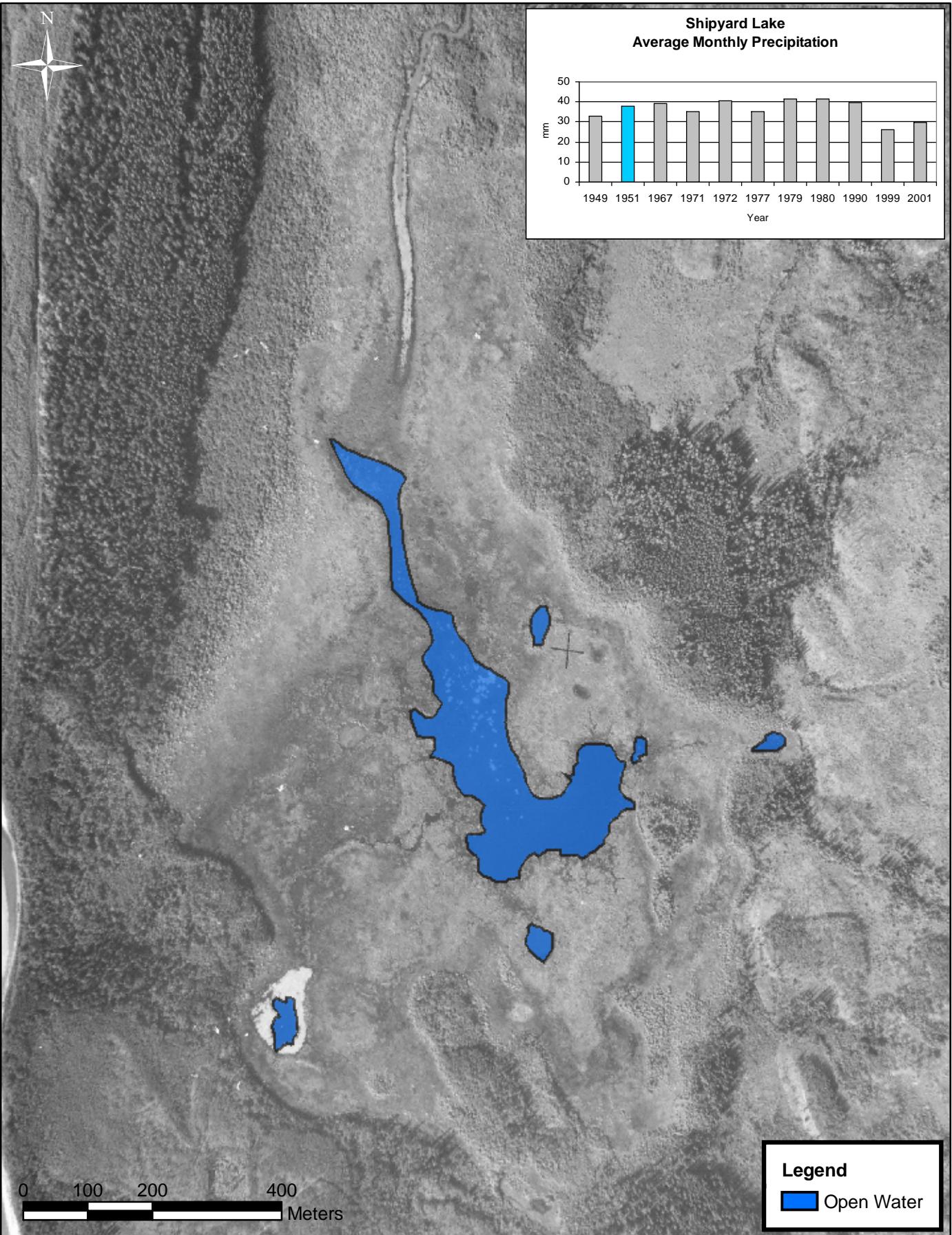
Peatlands, often termed muskeg, differ from non-peat forming wetlands by having a decrease in decomposition relative to plant production, thus allowing for the accumulation of peat. For a wetland to be classified as peatland in Canada, peat accumulation must > / = 40 cm. Peatlands are divided into two peat sequestering system, fens and bogs.

Fens are ecosystems that are affected by mineral soil waters (ground and/or surface) that may be relatively rich in mineral elements. Fens are influenced by flowing surface water or associated lakes and ponds. Fens have water levels at or near the peat surface. Fens can be open and dominated by *Carex*, *Scirpus*, and *Eriophorum* (*Fong*); or shrubby and dominated by *Betula* and *Salix* (*Fons*); or wooded to forested with species such as *Picea mariana*, *Larix laricina*, *Betula*, and *Salix* (*Ftnn* or *Ffnn*). Fens can be patterned (have flarks and strings) (*Fopn* or *Ftpn*). Poor fens are low in indicator species, while extreme-rich fens are high in indicator species; moderate-rich fens are intermediate. Poor fens are acid (pH 4.5-5.5) and are ecologically more similar to bogs than to moderate-rich or rich fens. They are dominated by oligotrophic and mesotrophic species of *Sphagnum*. Moderate-rich fens have a slightly acid to neutral pH (5.5-7.0) and have species such as *Drepanocladus* and *Calliergonella*, and low abundances of mesotrophic species of *Sphagnum*. Extreme-rich fens have a basic pH (above 7.0) and are characterized by species of *Drepanocladus*, *Scorpidium*, and *Campylium*.

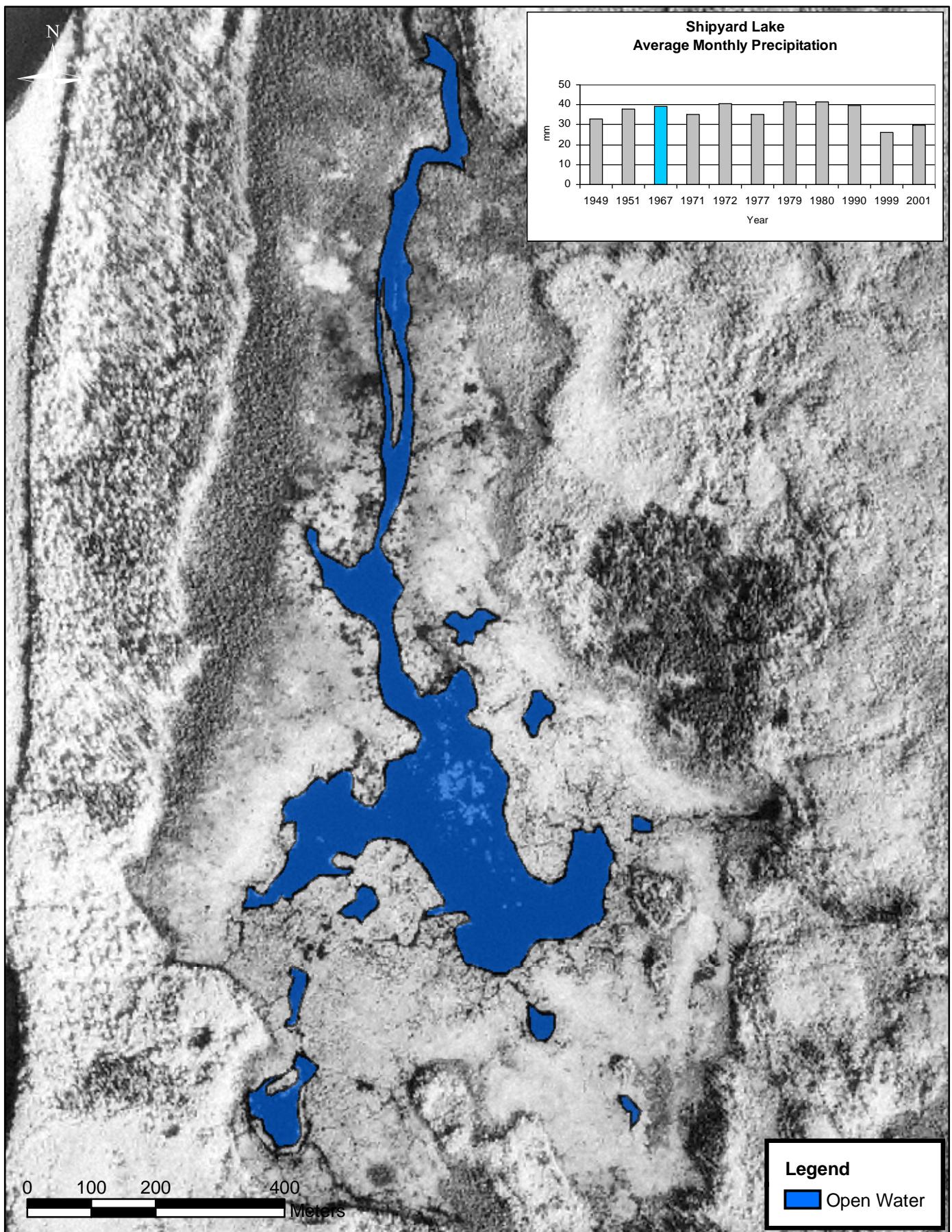
Bogs are peatlands that receive water only from precipitation and the water table is generally 40-60 cm below the peat surface. Bogs are acidic ecosystems with pH below 4.5 and are generally poor in available nutrients. Bogs are dominated by oligotrophic species of *Sphagnum* and feather mosses such as *Pleurozium schreberi* and *Hylocomnium splendens*. They can be open, wooded or forested with only one tree species, *Picea mariana*. Permafrost can be found in peatlands and the above classification recognizes permafrost features (x = permafrost present, c = collapse scar, r = internal lawns with islands of forested peat plateaus, and I = internal lawns). See Halsey and Vitt (1996) for detailed AWI classification.



