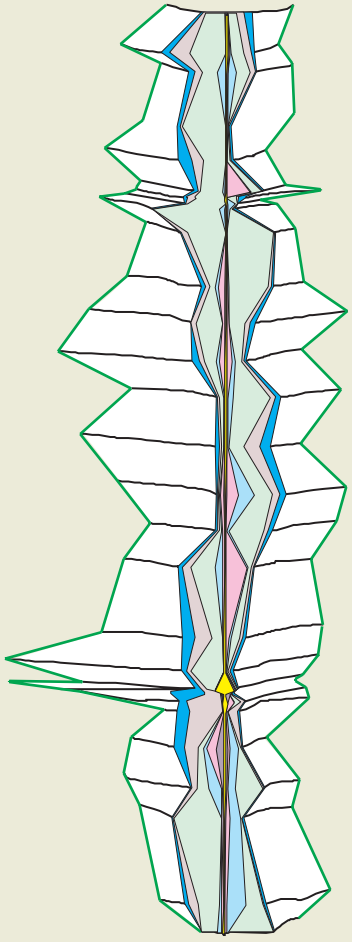
Extent of Areal Inundation of Riverine Wetlands Along Cypress Creek and the Peace, Alafia, North Prong Alafia, and South Prong Alafia Rivers, West-Central Florida

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 02-4254

Prepared in cooperation with the
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT



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Cover photographs

Top— Downstream view of the Peace River from the gaging station near Bartow (02294655); Polk County, Florida
Photograph by B.R. Lewelling, January 2003

Bottom— Downstream view of Cypress Creek from Old Ranch Road in section 9, township 27 south, and range 19 east; Hillsborough County, Florida
Photograph by Dan Duerr, January 2003

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Tallahassee, Florida
2003

U.S. DEPARTMENT OF THE INTERIOR
GALE A. NORTON, Secretary

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CONTENTS

FIGURES

TABLES

CONVERSION FACTORS, DATUMS, ACRONYMS, AND ABBREVIATIONS

Multiply	By	To obtain
acre	4047	square meter
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
square mile (mi^2)	2.590	square kilometer
cubic foot per second (ft^3/s)	0.02832	cubic meter per second

ACRONYMS USE IN THIS REPORT

HEC–RAS	Hydrologic Engineering Center River Analysis System
NWI	National Wetlands Inventory
SR	State Road
SWFWMD	Southwest Florida Water Management District
US	U.S. Highway
USGS	U.S. Geological Survey

Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGVD of 1929); horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

Extent of Areal Inundation of Riverine Wetlands Along Cypress Creek and the Peace, Alafia, North Prong Alafia, and South Prong Alafia Rivers, West-Central Florida

By B.R. Lewelling

ABSTRACT

Riverine and palustrine system wetlands are a major ecological component of river basins in west-central Florida. Healthy wetlands are dependent upon the frequency and duration of periodic flooding or inundation. This report assesses the extent, area, depth, frequency, and duration of periodic flooding and the effects of potential surface-water withdrawals on the wetlands along Cypress Creek and the Peace, Alafia, North Prong Alafia, and South Prong Alafia Rivers. Results of the study were derived from step-backwater analysis performed at each of the rivers using the U.S. Army Corps of Engineers Hydrologic Engineering Center-River Analysis System (HEC-RAS) one-dimensional model. The step-backwater analysis was performed using selected daily mean discharges at the 10th, 50th, 70th, 80th, 90th, 98th, 99.5th, and 99.9th percentiles to compute extent of areal inundation, area of inundation, and hydraulic depth to assess the net reduction of areal inundation if 10 percent of the total river flow were diverted for potential withdrawals.

The extent of areal inundation is determined by cross-sectional topography and the degree to which the channel is incised. Areal inundation occurs along the broad, low relief of the Cypress Creek floodplain during all selected discharge percentiles. However, areal inundation of the Peace and Alafia Rivers floodplains, which generally have deeply incised channels, occurs at or above discharges at the 80th percentile. The greatest area of inundation along the three rivers generally occurs between the 90th and 98th percentile discharges. The decrease in inundated area resulting from a potential 10-percent withdrawal in discharge ranged as follows: Cypress Creek, 22 to 395 acres (1.7 to 8.4 percent); Peace River, 17 to 1,900 acres (2.1 to 13.6 percent); Alafia River, 1 to 90 acres (1 to 19.6 percent); North Prong Alafia River, 1 to 46 acres (0.7 to 23.4 percent); and South Prong Alafia River, 1 to 75 acres (1.5 to 13.4 percent).

INTRODUCTION

Locating alternative sources of water supply to meet the demand caused by an increasing population has become a major concern in west-central Florida. The need for water supply is further complicated by declining ground-water levels in the Upper Floridan aquifer, the principal source of supply in the area. Surface-water withdrawals from area rivers, however, have become an increasingly important alternate supply source. The health of the riverine wetlands

located along these rivers depends upon the frequency and duration of periodic flooding or inundation. The U.S. Geological Survey (USGS), in cooperation with the Southwest Florida Water Management District (SWFWMD), evaluated a potential range in areal inundation resulting from withdrawals of 10 percent of average daily flows when flows exceed regulatory minimum for Cypress Creek and the Peace, Alafia, North Prong Alafia, and South Prong Alafia Rivers (Southwest Florida Water Management District, 2001).

Purpose and Scope

The purpose of this report is to present the extent of areal inundation using period-of-record streamflow and the extent of areal inundation based on a potential diversion of 10 percent of the total discharge during periods when flows exceed the regulatory minimum along Cypress Creek, and the Peace, Alafia, North Prong Alafia, and South Prong Alafia Rivers (fig. 1). Extent of areal inundation was determined for the 10^{th}, 50^{th}, 70^{th}, 80^{th}, 90^{th}, 98^{th}, 99.5^{th}, and 99.9^{th} percentiles. Percentiles were determined based on the long-term concurrent daily mean discharge record for gages on Cypress Creek (1965-98), Peace River (1940-98), and Alafia River (1964-92). Regulatory minimums determined by the SWFWMD for the Peace and Alafia Rivers approximate the 10^{th} percentile discharge used in this report at 130 and 67 ft^3/s, respectively.

Water-surface elevations at selected cross sections of the study rivers were computed using the U.S. Army Corps of Engineers Hydrologic Engineering Center-River Analysis System (HEC-RAS) one-dimensional step-backwater model (Warner and Brunner, 1998). Computed water-surface elevations were used to generate water-surface profiles, areal inundation width and acreage, and hydraulic depth (the ratio of the cross-sectional area to the surface width). Existing hydrologic, hydraulic, and cross-sectional data were used for the step-backwater analysis.

Previous Investigations

Most analyses of data from flooding events in west-central Florida have focused on hazard and damage analysis of peak flows and widespread areal inundation for events with a relatively rare probability of occurrence (for example, the 25-, 50-, or 100-year flood). Robertson (1978) presented flood profiles based on E431 step-backwater analysis (Shearman, 1976) along a 19.2-mi reach of the Alafia River, a 9.5-mi reach of the North Prong Alafia River, and a 9.8-mi reach of the South Prong Alafia River. Murphy (1978) computed flood profiles using E431 step-backwater analysis along a 27.3-mi reach, from the mouth of Cypress Creek to the gage at State Highway 52, and along a 4.0-mi tributary and a 1.2-mi distributary reach. Murphy and others (1978) computed flood profiles using E431 step-backwater analysis along a 70-mi reach of the Peace River from Arcadia to Bartow.

Acknowledgments

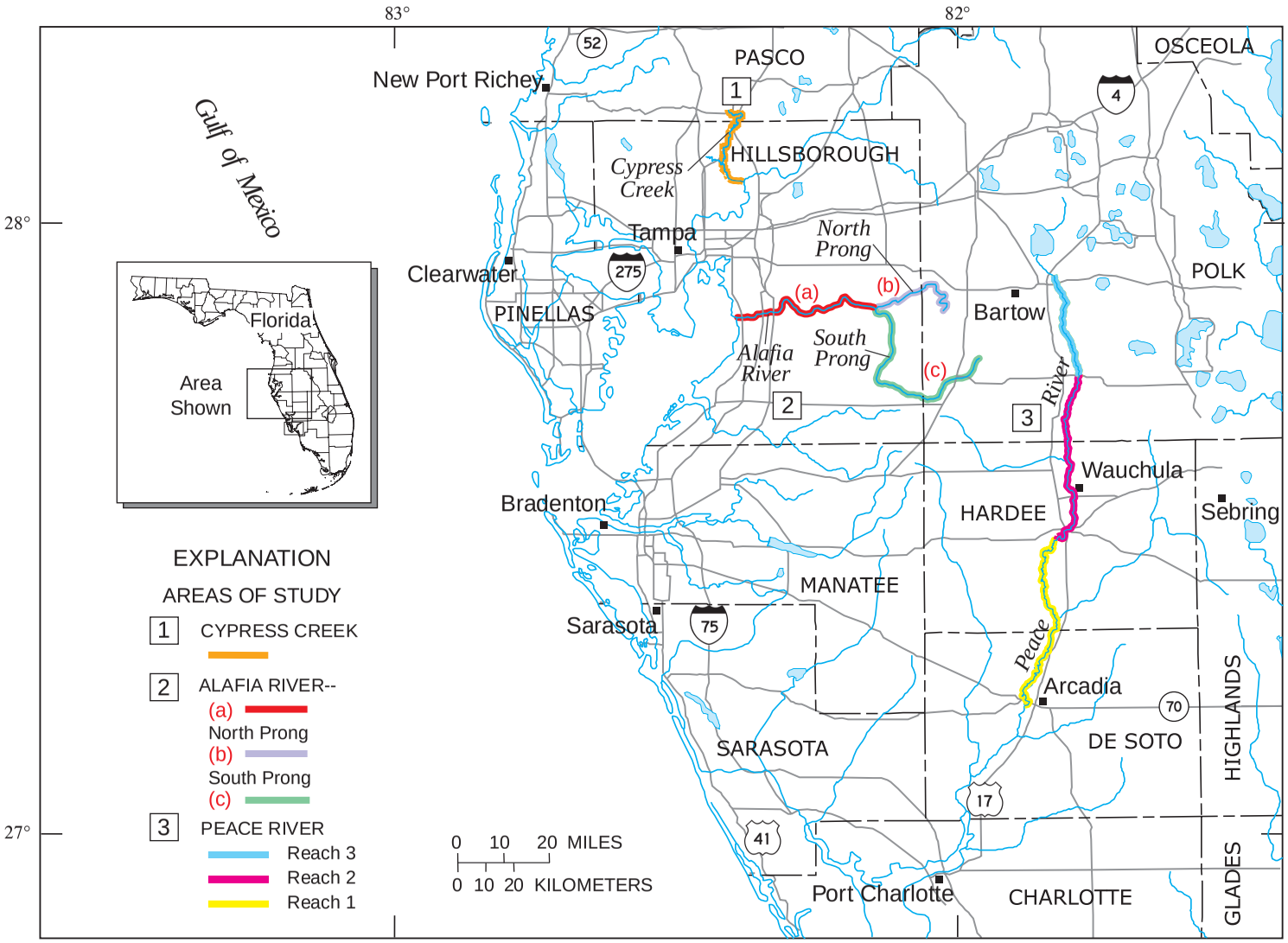
The author gratefully acknowledges Dr. Arthur Miller, Pennsylvania State University, and the Texas Department of Transportation for their assistance with the HEC-RAS model. Special thanks are given to Caroline (Humphrey) Masek, engineering student, for her contribution to the study.

DESCRIPTION OF STUDY AREA

The study area includes three river systems located in west-central Florida: Cypress Creek in south-central Pasco and north-central Hillsborough Counties; Peace River in Polk, Hardee, and De Soto Counties; and the Alafia, North Prong Alafia, and South Prong Alafia Rivers in southeastern Hillsborough and southwestern Polk Counties (fig. 1).

Based on map delineation by the National Wetlands Inventory (NWI) of the U.S. Fish and Wildlife Service, the three study rivers have been classified predominately as riverine system and palustrine system wetlands (Cowardin and others, 1979). The riverine system includes all the wetlands contained within a channel, and the palustrine system consists of river floodplains. Water in a riverine system is usually, but not always, flowing. The riverine system is bounded by the palustrine system, which is bounded by uplands.

Cypress Creek is a major tributary to the Hillsborough River and is characterized by low-topographic relief and frequent, widespread, and prolonged areal inundation. Much of the 27-mi-long study reach has a poorly incised and poorly defined low-gradient channel, located within a broad, swampy floodplain. The extent of areal inundation at locations along Cypress Creek can be large during the relatively low-discharge conditions that occur at the 50^{th} percentile or median discharge (4 to 21 ft^3/s).



Base from U.S. Geological Survey digital data, 1:2,000,000, 1972
Albers Equal-Area Conic projection
Standard Parallels 29°30′ and 45° 30′, central meridian -83° 00′

Figure 1. Location of study area including Cypress Creek and the Peace, Alafia, North Prong Alafia, and South Prong Alafia Rivers, west-central Florida.

The Peace River channel generally is deeply incised and well defined along most of the 70-mi-long study reach, except for areas along the upper Peace River where the banks are low lying. Much of the surface drainage to the upper reach of the Peace River is controlled by phosphate-mine outfall structures and reclaimed channels. Surface drainage to the middle and lower reaches of the Peace River typically is from well-developed, naturally formed tributaries. The Peace River floodplain, generally characterized by low topographic relief, is subject to periodic inundation.

Channels along the Alafia River system study reaches typically are deeply incised, confining all but the highest discharges within the bank. The Alafia River system channel has a moderate gradient and meanders slightly. The Alafia River is affected by tidally influenced backwater from the mouth to the reach directly downstream from the Alafia River at the Lithia gage.

Unique physiographic characteristics (shape, gradient, and length of the basin and channel) affect the hydraulic conditions of the three river systems. Percentile discharges at each of the three study rivers were determined from cumulative frequency curves for selected record periods. Cumulative frequency curves indicate the percentage of time that the daily mean discharge is less than or equaled over specific periods of time (fig. 2). Periods of zero flow at Cypress Creek result from poorly incised channel reaches that occur above the water table, limiting baseflow contribution. Both the Peace and Alafia Rivers have similar flow regimes due to the size of the watersheds and their generally deeply incised channels, which support baseflow conditions sufficient to avoid zero-flow days. Although the record periods differ, a comparison of the 50th percentile or median discharge for Cypress Creek, Peace River and Alafia River indicates a wide variation in flow characteristics, of 21, 481, and 184 ft^3/s, respectively.

METHODOLOGY

The HEC-RAS step-backwater analysis model was used to estimate water-surface elevation, extent of areal inundation, and hydraulic depth at each cross section. Water-surface profiles were generated along the channels using computed water-surface elevation at each cross section. Study river reaches are referenced in this report from a downstream to upstream location, consistent with the direction the step-backwater analysis was performed.

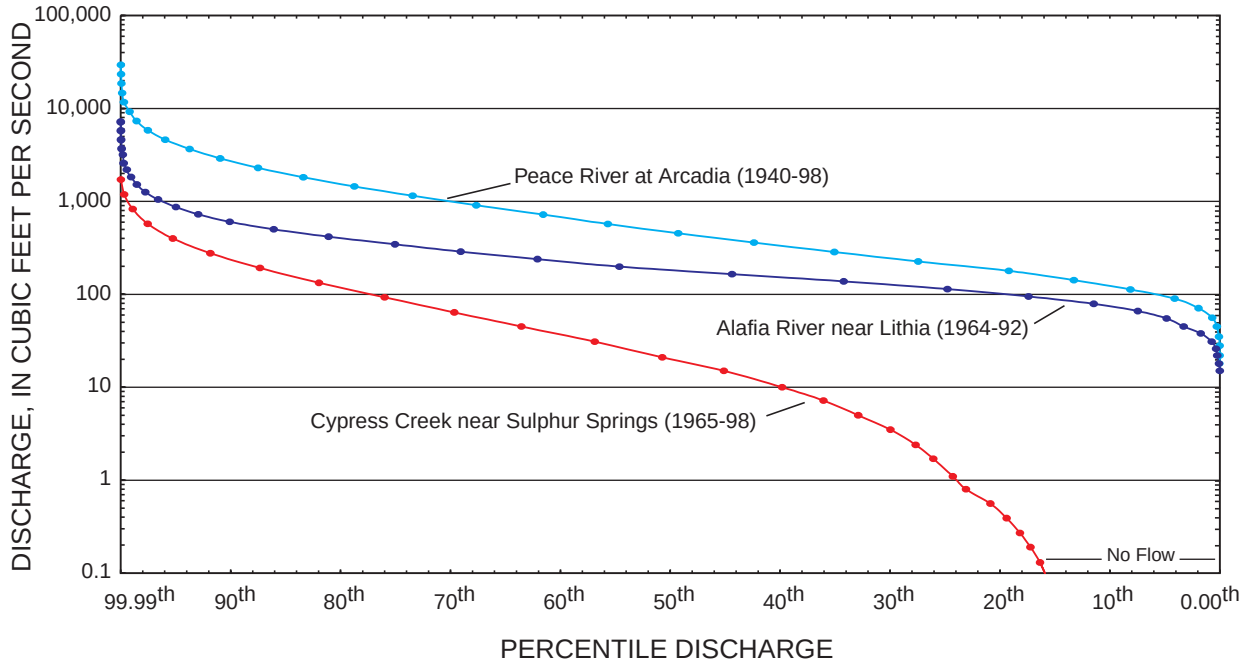


Figure 2. Percentiles of daily mean discharge for the Peace River at Arcadia, Alafia River at Lithia, and Cypress Creek near Sulphur Springs gaging stations for selected periods.

Hydraulic and cross-sectional geometry data for the stream channels and floodplains were determined from three sources: (1) field surveys; (2) detailed aerial 1-ft topographic contour maps (scale 1:200); or (3) previous step-backwater analyses by Murphy (1978), Murphy and others (1978), and Robertson (1978). Original E431 hydraulic and cross-sectional data were reformatted or modified to be compatible with HEC-RAS.

Cross-section geometry of the channel and floodplains are defined by coordinates of both the horizontal distance from the left bank (looking downstream) and the corresponding land-surface elevation (fig. 3). The land-surface elevation of the first and last horizontal coordinate were selected to contain the highest water-surface elevation estimated at each cross section. However, because water elevations computed in this study represent more frequently occurring discharge conditions, the maximum water-surface elevation rarely approached the estimated elevation in the original step-backwater analysis for a 100-year flood. The reference distance of the cross-section location, measured in feet upstream from the mouth, and the corresponding reference identification number assigned to each cross section were obtained from the previous referenced investigations of the three river systems. The area of inundation for a given flow was estimated by extending straight lines between the landward extents of inundation at the various cross sections and calculating the water-surface area within this boundary. Such estimates do not reflect the natural shape of the topographic contours between adjacent cross sections. Selection of cross-section locations were determined to best represent existing field conditions along the reach.

Cross sections were divided into subareas based on existing hydraulic characteristics. The Manning's roughness coefficient, *n*, was used to describe the degree of flow resistance of the channel and floodplain, and is a function of bed material size, depth of flow, cross sectional geometry, type and density of vegetation, and degree of channel meandering. Most of the roughness coefficients used in previous step-backwater analyses of Cypress Creek (Murphy, 1978), Peace River (Murphy and others, 1978), and Alafia River (Robertson, 1978) were used in this study.

Percentile discharges used in the step-backwater analysis were based on concurrent long-term streamflow records for each study location. Selected percentiles included the 10^{th}, 50^{th}, 70^{th}, 80^{th}, 90^{th}, 98^{th}, 99.5^{th}, and 99.9^{th}. Percentile is a value on a scale of 0 to 100 that indicates the percentage of a streamflow distribution that is equal to or less than a specific discharge. For example, at the 90^{th} percentile discharge, 90 percent of the flows are equal to or less than a specific discharge, based on the selected period, and 10 percent of the flows are greater. To simplify terminology in this report, the 10^{th} percentile of daily mean discharge is identified as P_{10} discharge, the 50^{th} percentile as the P_{50} discharge, and so forth for each of the selected percentile discharges. Also, the potential 10-percent withdrawal at the P_{10} discharge is identified as $P_{10\text{-}10}$ discharge, the P_{50} discharge as the $P_{50\text{-}10}$ discharge, and so forth. The P_{10} discharge was omitted from the Cypress Creek analysis because the daily mean discharge was less than 0.01 ft^3/s.

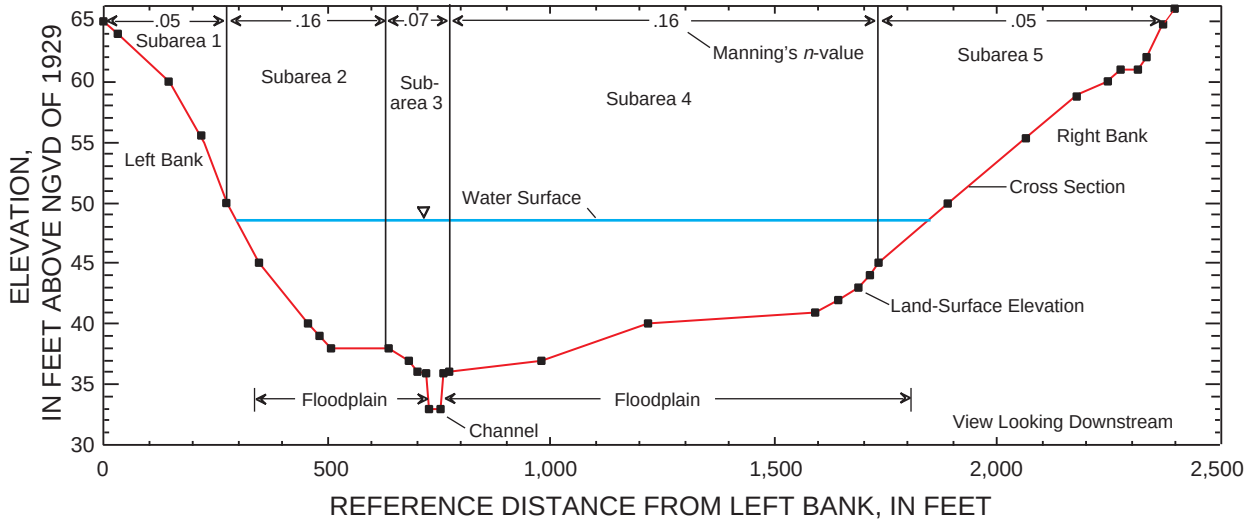


Figure 3. Example cross section showing Manning's *n*-values, subareas, and water-surface elevation.

To estimate differences in area of inundation resulting from a potential 10-percent surface-water withdrawal for the three river systems, a second step-backwater analysis was performed using 10-percent less discharge for each of the selected percentile discharges. To differentiate between the two analyses, the analysis performed using 100 percent of the discharge for the selected period of record is identified as the "existing step-backwater analysis" and the analysis performed using 10-percent less discharge is identified as the "potential step-backwater analysis." Results of the existing and potential analyses were then compared to evaluate effects of the potential withdrawals.

The reliability of the step-backwater analysis is limited by the quality of hydraulic and cross-sectional data. The basis for the selection of discharge data is critical when considering the period of record for analysis and the confidence in the data and method used to develop the analysis. Selection of Manning's *n-value* roughness coefficients is subjective, and affects the computed water-surface elevation at a cross section. Accuracy of the cross-sectional data, whether field surveyed or determined from aerial-contour maps, affects the reliability of the results of the step-backwater analysis. If the distance between adjacent cross-section locations is too great, it can affect the step-backwater energy balance computation. Results of the step-backwater analysis are judged to be good when the computed water-surface elevation converges successfully within +/- 0.5 ft of the established stage-discharge relation at an upstream gaged cross section.

CYPRESS CREEK

Cypress Creek drains approximately 164 mi ^{2} in south-central Pasco and north-central Hillsborough Counties and is a major tributary to the Hillsborough River (fig. 1). The upstream half of the watershed is largely undeveloped, whereas the downstream half is dominated by numerous residential subdivisions. The floodplain is characterized by low topographic relief and frequent, widespread, and prolonged areal inundation. The low-gradient channel generally is poorly incised and poorly defined. The USGS operates three long-term streamflow gages on Cypress Creek at: Sulphur Springs (02303800); Worthington Gardens (02303420); and San Antonio (02303400) (fig. 4).

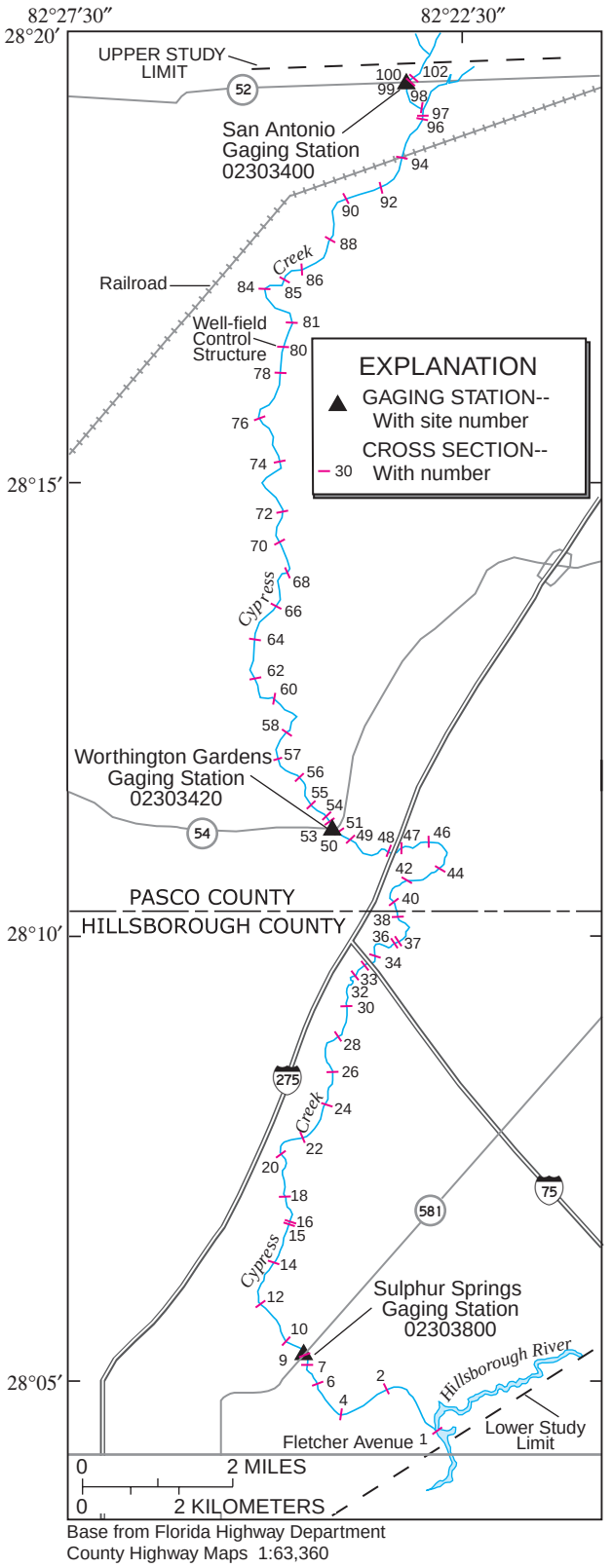


Figure 4. Locations of Cypress Creek and the Sulphur Springs, Worthington Gardens, and San Antonio gaging stations and the study cross sections, west-central Florida. (Location of study area shown in figure 1).

The Cypress Creek channel and floodplain were delineated by the NWI and are classified as predominately forested wetlands of the palustrine system. Because the channel is poorly incised and poorly defined along most of its length, limited open-water reaches are classified as riverine wetlands. These riverine wetlands typically are located along contracted reaches bounded by uplands. The forested wetlands that occur along the broad Cypress Creek floodplain are classified by the NWI as either broad-leaved, needle-leaved, or indeterminate deciduous. The length of the study floodplain corridor is bounded by uplands.

Step-backwater analysis was performed along the 27.3-mi Cypress Creek study reach, from the mouth at the confluence with the Hillsborough River to the San Antonio gage at SR 52 (fig. 4). Initial water-surface elevations for each of the selected percentile discharges were determined from the stage-discharge relation developed at the Sulphur Springs gage at SR 581. Selected percentile discharges, P_{50}, P_{70}, P_{80}, P_{90}, P_{98}, $P_{99.5}$, and $P_{99.9}$, were based on the concurrent period 1965-98 at the Sulphur Springs and San Antonio gages. The Worthington Gardens gage at SR 54 was not included in the analysis because the gage had a 10-yr shorter period of record than the other two gages. However, the stage-discharge relation developed at the Worthington Gardens gage was used to check computed water-surface elevations.

Water-surface profiles were based on elevations computed at the 97 cross sections along Cypress Creek for each of the seven selected percentile discharges (fig. 5). Water-surface elevations computed at the Worthington Gardens and San Antonio gages for each of the percentile discharges were considered reliable because they converged within 0.5 ft of the developed stage-discharge relation. Modeled discharges were proportionally reduced at selected upstream cross sections during the analysis to adjust for the decrease in size of contributing drainage area (table 1).

Topographic relief, channel gradient and depth, and discharge control the extent of areal inundation along Cypress Creek. Areal inundation may be substantial during relatively low-discharge conditions. At the mouth of Cypress Creek, for example, the width of the areal extent of inundation can range from more than 6,000 ft during a P_{50} discharge (21 ft^3/s) to 8,000 ft during a $P_{99.9}$ discharge (1,602 ft^3/s) (figs. 6 and 7a and app. A). Many cross sections along Cypress Creek have low topographic relief that result in widespread areal inundation for most of the selected percentile discharges. The reach from the Interstate 75 bridge (cross section 33) to the arched bridge (cross section 54) is controlled by high relief, limiting areal inundation to only the highest percentile discharges (fig. 6). A comparison of the maximum extent of areal inundation for the selected percentile discharges at each cross section is shown in figure 6. However, the figure does not indicated the existence of elevated land surface along the cross section that may be completely inundated during high-flow periods or may form islands during low-flow periods, thus reducing the actual distance inundated. Appendix A presents the actual distance, in feet, each cross section is inundated.

Based on the number of days that streamflow equaled or exceeded the selected percentile discharges during the 34-year study period, areal inundation along Cypress Creek was highly variable among years (table 2). The number of days that flow was at the P_{50} discharge ranged from a minimum of 35 days (1992) to a maximum of 284 days (1966), with an average of 180 days per year. However, the $P_{99.9}$ discharge occurred only once (1965) for a 2-day period. By far the percentiles of common occurrence to the wetlands are the P_{50}, P_{70}, P_{80}, P_{90} discharges, which generally occur annually, with durations typically exceeding 100 days during moderate-to-wet conditions. The frequency of the P_{98} and $P_{99.5}$ discharges occurred in less than one-half of the years during the 34-year record period.

The estimated mean number of days per year during the 34-year record that selected percentile discharges occurred at two example cross sections are shown in figure 7. Cross section 1 is widely inundated during the P_{50} discharge, which occurs on an average of 180 days per year. At cross section 28, however, the extent of areal inundation for the P_{50} discharge is confined within the banks of the channel during that same period. Areal inundation of the floodplain along the entire study reach occurs only for percentiles above the P_{70} discharge. Floodplain inundation at the P_{80} discharge occurs an average of 72 days per year.