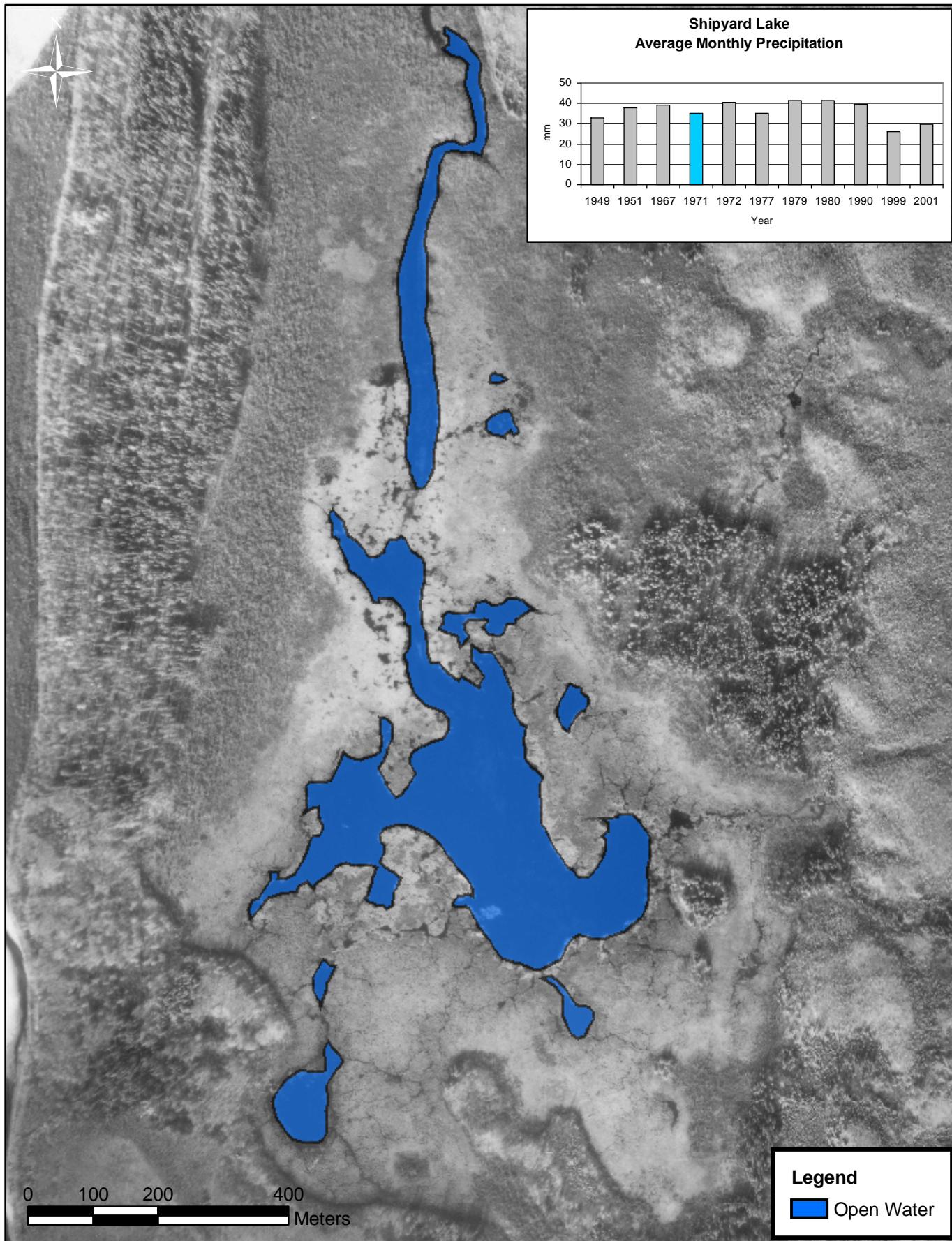
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RAMP	Scale: 1:8 000 Date: 17/12/03 Drawn By: SAR/SB Approved By:	Shipyard Lake - 1967 Aquatic Vegetation	Original aerial photo date: 1967 Original aerial photo scale: 1:31 680	Figure No.: A7.5
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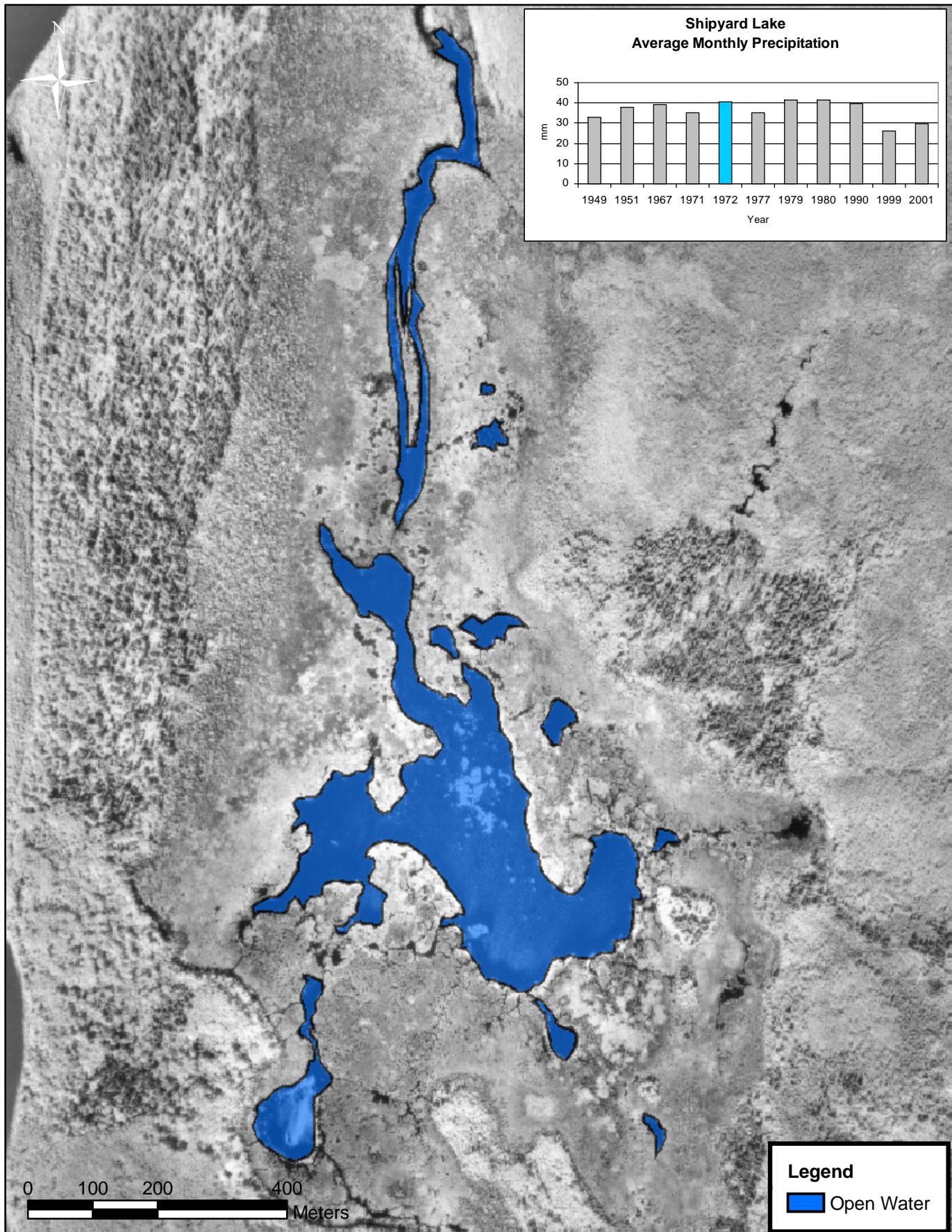
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Approved By:

Shipyard Lake - 1971

Aquatic Vegetation

Original aerial photo date: 1971
Original aerial photo scale: 1:12 000

Figure No.:
A7.6



RAMP

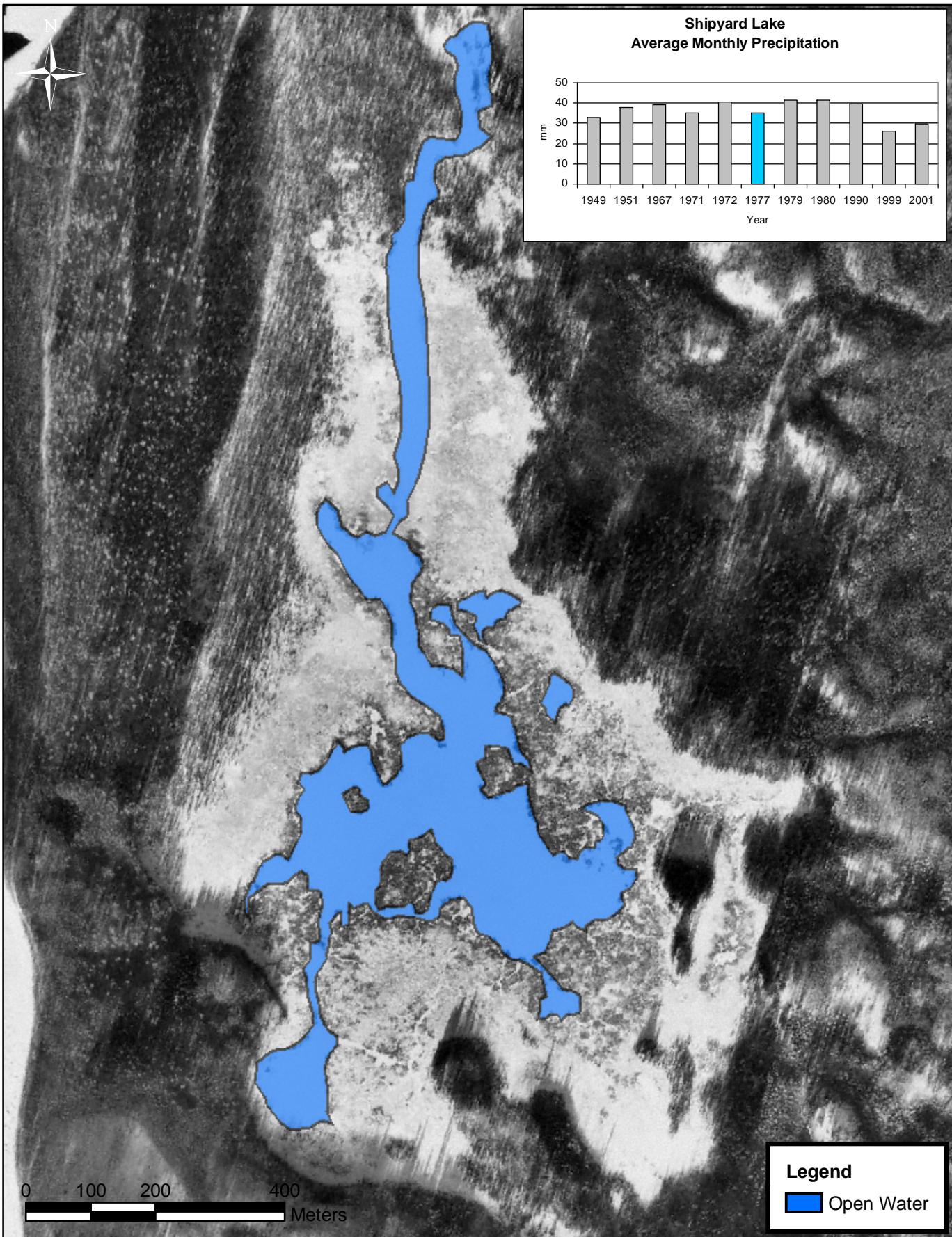
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Shipyard Lake - 1972

Aquatic Vegetation

Original aerial photo date: 1972
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Figure No.:
A7.7



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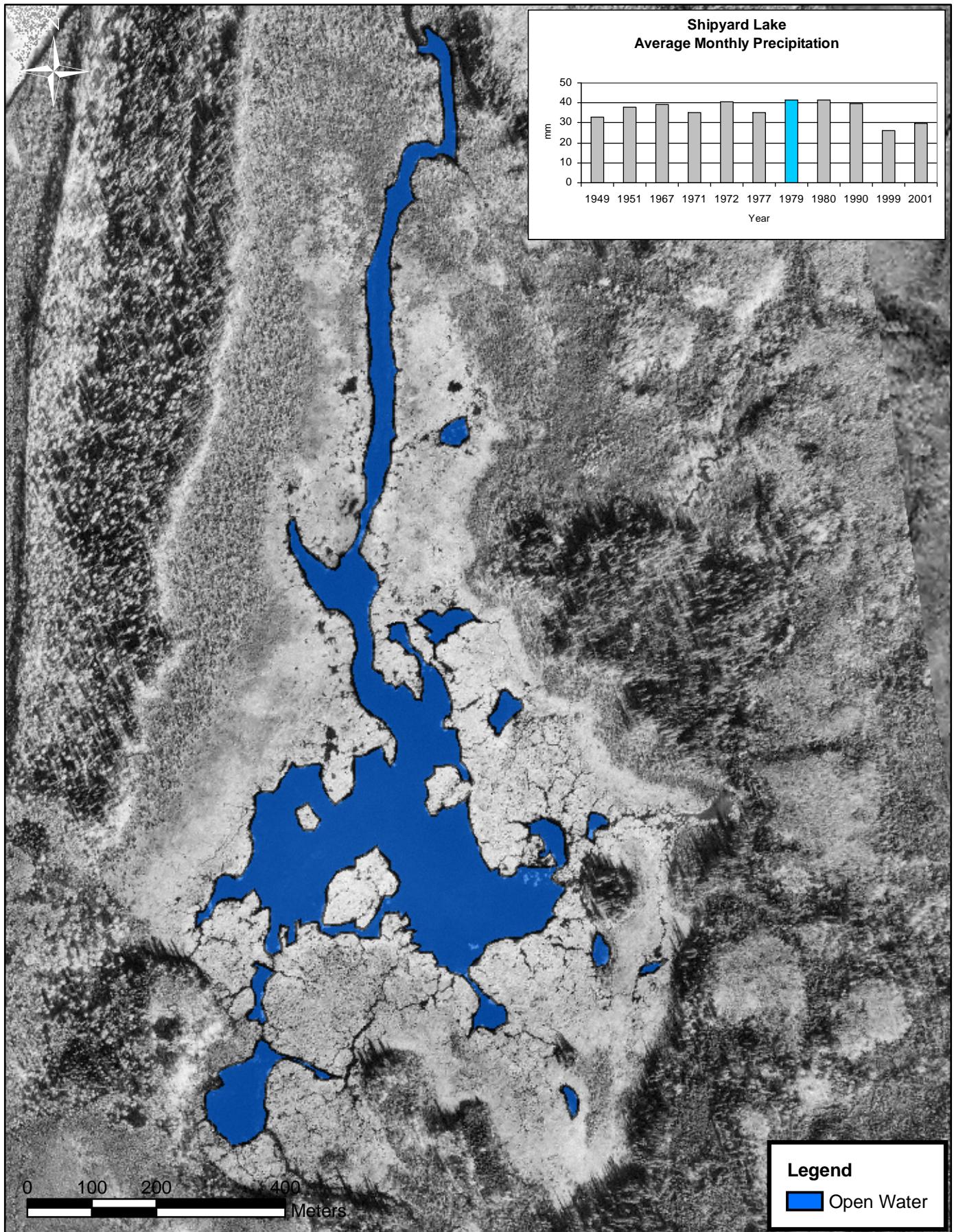
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Approved By:

Shipyard Lake - 1977

Aquatic Vegetation

Original aerial photo date: 1977
Original aerial photo scale: 1 : 25 000

Figure No.:
A7.8



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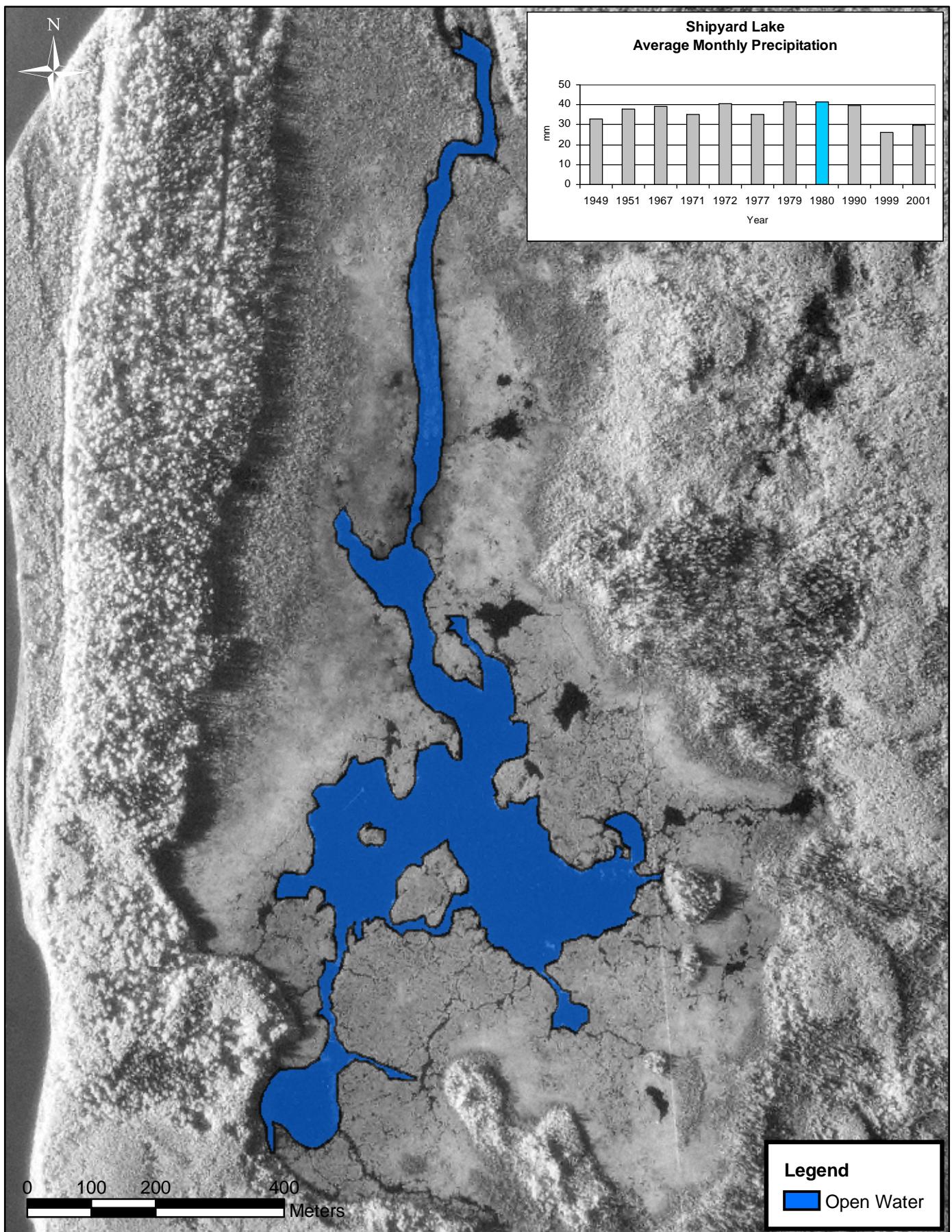
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Shipyard Lake - 1979

Aquatic Vegetation

Original aerial photo date: 1979
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Figure No.:
A7.9


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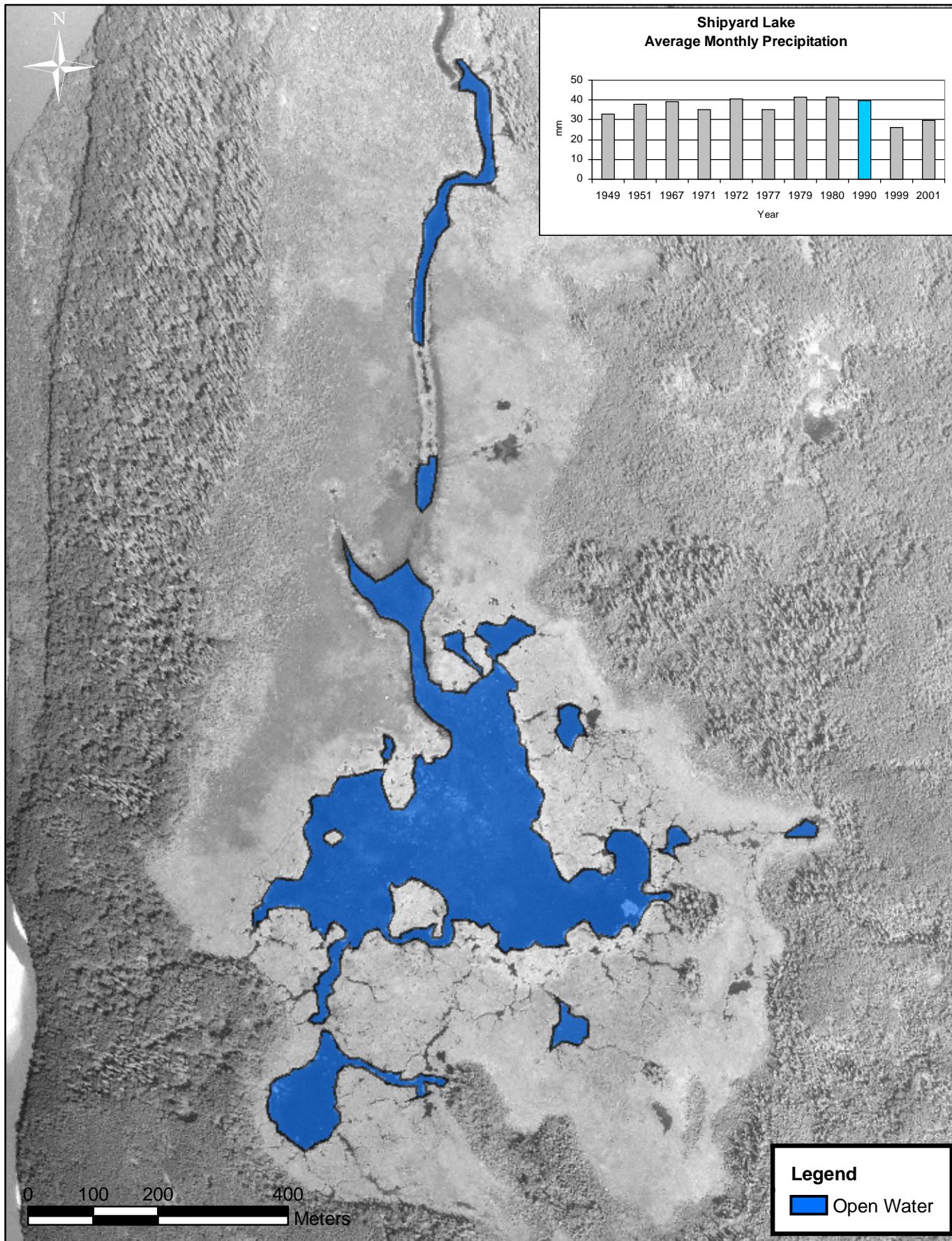
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Shipyard Lake 1980

Aquatic Vegetation

Original aerial photo date: 1980
Original aerial photo scale: 1:25 000

Figure No.:
A7.10



RAMP

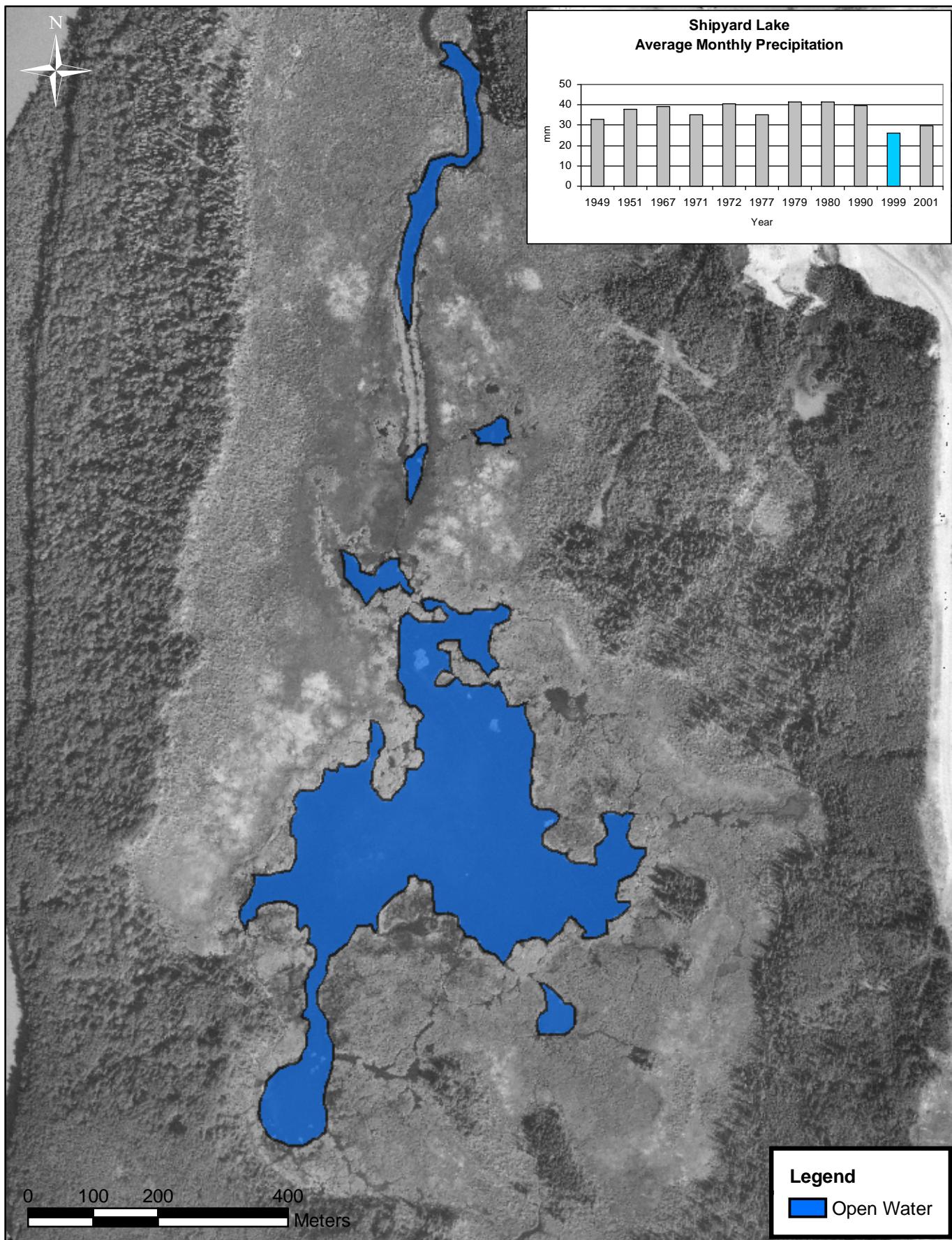
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Approved By:

Shipyard Lake - 1990

Aquatic Vegetation

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Figure No.:
A7.11



RAMP

Scale: 1:8 000
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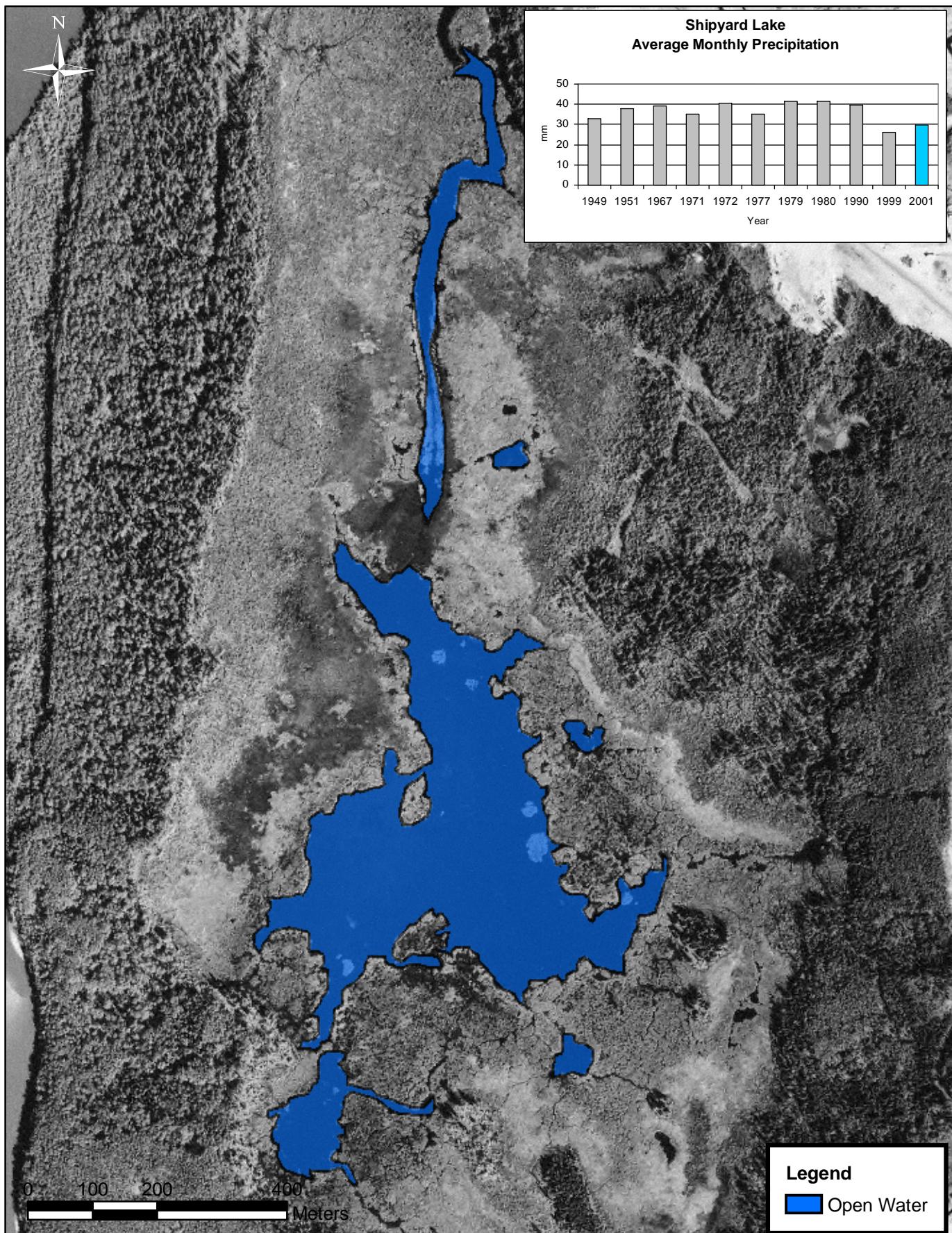
Shipyard Lake - 1999