Hydraulic depths were computed at each cross section for the selected percentile discharges (app. B). Because the channel is not well defined or incised along much of Cypress Creek, hydraulic depth at many cross sections can be considered an estimate of the floodplain inundation depth. Hydraulic depth increases at locations where reaches contract, whether the contraction is the result of channel modifications, such as a bridge, culvert, or control structure, or the result of the natural topography (fig. 5). Differences in hydraulic

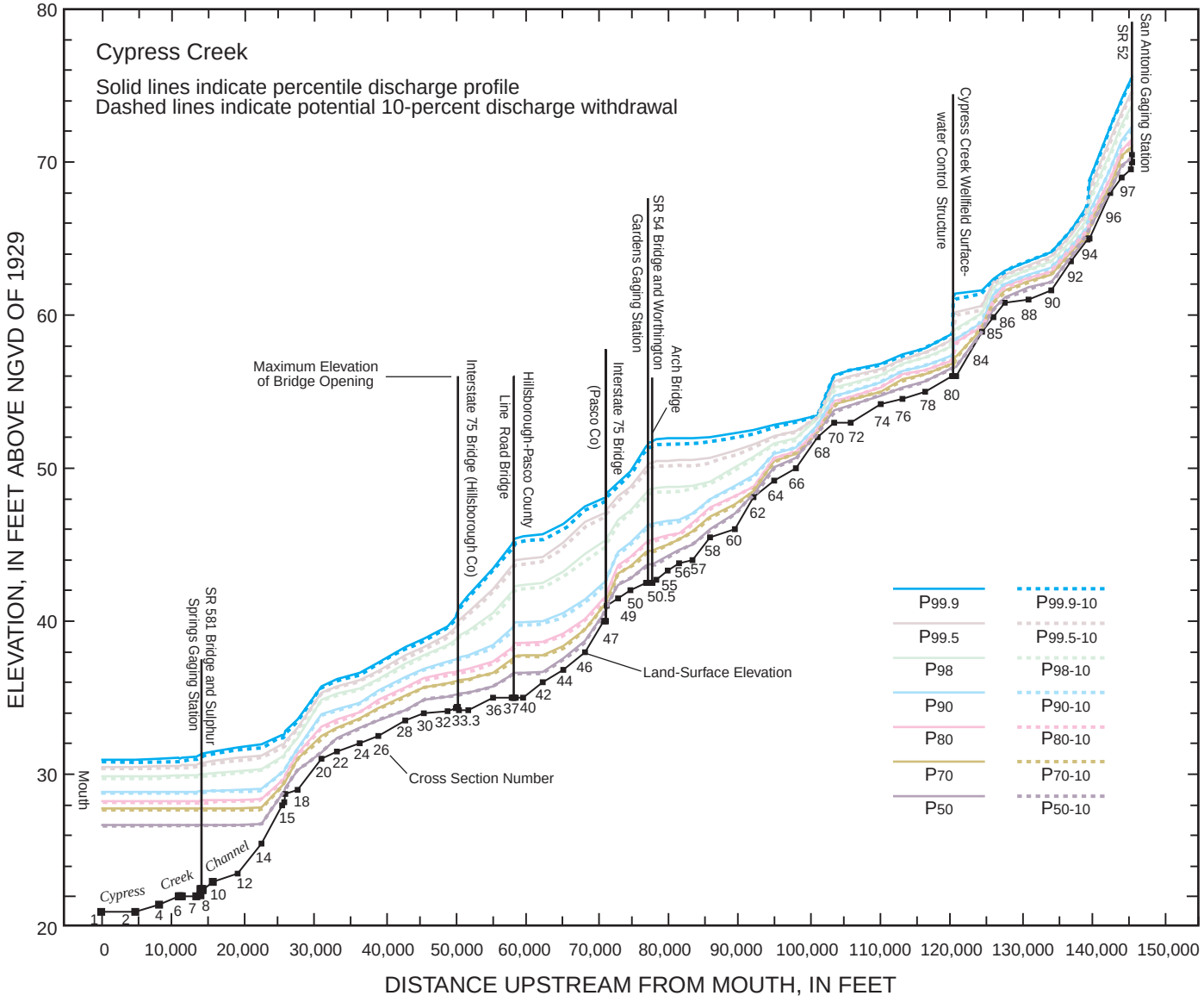


Figure 5. Water-surface profiles along Cypress Creek for existing conditions and a potential 10-percent discharge withdrawal, from the mouth to SR 52.

depth shown at cross sections 1 (mouth) and 28 in figure 7 may be attributed to topography, channel configuration, and slope. Hydraulic depth at cross section 1 is affected by backwater from the Hillsborough River. Mean hydraulic depth of the channel and floodplain ranged from approximately 0.85 to 2.89 ft. The relatively shallow mean depths of Cypress Creek reflect the effects of widespread inundation.

Areal inundation along Cypress Creek was computed in acres for each of the selected percentile discharges (app. C). Total acreage of inundated area along Cypress Creek was calculated by totaling the computed water-surface area between adjacent cross sections. This calculation was done for each of the selected percentile discharges. Areal inundation ranged from approximately 1,200 (P_{50}) to 9,000 ($P_{99.9}$) acres (fig. 8). The greatest increase in inundated area between percentile discharges is 2,326 acres, which occurs between the P_{90} to the P_{98} discharges.

Based on the period of streamflow record 1965-98, the difference in total inundated area of the existing step-backwater analysis was compared to the inundated area that resulted from a potential 10-percent withdrawal in streamflow. This evaluation was made by

Table 1. Cross sections, drainage area, and percentile discharges used in step-backwater analysis based on the concurrent period 1965-98 at the Cypress Creek, Sulphur Springs, and San Antonio gages

[ft^3/s, cubic feet per second; mi^2, square miles]

Cross-section range	Drainage area (mi^2)	Discharge (ft^3/s)						
		P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
1-8	165	21	67	124	250	670	1,124	1,602
[1]9-17	160	20	65	120	242	650	1,090	1,554
18-26	134	13	44	80	164	449	796	1,233
28-48	122	12	40	73	149	409	725	1,123
[2]40-72	117	12	38	70	143	392	695	1,077
74-81	76	8	25	46	93	255	451	700
82-94.5	70	7	23	42	86	235	416	644
[3]95-102	56	4	14	25	52	148	284	487

[1]Sulphur Springs gage at SR 581.
[2]Worthington Gardens gage at SR 54.
[3]San Antonio gage at SR 52.

performing a second step-backwater analysis for the concurrent period using the same selected percentile discharges reduced by 10 percent. The difference in the total inundated area was compared between the two step-backwater analyses. Hydraulic and geometric data used for both analyses were identical, except for the starting discharge and water-surface elevation used at the initial cross section. Rated and computed water-surface elevations of the second step-backwater analysis converged successfully at both the Worthington Garden and the San Antonio gages. A comparison in elevation of the computed water-surface profiles resulting from a potential 10-percent discharge withdrawal is shown in figure 5. The lower water-surface elevation profiles resulting from a potential 10-percent discharge withdrawal reduces the extent of areal inundation from about 22 (P_{50}) to 395 (P_{90}) acres, which corresponds to an approximate 1.7 and 8.4 percent decrease of inundated area, respectively (fig. 8 and app. D). The greatest decrease in inundated area (395 acres) occurs at the $P_{90\text{-}10}$ discharge (fig. 9a-g), and most of the decrease in area is attributed to the reaches between cross sections 70, 72, and 74 (fig. 9d).

PEACE RIVER

The 2,350-mi^2 Peace River watershed is located in Polk, Hardee, De Soto, and Charlotte Counties (fig. 10). The Peace River begins northeast of Bartow, at the confluence of Saddle Creek and the Peace Creek Drainage Canal, and flows southward for about 105 mi to Charlotte Harbor. The watershed is predominately rural with several small municipalities. Much of the upper and middle watershed has been strip-mined for phosphate and subsequently reclaimed.

Generally well defined and deeply incised, the Peace River channel is delineated on maps by the NWI predominately as a riverine system (Cowardin and others, 1979). The riverine system is further classified as lower perennial because the gradient is low and the velocity is slow. In areas along the upper Peace River, where the channel is poorly defined and poorly incised, the channel may be classified as a palustrine forest wetland. Palustrine wetlands, dominated by either broad-leaved, needle-leaved, or indeterminate deciduous forest, occur along most of the Peace River floodplain. The length of the study floodplain corridor, from Arcadia to Bartow, is bounded by uplands.

Surface-water drainage to the upper Peace River, from Bartow to Bowling Green, is generally limited to phosphate-mine outfalls and reclaimed channels. Along this reach, much of the natural surface drainage has been altered by the effects of strip mining. Surface-water drainage to the Peace River, from downstream of Bowling Green to Charlotte Harbor, typically is from well-developed, naturally formed tributaries. The lower reach of the Peace River, from downstream of Arcadia to Charlotte Harbor, is affected by tidally influenced backwater.

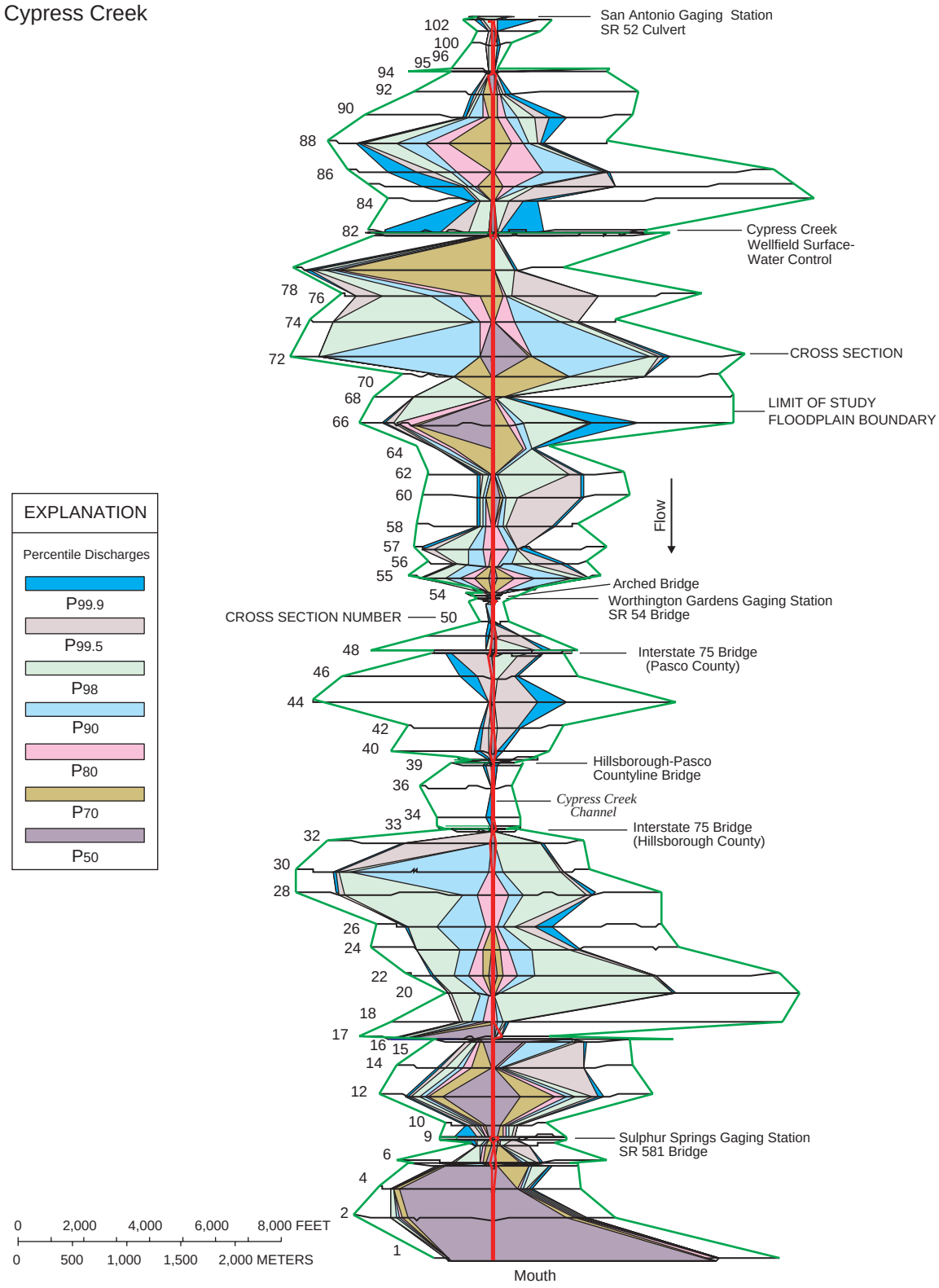
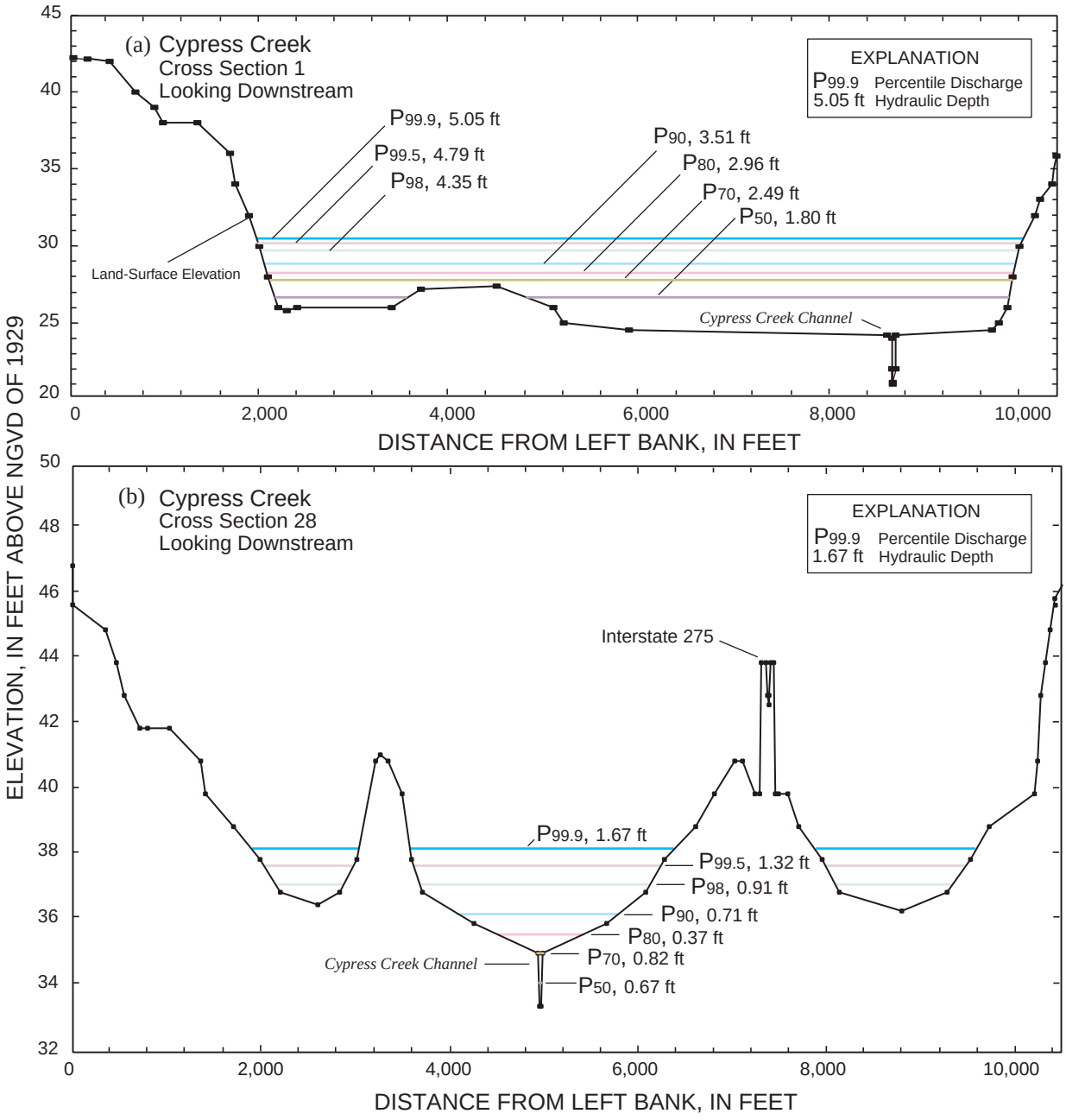


Figure 6. Extent of areal inundation along the Cypress Creek channel and floodplain for selected percentile discharges.



Cypress Creek near Sulphur Springs
Based on 34 Years Record, 1965-98

Percentile	Mean number days/yr	Occurrence in years
P_{50}	180	34
P_{70}	114	33
P_{80}	72	31
P_{90}	37	27
P_{98}	19	16
$P_{99.5}$	4	9
$P_{99.9}$	2	1

Figure 7. Estimated extent and frequency of areal inundation and hydraulic depth for Cypress Creek at selected cross sections for each of the selected percentile discharges.

Table 2. Approximate number of days daily mean discharge equaled or exceeded the selected percentile discharges at Cypress Creek near Sulphur Springs, 1965-98

[P_{50}, 50-percentile discharge; --, no days]

Year	Number of days/year						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
1965	258	176	101	66	33	10	2
1966	284	216	134	61	--	--	--
1967	188	118	57	34	11	--	--
1968	112	80	48	6	--	--	--
1969	263	121	83	49	8	2	--
1970	277	257	190	109	16	--	--
1971	155	81	47	20	5	--	--
1972	189	95	30	--	--	--	--
1973	178	120	82				
1974	211	150	115	77	19	1	--
1975	169	86	64	16	--	--	--
1976	207	132	61	9	--	--	--
1977	122	18	4	--	--	--	--
1978	219	144	87	41	3	--	--
1979	156	108	83	44	22	1	--
1980	209	73	32	73	10	1	--
1981	113	77	50	77	17	--	--
1982	246	173	114	62	13	4	--
1983	283	227	165	103	34	4	--
1984	277	211	106	16	--	--	--
1985	61	57	48	25	5	--	--
1986	232	158	57	10	--	--	--
1987	282	123	58	26	13	5	--
1988	156	69	35	18	12	--	--
1989	156	74	38	10	--	--	--
1990	57	--	--	--	--	--	--
1991	104	68	46	8	--	--	--
1992	35	9	--	--	--	--	--
1993	92	23	--	--	--	--	--
1994	59	34	9	--	--	--	--
1995	206	104	57	13	--	--	--
1996	226	134	45	13	--	--	--
1997	72	34	11	3	--	--	--
1998	267	219	182	133	84	10	--
Mean number days	180	114	72	37	19	4	2

Step-backwater analysis was performed at 238 cross sections located along a 70-mi length of the Peace River channel from Arcadia to Bartow. Step-backwater analysis was performed using the selected percentile discharges (P_{10}, P_{50}, P_{70}, P_{80}, P_{90}, P_{98}, $P_{99.5}$, and $P_{99.9}$) for the concurrent long-term period 1940-98 at three Peace River gages: Arcadia (02296750); Zolfo Springs (02295637); and Bartow (02294650). Proportionally reduced discharges, based on gaged data, were introduced into the step-backwater analysis at selected cross sections to compensate for the decrease in contributing drainage area (table 3).

Because of the large number of cross sections and variations in channel and hydraulic characteristics, the step-backwater analysis of the Peace River was divided into three study reaches. Each reach began and ended at a long-term streamflow gage. Reach 1 included 81 cross sections along the 32.3-mi length from the Arcadia to Zolfo Springs gages; reach 2 included 95 cross sections along the 23.6-mi length from the Zolfo Springs to Fort Meade gages; and reach 3 included 64 cross sections along the 13.9-mi length from the Fort Meade to Bartow gages (fig. 10). The reach downstream from Arcadia to Charlotte Harbor was not included in the analysis because of tidally affected backwater conditions. Cross sections used for the Peace River were developed by Murphy and others (1978), except at bridge locations.

The number of days areal inundation occurs annually along the Peace River for a specific percentile discharge is variable, based predominantly on seasonal climatic conditions. However, discharge conditions along the upper Peace River may be affected by a limited number of surface-water control structures at phosphate-mine outfalls and losses to sinkholes. Most of the percentiles at or below the P_{90} discharge occur annually, based on the Arcadia gage (table 4). However, the highest percentile discharge ($P_{99.9}$) occurred for only 6 years out of the 59-year period, 1940-98.

Reach 1–Arcadia to Zolfo Springs

The Peace River channel along reach 1, from Arcadia to Zolfo Springs, is generally broad, well defined, and deeply incised (fig. 11). The channel generally confines all but the highest discharges within the banks. Numerous meanders and oxbows along the reach are characteristic of a sandy, low-gradient channel. Daily mean discharge at the Arcadia gage during the study period (1940-98) ranged from 14 to 24,200 ft^3/s, with a median discharge of 481 ft^3/s (P_{50}) (fig. 2).

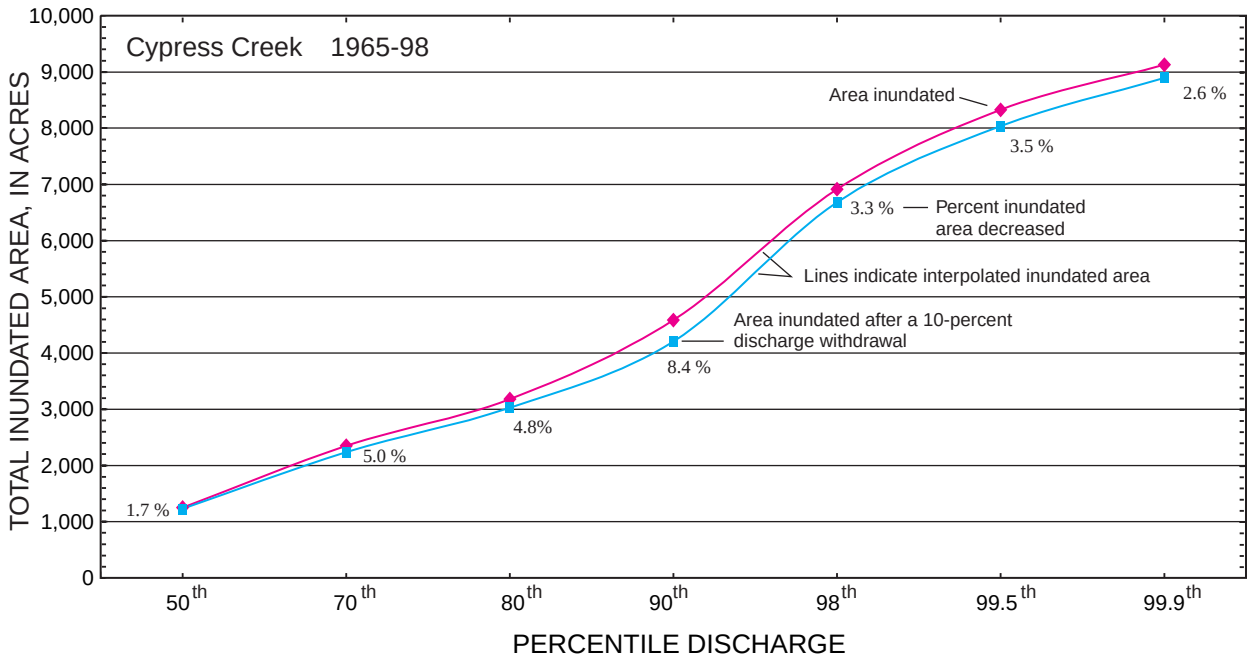


Figure 8. Estimated total inundated area along Cypress Creek for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

Water-surface profiles were based on elevations computed at the 81 cross sections along reach 1 for each of the eight selected percentile discharges (fig. 12). Extent of areal inundation, acreage of inundation, and hydraulic depth also were computed based on the results of the water-surface elevations.

Estimated maximum extent of floodplain inundation exceeds 12,400 ft (cross section 264) during $P_{99.9}$ discharge (fig. 13 and app. E). Mean extent of inundation for the 81 cross sections along the reach 1 can range from 99 ft (P_{10}) to 5,181 ft ($P_{99.9}$). The channel along much of the reach generally confines most flow regimes at or below the P_{80} discharge (fig. 13). The mean inundation extent at the P_{80} discharge (238 ft) approximates the channel width. Mean inundation extents are similar for both the $P_{99.5}$ (4,529 ft) and $P_{99.9}$ (5,181 ft) discharges, which indicates a limited increase in inundation for increased discharge at these percentiles. However, an approximate four-fold increase in mean inundation extent occurs from the P_{90} (625 ft) to the P_{98} (2,521 ft) discharge, and about a two-fold increase from the P_{98} (2,521 ft) to the $P_{99.5}$ (4,529 ft) discharge. A comparison of the maximum extent of areal inundation for the selected percentile discharges at each cross section is shown in figure 13. However, the figure does not indicated the existence of elevated land surface along the cross section that may be completely inundated during high-flow periods or may form islands during low-flow periods, thus reducing the actual distance inundated. Appendix E presents the actual distance, in feet, each cross section is inundated.

The estimated mean number of days a year and the number of years during the 59-year record that selected percentile discharges occurred at three example cross sections for the Peace River are shown in figure 14. In example cross section 208 (fig. 14a), surface-water elevations at or below the P_{90} discharge are confined within the banks of the channel and elevations at or above the P_{98} discharge can inundate the floodplain.

Hydraulic depths for the selected percentile discharges ranged from a minimum of 0.8 to a maximum of 12 ft, and a mean of 1.7 to 5.4 ft (app. F). A mean depth of approximately 5 ft occurs during the P_{80} discharge, and generally is confined within the channel. Because of the large cross-sectional area of the floodplain, hydraulic depths may be relatively shallow for those higher percentile discharges that inundate both the channel and the floodplain, which is illustrated in example cross section 208 (fig. 14a). The hydraulic depth for the P_{90} discharge is 10.2 ft, whereas, the P_{98} discharge depth is only 2.4 ft.

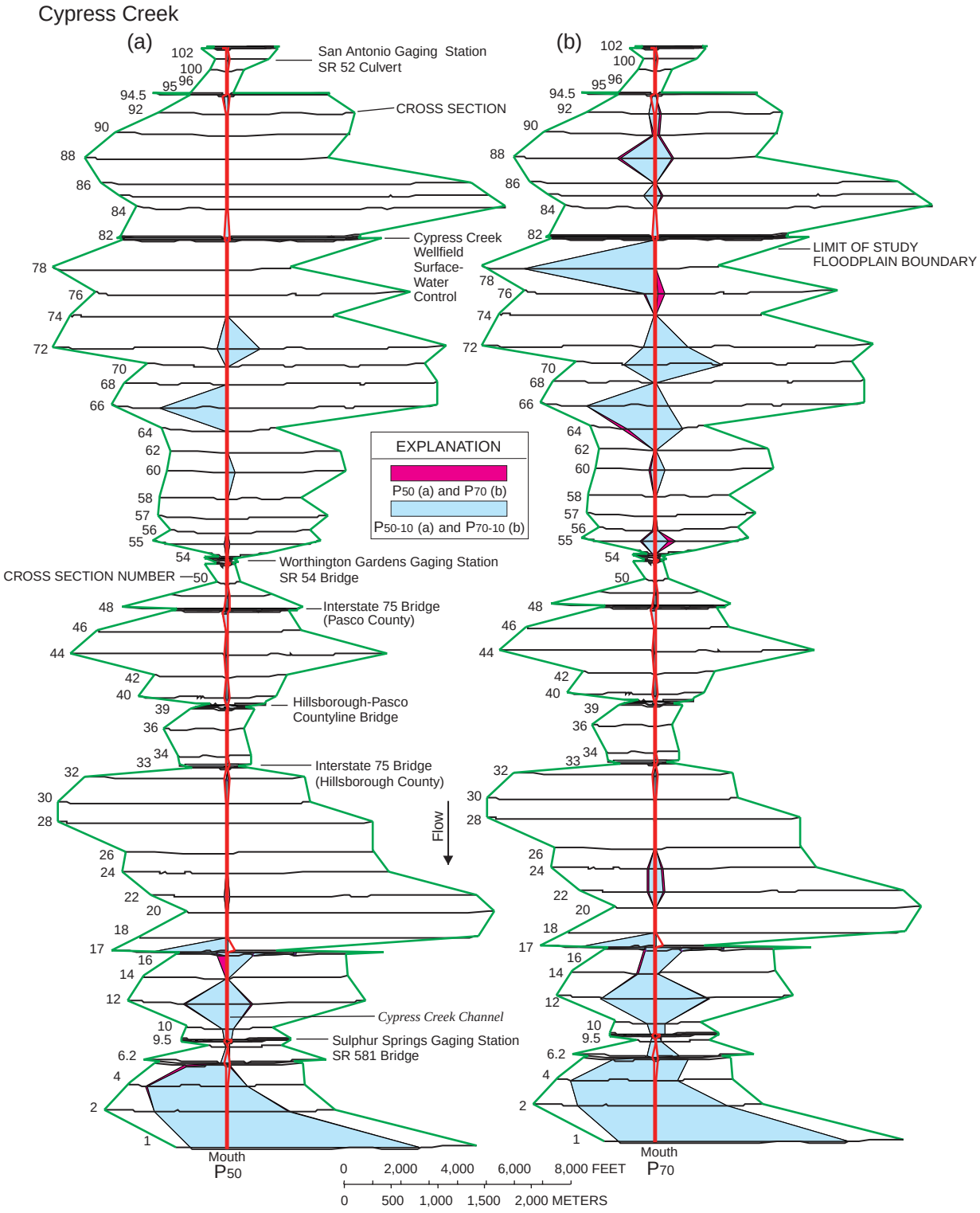


Figure 9. Extent of areal inundation along Cypress Creek for the (a) P_{50}, (b) P_{70}, (c) P_{80}, (d) P_{90}, (e) P_{98}, (f) $P_{99.5}$, and (g) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal.

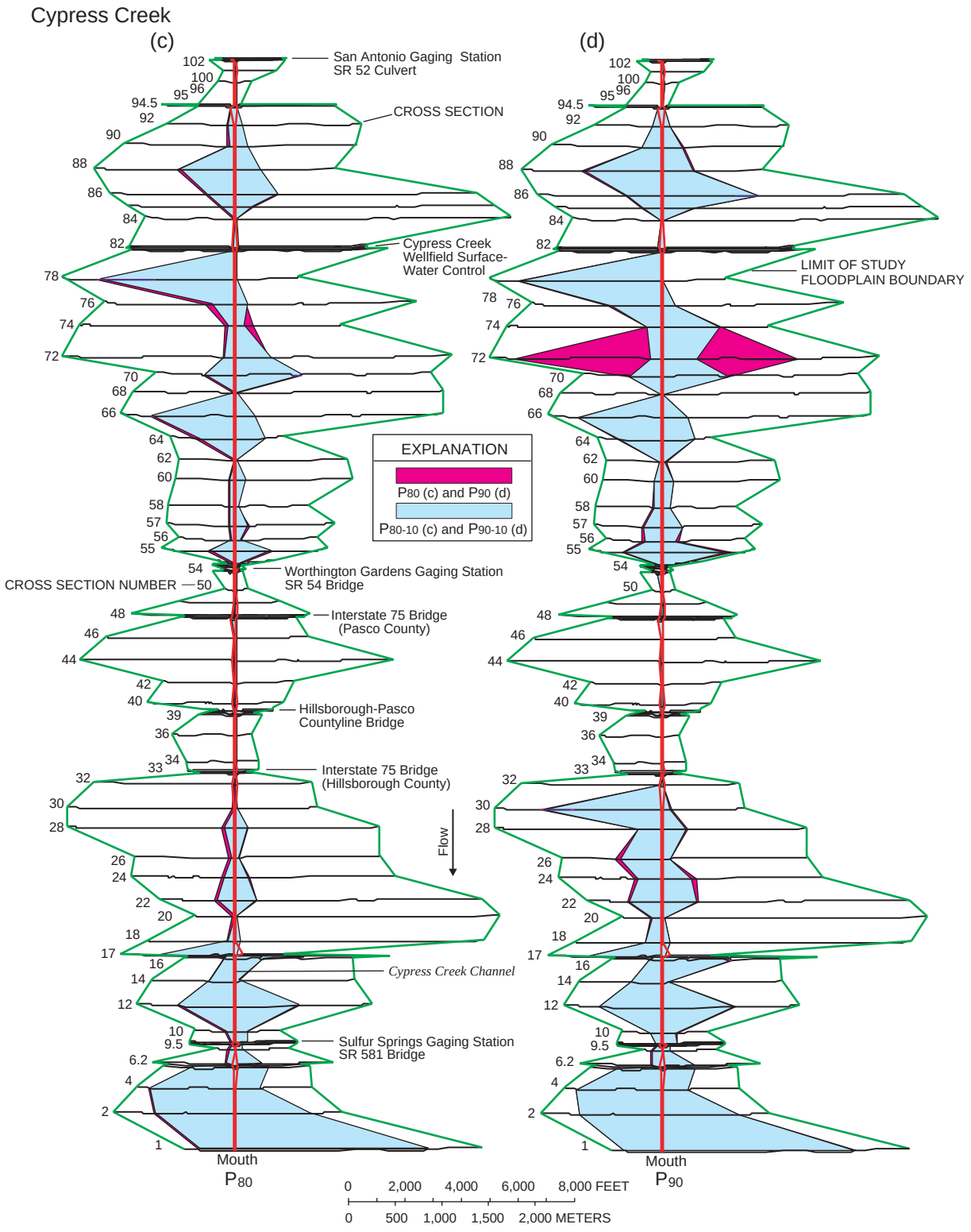


Figure 9. Extent of areal inundation along Cypress Creek for the (a) P_{50}, (b) P_{70}, (c) P_{80}, (d) P_{90}, (e) P_{98}, (f) $P_{99.5}$, and (g) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