Aquatic Vegetation

Original aerial photo date: 1999
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Figure No.:

A7.12



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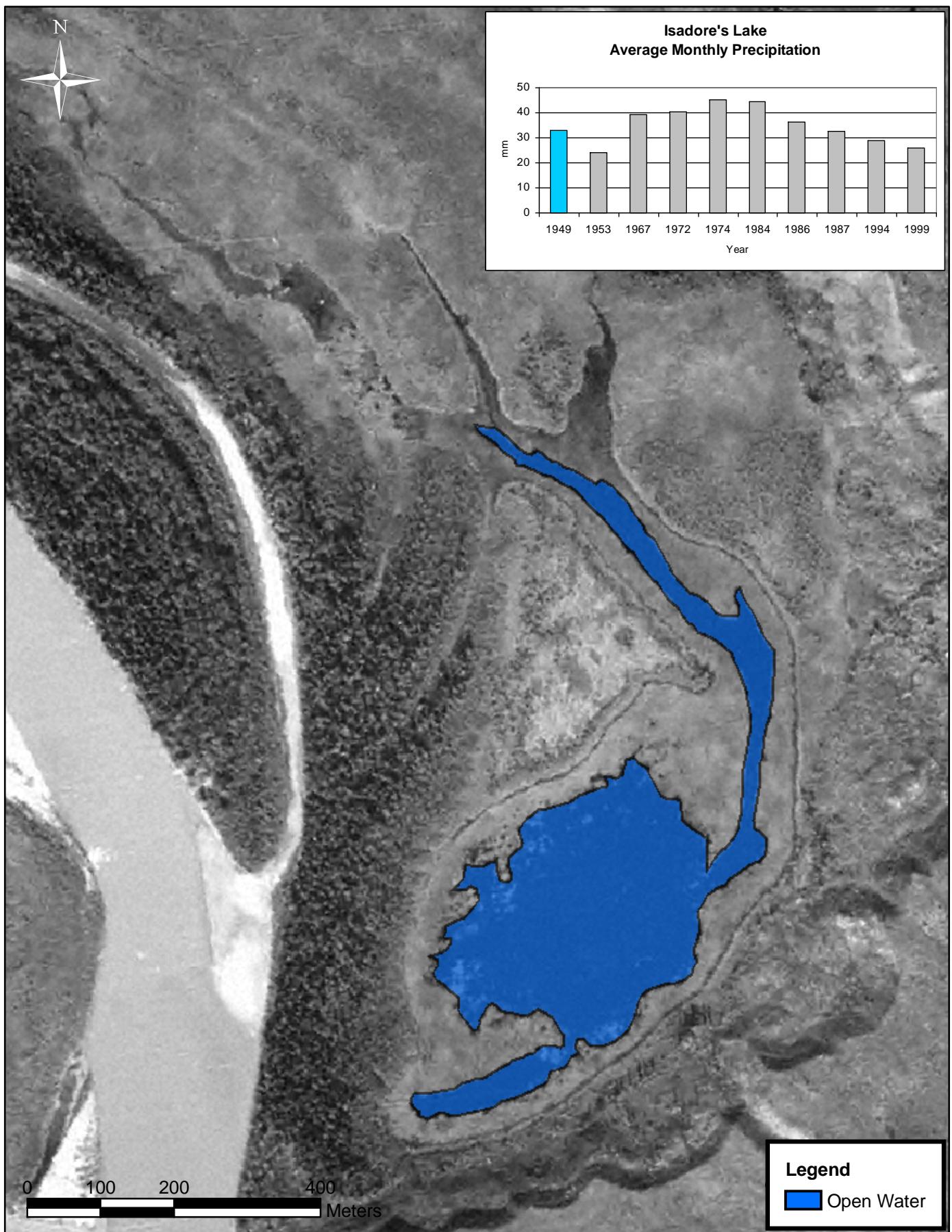
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Approved By:

Shipyard Lake - 2001

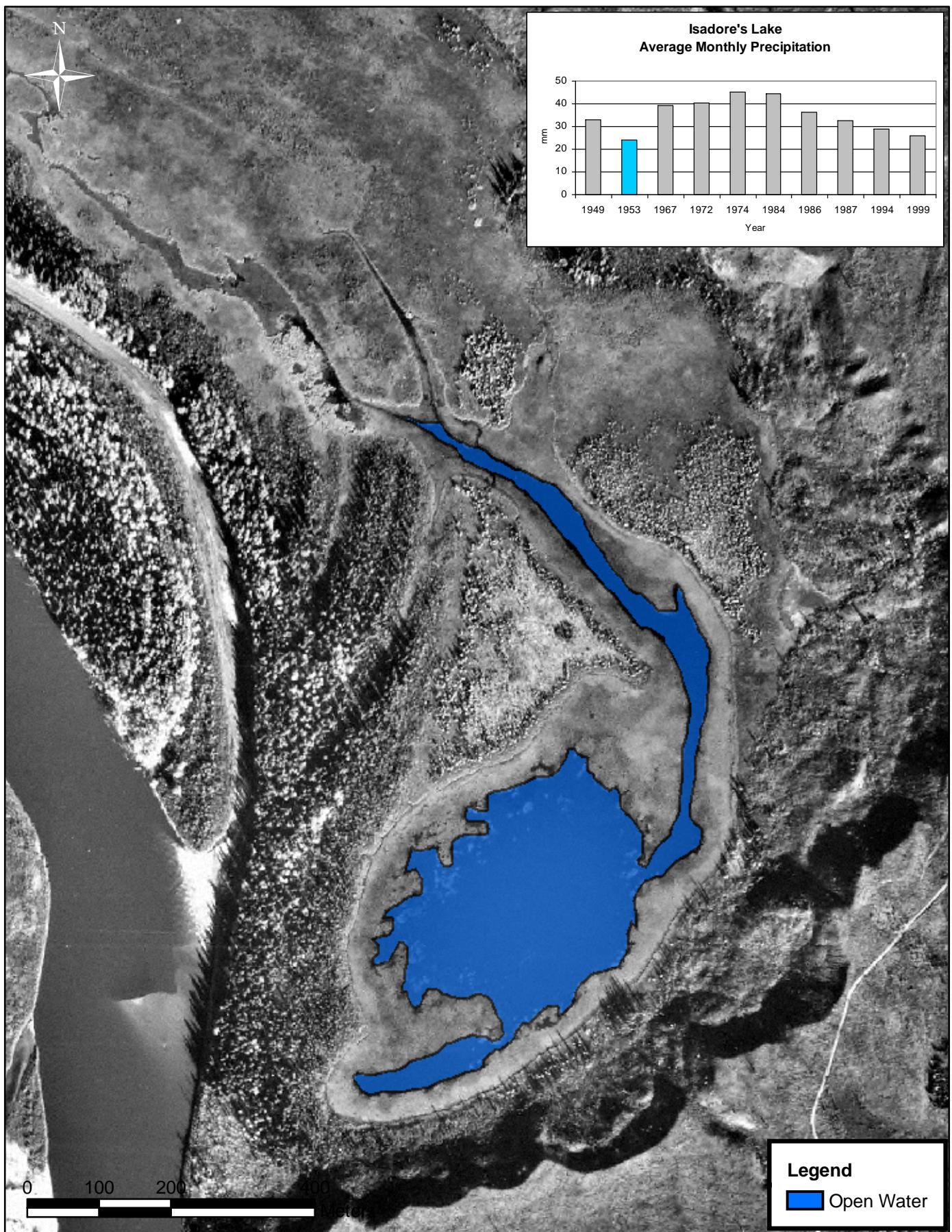
Aquatic Vegetation

Original aerial photo date: 2001
Original aerial photo scale: 1:20 000

Figure No.:
A7.13



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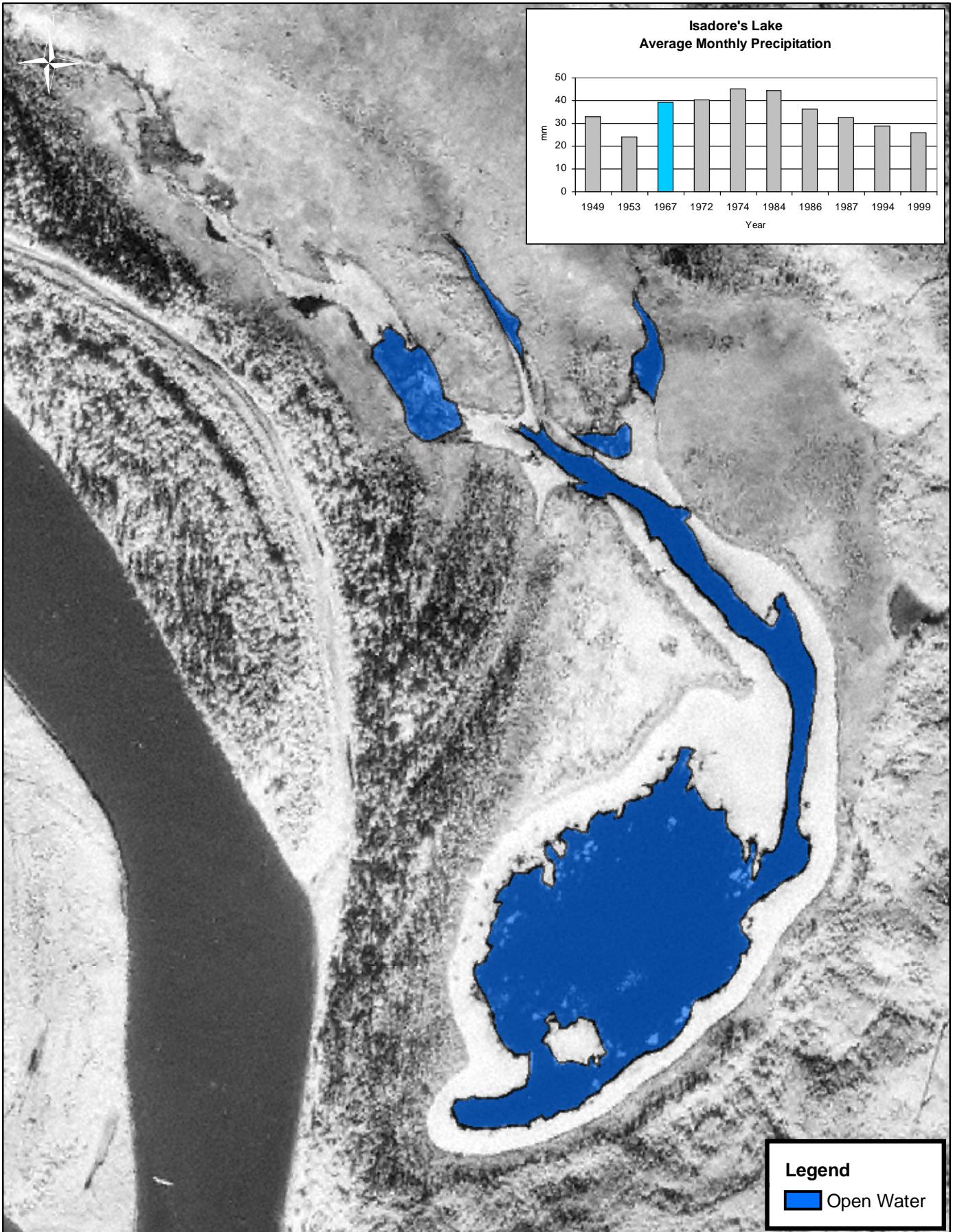
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Isadore's Lake - 1953

Aquatic Vegetation

Original aerial photo date: 1953
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Figure No.:
A7.15



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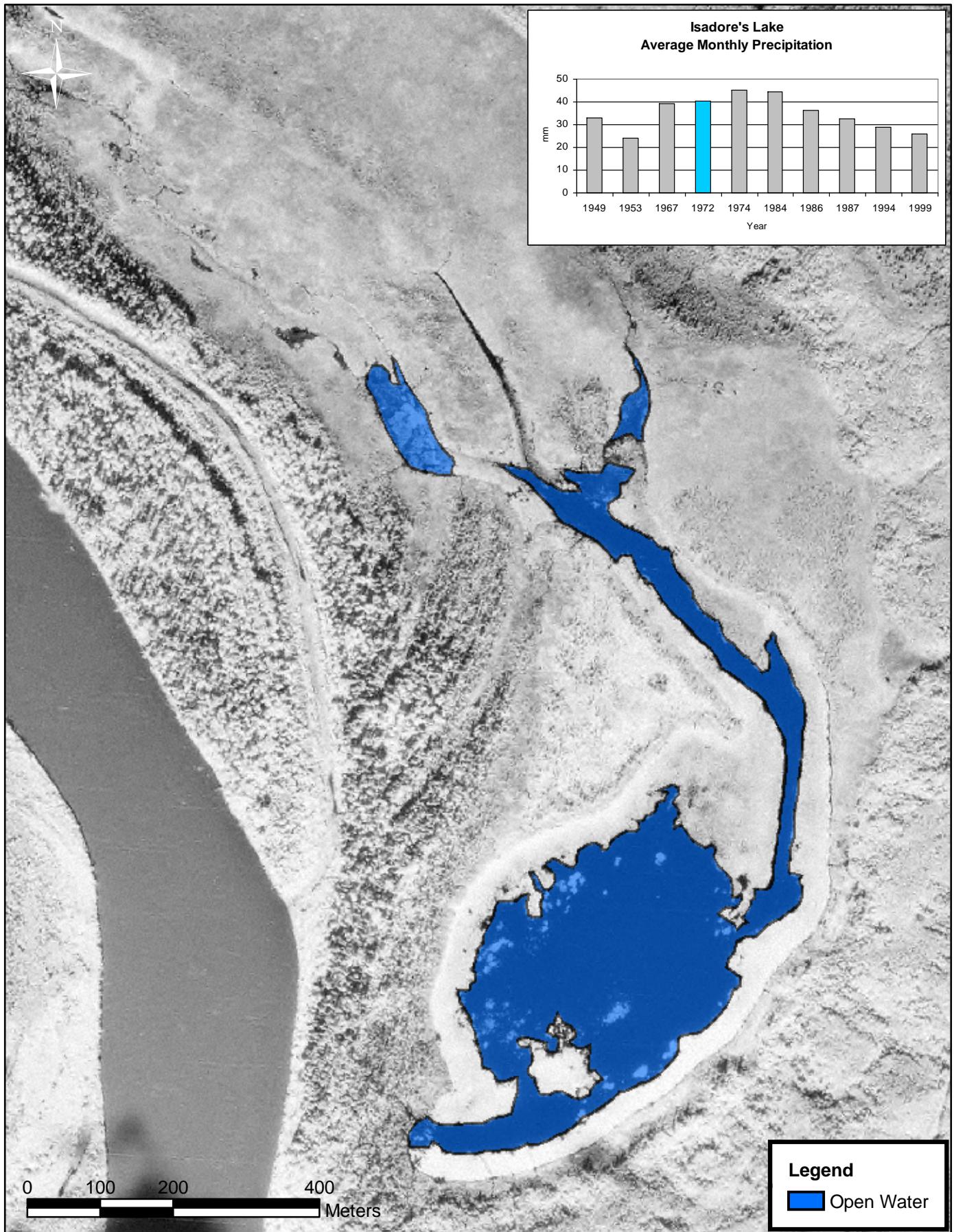
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Isadore's Lake - 1967

Aquatic Vegetation

Original aerial photo
date: 1967
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Figure No.:
A7.16


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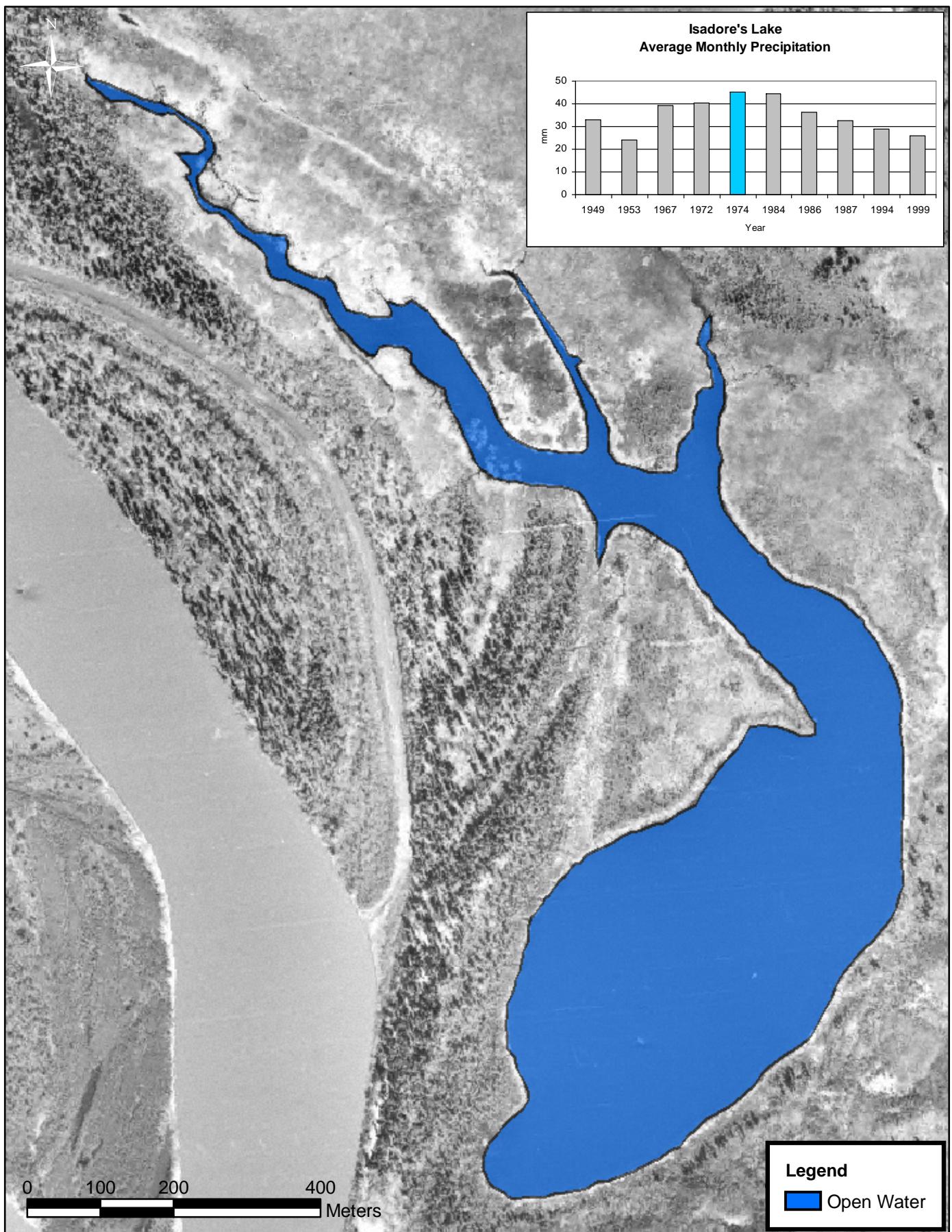
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Isadore's Lake - 1972

Aquatic Vegetation

 Original aerial photo date: 1972
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 Figure No.:
A7.17


RAMP

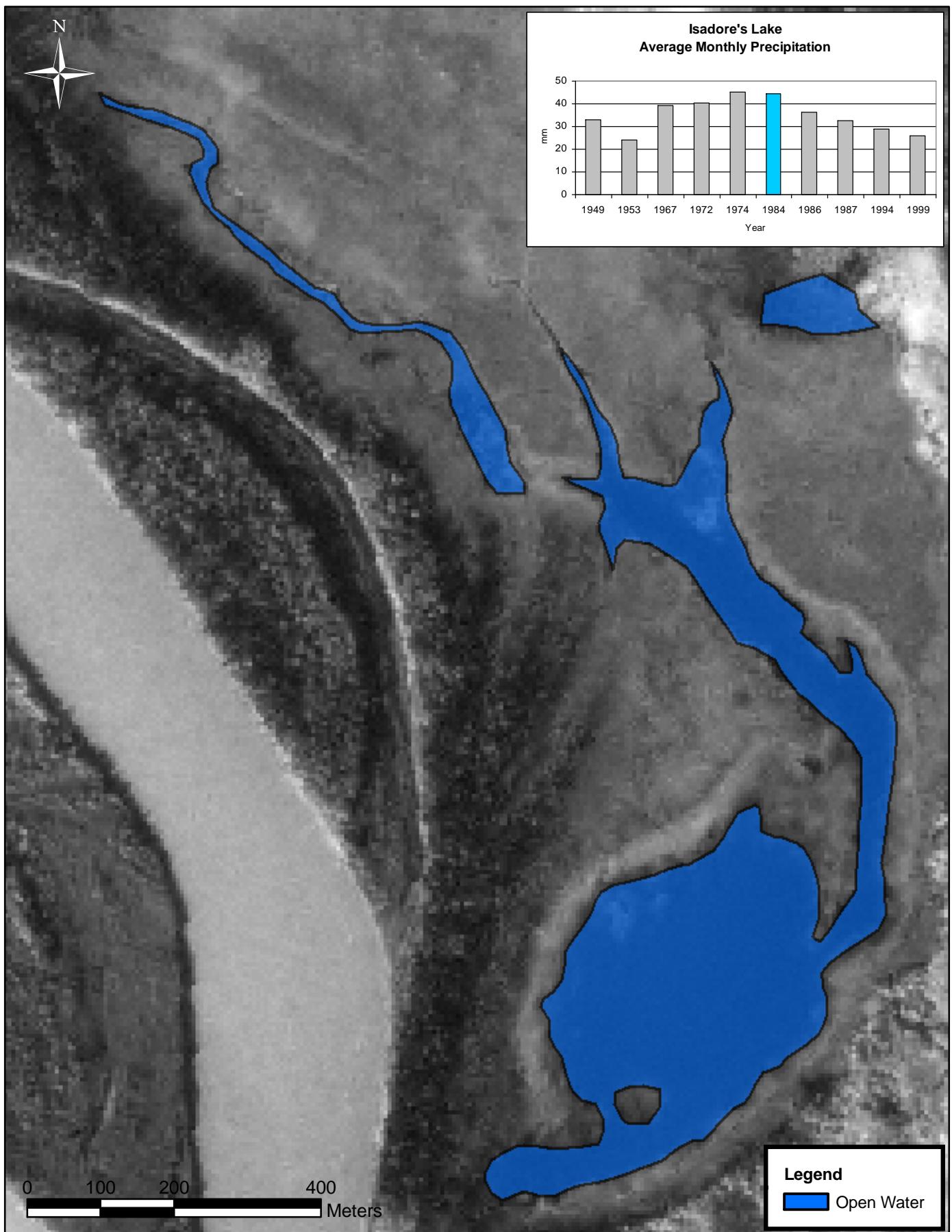
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Approved By:

Isadore's Lake - 1974

Aquatic Vegetation

 Original aerial photo date: 1974
 Original aerial photo scale: 1:12 000

 Figure No.:
A7.18



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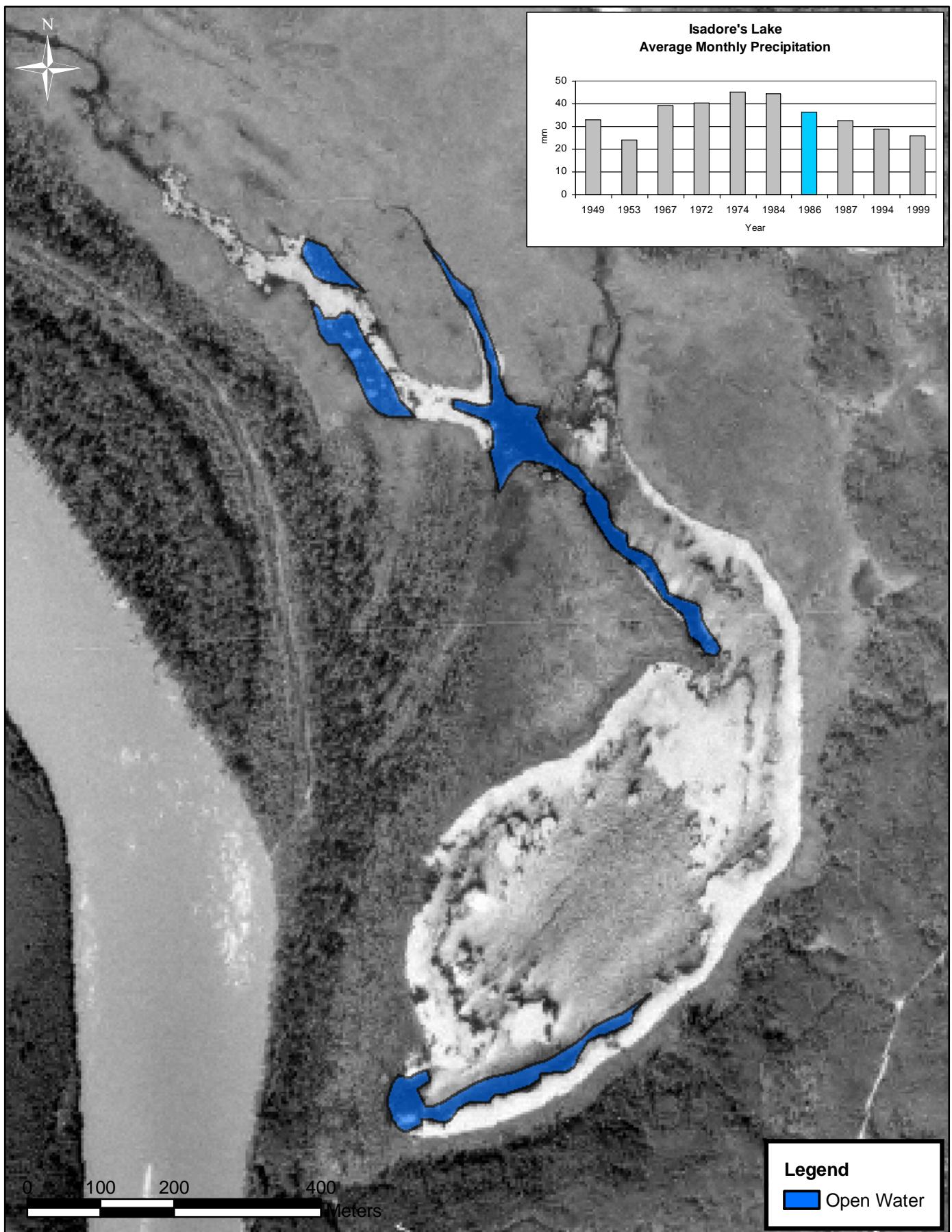
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Isadore's Lake - 1984