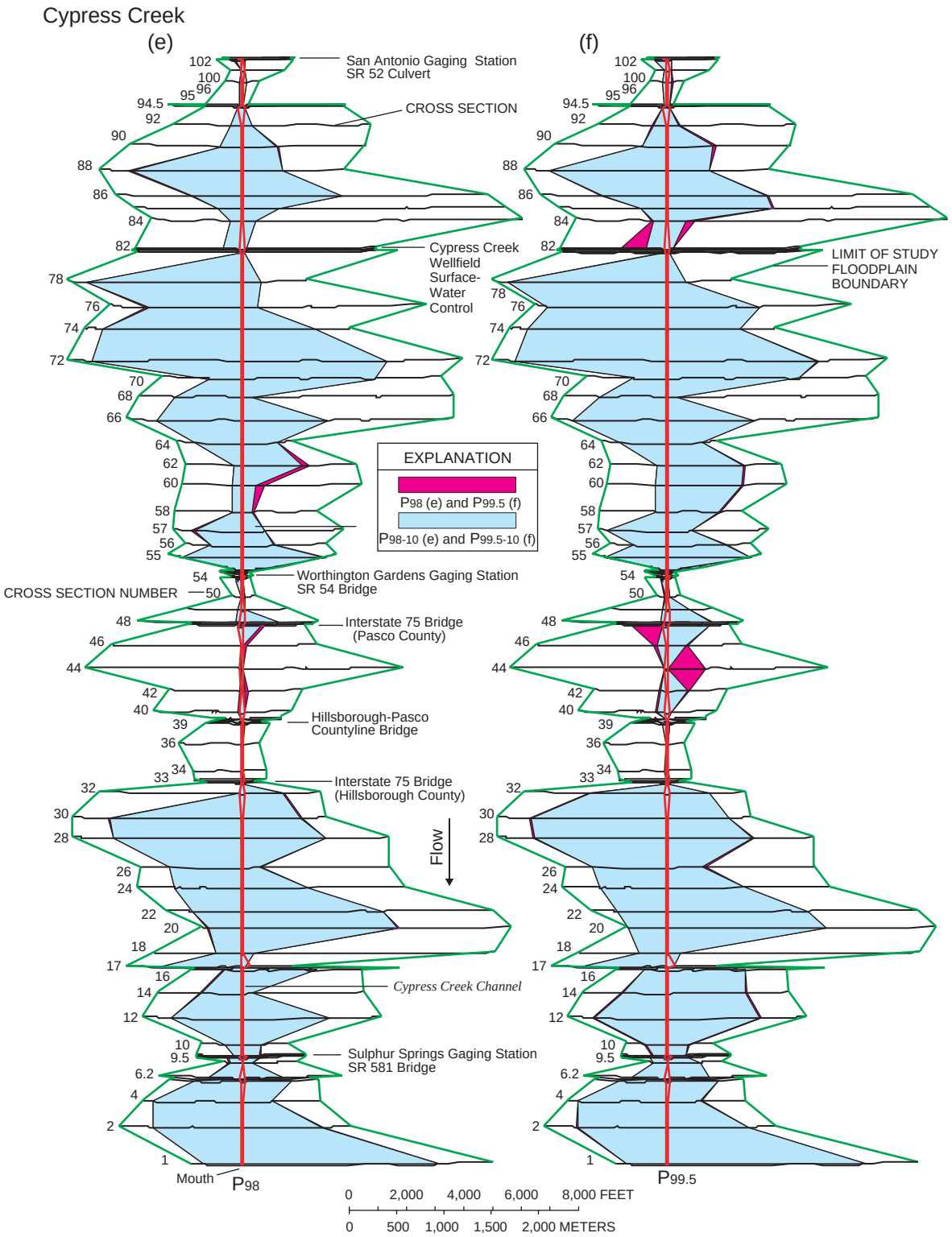


Figure 9. Extent of areal inundation along Cypress Creek for the (a) P_{50}, (b) P_{70}, (c) P_{80}, (d) P_{90}, (e) P_{98}, (f) $P_{99.5}$, and (g) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

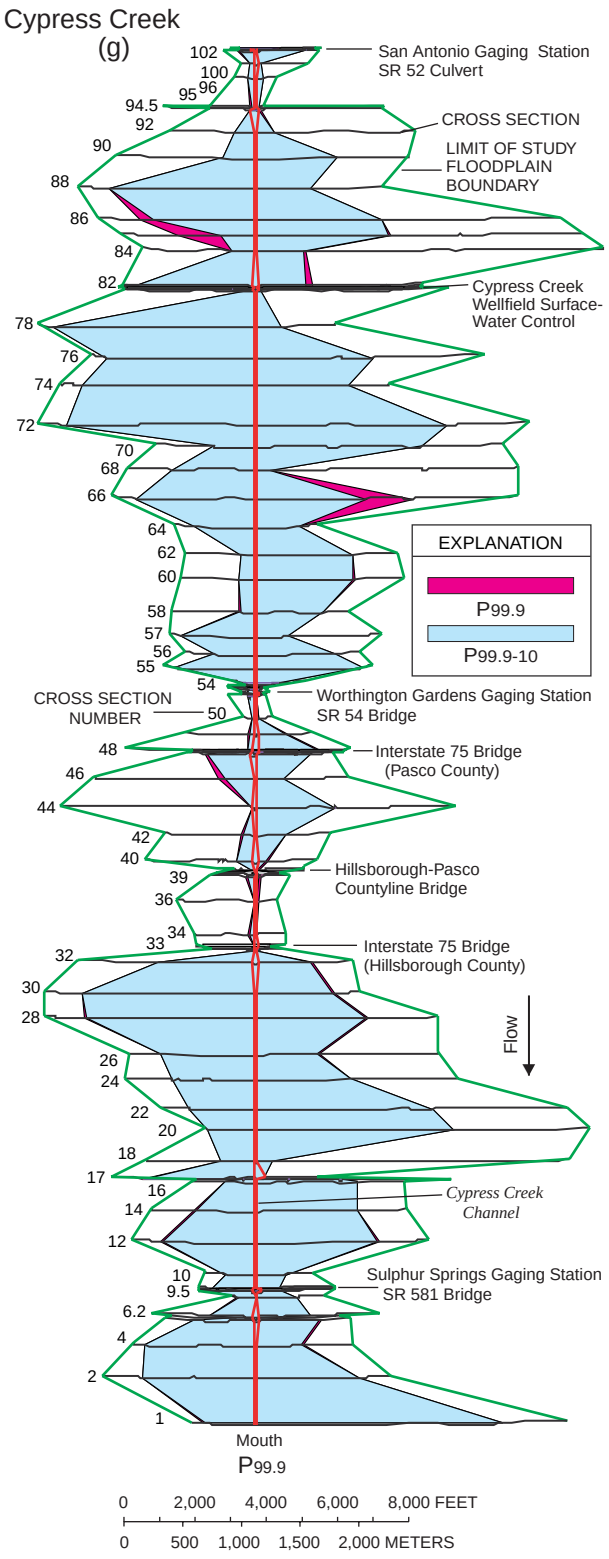


Figure 9. Extent of areal inundation along Cypress Creek for the (a) P_{50}, (b) P_{70}, (c) P_{80}, (d) P_{90}, (e) P_{98}, (f) $P_{99.5}$, and (g) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

Total area of areal inundation within the channel and floodplain for reach 1 ranged from 377 to 17,196 acres for the selected percentile discharges (fig. 15 and app. G). Inundated area that occurred below the P_{80} discharge generally was confined within the banks of the channel (fig. 13). The difference in total area inundated between the P_{10} (377 acres) and P_{80} (888 acres) discharges was 511 acres, which largely included just the channel. However, the area between the P_{90} (2,120 acres) and $P_{99.9}$ (17,196 acres) discharges was greater than 15,000 acres, which included both the channel and the floodplain. The greatest increase in area of inundation occurred from the P_{90} to P_{98} discharges and from the P_{98} to $P_{99.5}$ discharges, with more than 6,000 acres each.

Based on the period of streamflow record, 1940-98, differences in the total inundated area of the existing step-backwater analysis were compared with a potential reduction in streamflow of 10 percent. The loss of inundated area between the existing step-backwater analysis and the potential step-backwater analysis ranged from approximately 5 (P_{10}) to 1,500 (P_{98}) acres, which corresponds to a decrease in inundated area of 1.3 and 17.8 percent, respectively (fig. 15 and app. H). Decreases of inundated area at or below the P_{80-10} discharge generally occurred within the channel and ranged from 5 to 110 acres (fig. 16a-h and app. H). The greatest decrease of inundated area occurred at the P_{98-10} discharge with 1,469 acres. The decrease in inundated area at both the $P_{99.5-10}$ and the $P_{99.9-10}$ discharges was greater than 700 acres.

Reach 2–Zolfo Springs to Fort Meade

Reach 2 of the Peace River, from Zolfo Springs to Fort Meade, shares many of the same channel characteristics as reach 1 (fig. 17). The channel is generally well defined and deeply incised, confining low-to-moderate discharges (P_{10}, 106 ft^3/s to P_{50}, 329 ft^3/s) within the banks. At many locations along the channel, the banks are formed from rock outcrops. Daily mean discharge at the Zolfo Springs gage during the study period (1940-98) ranged from 19 to 15,200 ft^3/s, with a median discharge of 329 ft^3/s (P_{50}).

The step-backwater analysis computed water-surface profiles using 95 cross sections along the 23.6-mi reach 2 (fig. 18). Mean inundation extent along reach 2, based on the average of 95 cross sections along the reach, was similar to that of reach 1 for the P_{10} (82 ft) through P_{90} (448 ft) discharges, due to similar channel

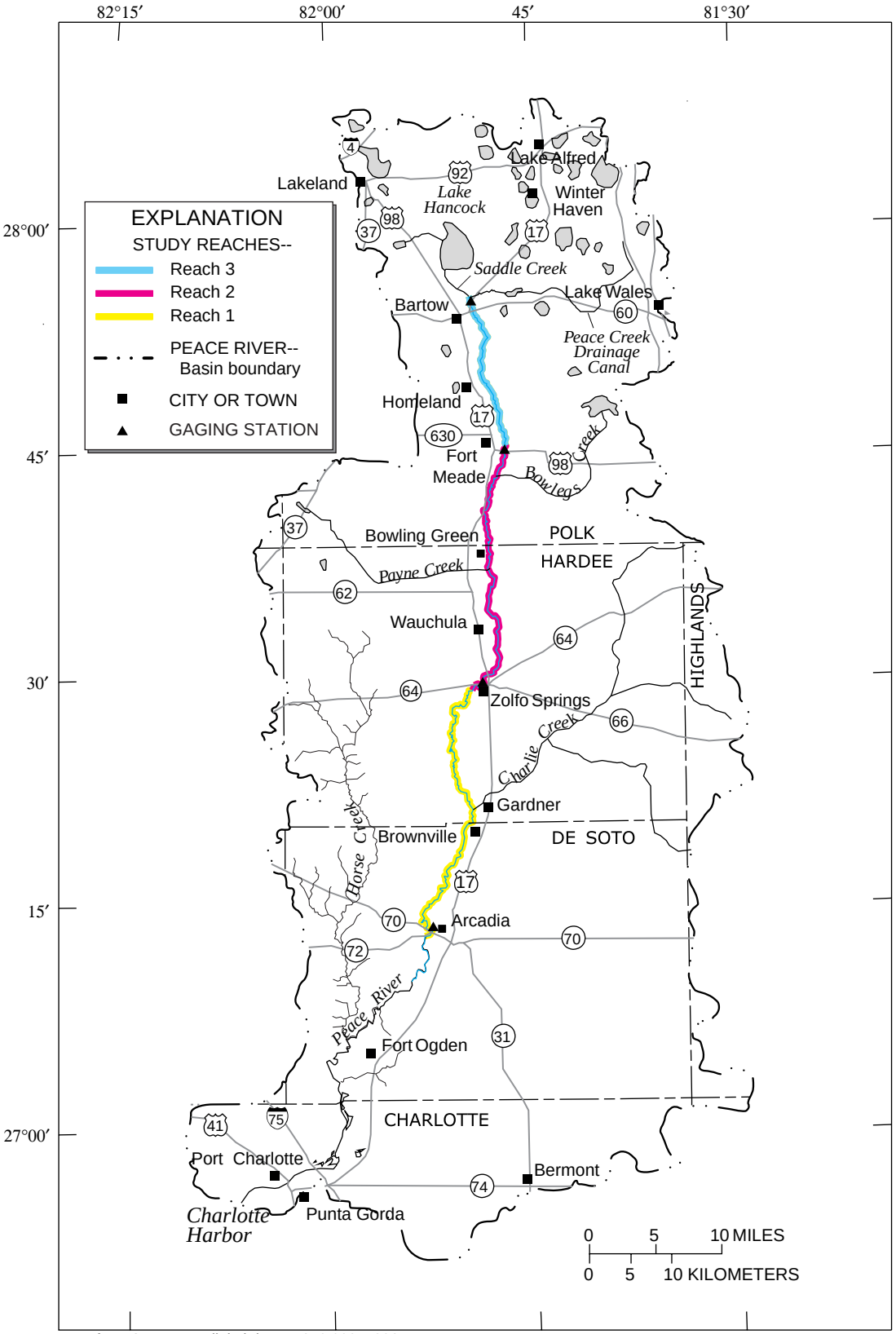


Figure 10. Location of the Peace River, study reaches, and the Arcadia, Zolfo Springs, Fort Meade, and Bartow gaging stations, west-central Florida. (Location of study area shown in figure 1).

Table 3. Cross sections, drainage area, and percentile discharges used in step-backwater analysis based on the concurrent period 1940-98 at the Peace River at the Arcadia, Zolfo Springs, and Bartow gages

[ft^3/s, cubic feet per second; mi^2, square miles]

Cross-section range	Drainage area (mi^2)	Discharge (ft^3/s)							
		P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
[1]148-174	1,367	130	481	1,009	1,549	2,747	6,160	11,920	15,950
176-210	1,302	127	463	960	1,464	2,591	5,826	11,170	15,149
212-284	960	112	367	699	1,030	1,768	4,069	7,224	10,936
[2]286-321	826	106	329	597	860	1,446	3,380	5,678	9,285
322-339	791	99	312	568	819	1,379	3,211	5,378	8,777
340-380	730	87	281	517	747	1,261	2,916	4,856	7,890
382-390	583	58	208	394	574	979	2,206	3,598	5,754
391-406	542	50	187	360	525	900	2,008	3,247	5,159
[3]406-446	465	35	148	296	434	752	1,636	2,588	4,040
448-490	434	29	133	270	398	693	1,487	2,323	3,589
492-[4]500	390	20	111	233	346	608	1,274	1,946	2,950

[1]Arcadia gage upstream from SR 70 bridge.
[2]Zolfo Springs gage at US Highway 17 bridge.
[3]Fort Meade gage at US Highway 98 bridge.
[4]Bartow gage at SR 60.

characteristics (app. I). Maximum estimated floodplain inundation exceeds 4,600 ft (cross section 294) during $P_{99.9}$ discharge. Mean extent for the 95 cross sections along the reach ranged from approximately 82 ft (P_{10}) to 2,542 ft ($P_{99.9}$). The channel generally confines most discharges at or below the P_{90} discharge, except at a few cross sections of low relief (fig. 19). The mean extent at the P_{80} discharge (209 ft) approximates the mean extent of a bankfull channel. Increases in the extent of mean areal inundation, of over 750 ft, occur from both the P_{90} (448 ft) to the P_{98} (1,209 ft) discharge and from the P_{98} (1,209 ft) to the $P_{99.5}$ (2,063 ft) discharge (app. I). Example cross section 292 shows river stages at or below the P_{90} discharge are generally confined within the banks of the channel, whereas those above may inundate the floodplain (fig. 14b). A comparison of the maximum extent of areal inundation for the selected percentile discharges at each cross section is shown in figure 19. However, the figure does not indicated the existence of elevated land surface along the cross section that may be completely inundated during high-flow periods or may form islands during low-flow periods, thus reducing the actual distance inundated. Appendix I presents the actual distance, in feet, each cross section is inundated.

Hydraulic depths that occur below the P_{90} discharge generally are confined within the banks of the channel, except at a limited number of cross sections in low-lying areas. Mean hydraulic depths range from approximately 1.5 to 5.5 ft and maximum depths ranged from 2.5 to 11 ft (app. J). A large difference in hydraulic depth occurs in the transition between channel and floodplain, because of the increase in cross-sectional area. This difference is illustrated in example cross section 292, where the hydraulic depth for the P_{90} discharge (3.9 ft) is largely confined to the channel (fig. 14b). However, when the large cross-sectional area of the floodplain is included during the P_{98} discharge, a hydraulic depth of 1.3 ft is calculated.

Total area of inundation within the channel and floodplain ranged from 225 (P_{10}) to 6,065 ($P_{99.9}$) acres (fig. 20 and app. K). Inundated area below the P_{90} discharge generally was confined to the channel (fig. 19).

Table 4. Approximate number of days daily mean discharge equaled or exceeded the selected percentile discharges at Peace River at Arcadia, 1940-98

[P_{10}, 10-percentile discharge; -- no days]

Year	Number of days							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
1940	350	221	131	86	28	--	--	--
1941	309	205	118	64	33	--	--	--
1942	365	248	151	98	50	8	--	--
1943	287	109	98	94	83	5	--	--
1944	307	107	75	37	14	--	--	--
1945	260	128	109	101	82	27	--	--
1946	329	161	106	74	41	--	--	--
1947	365	244	163	142	123	25	9	5
1948	359	269	184	116	62	12	5	2
1949	314	153	126	90	63	31	10	4
1950	318	86	38	25	19	9	--	--
1951	354	183	130	77	32	--	--	--
1952	366	178	62	26	8	3	--	--
1953	363	291	207	151	112	40	--	--
1954	365	323	206	158	101	27	--	--
1955	329	144	68	40	18	--	--	--
1956	299	56	32	17	8	--	--	--
1957	365	259	199	133	64	--	--	--
1958	365	284	182	107	69	4	--	--
1959	365	283	184	145	124	37	--	--
1960	366	308	218	157	100	35	12	7
1961	365	200	72	43	26	9	--	--
1962	260	118	86	64	32	10	--	--
1963	358	187	101	60	27	--	--	--
1964	366	220	128	67	24	--	--	--
1965	325	138	87	56	45	--	--	--
1966	360	224	169	88	49	3	--	--
1967	314	125	84	46	24	--	--	--
1968	334	140	110	89	66	6	--	--
1969	365	205	121	68	38	--	--	--

Table 4. Approximate number of days daily mean discharge equaled or exceeded the selected percentile discharges at Peace River at Arcadia, 1940-98 (Continued)

[P_{10}, 10-percentile discharge; -- no days]

Year	Number of days							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
1970	365	314	217	114	43	--	--	--
1971	336	92	63	28	14	4	--	--
1972	366	130	75	25	5		--	--
1973	359	170	128	90	32	--	--	--
1974	294	116	91	68	46	15	--	--
1975	281	94	55	28	7	--	--	--
1976	311	159	119	60	25	--	--	--
1977	290	86	33	8	5	--	--	--
1978	356	203	112	73	38	5	--	--
1979	336	170	94	62	27	1	--	--
1980	366	151	62	29	16	6	--	--
1981	216	47	27	15	2	--	--	--
1982	234	139	114	97	60	14	6	2
1983	365	252	179	122	78	--	--	--
1984	345	175	91	34	1	--	--	--
1985	123	60	34	13	4	--	--	--
1986	305	125	62	17	4	--	--	--
1987	347	148	74	40	16	--	--	--
1988	345	196	125	74	34	10	--	--
1989	316	88	13	--	--	--	--	--
1990	316	100	34	11	--	--	--	--
1991	281	127	89	73	37	--	--	--
1992	285	110	83	58	31	--	--	--
1993	365	169	96	38	12	--	--	--
1994	315	146	80	62	37	13	--	--
1995	353	296	182	113	82	18	--	--
1996	366	224	88	48	21	--	--	--
1997	239	98	52	34	13	--	--	--
1998	329	243	180	157	129	33	4	3
Mean number days	326	173	108	71	42	15	7	4

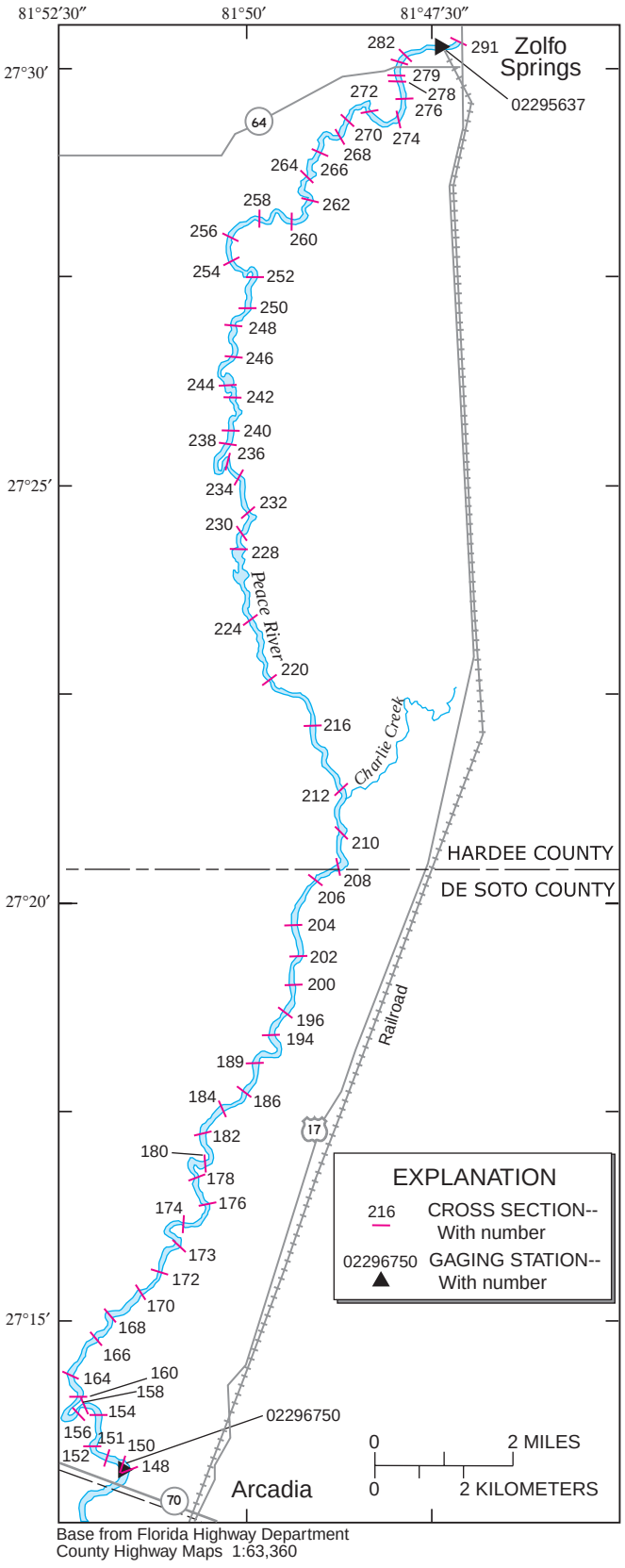


Figure 11. Location of reach 1 and channel cross sections along the Peace River from Arcadia to Zolfo Springs, west-central Florida. (Location of study area shown on figures 1 and 10).

The difference in inundated area between the P_{10} (225 acres) and P_{90} (1,118 acres) discharges, which were confined largely to within the channel, was approximately 900 acres. In contrast, the area of inundation between the P_{90} (1,118 acres) and $P_{99.9}$ (6,065 acres) discharges was approximately 5,000 acres, reflecting inundation changes solely within the floodplain. The greatest increase in inundated area occurred between the P_{90} to P_{98} discharges and between the P_{98} to $P_{99.5}$ discharges, with 1,964 and 1,810 acres, respectively.

The loss of inundated area between the existing step-backwater analysis and the potential step-backwater analysis ranged from 5.6 (P_{10}) to 373 (P_{98}) acres, which corresponds to a decrease in inundated area of 2.0 and 17.7 percent, respectively (fig. 20 and app. L). Decrease in inundated area at or below the P_{80-10} discharge generally occurred within the channel, and ranged from 5.6 to 45.8 acres. The greatest decrease in inundated area was 373 acres at the P_{98-10} discharge (fig. 21a-h).

Reach 3–Fort Meade to Bartow

Channel characteristics along the 13.9-mi reach from Fort Meade to Bartow vary greatly (fig. 22). The channel is deeply incised in one part of the reach and poorly defined in another. Numerous sinkholes, located in the channel and floodplain, divert streamflow and recharge underlying aquifers. Elevated reclaimed phosphate-mined landforms define the outer boundary along much of the floodplain corridor. Although widespread floodplain inundation can occur at moderate-to-high-discharge conditions, the extent is confined generally to within the corridor by adjacent reclaimed landforms. Daily mean discharge at the Peace River at Bartow gage during the study period (1940-98) ranged from 1.2 to 4,100 ft^3/s, with a median discharge of 111 ft^3/s (P_{50}).

Water-surface profiles were based on elevations computed at the 60 cross sections along reach 3 for each of the eight selected percentile discharges. Extent of areal inundation, acreage of inundation, and hydraulic depth were also computed based on the results of the water-surface elevations (fig. 23). Of the eight selected percentile discharges studied, the channel mostly confined only the P_{10} discharge (35 ft^3/s). Widespread inundation of the floodplain occurs at the P_{50} discharge in most areas, based on the Bartow (111 ft^3/s) and Fort Meade (148 ft^3/s) gaging stations, because the poorly incised channel cannot confine the streamflow

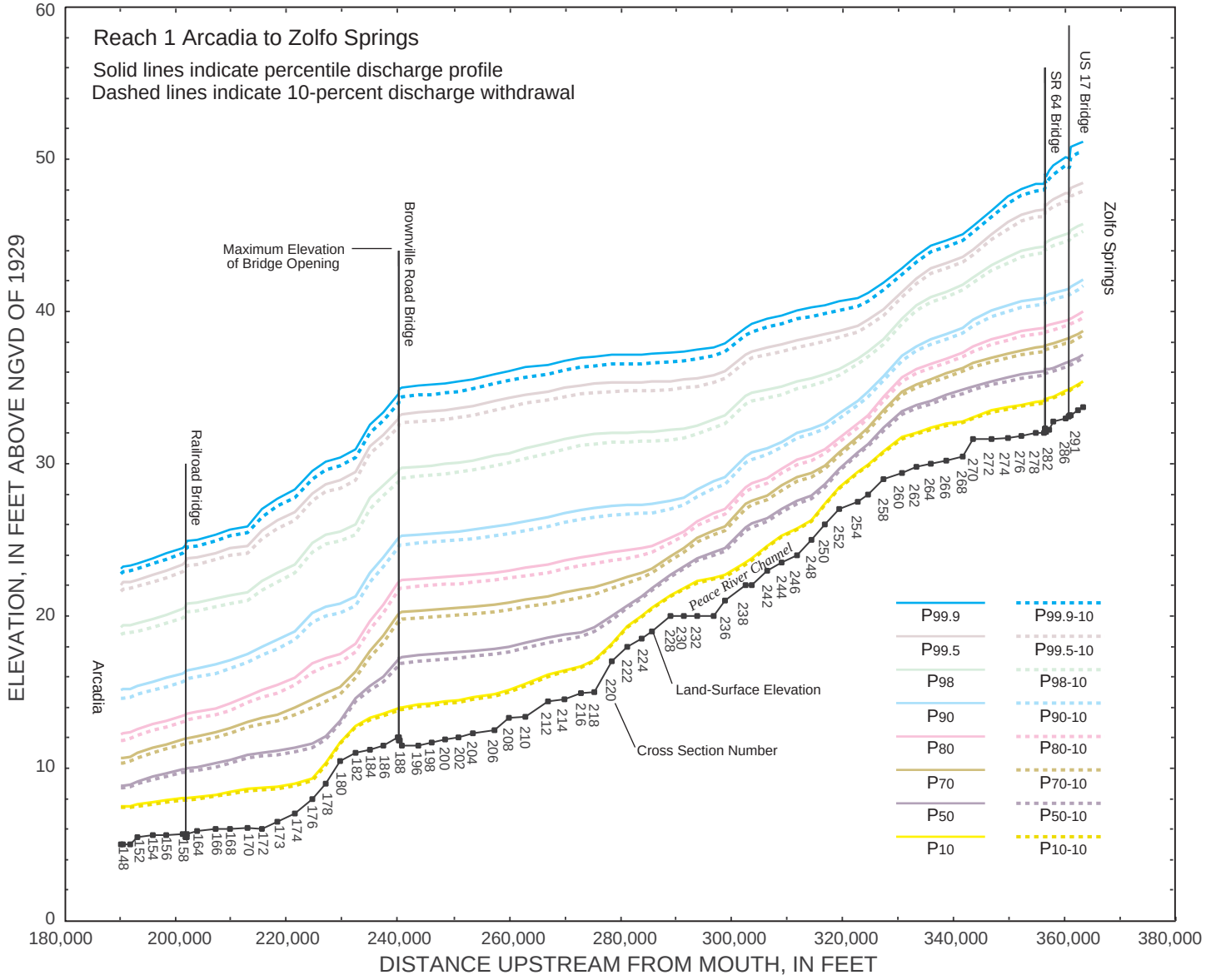


Figure 12. Water-surface profiles along reach 1 of the Peace River for existing conditions and a potential 10-percent discharge withdrawal.

within its banks. Maximum extent of floodplain inundation is 4,552 ft (cross section 492) during $P_{99.9}$ discharge (fig. 24 and app. M). The mean inundation width for the 60 cross sections along reach 3 can range from approximately 104 ft (P_{10}) to 1,953 ft ($P_{99.9}$). The inundated width of 104 ft may approximate the width of a bankfull channel. The largest increase in extent of mean inundation between percentiles is over 300 ft. This increase occurs both between the P_{10} (104 ft) to the P_{50} (424 ft) discharge and between the P_{50} (424 ft) to the P_{70} (819 ft) discharge (app. M). A comparison of the maximum extent of areal inundation for the selected percentile discharges at each cross section is shown in figure 24. However, the figure does not indicated the existence of elevated land surface along the cross section that may be completely inundated during high-flow periods or may form islands during low-flow periods, thus reducing the actual distance inundated. Appendix M presents the actual distance, in feet, each cross section is inundated.

Example cross section 480 shows that areal inundation of the floodplain is widespread for all percentile discharges greater than the P_{10} discharge (fig. 14c). An abrupt rise in land-surface elevation exists along

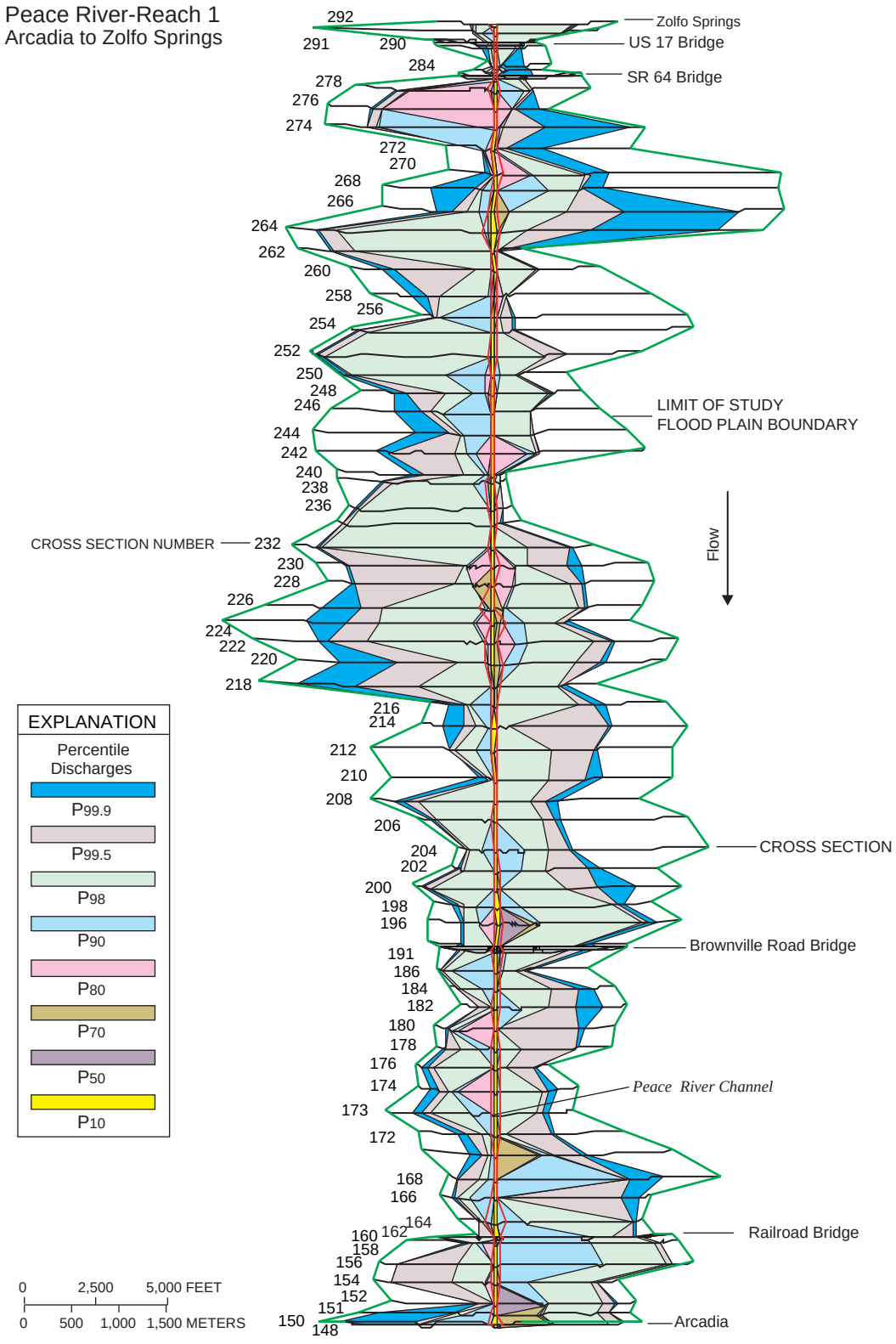


Figure 13. Extent of areal inundation along reach 1 of the Peace River channel and floodplain for selected percentile discharges.