Aquatic Vegetation

Original aerial photo date: 1984
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Figure No.:
A7.19



RAMP

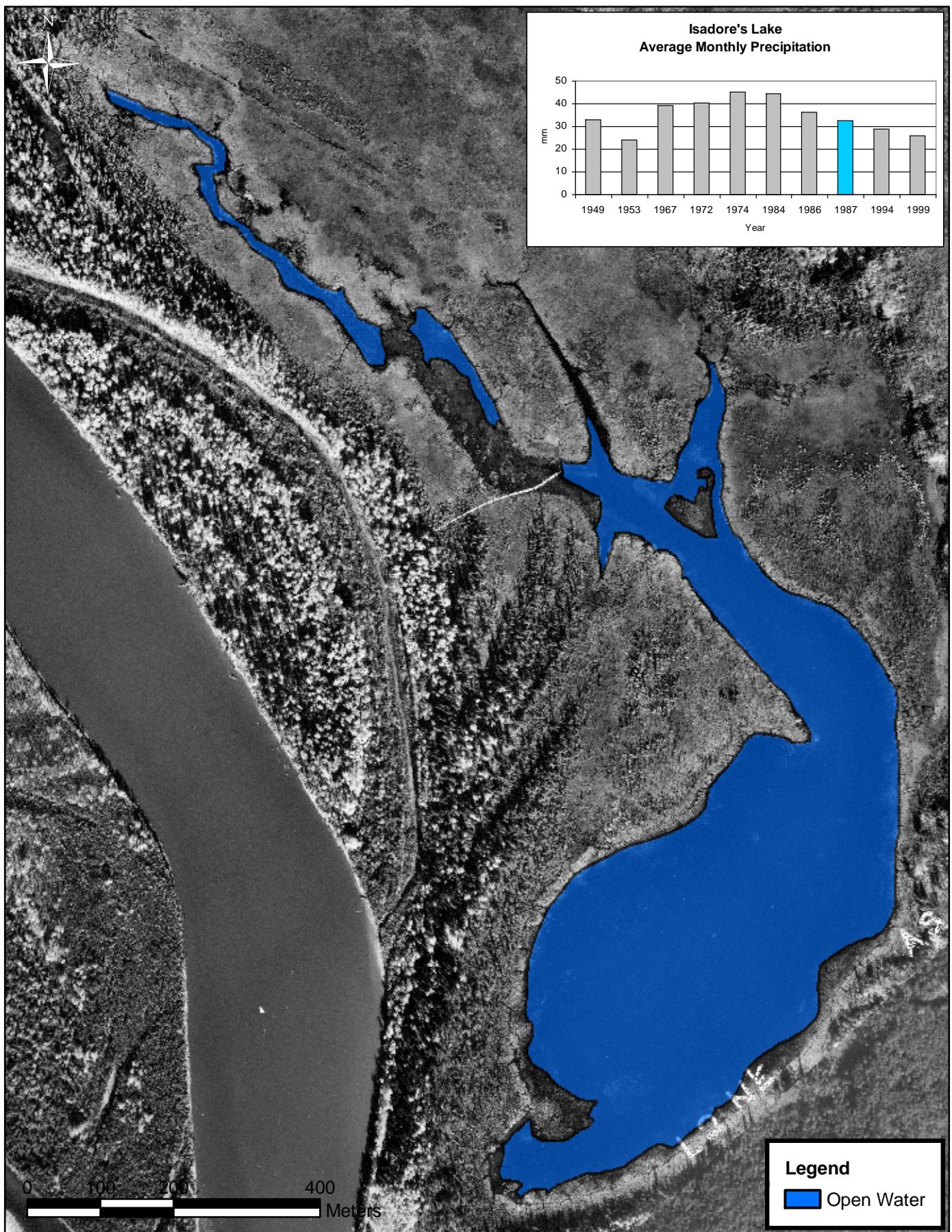
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Isadore's Lake - 1986

Aquatic Vegetation

Original aerial photo date: 1986
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Figure No.:
A7.20



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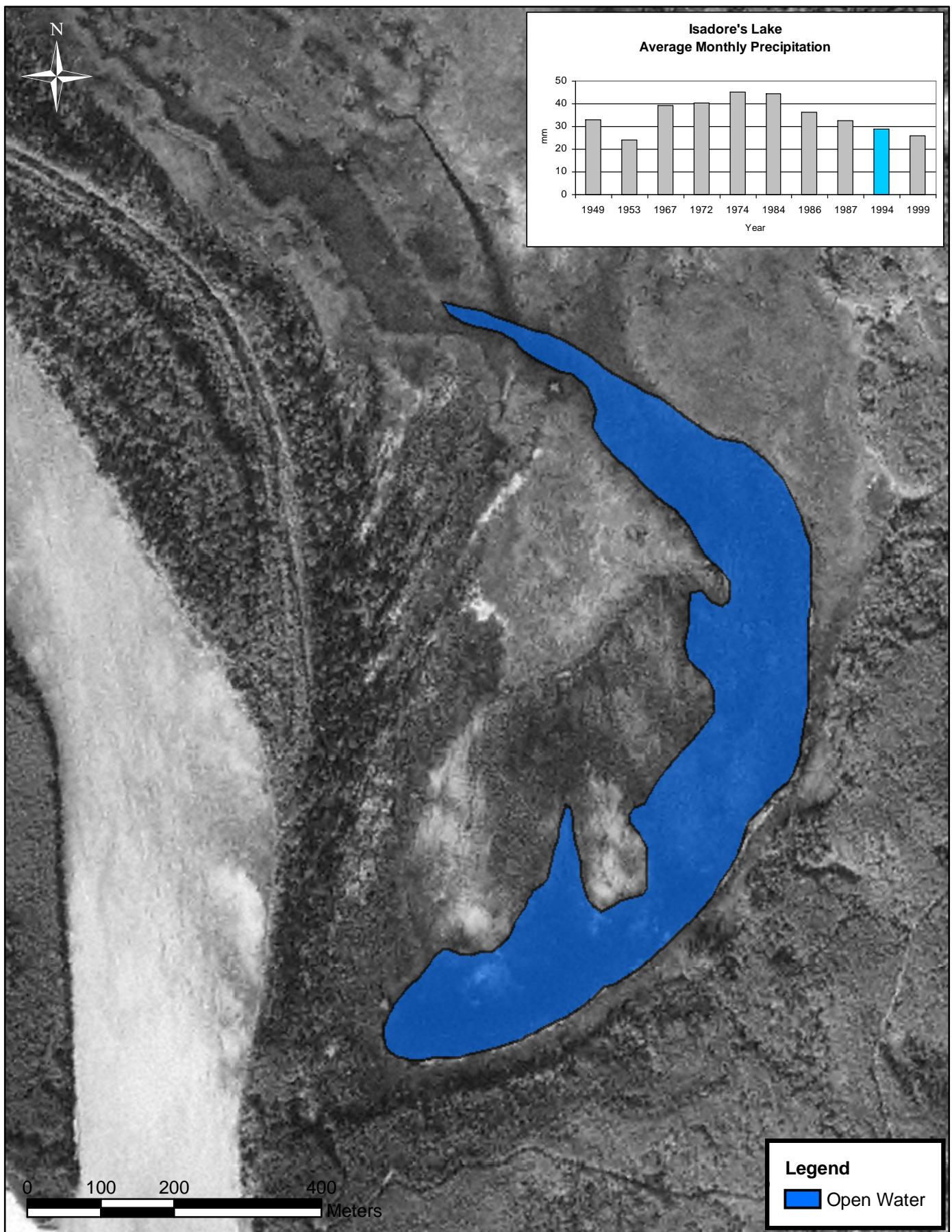
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Isadore's Lake - 1987

Aquatic Vegetation

Original aerial photo date: 1987
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Figure No.:
A7.21


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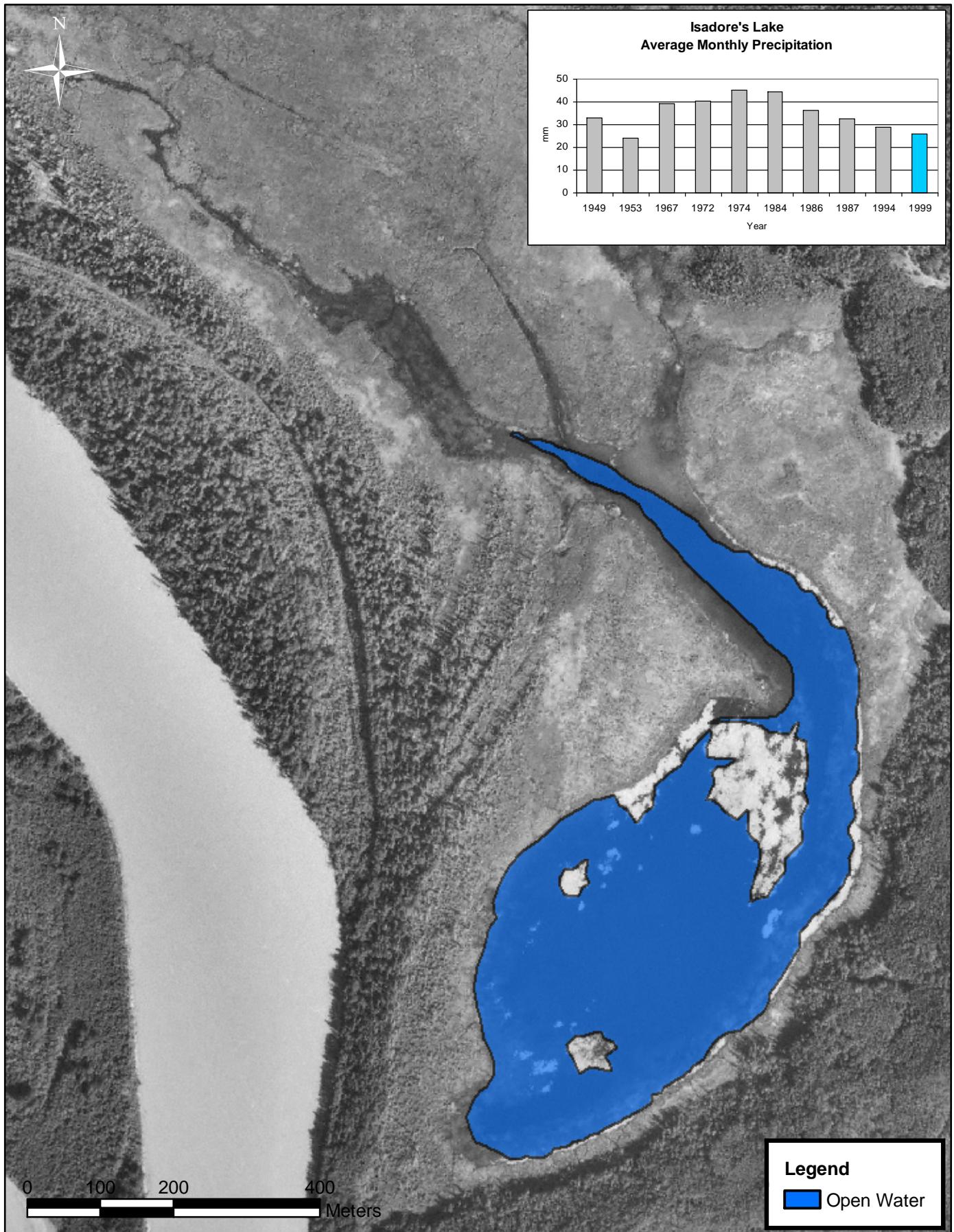
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Isadore's Lake - 1994