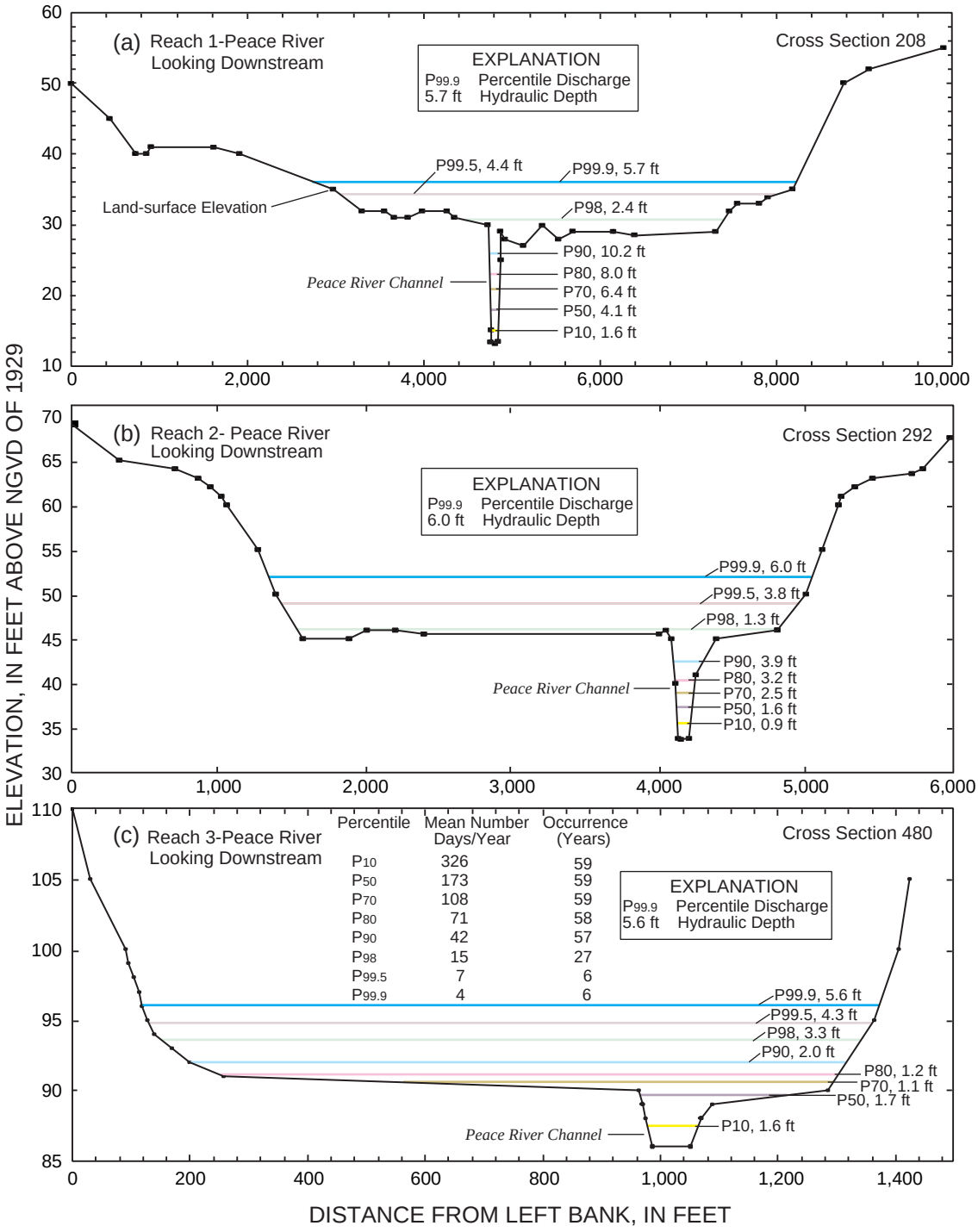


Figure 14. Estimated extent and frequency of areal inundation and hydraulic depth for Peace River cross sections along reaches 1, 2, and 3 for each of the selected percentile discharges.

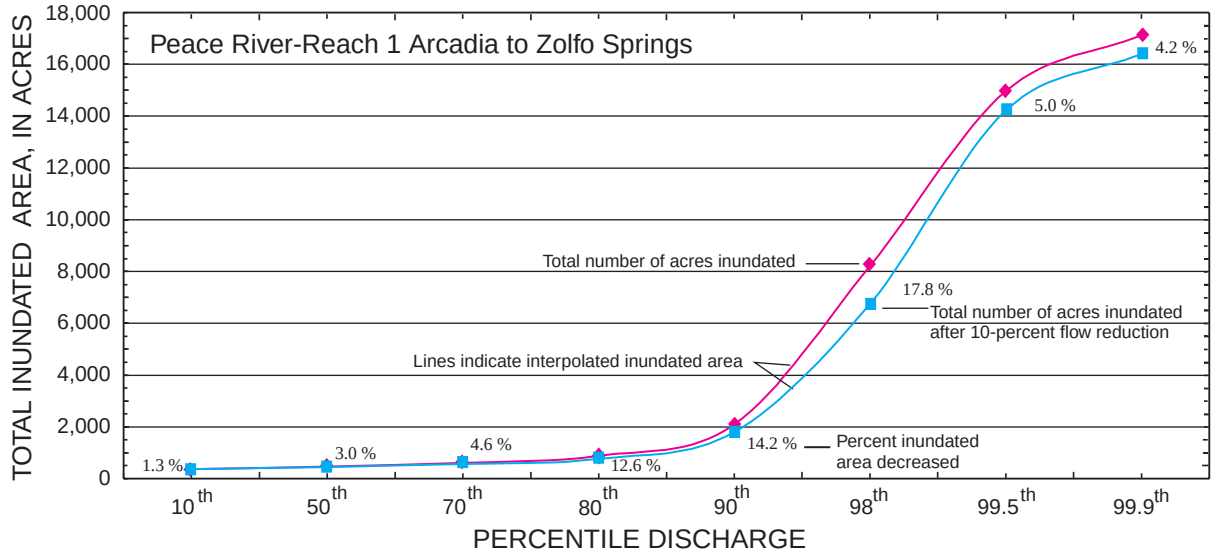


Figure 15. Estimated total inundated area along reach 1 of the Peace River for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

much of the floodplain boundary, which limits the extent of areal inundation during high flows in some areas. This change in topography is the result of elevated reclaimed phosphate-mined landforms constructed along the floodplain corridor boundary.

Hydraulic depths that occur at or below the P_{10} discharge generally are confined to the channel. Mean hydraulic depths ranged from 1.5 to 4.6 ft, and maximum depths ranged from 2.5 to 7.2 ft (app. N). Difference in mean hydraulic depth between successive percentile discharges is less than 1 ft. Example cross section 480 shows the mean number of days per year that a particular hydraulic depth could occur for an expected percentile discharge (fig. 14c). Because the channel generally is poorly incised, the maximum hydraulic depth for reach 3 is 7.2 ft, which is much less than the mean hydraulic depths for reach 1 or reach 2, which are 12 ft (app. F) and 11 ft (app. J), respectively.

Total inundated area within the channel and floodplain ranged from 173 (P_{10}) to 2,828 ($P_{99.9}$) acres (fig. 25 and app. O). Inundated area at or below the P_{10} discharge generally was confined within the channel at most cross sections (fig. 24). The greatest increase in inundated area was from the P_{10} to the P_{50} discharges with 571 acres, which occurred during the transition from channel to floodplain inundation.

Loss of inundated area between the existing step-backwater analysis and the potential step-backwater analysis, ranged from 6.5 (P_{10}) to 99.3 (P_{98}) acres, which corresponds to an approximate 4.0 and 1.1 percent decrease of inundated area, respectively (fig. 25 and app. P). However, the greatest percentage decrease of inundated area occurred at the $P_{50\text{-}10}$ discharge with 12.0 percent. The decrease of inundated area at the $P_{10\text{-}10}$ discharge generally occurred within the channel and was 6.5 acres. The greatest decrease in inundated area was 94.9 and 99.3 acres, which occurred at the $P_{50\text{-}10}$ and $P_{99.9\text{-}10}$ discharges, respectively (fig. 26a-h and app. P). Decreases associated with the $P_{50\text{-}10}$ discharge occur frequently, because the P_{50} discharge averages approximately 173 days per year (table 4). Whereas, the $P_{99.9\text{-}10}$ discharge occurs rarely, approximately once every 10 yrs for an average of 4 days. Decrease of inundated area at the P_{70}, P_{80}, P_{90}, P_{98}, and $P_{99.5}$ discharges were similar, and ranged from 48.1 to 76.7 acres, with a mean decrease of 61.6 acres (app. P).

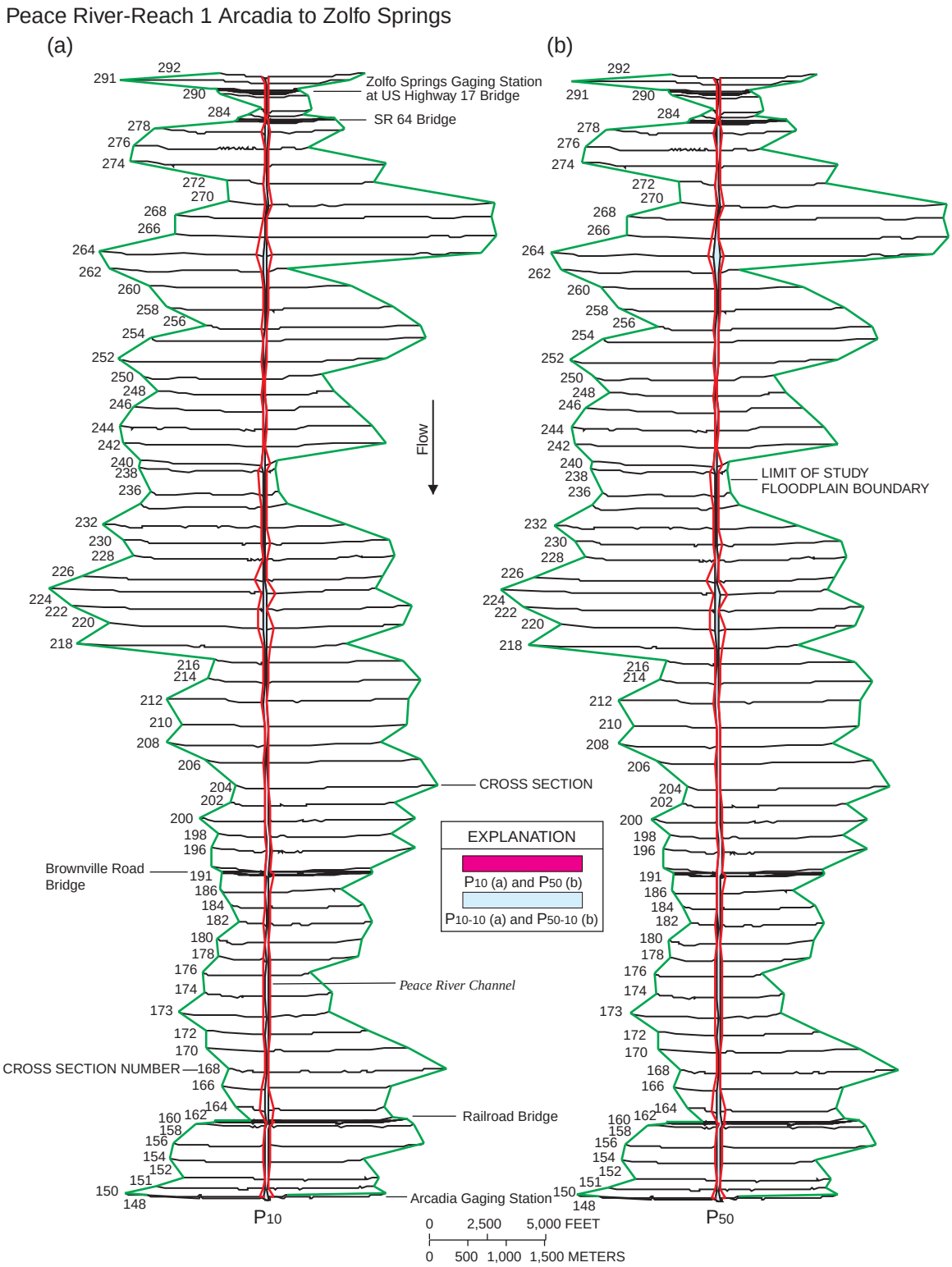


Figure 16. Extent of areal inundation along reach 1 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal.

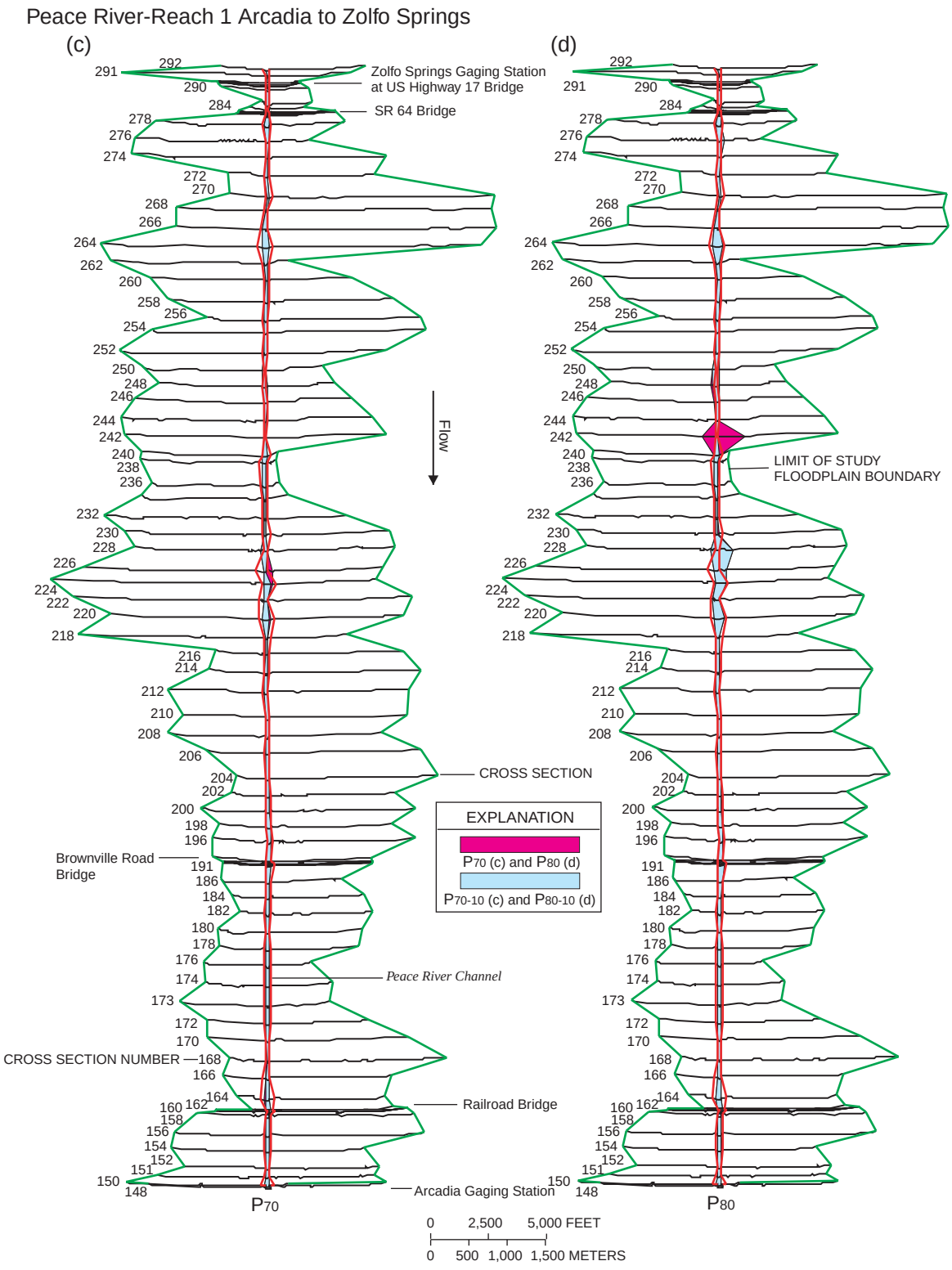


Figure 16. Extent of areal inundation along reach 1 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

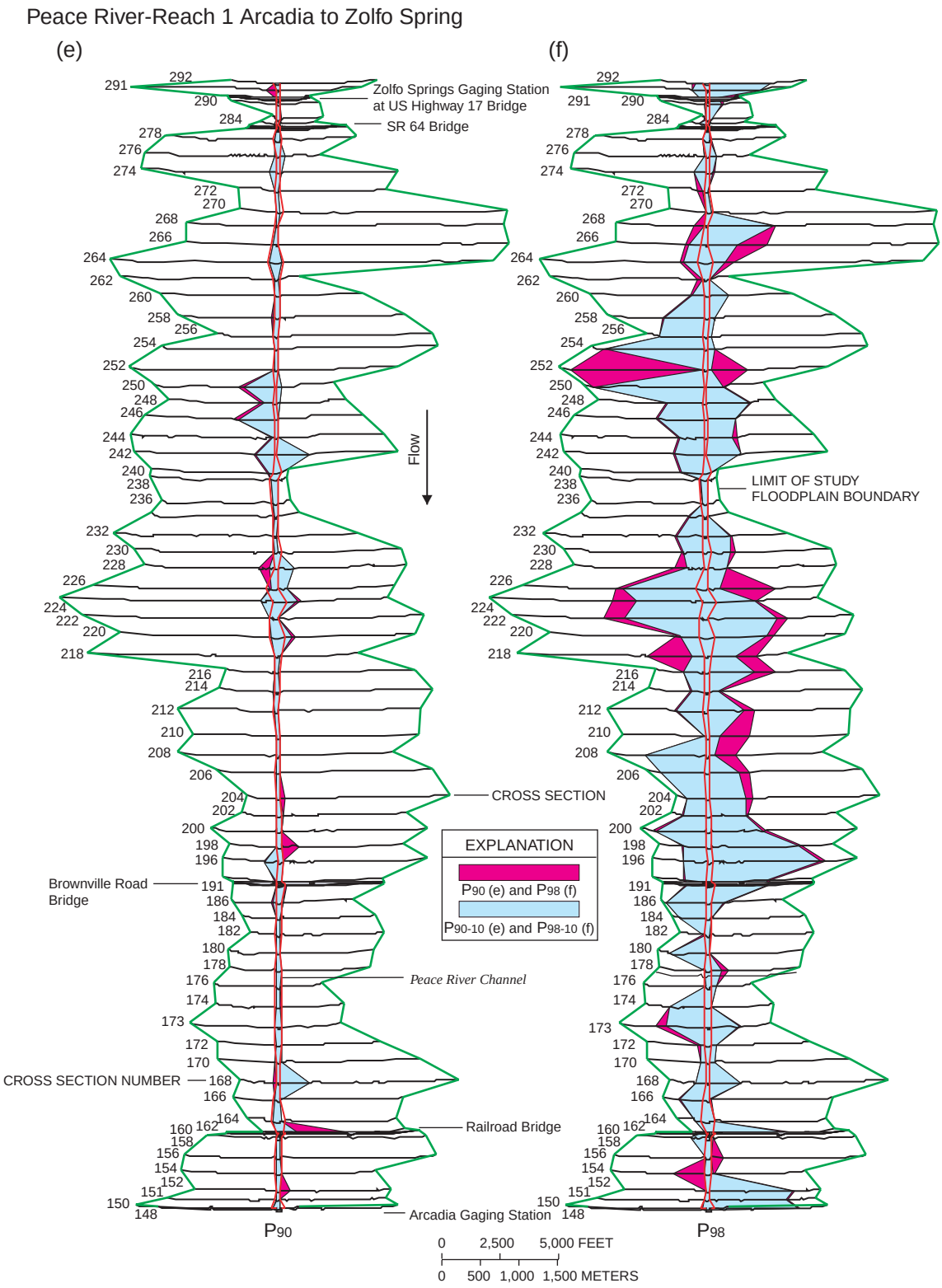


Figure 16. Extent of areal inundation along reach 1 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

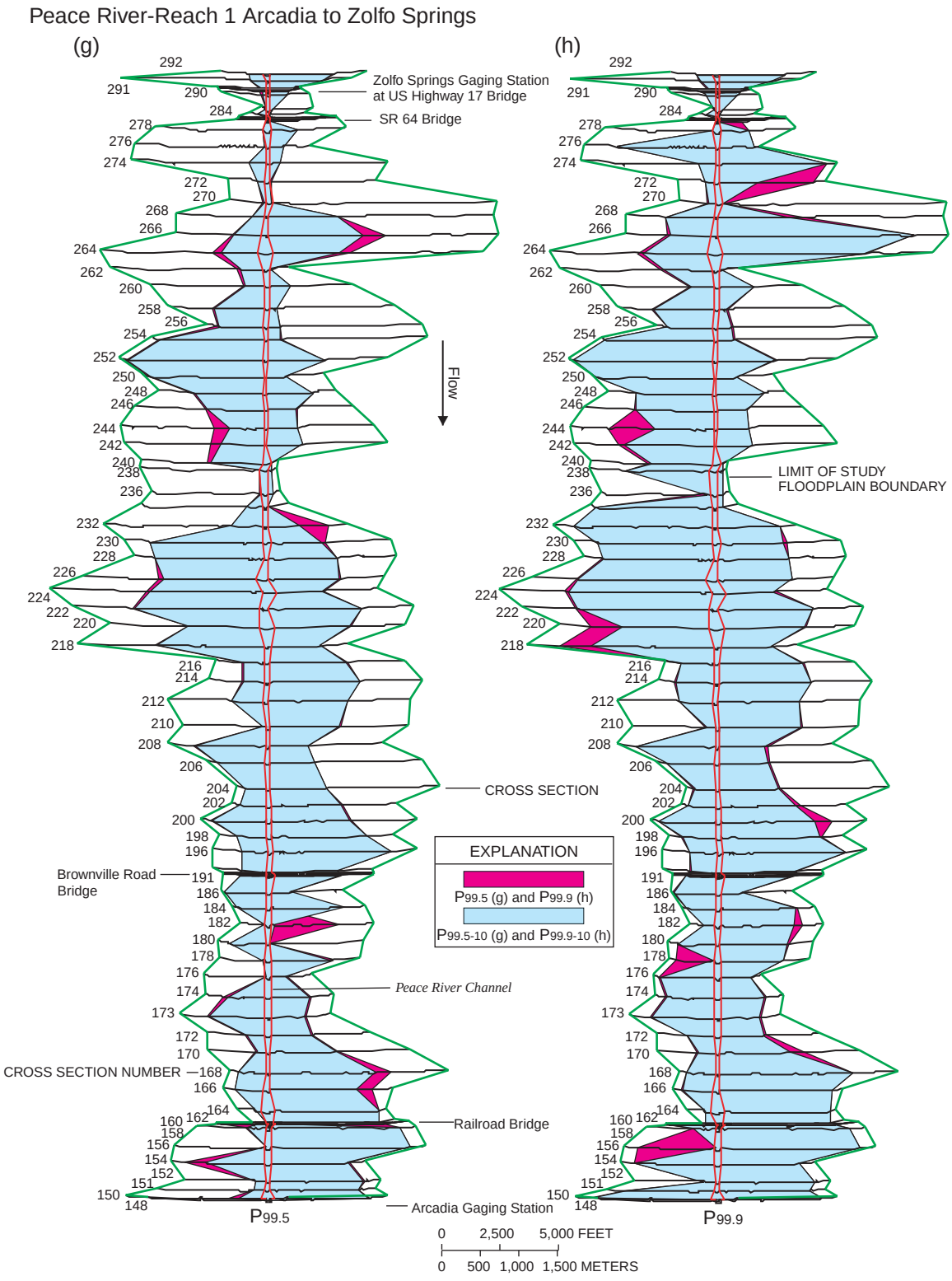


Figure 16. Extent of areal inundation along reach 1 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

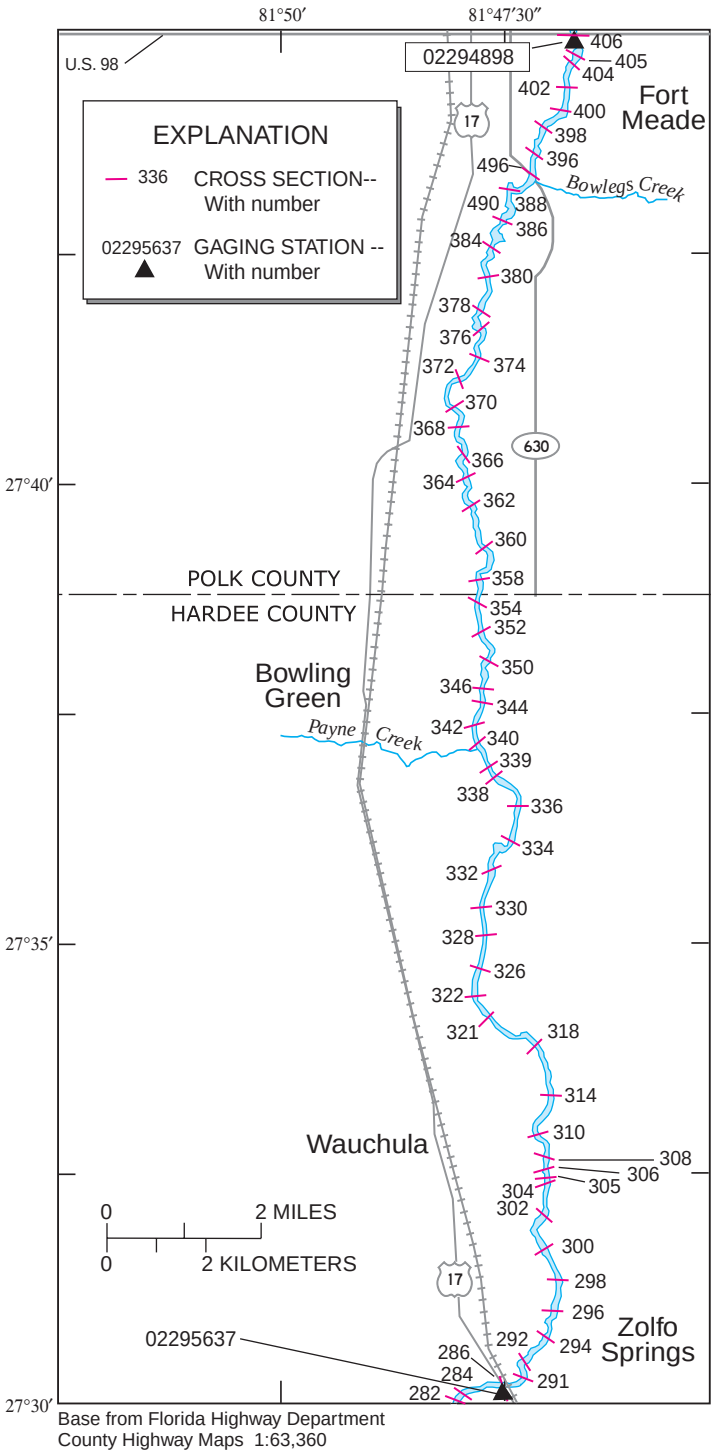


Figure 17. Location of reach 2 and cross sections along the Peace River from Zolfo Springs to Fort Meade, west-central Florida. (Location of study area shown in figures 1 and 10).

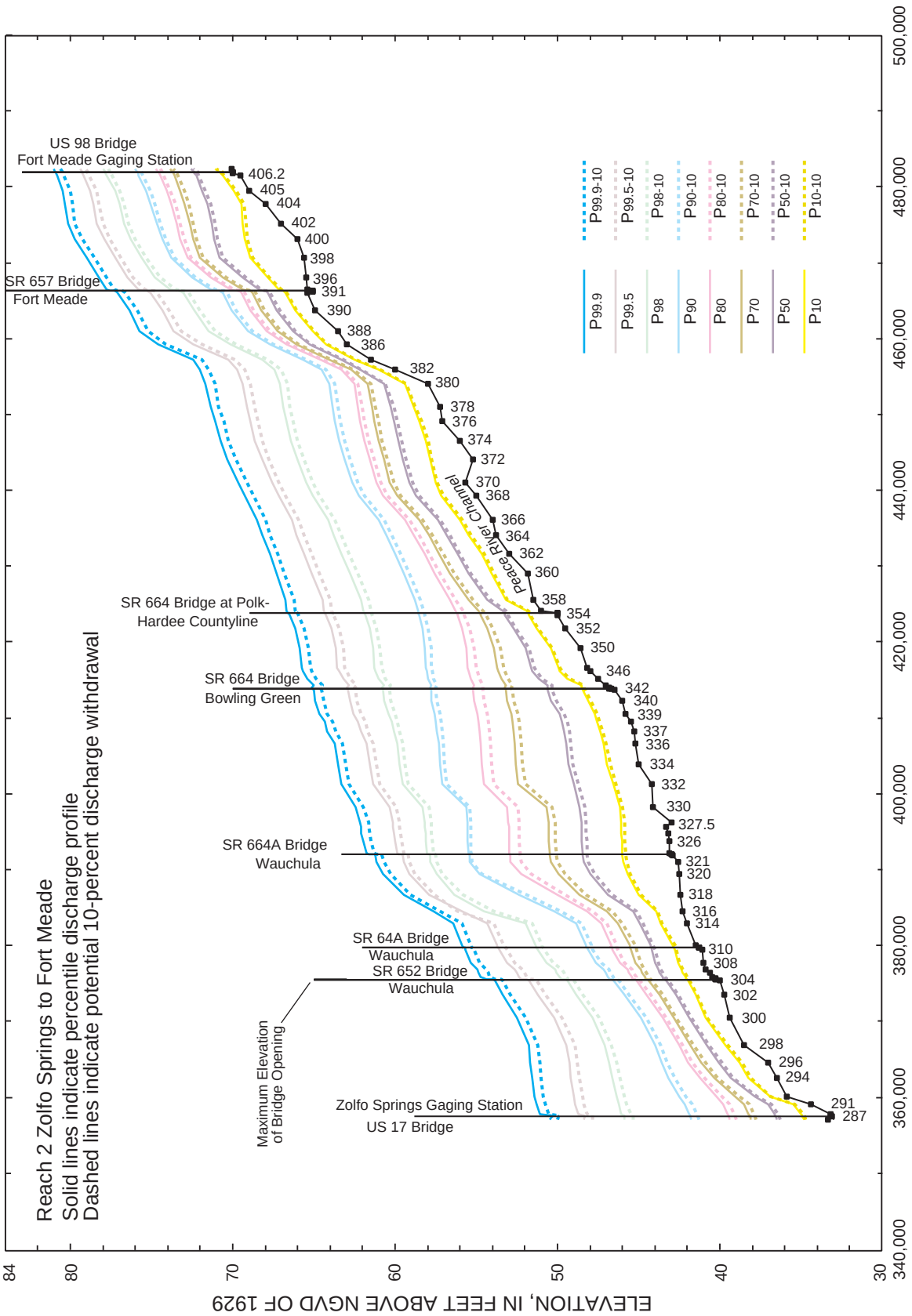


Figure 18. Water-surface profiles along reach 2 of the Peace River for existing conditions and a potential 10-percent discharge withdrawal.

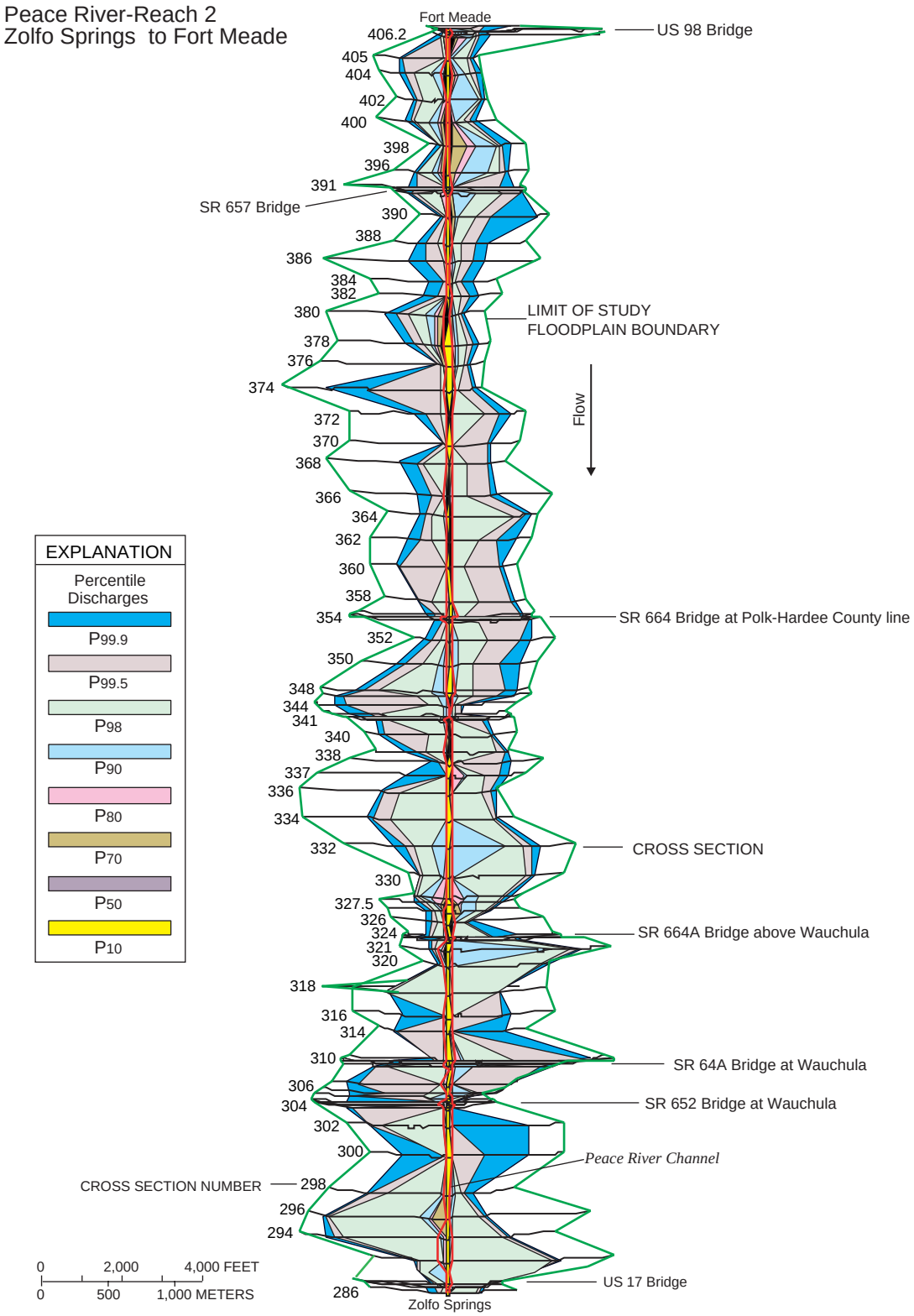


Figure 19. Areal inundation along reach 2 of the Peace River channel and floodplain for selected percentile discharges.

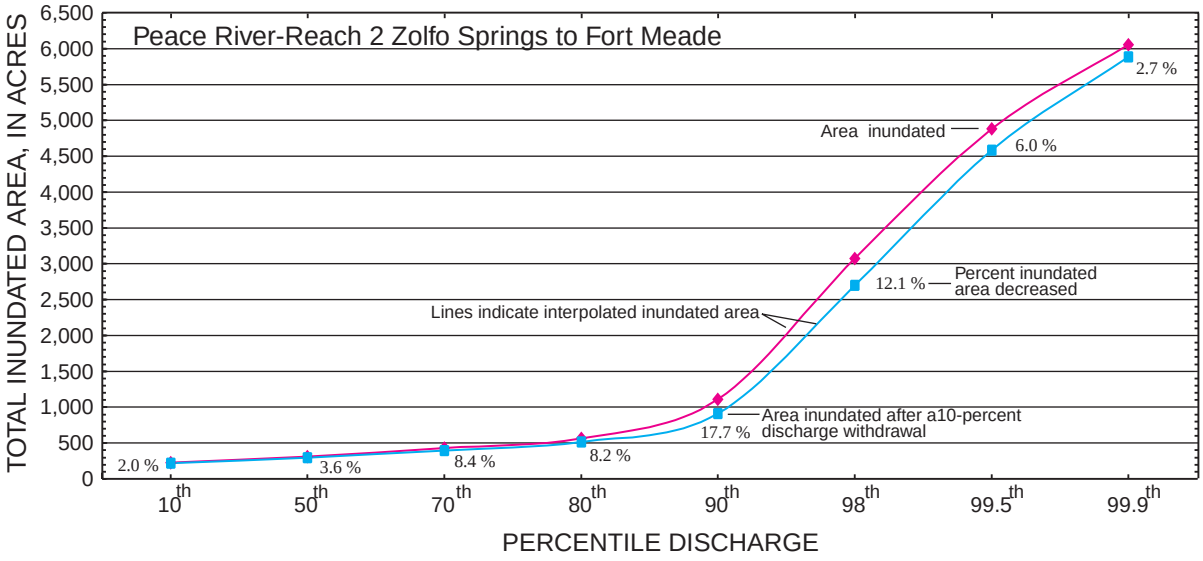


Figure 20. Estimated total inundated area along reach 2 of the Peace River for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

Inundated Area and Effects of Potential Discharge Withdrawals Along the Three Peace River Reaches

Combined area of total inundation for the three reaches of the Peace River, from Arcadia to Bartow, ranged from 775 (P_{10} discharge) to 26,089 ($P_{99.9}$ discharge) acres (fig. 27). The number of inundated acres for each of the reaches is based on differing reach lengths and their channel and floodplain configuration. Areal inundation along reaches 1 and 2, which share similar characteristics, is generally proportional to their channel lengths, 32.2 and 23.6 mi, respectively. However, reach 3 (13.9 mi), which is only 20 percent of the study channel length, has proportionally higher total areal inundation for most percentile discharges, especially the P_{50}, P_{70}, P_{80}, and P_{90} discharges. Because of a poorly incised channel along much of reach 3, areal inundation for the P_{10} discharge was small. Total decrease of inundated area along the Peace River from a potential 10-percent discharge withdrawal, based on the selected percentile discharges, ranged from about 17.1 (P_{10} discharge) to 1,891 (P_{98} discharge) acres, which corresponds to an approximate 2.1 and 13.6 percent decrease of inundated area, respectively.

ALAFIA RIVER SYSTEM

The Alafia River System is defined in this report as the Alafia, North Prong Alafia, and South Prong Alafia Rivers. The Alafia River System drains an approximate 420 mi^2 area of southwestern Polk County and southeastern Hillsborough County (figs. 1 and 28). The two principal tributaries, the North and South Prong Alafia Rivers, join together at the confluence with the Alafia River to form the headwaters.

Alafia River

The Alafia River channel meanders westward for approximately 23 mi, from the confluence with its two tributaries to the mouth. The approximately 335-mi^2 area of the upper Alafia River watershed is drained at the Lithia gage (02301500) at SR 640. Streamflow data have been collected continuously by the USGS at the Lithia gage since 1932. Extremes in daily mean discharge at the gage ranged from 6.6 (1945) to 40,800 ft^3/s (1933). The Alafia River downstream of the Lithia gage is affected by tidally influenced backwater.

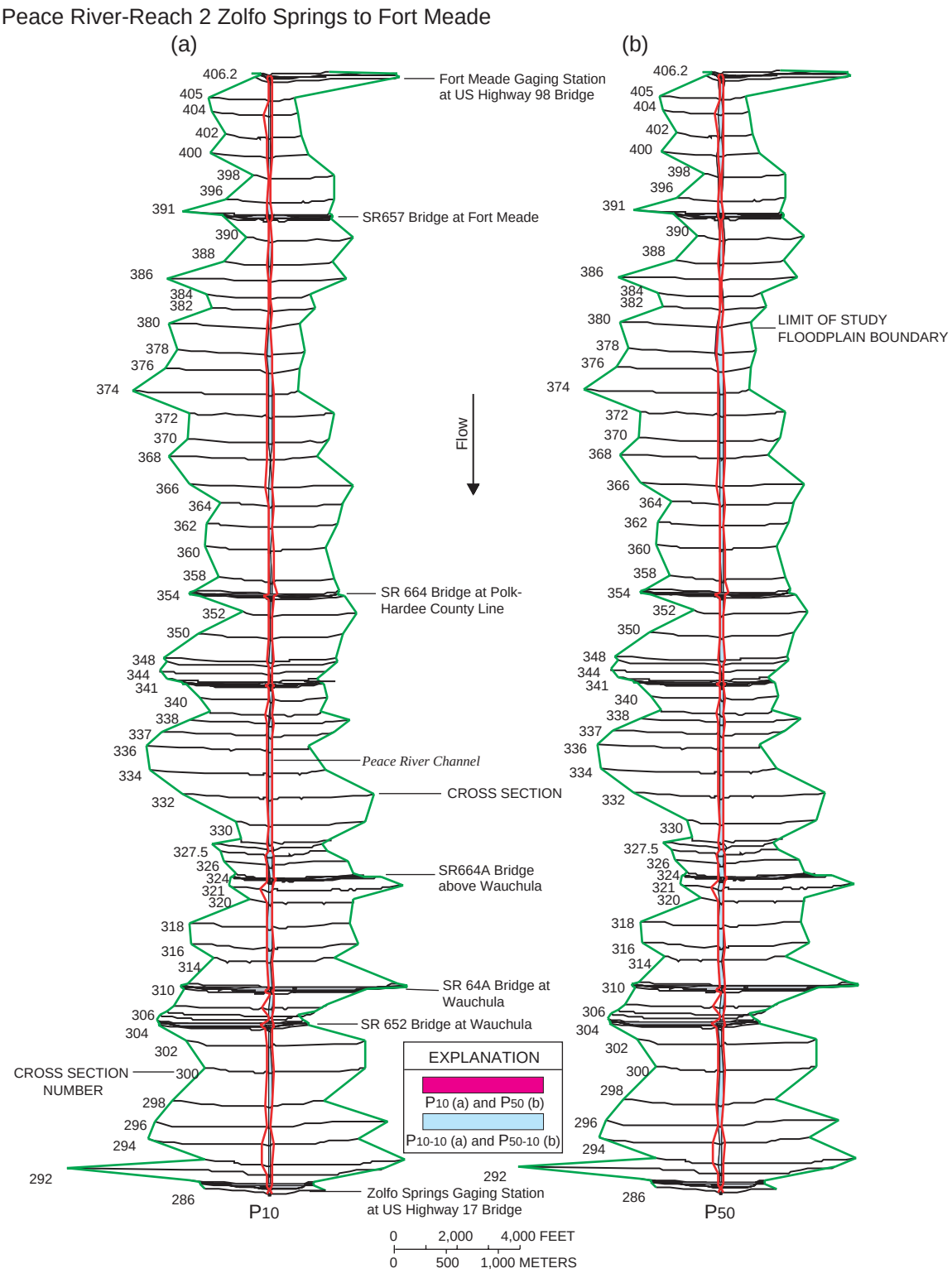


Figure 21. Extent of areal inundation along reach 2 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal.

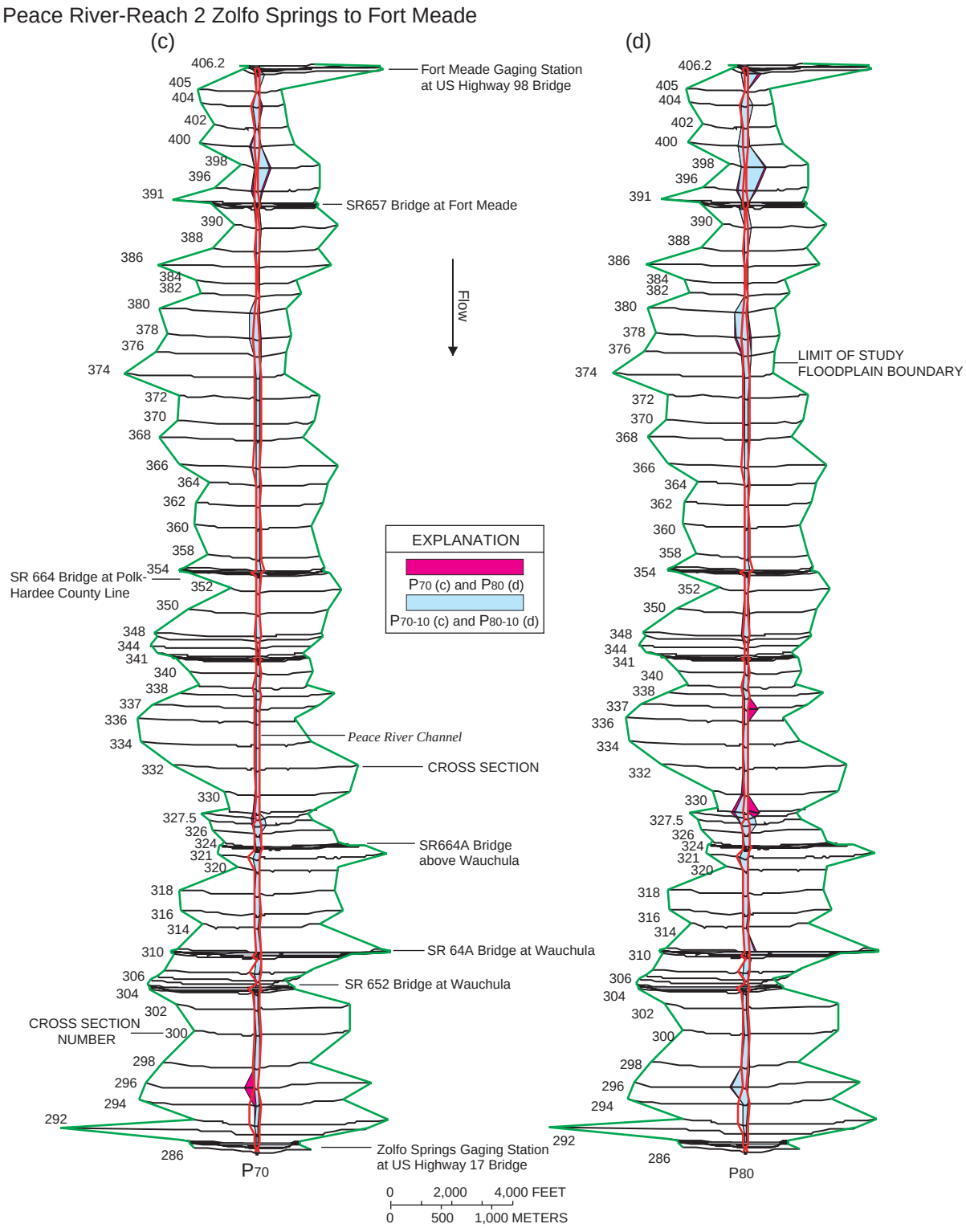


Figure 21. Extent of areal inundation along reach 2 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

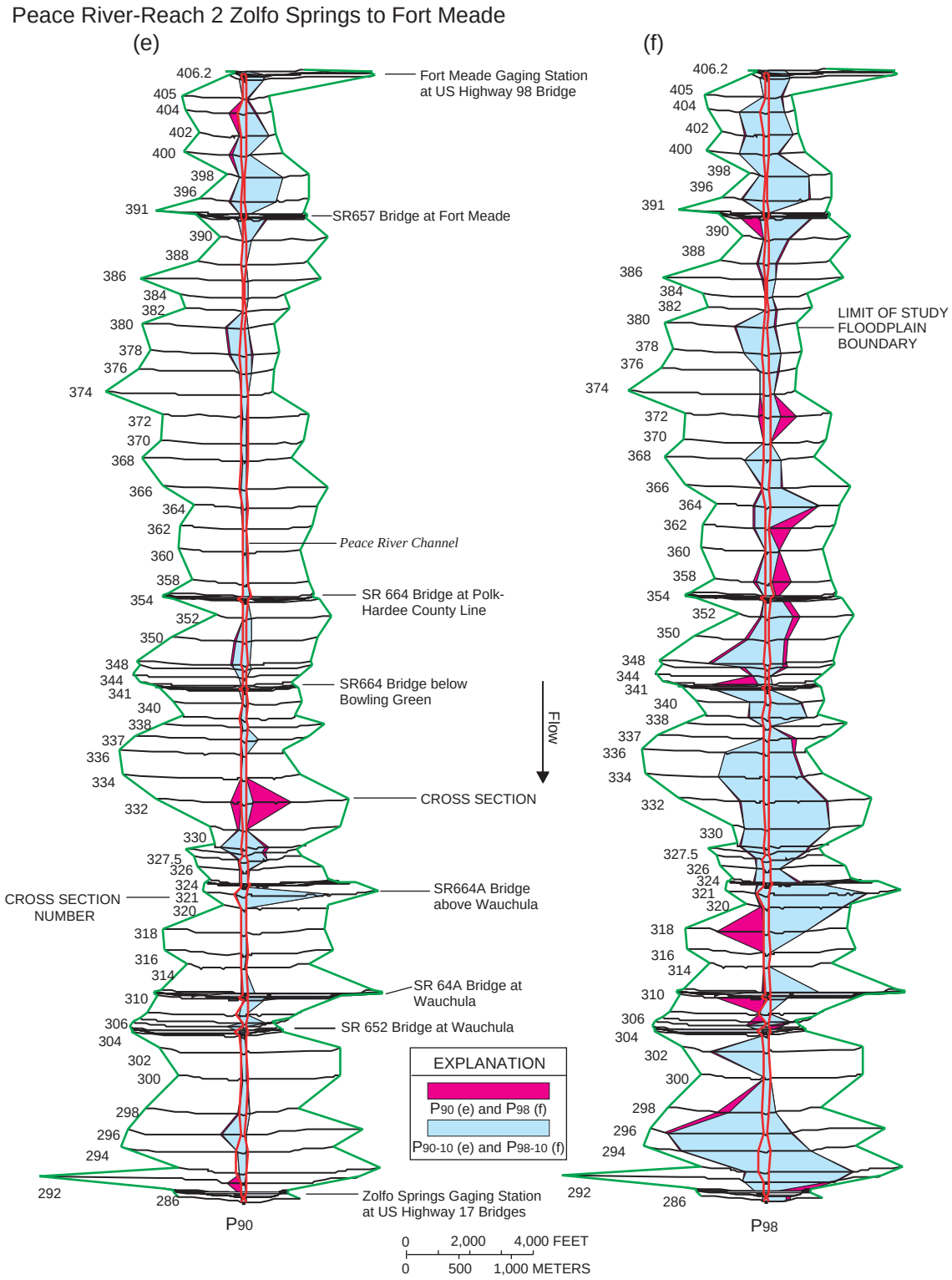


Figure 21. Extent of areal inundation along reach 2 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

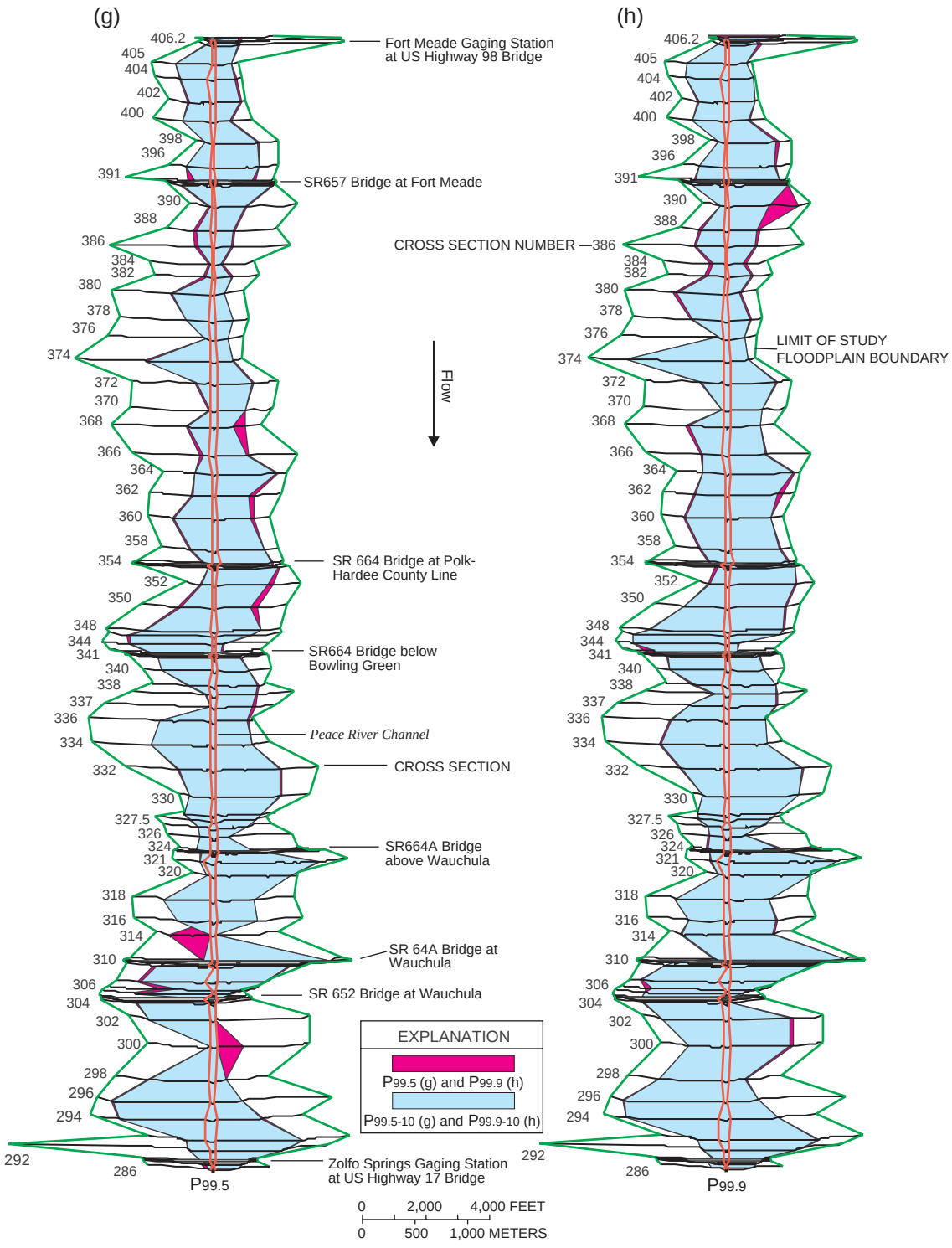


Figure 21. Extent of areal inundation along reach 2 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

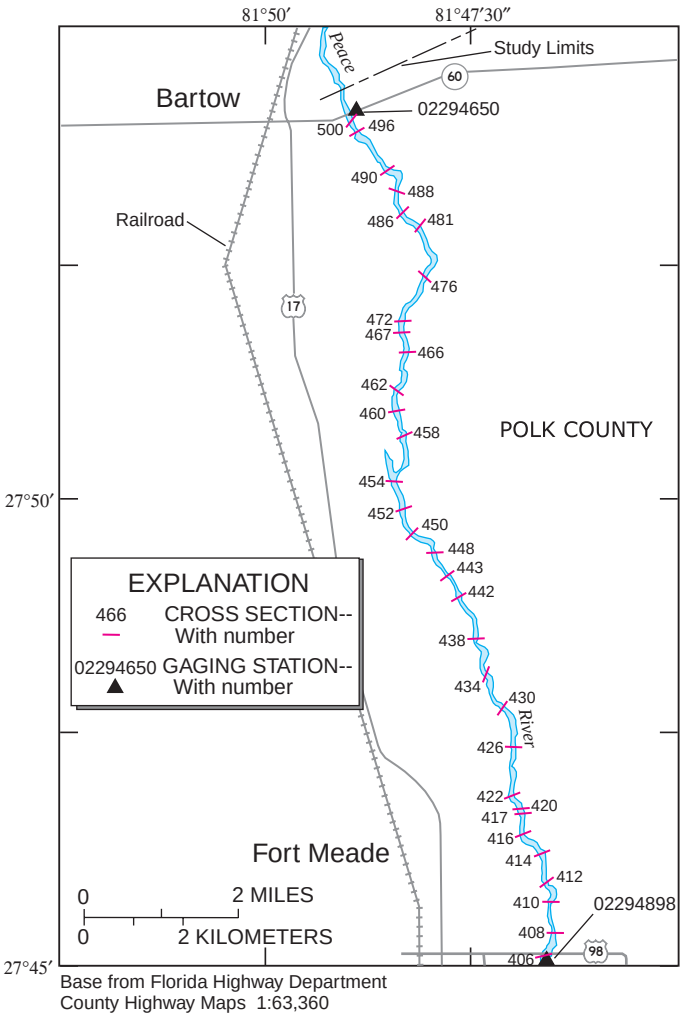


Figure 22. Location of reach 3 and study cross sections along the Peace River from Fort Meade to Bartow, west-central Florida. (Location of study area shown in figures 1 and 10).

The Alafia River study reach extends from SR 640 to the confluence with the North and South Prongs Alafia River. The channel generally is deeply incised and well defined, containing most low-to-moderate-discharge conditions (74.3 ft^3/s at P_{10} to 601 ft^3/s at P_{90}) within the banks. The floodplain corridor width is relatively narrow and uniform along the channel and is defined by high topographic relief at the boundary.

Although generally well defined and deeply incised, the channels along the Alafia, North Prong, and South Prong Alafia Rivers study reaches are delineated on NWI maps as palustrine forested wetlands. Most of the open-water channel of the Alafia River, downstream of the study reach, is classified as riverine wetlands. The floodplain corridor along the Alafia River system is delineated as a palustrine forested wetlands, bounded by uplands.

Step-backwater analysis was performed at 21 cross sections located along a 8.2-mi reach of the Alafia River, from the Lithia gage at SR 640 to the confluence with the North and South Prongs of the Alafia River. Step-backwater analysis was not performed downstream of the Lithia gage because of tidally influenced backwater conditions. Cross sections used for the Alafia River and tributaries were developed by Robertson (1978), except at bridge locations. Step-backwater analysis was based on the selected

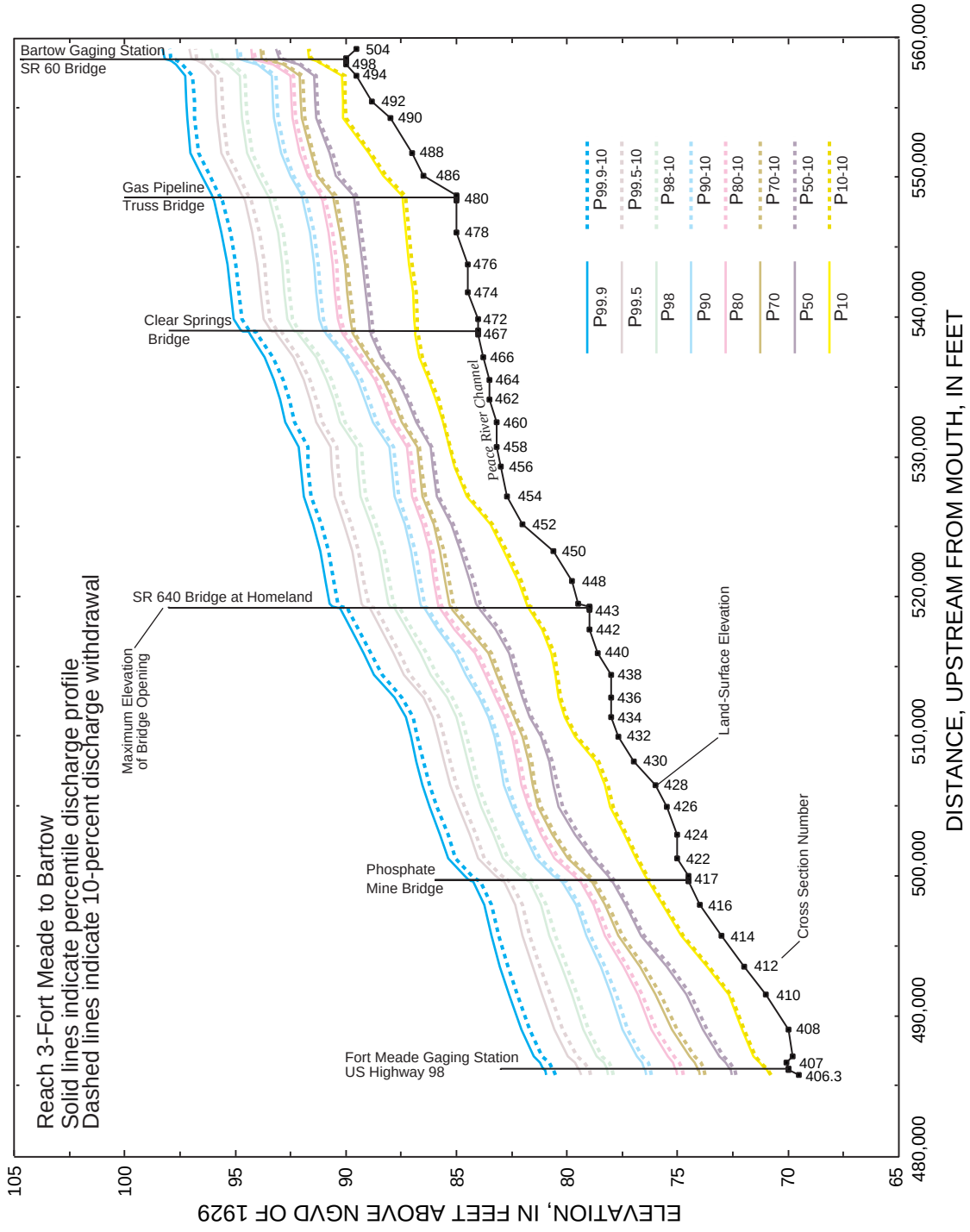


Figure 23. Water-surface profiles along reach 3 of the Peace River for existing conditions and a potential 10-percent discharge withdrawal.

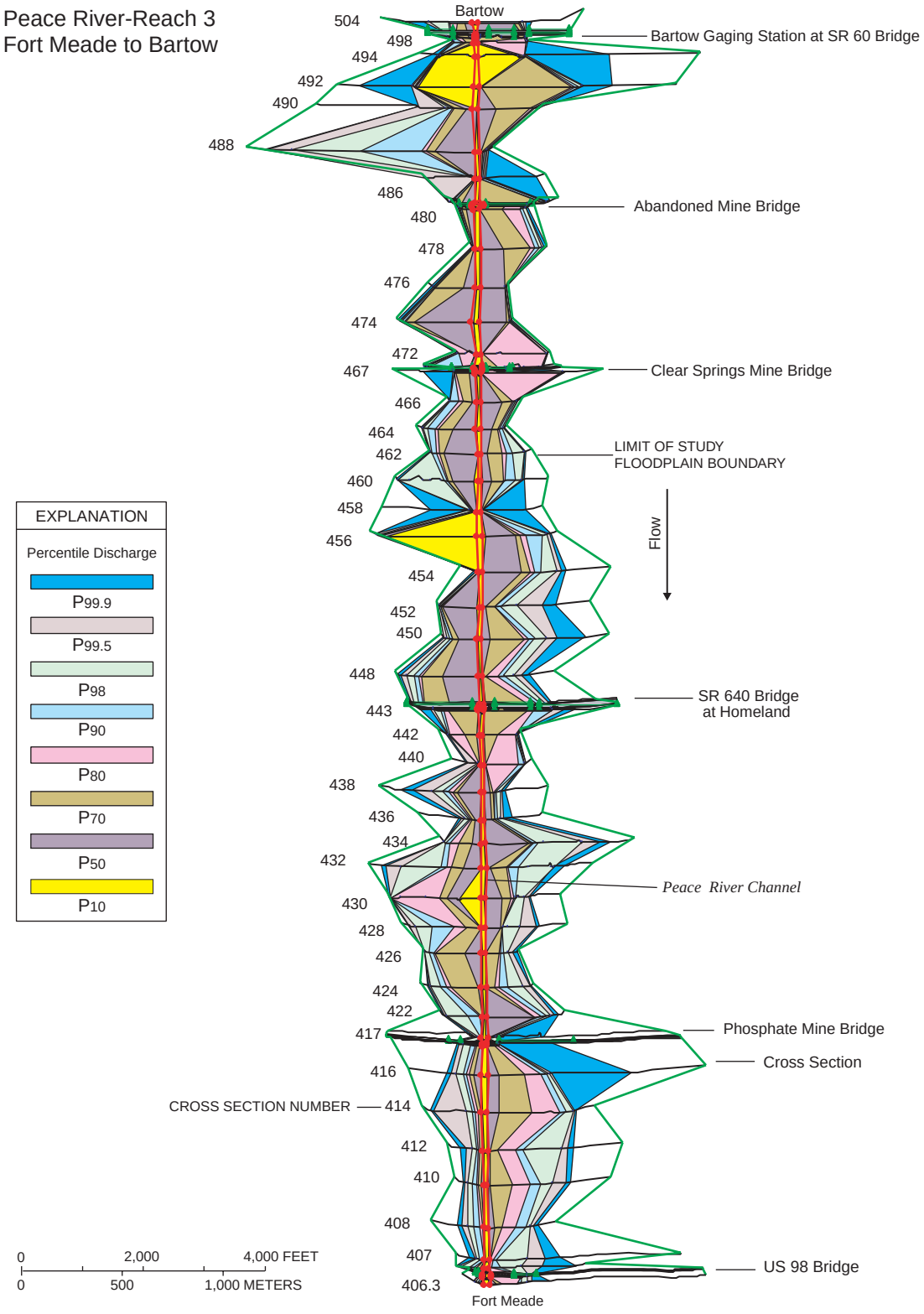


Figure 24. Extent of areal inundation along reach 3 of the Peace River channel and floodplain for selected percentile discharges.