Aquatic Vegetation

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A7.22


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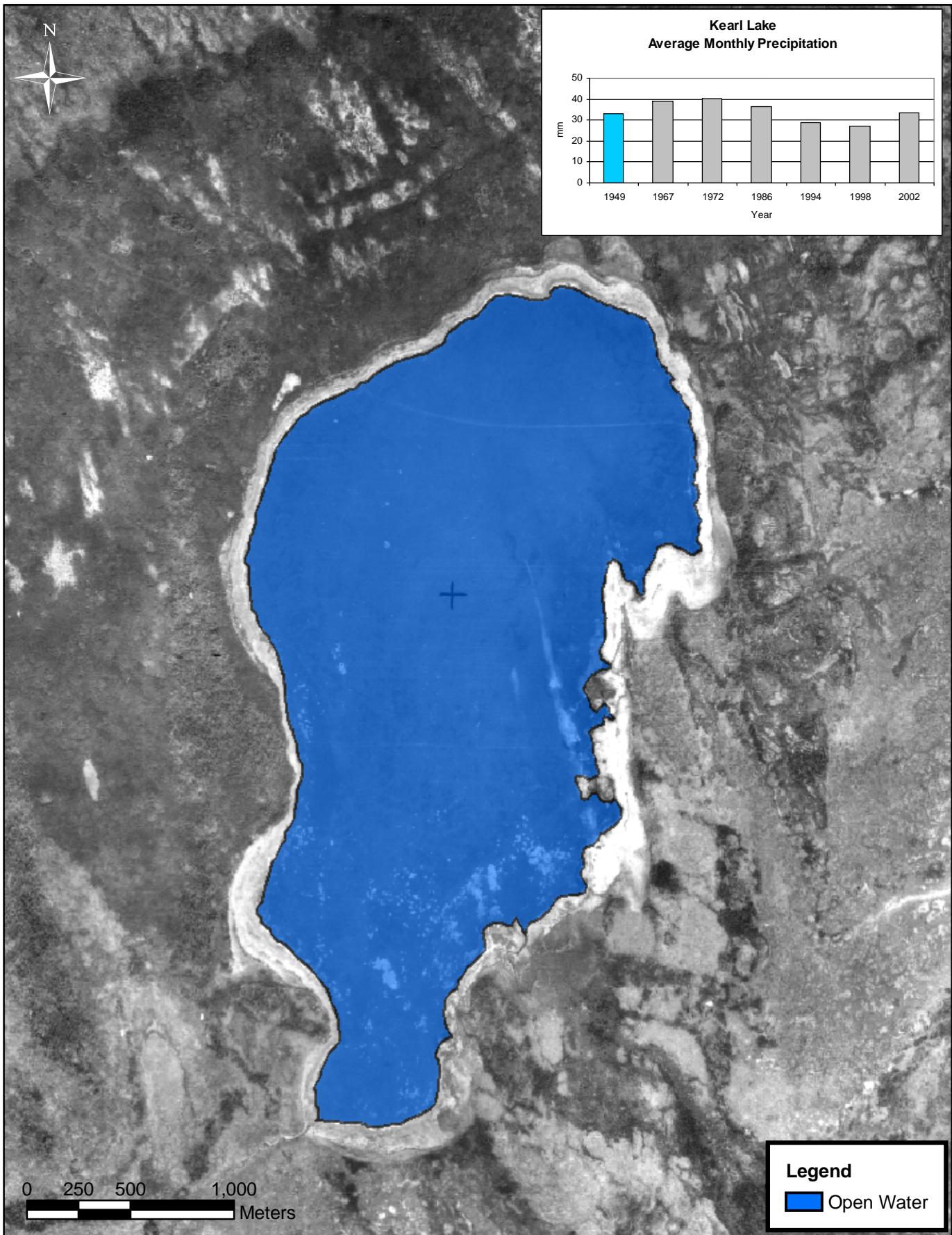
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Approved By:

Isadore's Lake - 1999

Aquatic Vegetation

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 Figure No.:
A7.23


RAMP

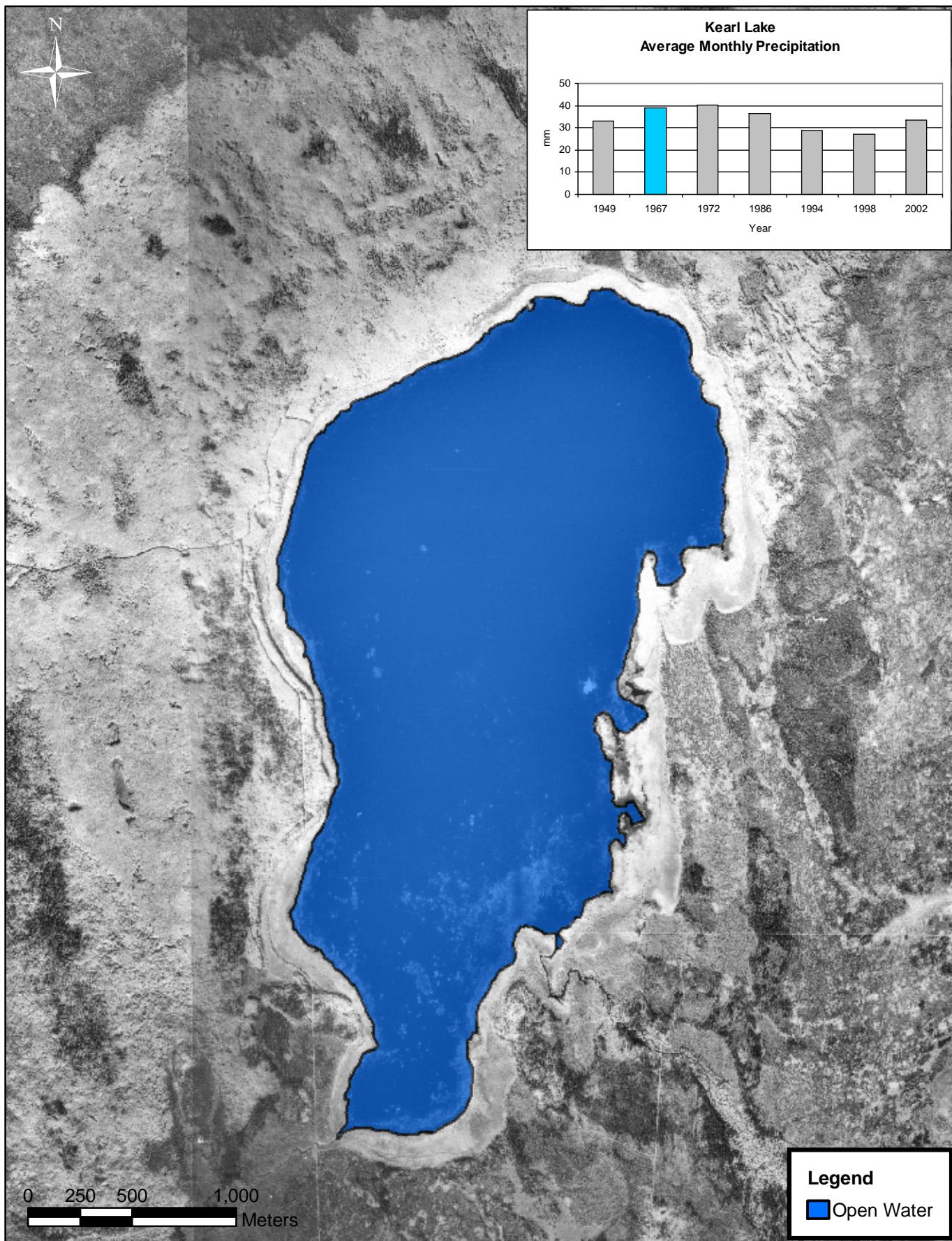
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Approved By:

Kearl Lake - 1949

Aquatic Vegetation

 Original aerial photo
date: 1949
Original aerial photo
scale: 1:40 000

 Figure No.:
A7.24



0 250 500 1,000 Meters

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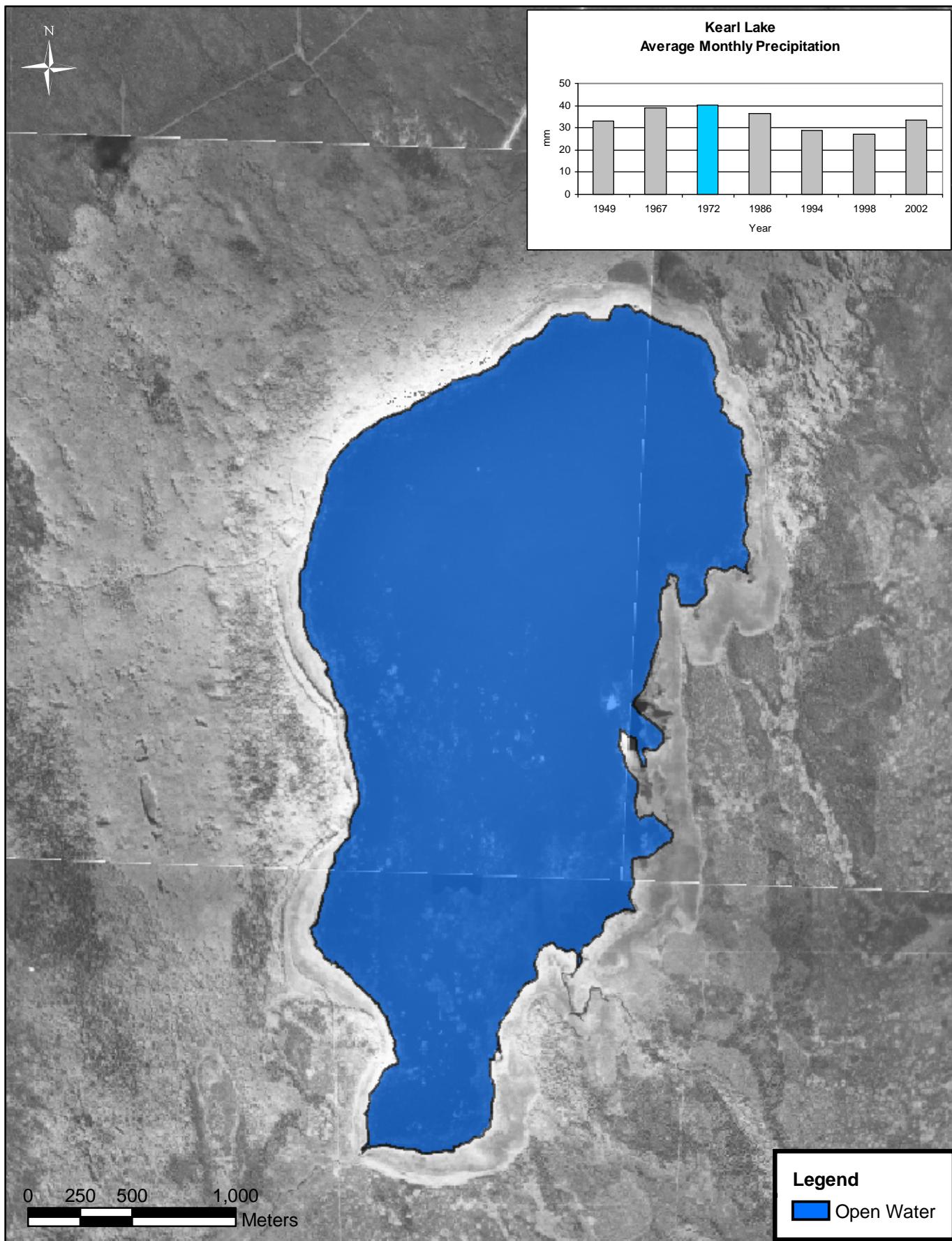
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Drawn By: SAR/SB
Approved By:

Kearl Lake - 1967

Aquatic Vegetation

Original aerial photo
date: 1967
Original aerial photo
scale: 1:40 000

Figure No.:
A7.25



RAMP

Scale: 1: 25 000

Date: 17/12/03

Drawn By: SAR/SB

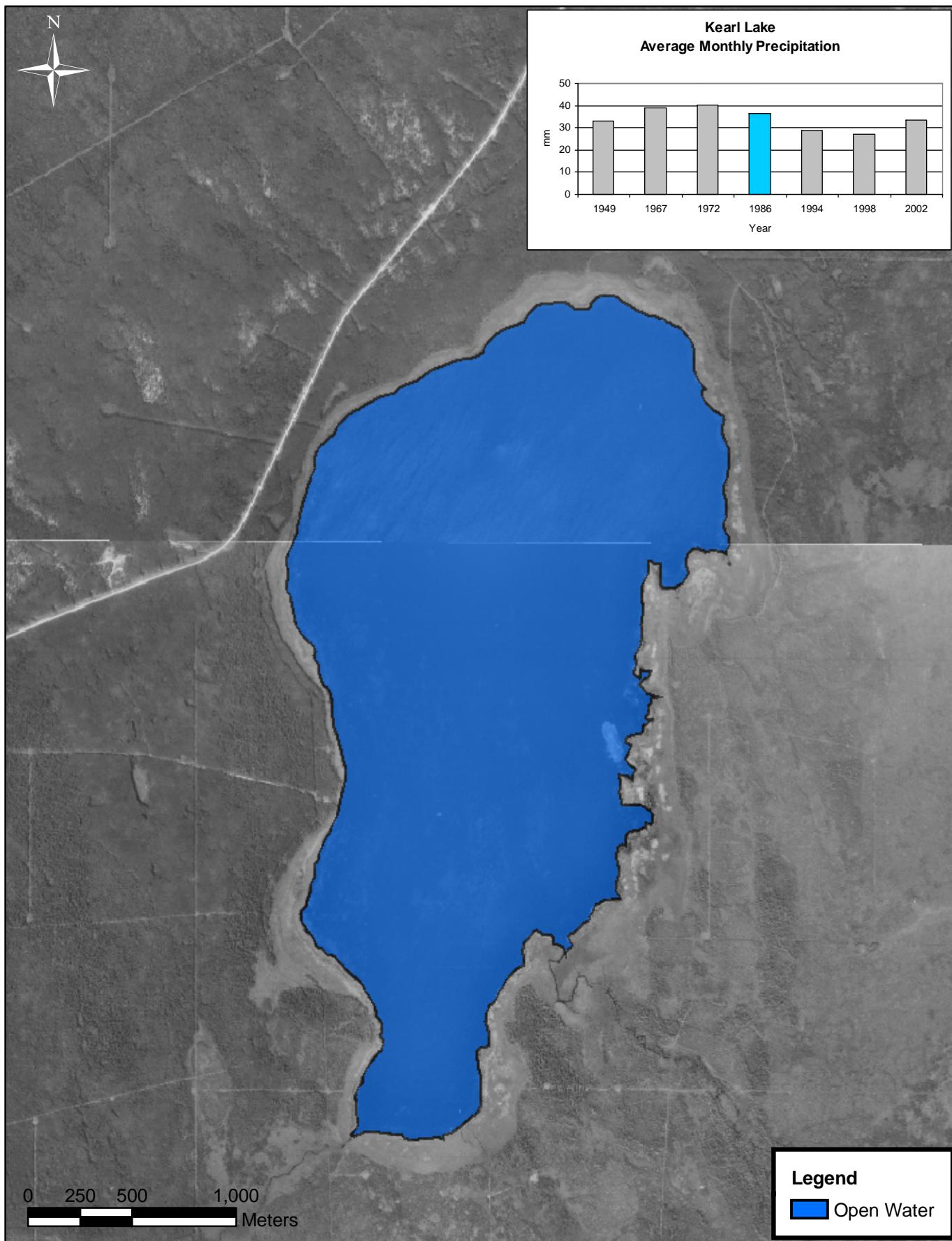
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Kearl Lake - 1972

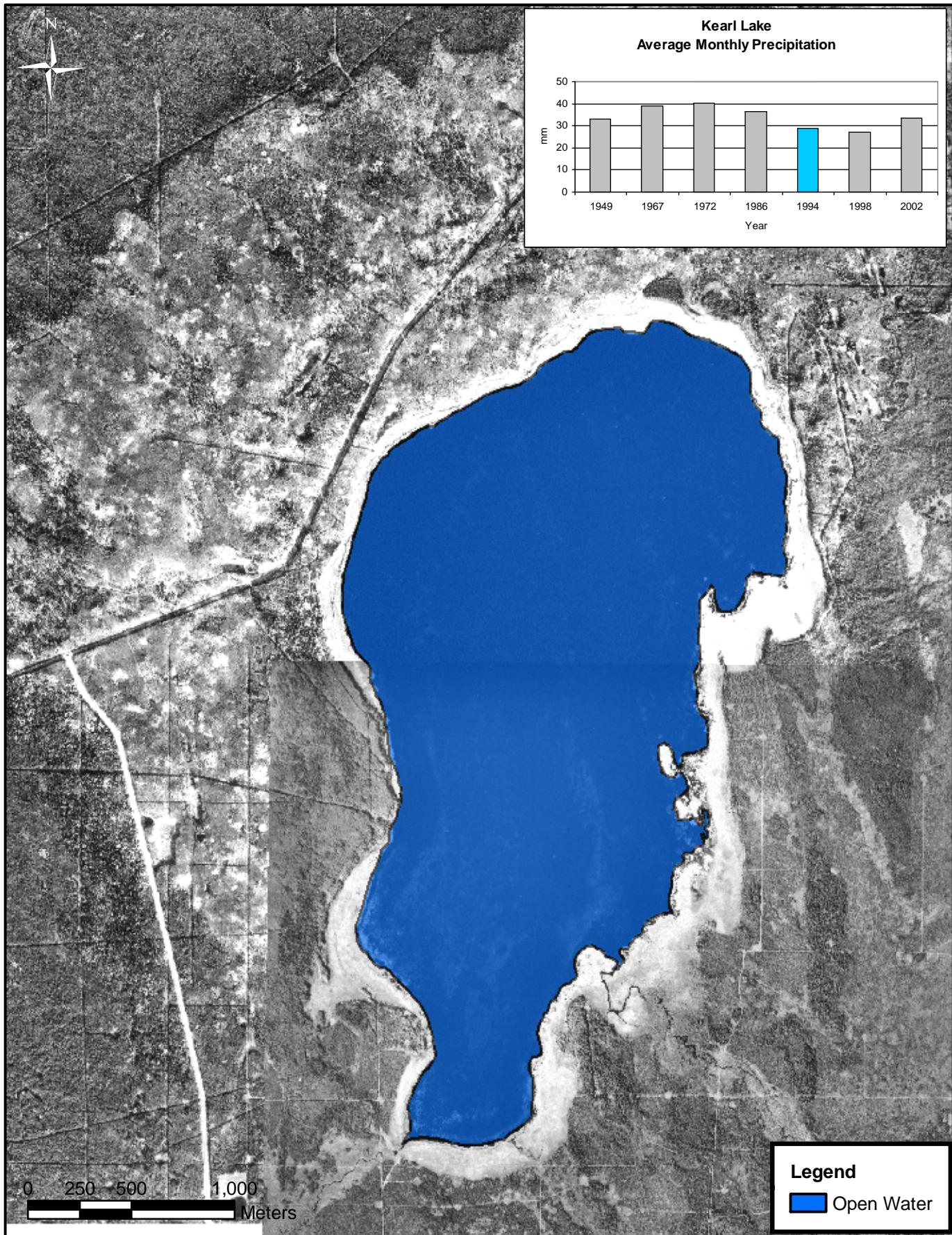
Aquatic Vegetation

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Figure No.:
A7.26



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RAMP

Scale: 1: 25 000

Date: 17/12/03

Drawn By: SAR/SB

Approved By:

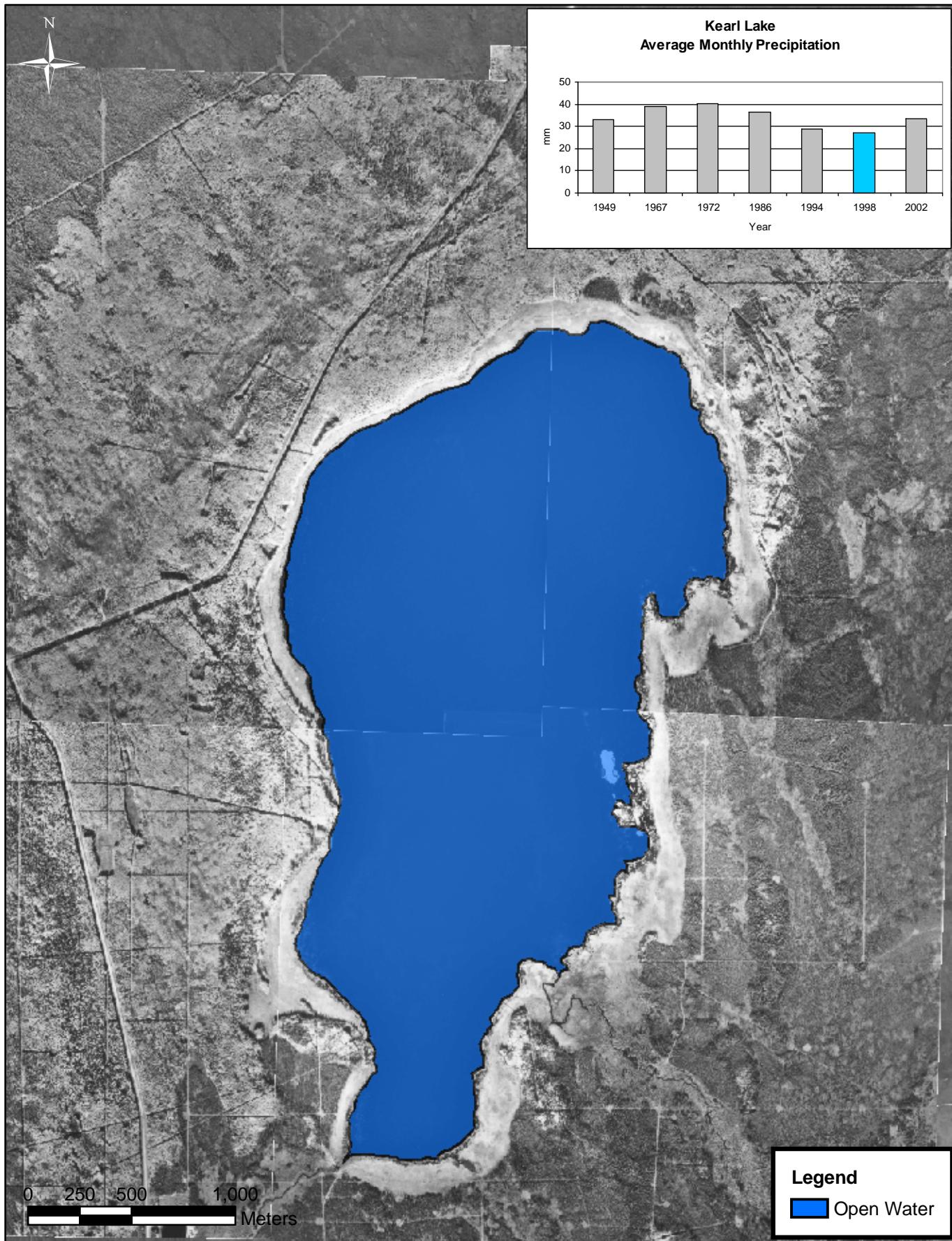
Kearl Lake - 1994

Aquatic Vegetation

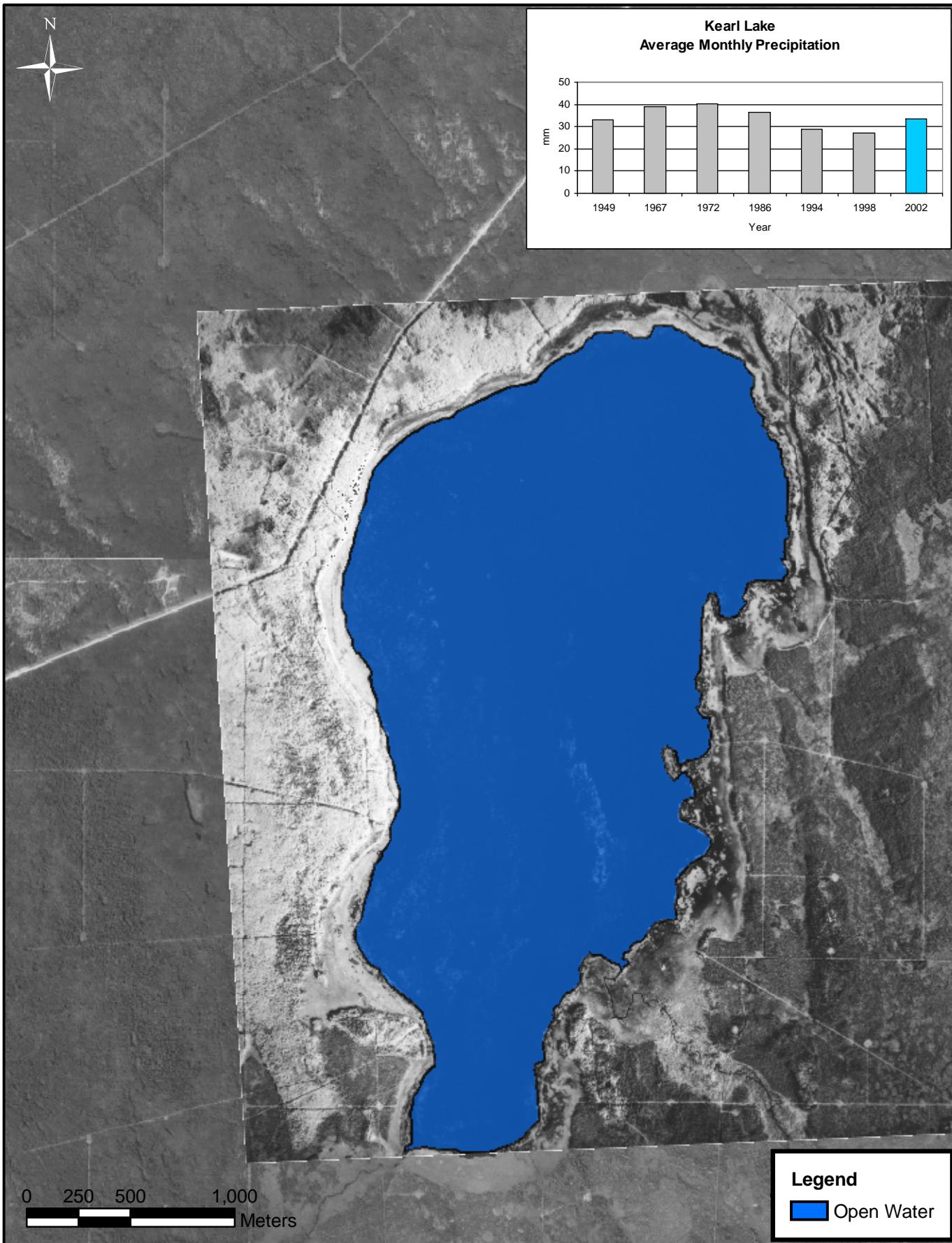
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Figure No.:

A7.28



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