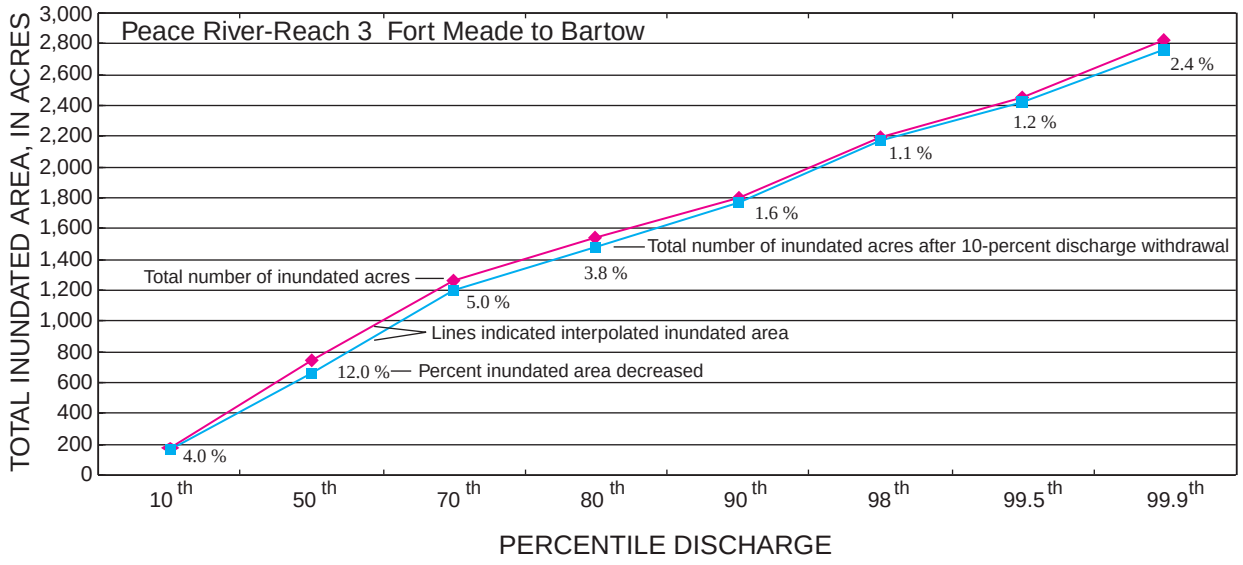


Figure 25. Estimated total inundated area along reach 3 of the Peace River for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

percentile discharges (P_{10}, P_{50}, P_{70}, P_{80}, P_{90}, P_{98}, $P_{99.5}$ and $P_{99.9}$) for the concurrent long-term period, 1964-92, at the Alafia River at Lithia, North Prong Alafia River at Keysville, and South Prong Alafia River near Lithia gages. The period of analysis included only concurrent record through 1992, because the North Prong Alafia River gage was temporarily discontinued during 1993-94. Proportionally reduced discharges were introduced at selected cross sections during the step-backwater analysis to compensate for the decrease in contributing drainage area (table 5). The results of the step-backwater analysis were considered reliable because the computed water-surface profiles converged within 0.5 ft of the stage-discharge relation at the North and South Prong Alafia River gages. Water-surface profiles, extent of areal inundation, and hydraulic depth at the 21 Alafia River cross sections were based on water-surface elevations computed during the step-backwater analysis (fig. 29).

The number of days per year that a specific percentile discharge occurred at Alafia River at Lithia gage was variable. The P_{10}, P_{50}, P_{70}, P_{80}, and P_{90} discharges occurred every year, and ranged from 1 (P_{90}) to 366 (P_{10}) days (table 6). During the 29-year study period, however, the frequency that the P_{98} (19 years), $P_{99.5}$ (16 years), and $P_{99.9}$ (4 years) discharges actually occurred was limited. The mean number of days the discharges occurred for the P_{98}, $P_{99.5}$, and $P_{99.9}$ discharges were 8, 4, and 3 days, respectively.

Maximum extent of floodplain inundation exceeds 3,300 ft (cross section 77) during $P_{99.9}$ discharge (3,820 ft^3/s) (fig. 30 and app. Q). Mean inundation width, based on the 21 cross sections, range from 61 ft (P_{10}) to 2,081 ft ($P_{99.9}$). The incised channel generally confines most discharges at or below the P_{90} discharge (601 ft^3/s) (table 5). Mean inundation width at the P_{90} discharge (132 ft) may approximate the bankfull channel width. A large increase in mean inundation occurs in the transition from channel to floodplain during the P_{90} (132 ft) to the P_{98} (942 ft) discharge. A comparison of the maximum extent of areal inundation for the selected percentile discharges at each cross section is shown in figure 30. However, the figure does not indicated the existence of elevated land surface along the cross section that may be completely inundated during high-flow periods or may form islands during low-flow periods, thus reducing the actual distance inundated. Appendix Q presents the actual distance, in feet, each cross section is inundated.

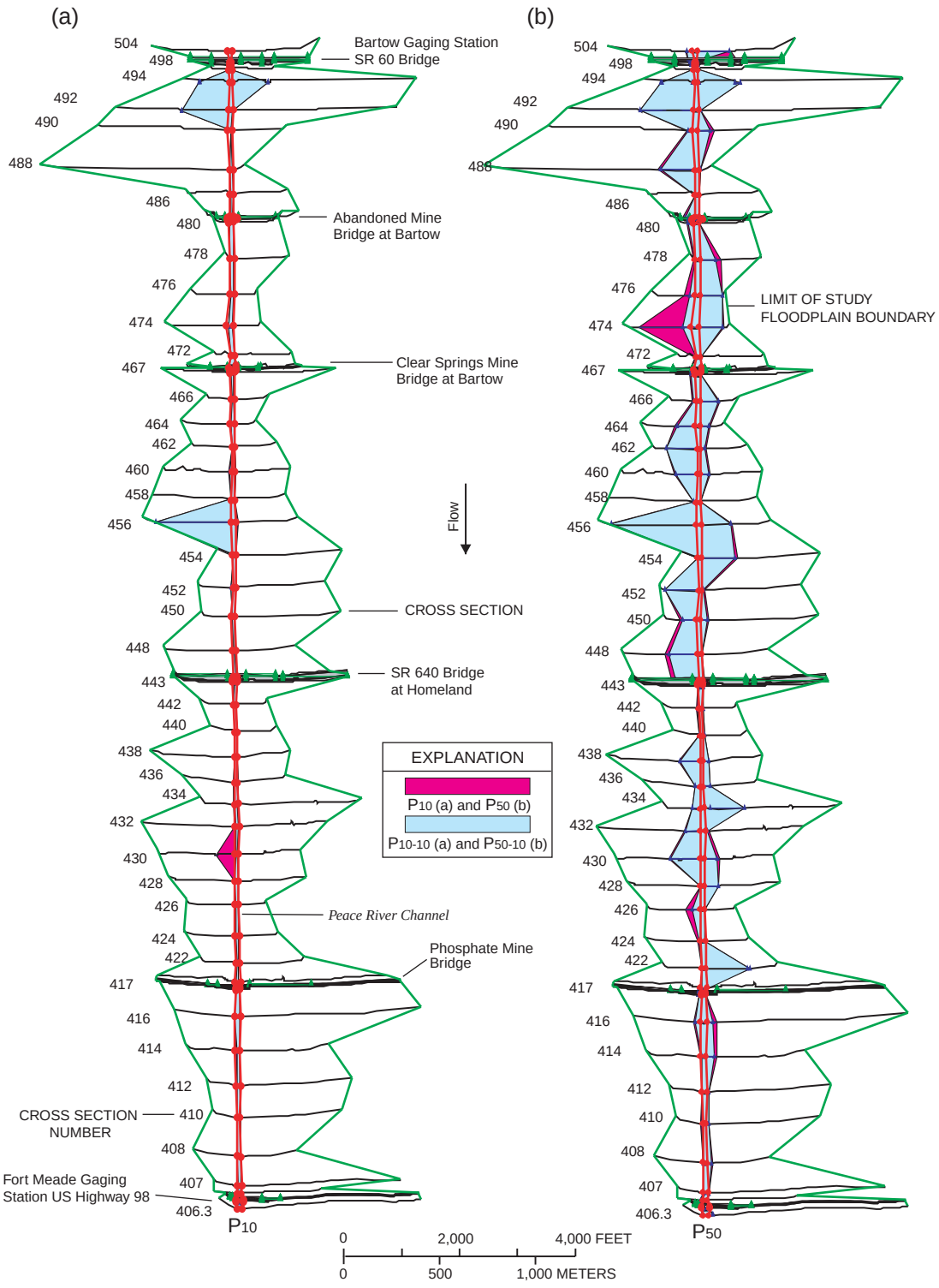


Figure 26. Extent of areal inundation along reach 3 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal.

Peace River-Reach 3 Fort Meade to Bartow

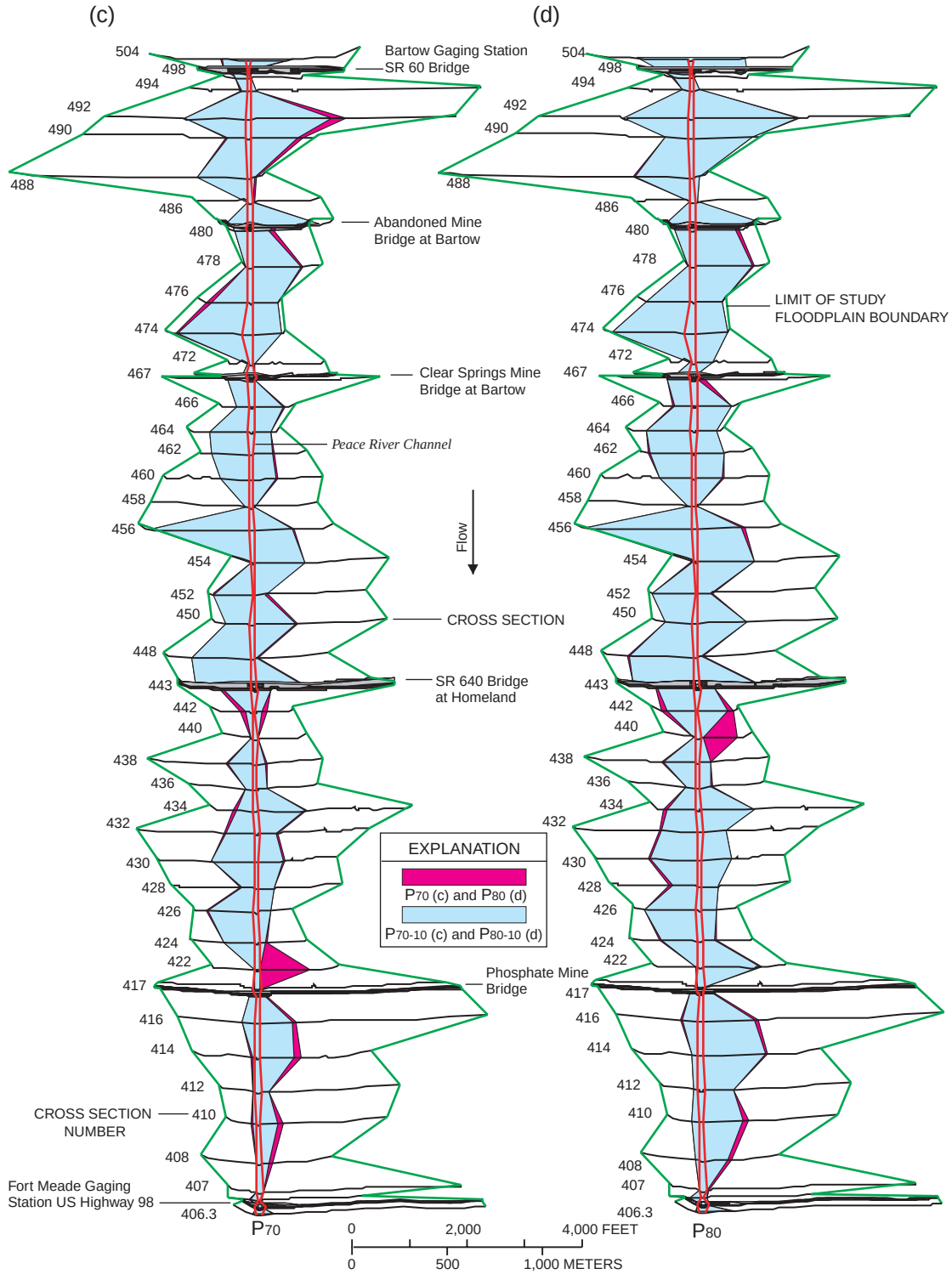


Figure 26. Extent of areal inundation along reach 3 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

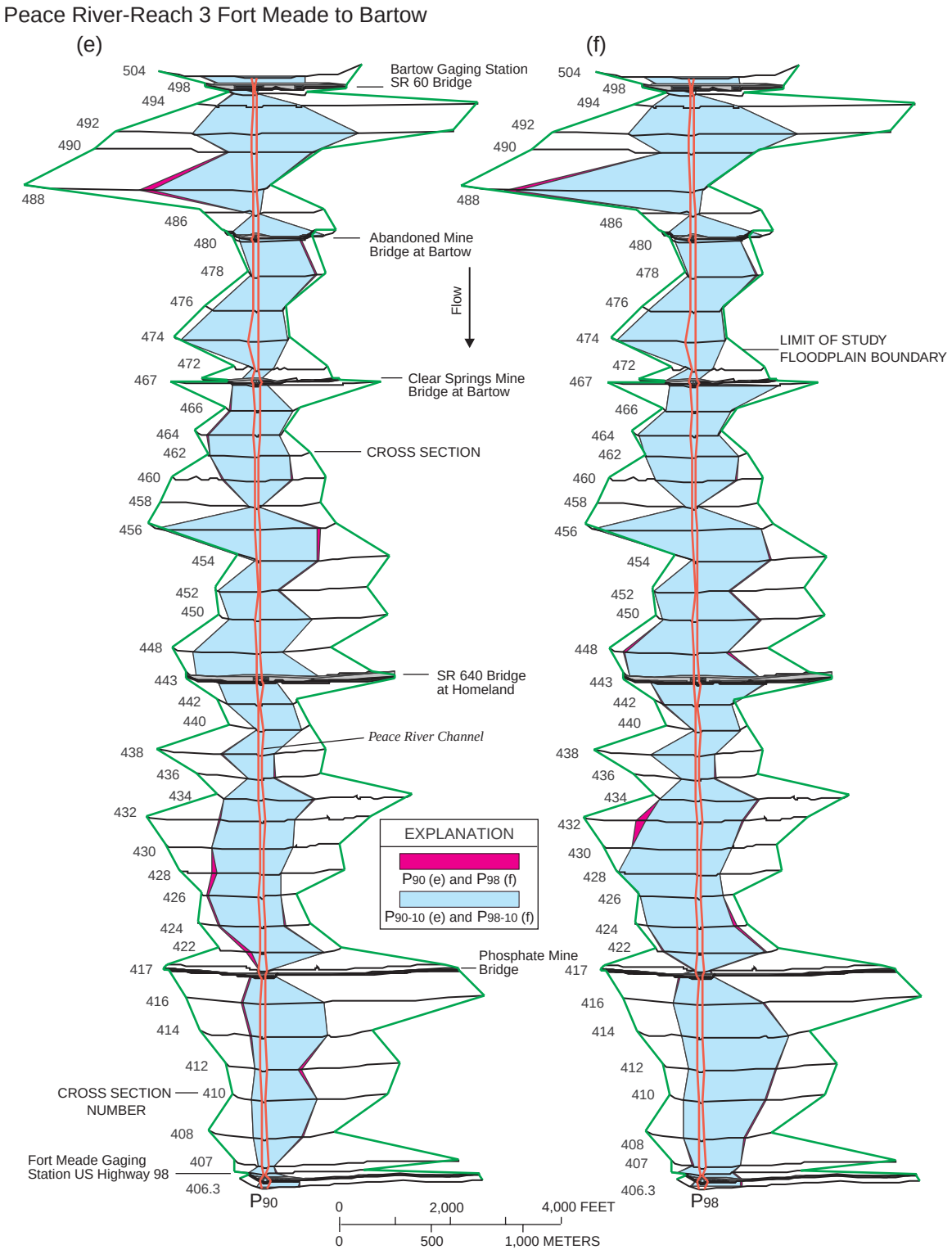


Figure 26. Extent of areal inundation along reach 3 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

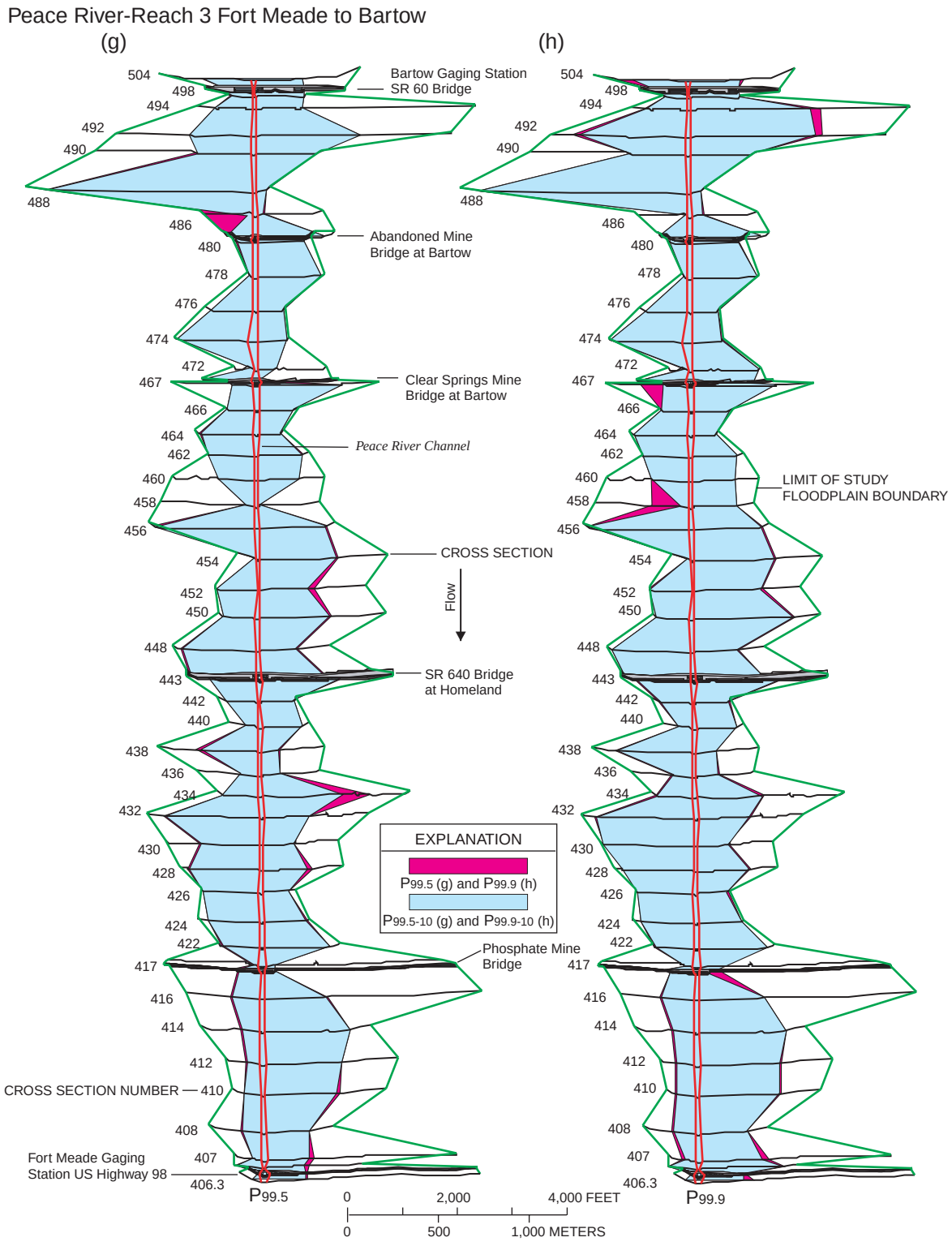


Figure 26. Extent of areal inundation along reach 3 of the Peace River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

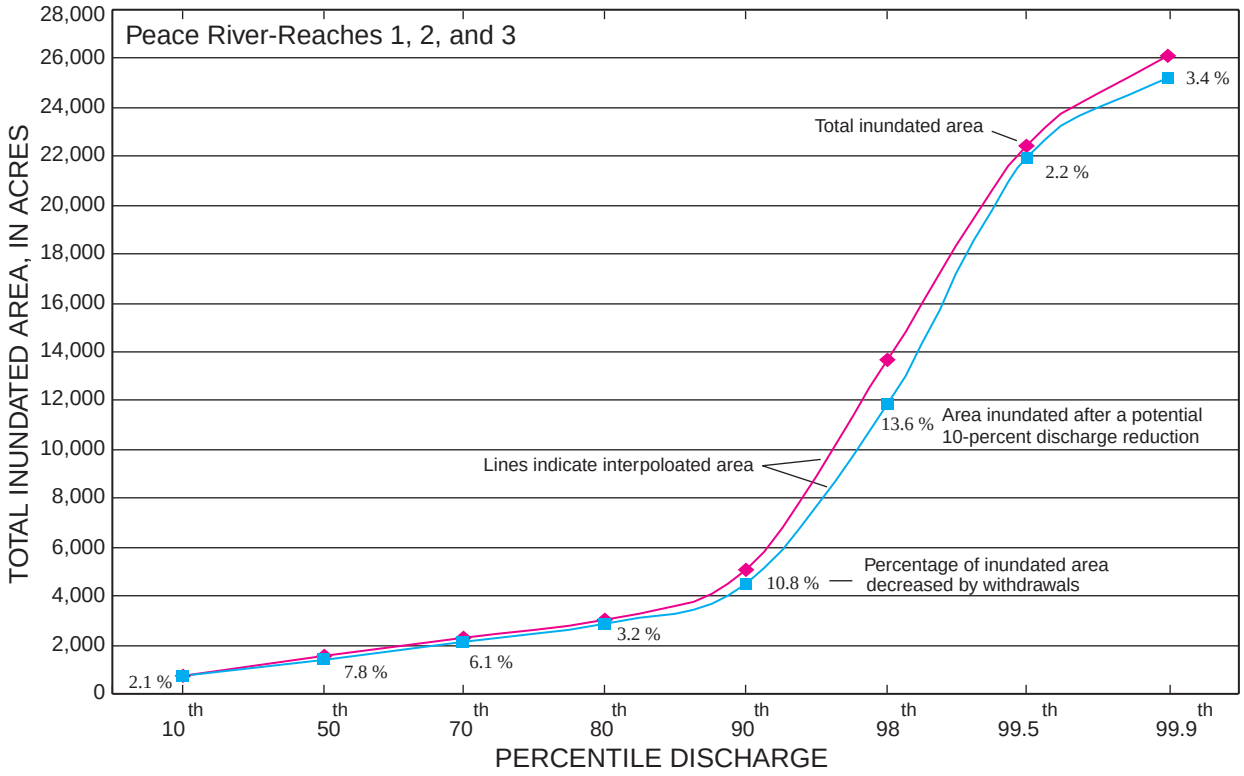
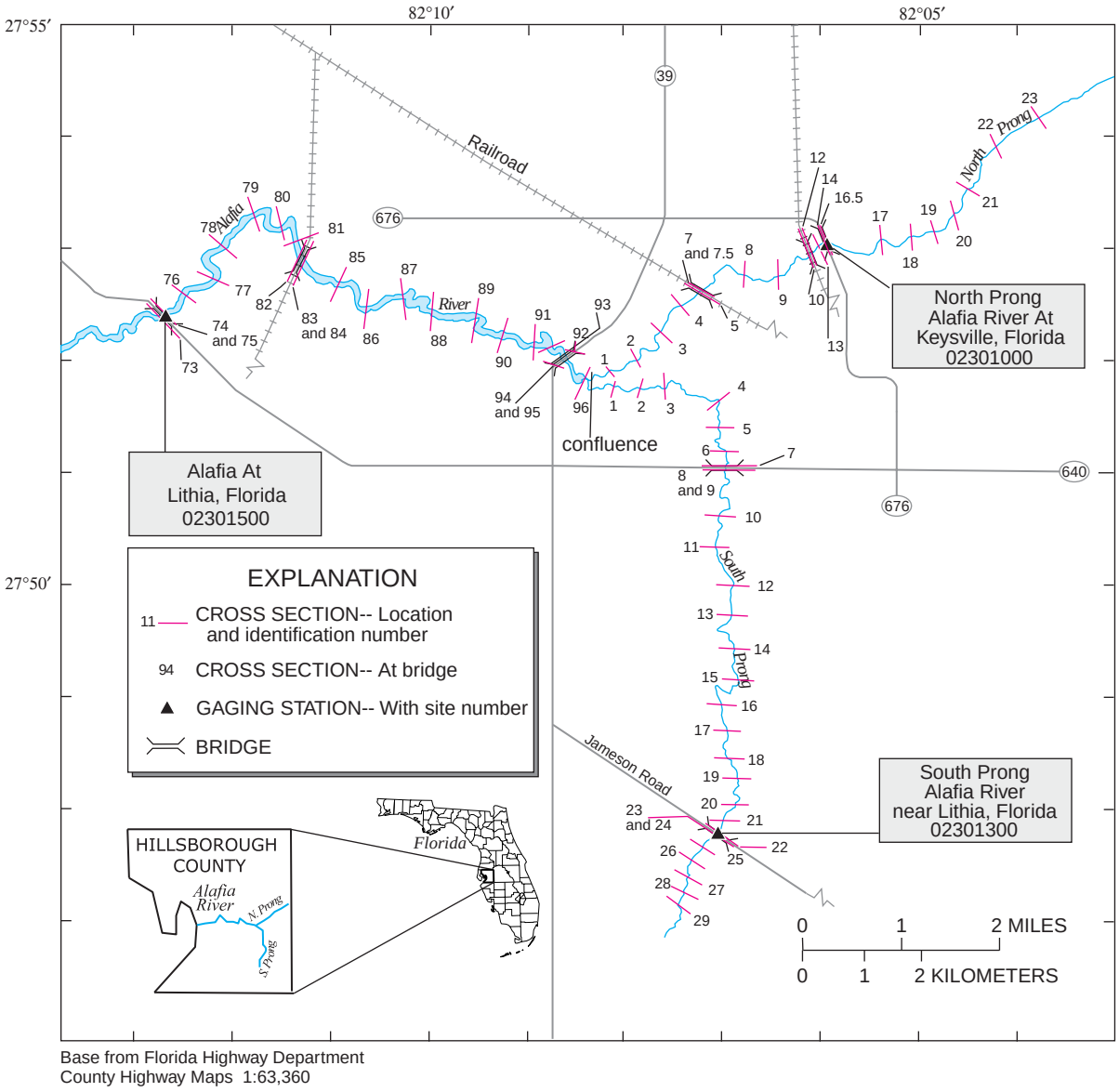


Figure 27. Estimated total inundated area along the three reaches of the Peace River for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

Example cross section 79 shows that percentile discharges at or below the P_{98} discharge (1,418 ft^3/s) are confined to the channel, and those above can inundate the floodplain (fig. 31a and table 5). At cross section 79, the extent of inundation at the $P_{99.5}$ discharge (2,417 ft^3/s) was approximately 1,500 ft, which occurred only 16 times during the 29-year study period, for an average of 4 days each time. Because the deeply incised channel contains most discharges, widespread inundation of the study reach floodplain may occur for a few days about every other year.

Maximum hydraulic depths ranged from 3.4 to 9.2 ft, and mean depths ranged from 1.8 to 4.8 ft. The hydraulic depth at the P_{90} discharge generally is confined to the channel (app. R). Total inundated area within the channel and floodplain ranged from 53 (P_{10}) to 1,445 ($P_{99.9}$) acres (fig. 32 and app. S). Inundated area below the P_{90} discharge (601 ft^3/s) generally was confined within the channel (fig. 30, and table 5). The difference in inundated area from the P_{10} to the P_{90} discharges was approximately 50 acres, which largely included the channel. However, the inundated area from the P_{90} to the P_{98} discharges (577 acres) and from the P_{98} to the $P_{99.5}$ discharges (469 acres) largely included the floodplain (app. S).

Total inundated area along the Alafia River for the period of streamflow record, 1964-92, was compared to inundated area resulting from a 10-percent discharge withdrawal. The decrease in inundated area between the existing conditions step-backwater analysis and the potential withdrawal step-backwater analysis ranged from approximately 1 (P_{10}) to 90 ($P_{99.9}$) acres, which approximate a 1.0 and 4.0 percent decrease of inundated area, respectively (fig. 32 and app. T). However, the greatest percentage decrease of inundated area occurred at the $P_{90\text{-}10}$ discharge with 19.6 percent. A decrease in inundated area at or below the $P_{90\text{-}10}$ discharge generally occurred within the channel and ranged from 0.7 to 20.6 acres (fig. 33a-h). The greatest decrease of inundated area occurred at the $P_{99.9\text{-}10}$ discharge with 89.5 acres (app. T).



Base from Florida Highway Department
County Highway Maps 1:63,360

Figure 28. Location of the Alafia, North Prong Alafia, and South Prong Alafia Rivers and cross sections, west-central Florida. (Location of study area shown in figure 1).

North Prong Alafia River

The North Prong Alafia River, a major tributary to the Alafia River, drains approximately 140 mi^2. The river flows in a southwesterly direction along an approximate 9.5-mi-long study reach, from cross section 23 to the confluence with the Alafia and South Prong Alafia Rivers (figs. 1 and 28). An approximate 135-mi^2 area of the North Prong Alafia River watershed is drained at the Keysville gage (02301000) at SR 676. Discharge data have been collected continuously at the Keysville gage by the USGS from 1950-92 and from 1995 to the present. Extremes in daily mean discharge at the Keysville gage ranged from 3.9 (1952) to 8,200 ft^3/s (1960). The channel along the study reach generally is deeply incised and well defined, confining all but the highest discharges within the banks.

Step-backwater analysis was performed at 22 cross sections along the North Prong Alafia River study reach, from the mouth (confluence) to cross section 23. The step-backwater analysis was based on the selected percentile discharges (P_{10}, P_{50}, P_{70}, P_{80},

Table 5. Cross sections, drainage area, and percentile discharges used in step-backwater analysis based on the concurrent period 1964-92 at the Alafia, North Prong Alafia, and South Prong Alafia Rivers gages

[ft^3/s, cubic feet per second; mi^2, square miles]

Cross-section range	Drainage area (mi^2)	Discharge (ft^3/s)							
		P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
Alafia River at Lithia									
[1]73-84	335	74.3	184	297	404	601	1,418	2,417	3,820
85-95	285	62.6	172	275	363	544	1,348	2,272	3,717
96-[2]1	275	60.2	170	271	355	532	1,334	2,242	3,696
North Prong Alafia River at Keysville									
1-14	140	38.3	98	147	185	270	683	1,175	1,906
[3]16-20	135	36.9	94	142	178	260	659	1,133	1,838
21-23	130	35.5	90	136	172	251	635	1,091	1,770
South Prong Alafia River near Lithia									
1-6	135	22	72	124	170	262	651	1,067	1,790
6.5-12	130	21	70	119	164	253	627	1,028	1,724
13-22	122	19.8	65	112	154	237	588	965	1,618
[4]24-29	107	17.4	57	98	135	208	516	846	1,419

[1]Alafia River at Lithia gage.
[2]Confluence with section 1 of the North and South Prong Alafia Rivers.
[3]North Prong Alafia River gage at Keysville.
[4]South Prong Alafia River near Lithia.

P_{90}, P_{98}, $P_{99.5}$ and $P_{99.9}$) for the concurrent long-term period 1964-92 at the Alafia River at Lithia, North Prong Alafia River at Keysville, and South Prong Alafia River near Lithia gages. The step-backwater analysis began at the Alafia River at Lithia gage and progressed upstream to the confluence with the North and South Prong Alafia Rivers. At the confluence and selected upstream cross sections, discharge was reduced to reflect the smaller contributing drainage area size (table 5). Step-backwater computations continued upstream along the North Prong Alafia River for approximately 4 mi to the Keysville gage at SR 676, then continued to termination at cross section 23. Water-surface profiles, extent of inundation, and hydraulic depth were based on the computed water-surface elevations for the selected discharge percentiles (fig. 34).

Estimated floodplain inundation exceeds 1,900 ft (cross section 16.5) during $P_{99.9}$ discharge (1,906 ft^3/s) (app. Q). Mean inundation width, based on the 22 cross sections, ranges from 68 ft (P_{10}) to 1,237 ft ($P_{99.9}$). The incised channel along much of the reach generally confines most flows at or below the P_{80} discharge (185 ft^3/s) upstream and the P_{90} discharge (270 ft^3/s) downstream of the gage (fig. 35 and table 5). The mean inundation width at the P_{80} discharge (160 ft) may approximate the mean width of the channel. The greatest increases in the extent of mean areal inundation, approximately 406 ft, occurs between the P_{90} (258 ft) to the P_{98} (664 ft) discharge (app. Q). A comparison of the maximum extent of areal inundation for the selected percentile discharges at each cross section is shown in figure 35. However, the figure does not indicated the existence of elevated land surface along the cross section that may be completely inundated during high-flow periods or may form islands during low-flow periods, thus reducing the actual distance inundated. Appendix Q presents the actual distance, in feet, each cross section is inundated.

Percentile discharges below P_{98} (683 ft^3/s) at example cross section 17 generally are confined within the channel, and those percentiles at or above P_{98} may inundate the floodplain (fig. 31b and table 5). The approximate mean number of days that inundation of the floodplain occurs at the P_{98} discharge is 8 days per year based on the Alafia River at Lithia gage (table 6). During the 29-year study period, discharge conditions at the P_{98} occurred 19 times.

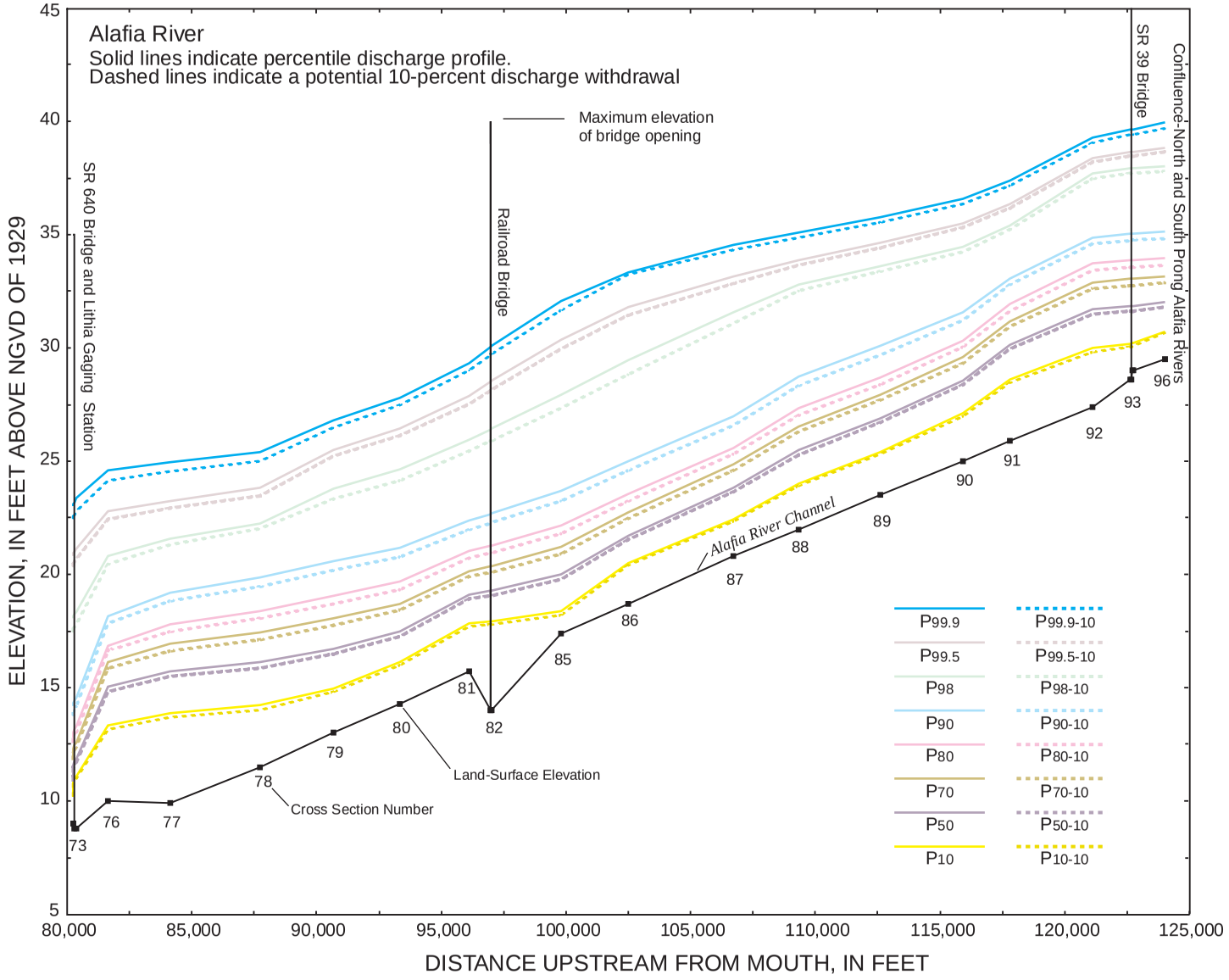


Figure 29. Water-surface profiles along the Alafia River for existing conditions and a potential 10-percent discharge withdrawal, from the SR 640 bridge to the confluence with the North and South Prong Alafia Rivers.

Table 6. Approximate number of days daily mean discharge equaled or exceeded the percentile discharges at Alafia River at Lithia, 1964-92

[P_{10}, 10-percentile discharge; -- no days]

Year	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
1964	366	260	187	101	49	7	2	--
1965	365	231	122	69	39	10	3	--
1966	365	282	200	136	67	--	--	--
1967	348	191	130	78	39	15	7	3
1968	348	159	135	99	77	19	7	--
1969	365	237	168	102	52	5	--	--
1970	363	321	250	135	57	10	1	--
1971	345	125	93	49	19	--	--	--
1972	366	141	85	56	27	3	--	--
1973	365	198	149	96	52	4	2	--
1974	350	135	85	62	42	15	3	--
1975	314	107	84	57	22	--	--	--
1976	341	208	140	84	43	2	--	--
1977	270	60	21	7	2	--	--	--
1978	333	157	96	62	32	--	--	--
1979	352	203	147	113	81	21	10	3
1980	366	276	157	72	23	4	2	--
1981	252	72	43	29	19	3	1	--
1982	346	152	112	74	32	6	2	--
1983	365	211	178	140	96	7	2	--
1984	350	225	145	77	23	--	--	--
1985	178	66	38	19	9	3	1	--
1986	284	111	73	39	18	--	--	--
1987	313	145	113	81	45	5	4	--
1988	349	164	118	62	31	9	6	4
1989	312	106	58	25	16	--	--	--
1990	247	77	32	13	1	--	--	--
1991	233	111	76	45	25	8	5	1
1992	228	74	41	21	12	--	--	--
Mean	323	166	113	69	36	8	4	3
Maximum	366	321	225	140	96	21	10	4
Minimum	178	60	21	7	1	0	0	0

Hydraulic depths below the P_{90} discharge generally are confined to the channel. Mean hydraulic depths ranged from approximately 1.6 to 3.7 ft, and maximum depths ranged from 2.8 to 6.9 ft (app. R). Because of the increase in cross-sectional area in the transition from the channel to floodplain in example cross section 17, the hydraulic depth of 2.4 ft at the P_{90} discharge is double that of the P_{98} discharge (1.2 ft) (fig. 31b).

Total area of inundation within the channel and floodplain ranged from 48.2 (P_{10}) to 854 ($P_{99.9}$) acres (fig. 36 and app. S). Inundated area below the P_{80} discharge upstream and the P_{90} discharge downstream of the gage generally was confined within the channel at most cross sections (fig. 35).The inundated area from the P_{10} to the P_{80} discharges was approximately 111 acres, which largely consists of the channel area, whereas, the inundated area from the P_{80} to the $P_{99.9}$ discharges, which includes both the channel and floodplain, was 695 acres. The greatest increase in area of inundation between percentiles was 248 acres, which occurred from the P_{90} to P_{98} discharges.

The difference in inundated area, between the existing conditions step-backwater analysis and a potential withdrawal step-backwater analysis, ranged from 0.4 (P_{10}) to 45.5 (P_{98}) acres, which corresponds to an approximate 0.7 and 9.0 percent decrease of inundated area, respectively (fig. 36 and app. T). However, the greatest percentage decrease of inundated area occurred at the $P_{80\text{-}10}$ discharge with 23.4 percent. Decrease of inundated area at or below the $P_{80\text{-}10}$ discharge generally occurred within the channel, and ranged from approximately 0.4 to 38 acres. The greatest decrease, 45.5 acres, occurred at the $P_{98\text{-}10}$ discharge (fig. 37a-h).

South Prong Alafia River

The South Prong Alafia River drains approximately 135 mi^2. The 10-mi-long South Prong Alafia River study reach generally flows in a northerly direction, from cross section 29 to the confluence with the Alafia and North Prong Alafia Rivers at cross section 1 (figs. 1 and 28). A 107-mi^2 area of the watershed is drained at the South Prong Alafia River near Lithia gage (02301300) at Jameson Road. Discharge data have been collected continuously by the USGS at the gage from 1962 to the present. Extremes in daily mean discharge at the gage ranged from 1.2 ft^3/s (1981) to 2,430 ft^3/s (1967). The low-water channel along the study reach of the South Prong Alafia River generally is deeply incised and well defined.

Step-backwater analysis was performed using 31 cross sections located along the South Prong Alafia River from cross section 1 (confluence) to cross section 29. Step-backwater analysis computations for the South Prong Alafia River began at the Alafia River near Lithia gage and progressed upstream to the confluence with the North and South Prong Alafia Rivers.

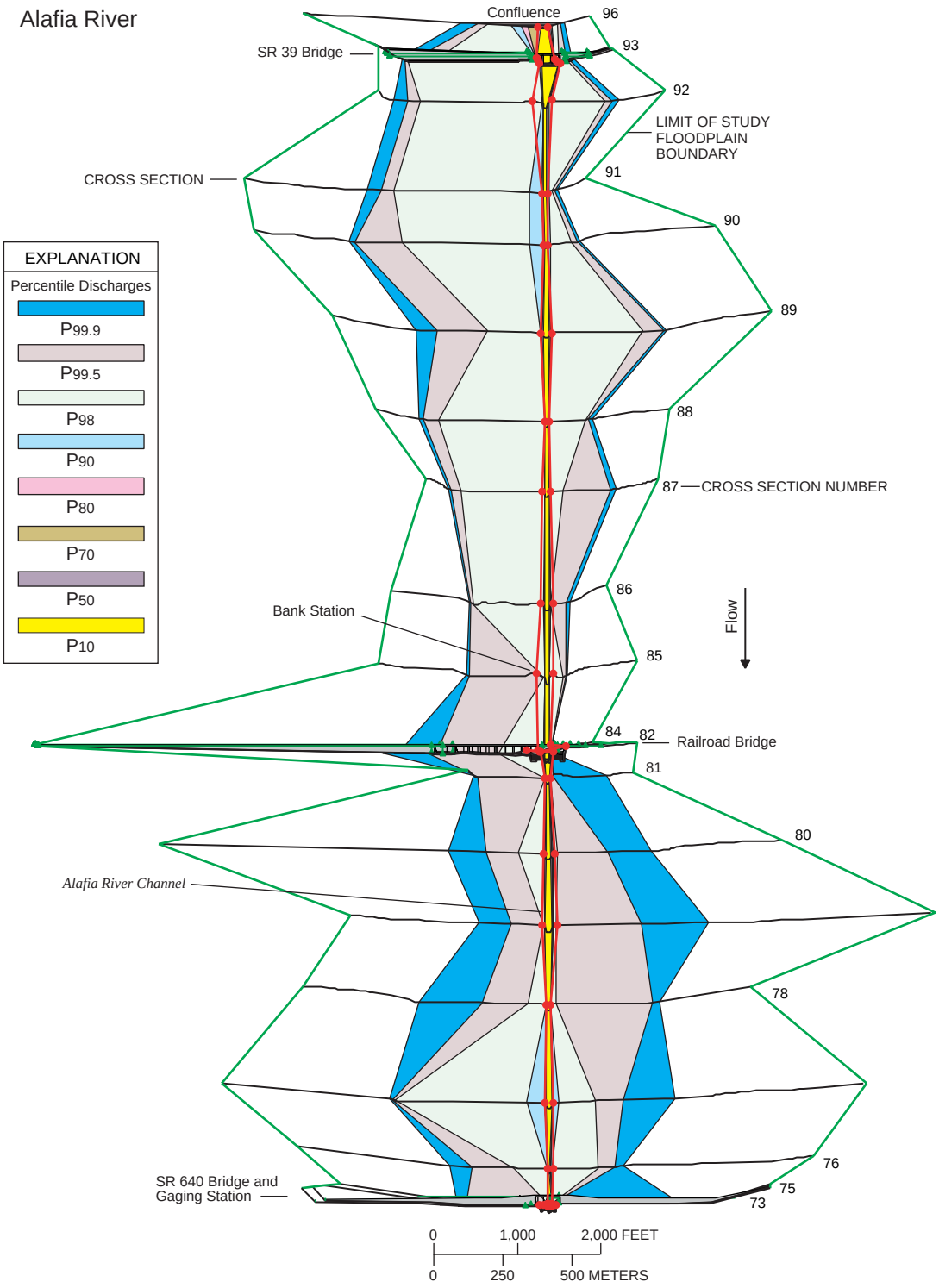


Figure 30. Extent of areal inundation along the Alafia River channel and floodplain for selected percentile discharges, from SR 640 to the confluence with the North and South Prong Alafia Rivers.

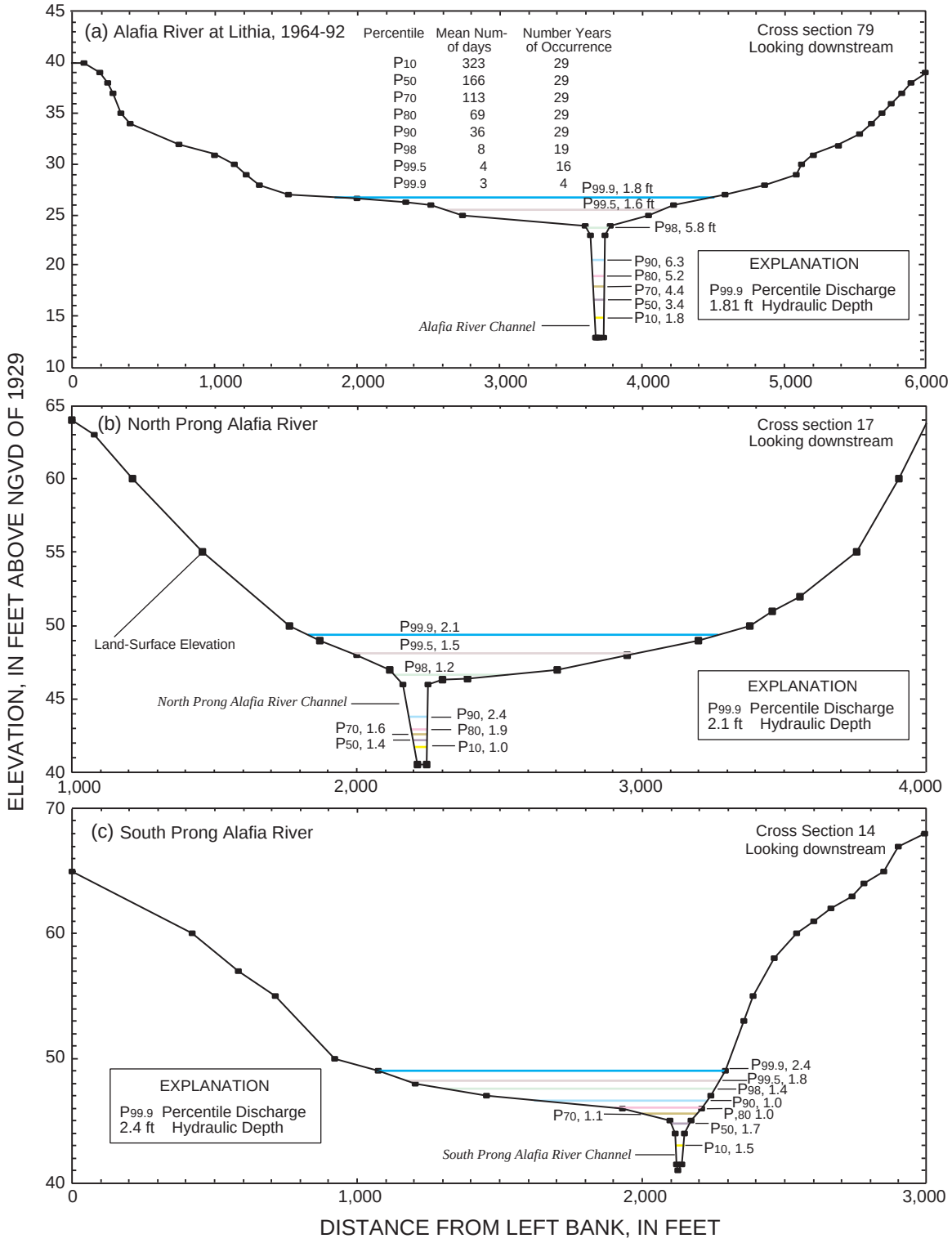


Figure 31. Estimated extent and frequency of areal inundation and hydraulic depth for (a) Alafia, (b) North Prong Alafia, and (c) South Prong Alafia Rivers selected cross sections for each of the percentile discharges.

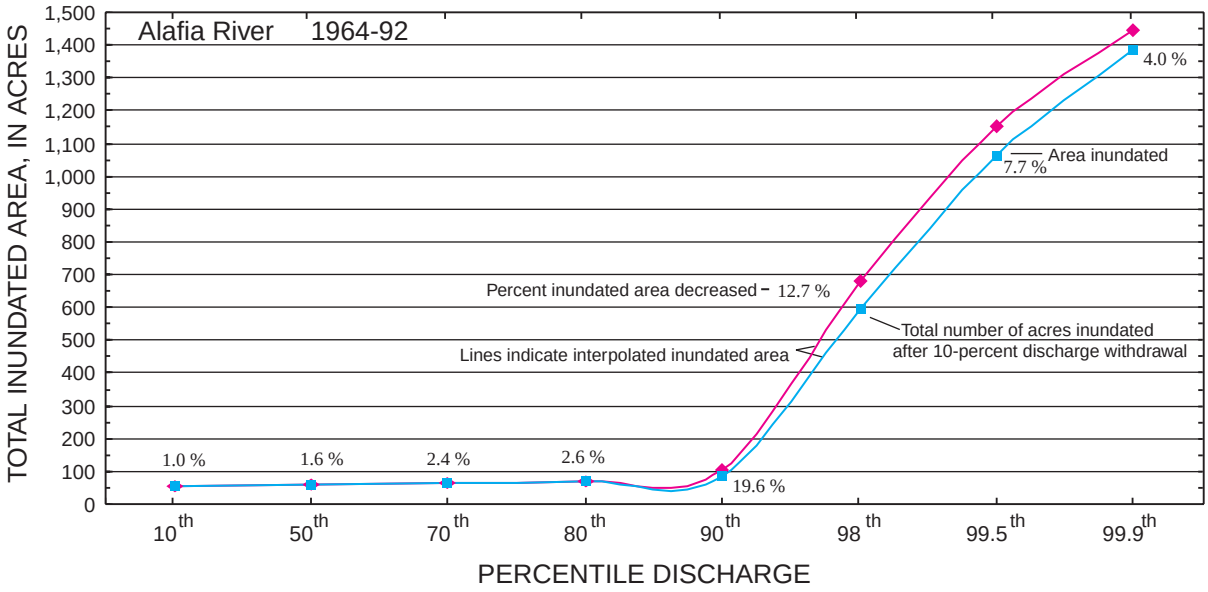


Figure 32. Estimated total inundated area along the Alafia River for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

At the confluence, discharge was reduced to reflect the smaller drainage area contribution of the South Prong Alafia Rivers. Step-backwater computations continued upstream along the South Prong Alafia River for approximately 7.6 mi to the gage at Jameson Road, then continued to termination at cross section 29. Water-surface elevations, computed during the step-backwater analysis, were used to produce water-surface profiles, extent of areal inundation, and hydraulic depth at the 31 cross sections (fig. 38).

Estimated floodplain inundation exceeds 1,600 ft (cross section 20) during $P_{99.9}$ discharge (app. Q). Mean inundation width for the 31 cross sections along the reach can range from 36 ft (P_{10}) to 1,135 ft ($P_{99.9}$). The incised channel generally confines most flows within the banks below the P_{80} discharge (170 ft^3/s) along much of the reach, except at a limited number of low-lying cross sections (fig. 39 and table 5). The mean inundation width at the P_{80} discharge (109 ft) may approximate the mean width of the bankfull channel. The greatest increase in the extent of mean inundation was 566 ft from the P_{90} (197 ft) to the P_{98} (763 ft) discharge (app. Q). A comparison of the maximum extent of areal inundation for the selected percentile discharges at each cross section is shown in figure 39. However, the figure does not indicated the existence of elevated land surface along the cross section that may be completely inundated during high-flow periods or may form islands during low-flow periods, thus reducing the actual distance inundated. Appendix Q presents the actual distance, in feet, each cross section is inundated.

Example cross section 14 shows discharges at or below P_{50} generally are confined to the channel, and those above may inundate the floodplain (fig. 31c). The approximate mean number of days that inundation of the floodplain occurs at the P_{50} discharge is 166 days per year, based on the 29-year study period at Alafia River at Lithia (table 6).

Hydraulic depths at or below the P_{50} discharge generally reflect the channel. Mean hydraulic depths ranged from approximately 1.2 (P_{10}) to 2.5 (P_{80}) ft, and maximum depths ranged from 2.2 (P_{10}) to 4.4 (P_{90}) ft (app. R). Cross section 14 has an approximate 1-ft hydraulic depth that occurs during the P_{90} discharge an average of about 36 days per year, based on a width of more than 600 ft.

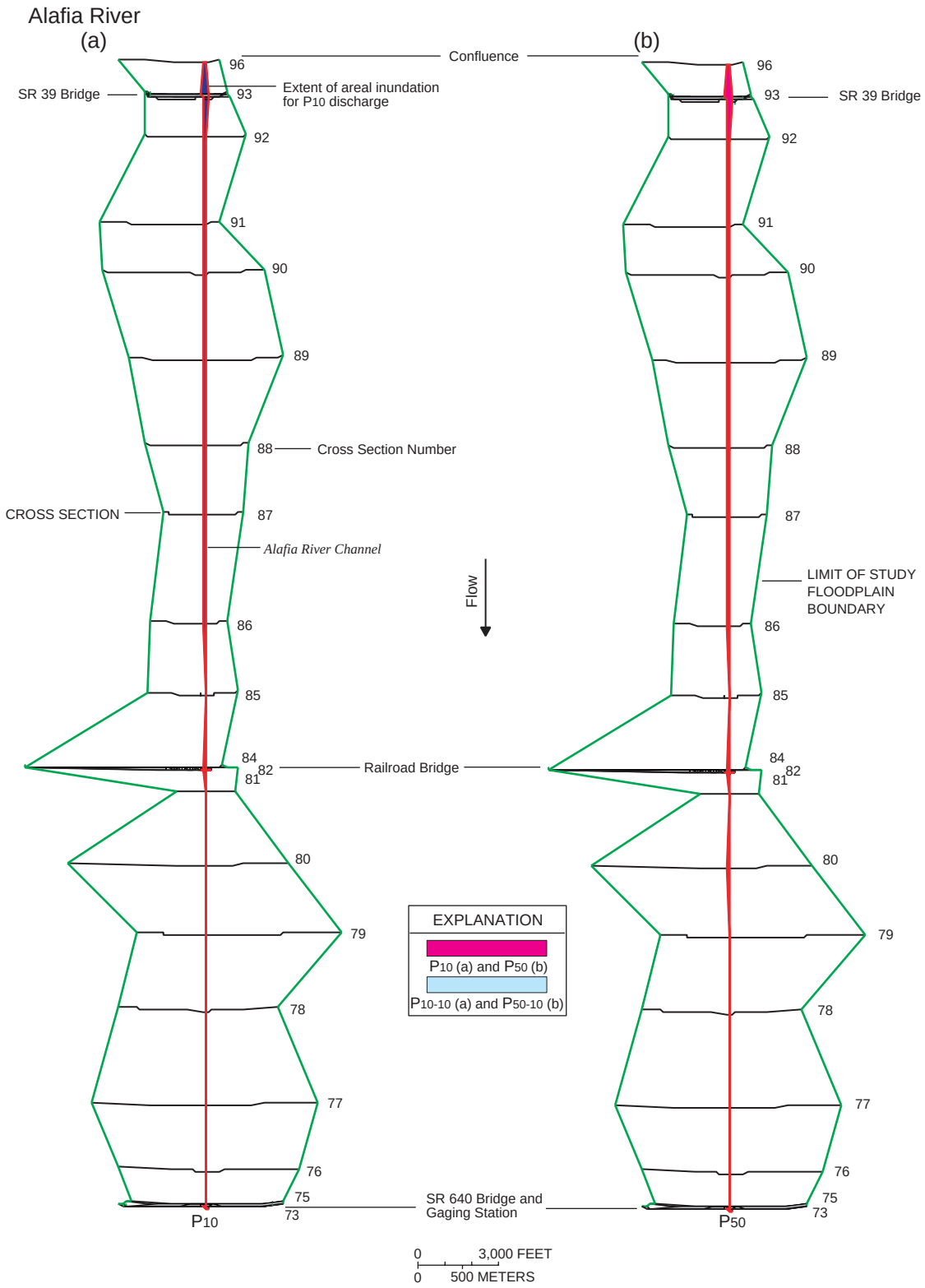


Figure 33. Extent of areal inundation along the Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal.

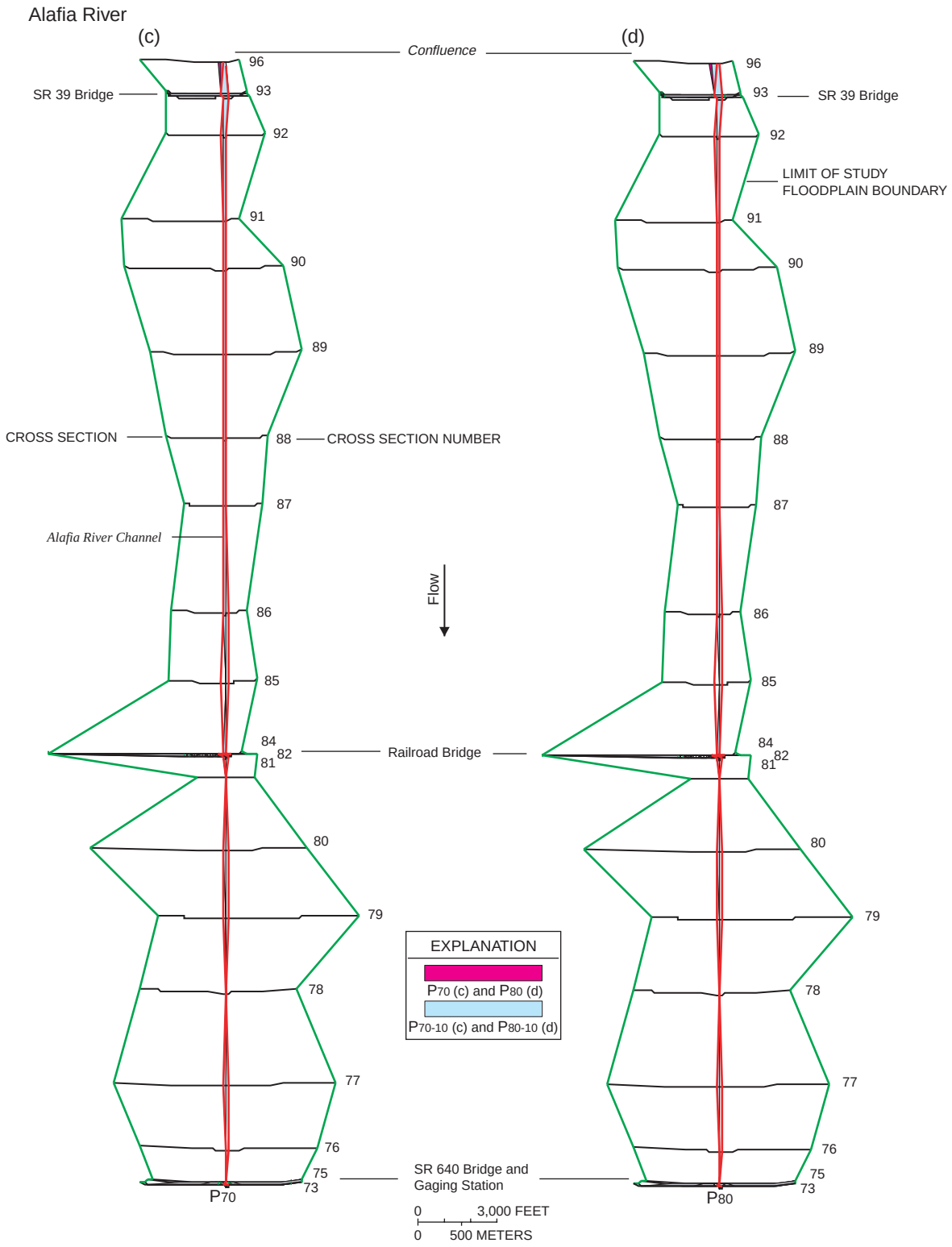


Figure 33. Extent of areal inundation along the Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

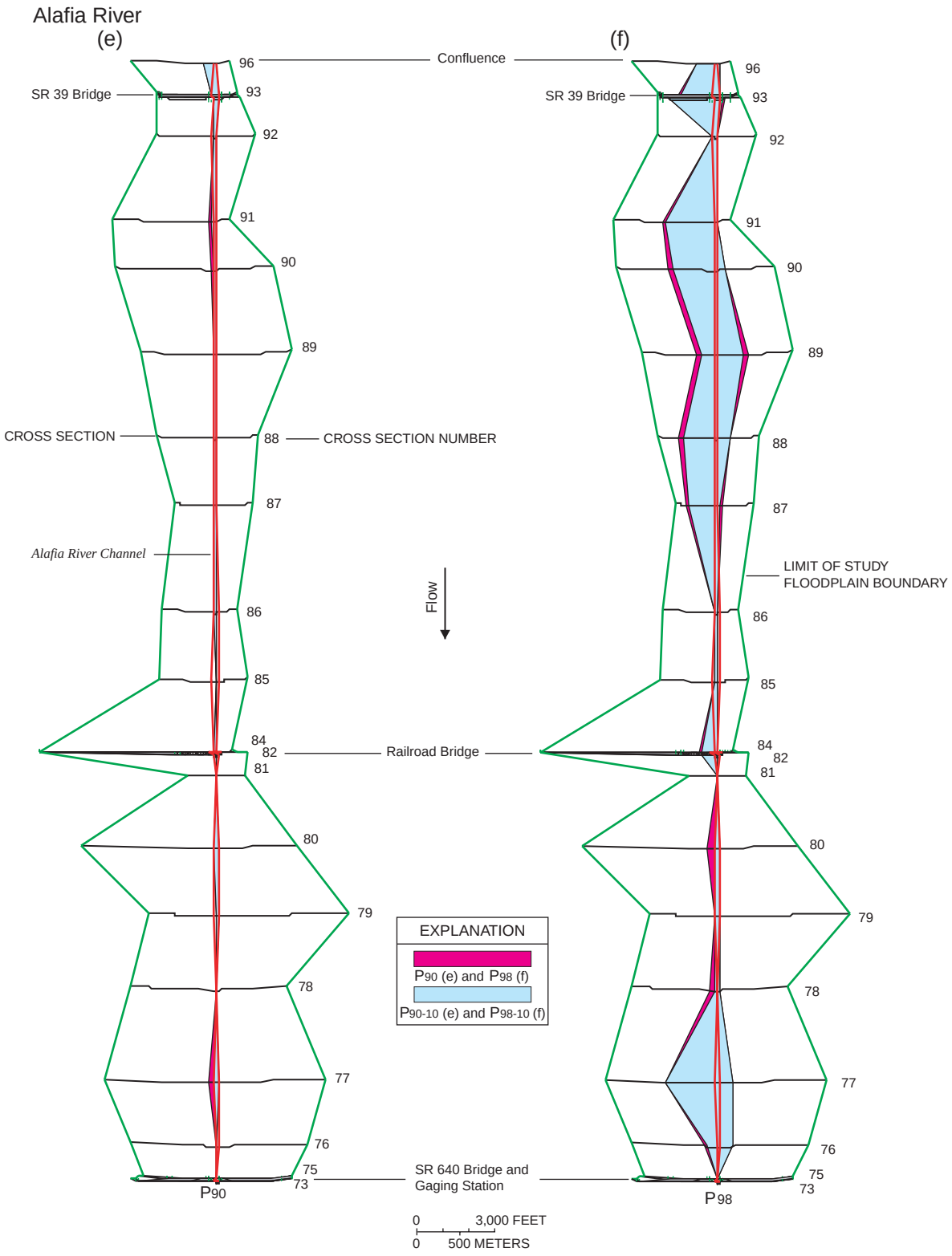


Figure 33. Extent of areal inundation along the Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

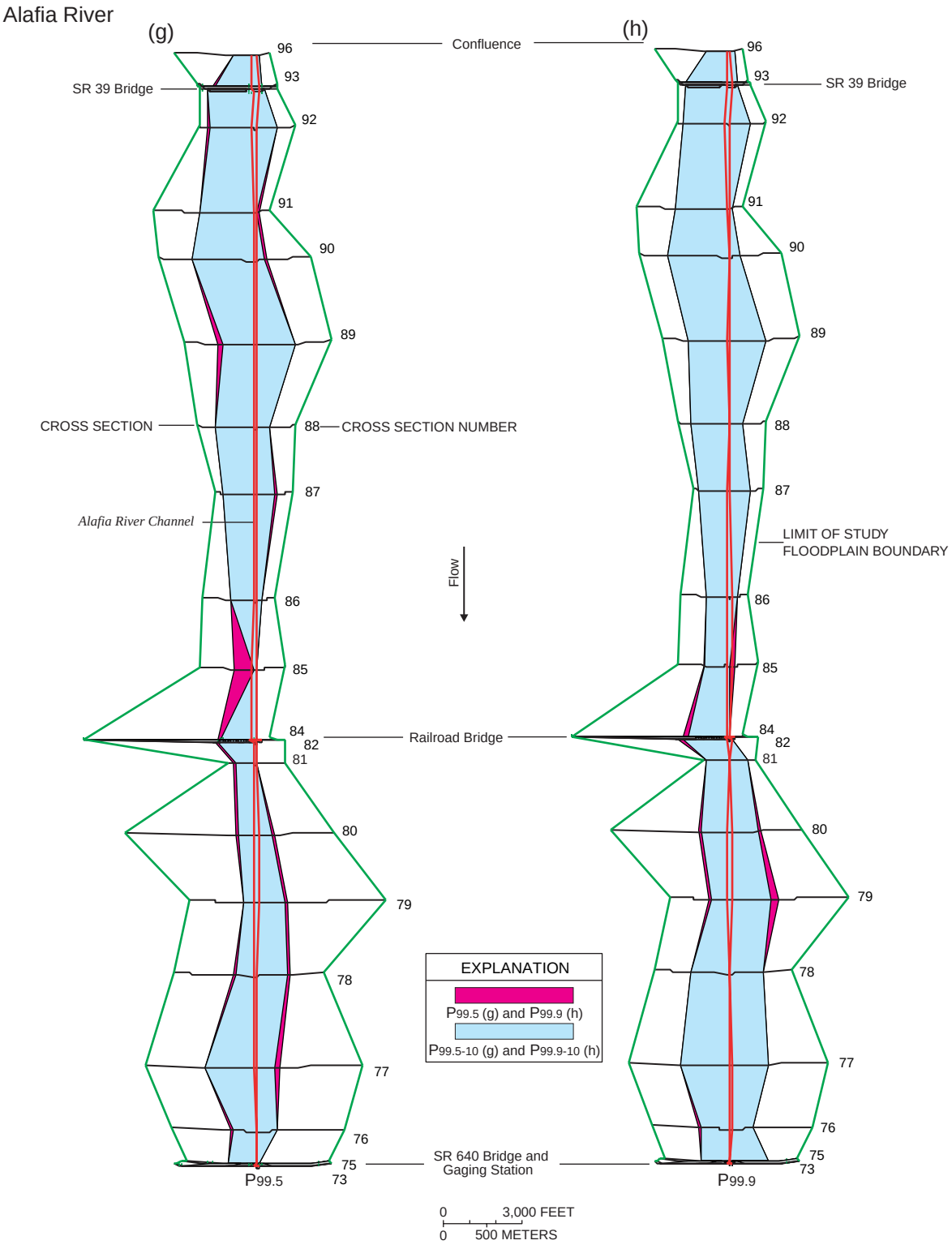


Figure 33. Extent of areal inundation along the Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

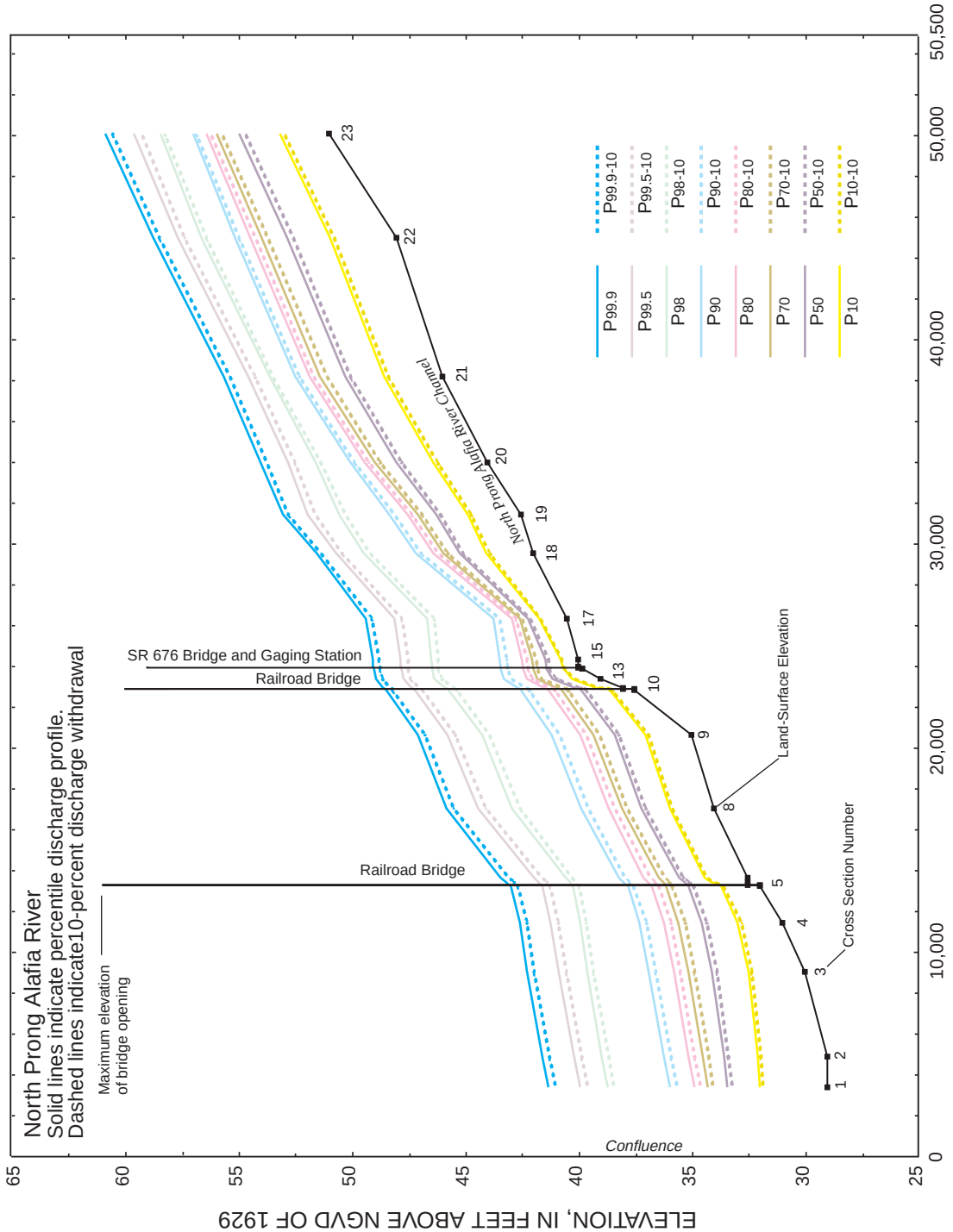


Figure 34. Water-surface profiles along the North Prong Alafia River for existing conditions and a potential 10-percent discharge withdrawal, from the confluence with the Alafia and South Prong Alafia Rivers to cross section 23.

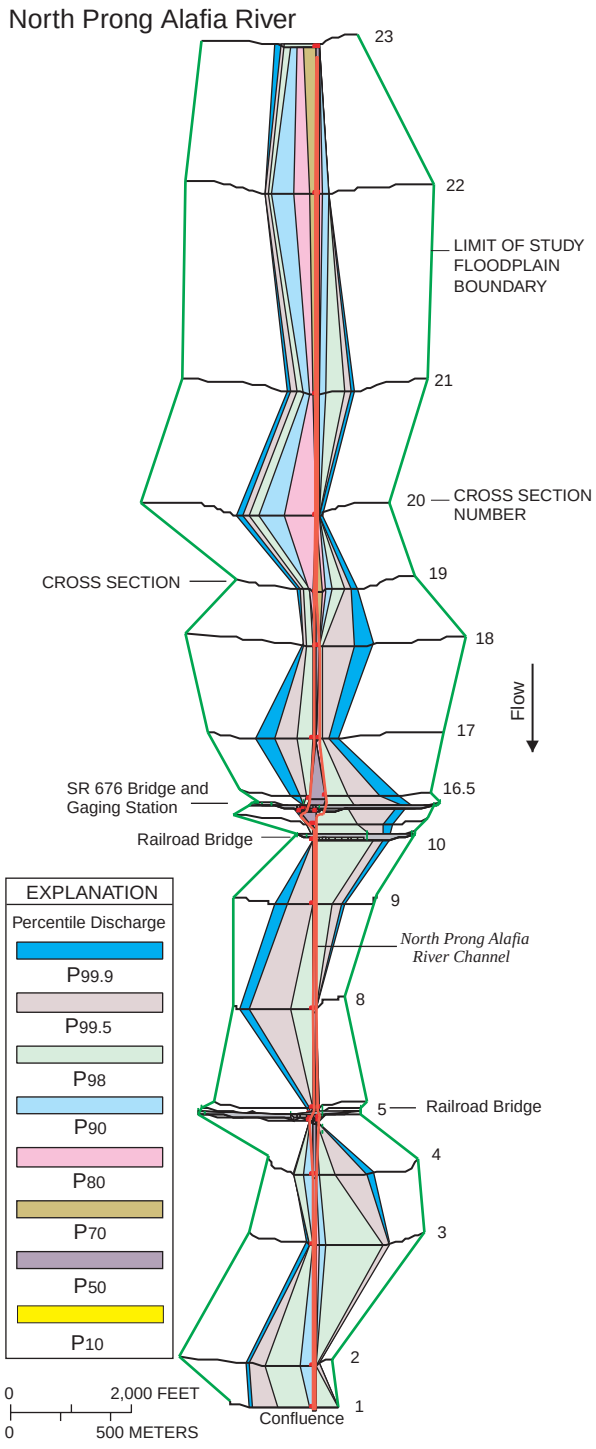


Figure 35. Extent of areal inundation along the North Prong Alafia River channel and floodplain for selected percentile discharges, from the confluence with the Alafia and South Prong Alafia Rivers to cross section 23.

Total inundated area of the channel and floodplain ranged from 36.6 (P_{10}) to 1,055 ($P_{99.9}$) acres (fig. 40 app. S). The difference in inundated area between the P_{10} and P_{80} discharges was approximately 80 acres, which largely includes the area confined within the channel, whereas the inundated area between the P_{80} and $P_{99.9}$ discharges, which generally includes the floodplain, was 938 acres. The greatest increase in area of inundation (538 acres) occurs between the P_{90} and P_{98} discharges.

Decrease in inundated area, between the existing step-backwater analysis and the potential step-backwater analysis, ranged from 0.2 (P_{10}) to 75 (P_{98}) acres, which corresponds to an approximate 1.5- and 10-percent decrease of inundated area, respectively (fig. 40 and app. T). However, the greatest percentage decrease of inundated area occurred at the $P_{90\text{-}10}$ discharge with 13.4 percent. Decrease of inundated area at or below the $P_{80\text{-}10}$ discharge generally occurred within the channel and ranged from 0.2 to 10.4 acres. The greatest decrease in inundated area (75 acres) occurs at the $P_{98\text{-}10}$ discharge (fig. 41a-h).

Inundated Area and Effects of Potential Discharge Withdrawals Along the Alafia River System

Total inundated area for the Alafia, North Prong Alafia, and South Prong Alafia Rivers ranged from 137.8 (P_{10} discharge) to 3,354 ($P_{99.9}$ discharge) acres (fig. 42 and app. S). Although the lengths of the Alafia, North Prong Alafia, and South Prong Alafia River study reaches are similar at 8.2, 9.5, and 10 mi, the acreage of inundation for the $P_{99.9}$ discharge for the Alafia River was 41 and 27 percent greater than that of the North and South Prong Alafia River, respectively (app. S). At the P_{80} discharge, the 348 acres inundated along the Alafia River system generally are confined to the channel. The largest increase in inundated area is 1,363 acres, which occurs between the P_{90} and the P_{98} discharges. Decrease of total inundated area along the Alafia, North Prong Alafia, and South Prong Alafia Rivers study reaches ranged from about 1.3 (P_{10} discharge) to 196 (P_{98} discharge) acres, which corresponds to a 1.1 and 10.7 percent decrease of inundated area, respectively. However, the greatest percentage decrease of inundated area occurred at the $P_{80\text{-}10}$ discharge with 14.5 percent.

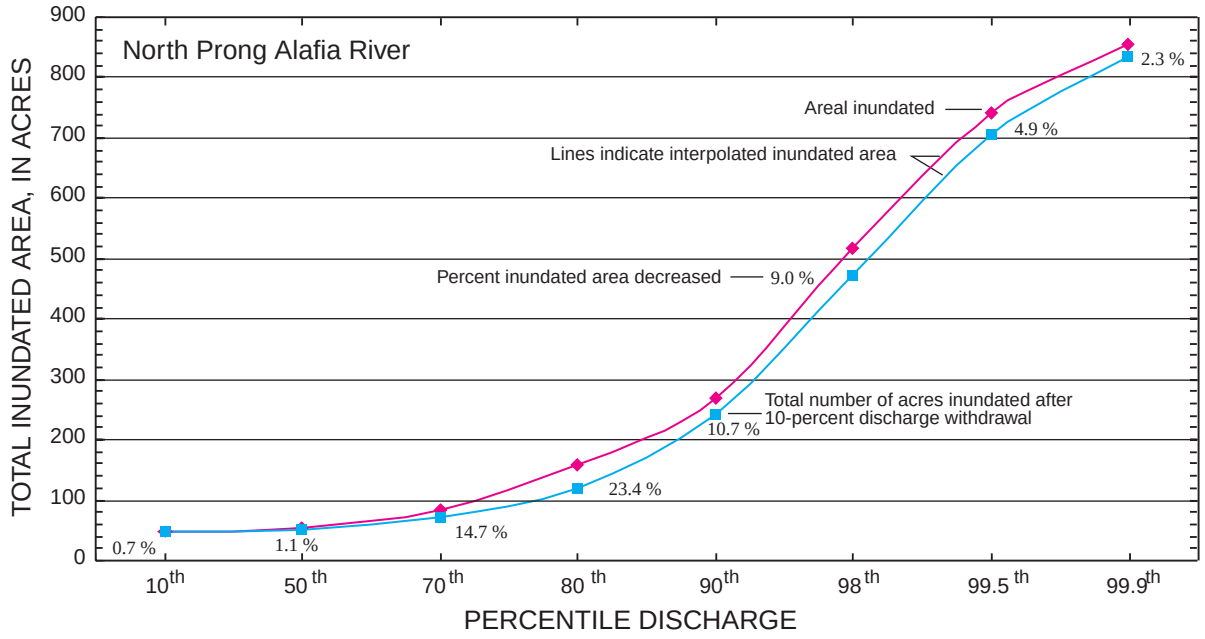


Figure 36. Estimated total inundated area along the North Prong Alafia River for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

SUMMARY

Riverine and palustrine wetlands are a major ecological component of river basins in west-central Florida. Healthy wetlands are dependent upon the frequency and duration of periodic inundation. This report assesses the extent, area, depth, frequency, and duration of periodic flooding and the effects of potential surface-water withdrawals on Cypress Creek and the Peace, Alafia, North Prong Alafia, and South Prong Alafia Rivers. Results of the study were based on step-backwater analysis performed at each of the river systems using the U.S. Army Corps of Engineers Hydrologic Engineering Center-River Analysis System (HEC-RAS) one-dimensional model. Step-backwater analysis of selected mean daily discharges at the 10th, 50th, 70th, 80th, 90th, 98th, 99.5th, and 99.9th percentiles was used to compute extent of inundation, area, and hydraulic depth. An assessment of the net changes of areal inundation was compared between existing and potential conditions, if 10 percent of the total river flow were diverted for potential withdrawals.

Cypress Creek, a major tributary to the Hillsborough River, drains a 164 mi^2 area north of the city of Tampa. The low-gradient channel generally is poorly incised and defined. Widespread areal inundation of lower Cypress Creek occurs at the 50th percentile. However, the most widespread inundation of the broad palustrine wetlands, which dominate the length of the Cypress Creek floodplain, occurs at the 80th percentile. The total inundated area of Cypress Creek ranged from about 1,200 (50th percentile) to 9,000 (99.9th percentile) acres. The mean hydraulic depth ranged from 0.8 to 2.9 ft, with a maximum depth of 7.8 ft. Based on a potential 10-percent withdrawal in discharge, the decrease in area of inundation along Cypress Creek ranged from 22 to 395 acres, and the percent of decreased inundated area ranged from 1.7 to 8.4 percent.

A 70-mi-long channel of the Peace River was divided into three study reaches: Arcadia to Zolfo Springs (reach 1), Zolfo Springs to Fort Meade (reach 2), and Fort Meade to Bartow (reach 3). The step-backwater analysis was based on the concurrent long-term streamflow record, 1940-98, at the Peace River at Arcadia, Zolfo Springs, and Bartow gages. Total inundated area of reach 1 ranged from 377 to 17,196 acres. Mean hydraulic depth ranged from 1.7 to 5.4 ft, with a maximum depth of 12 ft. The decrease in area of inundation from a potential 10-percent withdrawal in discharge ranged from approximately 5 to 1,500 acres.

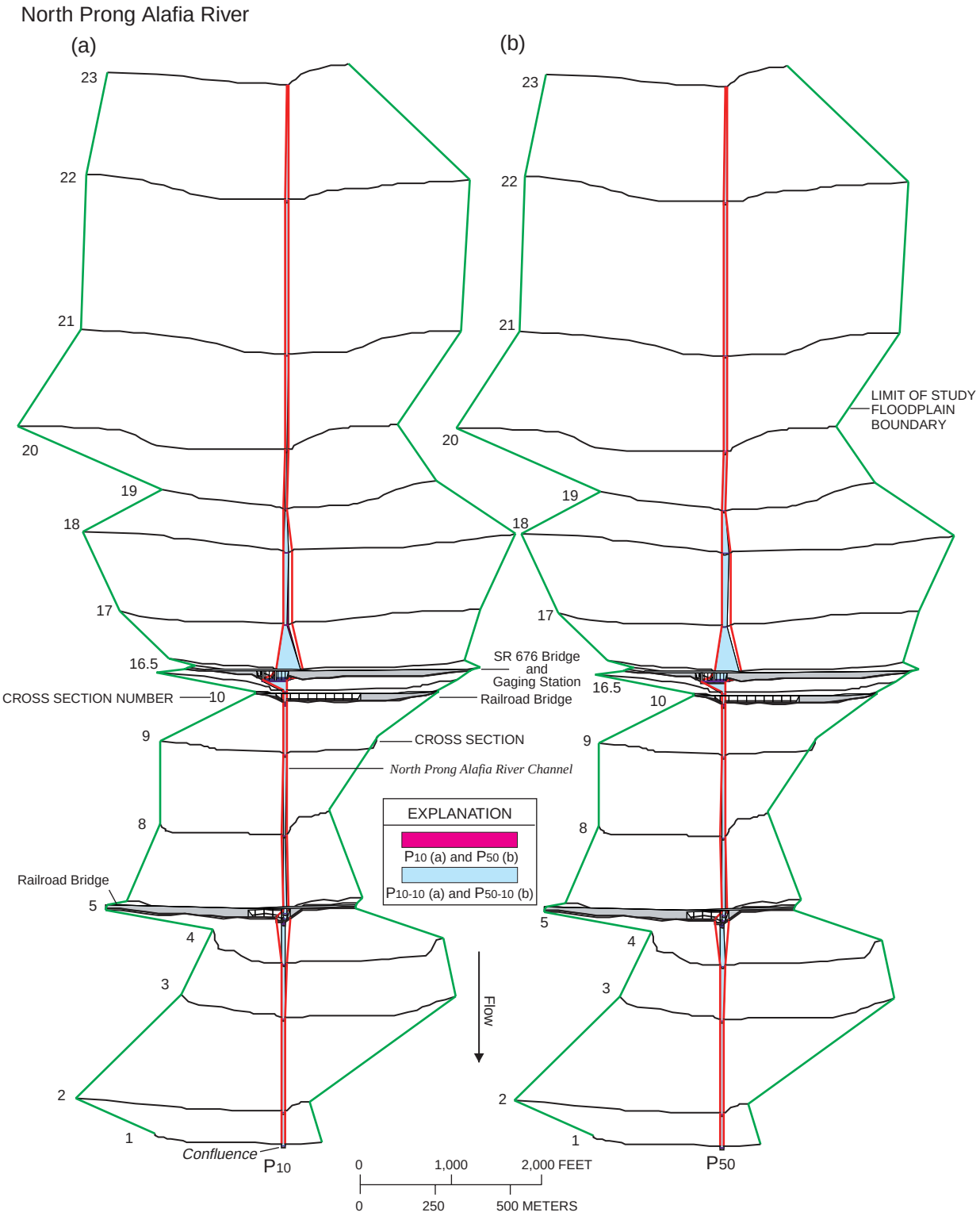


Figure 37. Extent of areal inundation along the North Prong Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal.

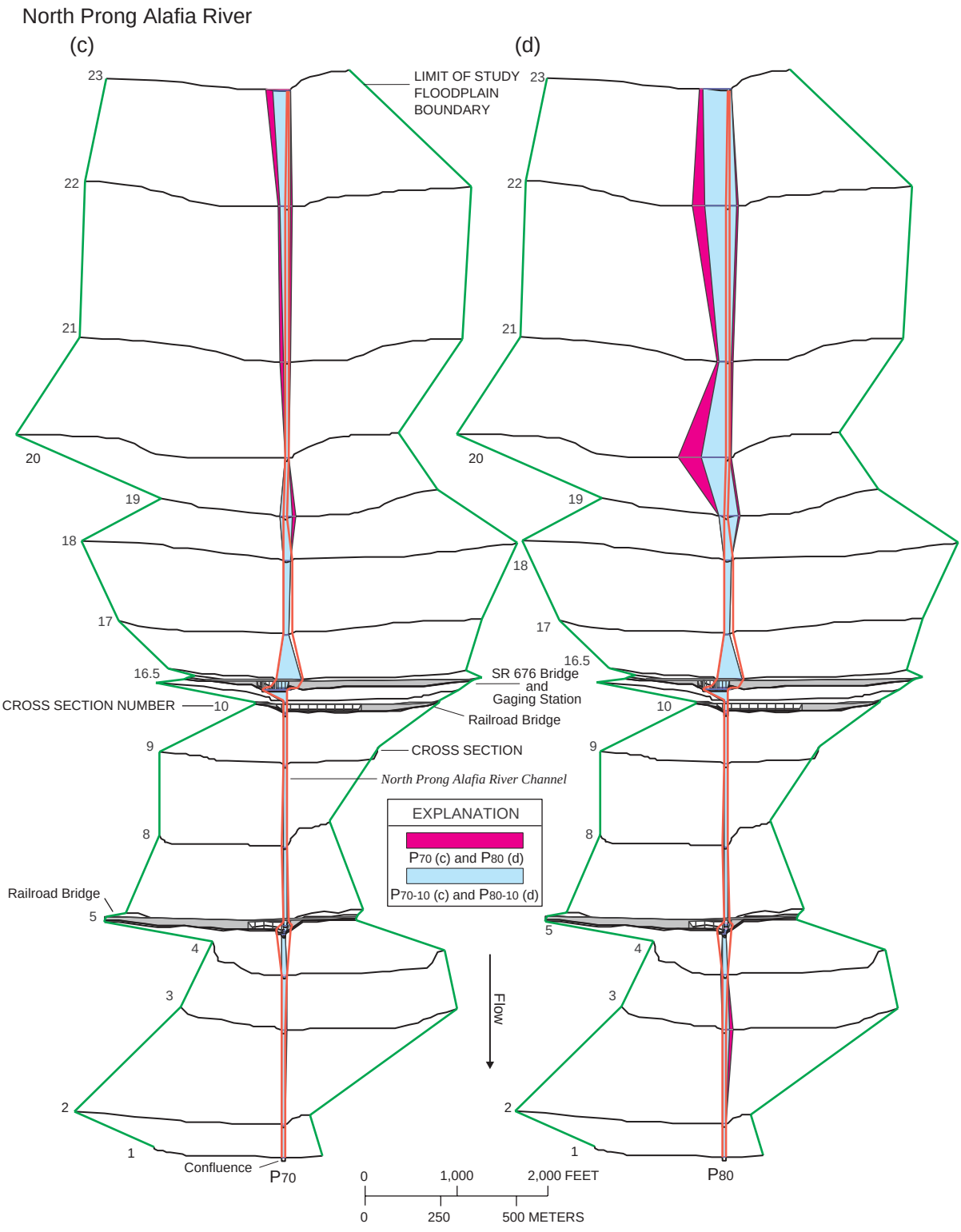


Figure 37. Extent of areal inundation along the North Prong Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

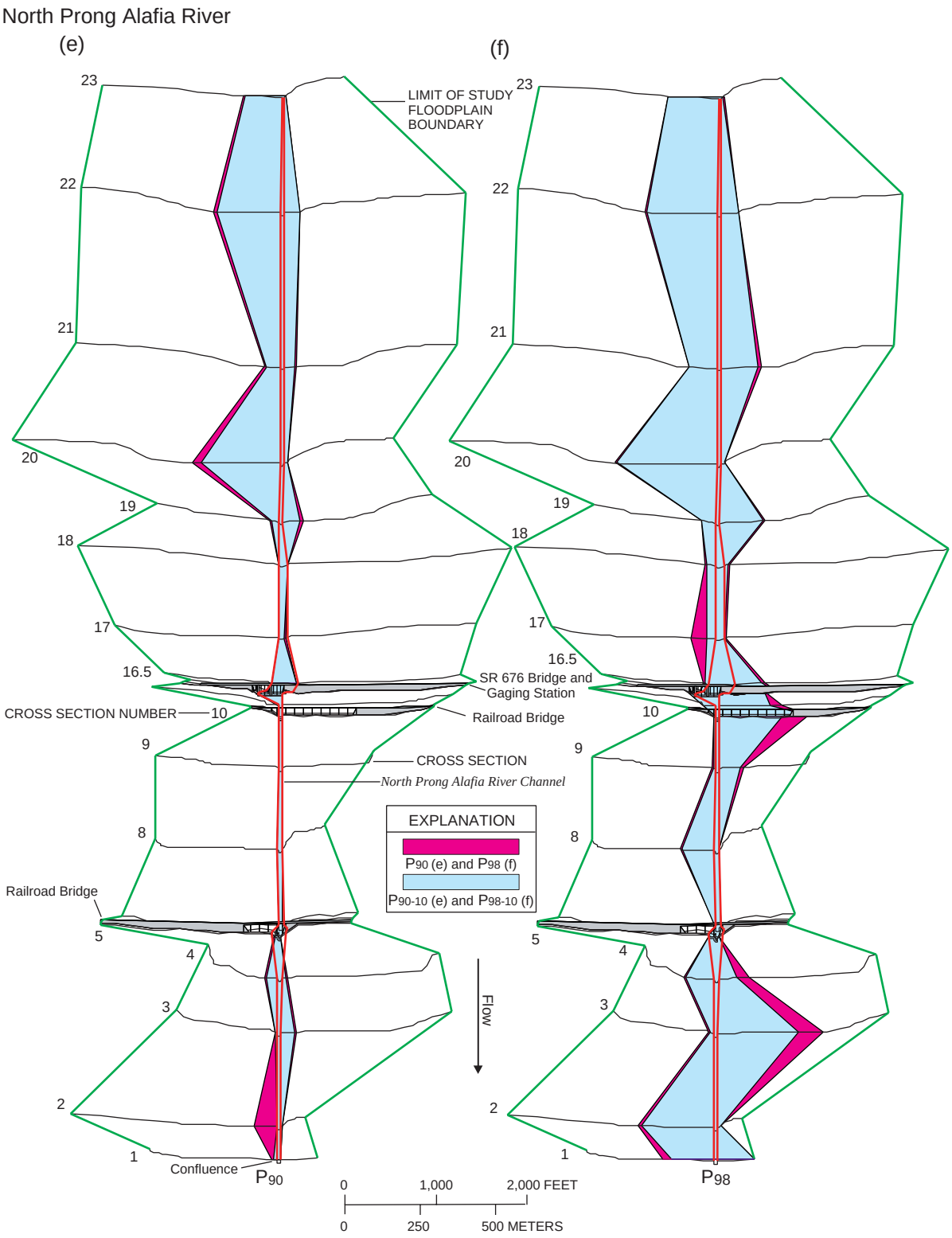


Figure 37. Extent of areal inundation along the North Prong Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

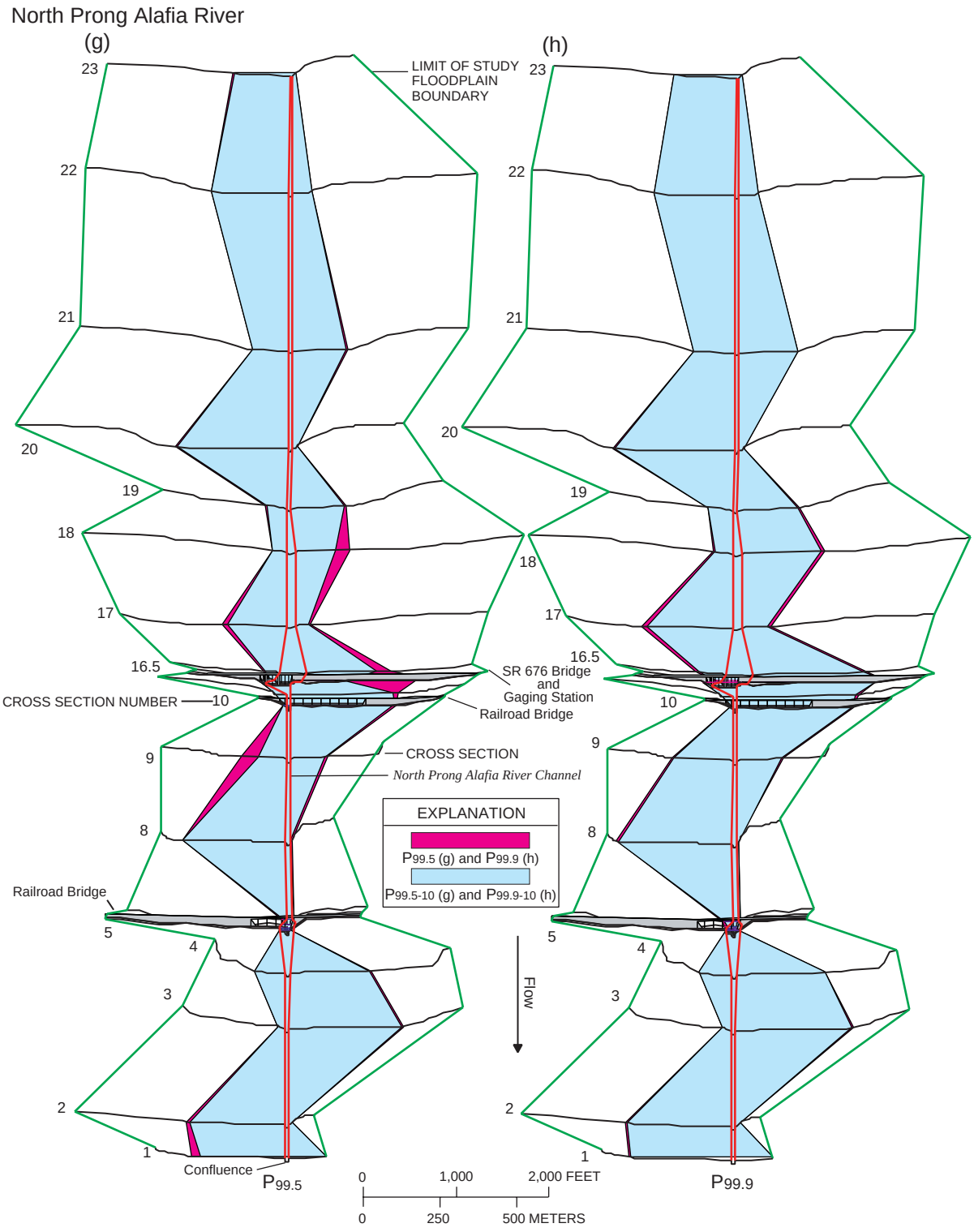


Figure 37. Extent of areal inundation along the North Prong Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and a potential 10-percent discharge withdrawal. (Continued)

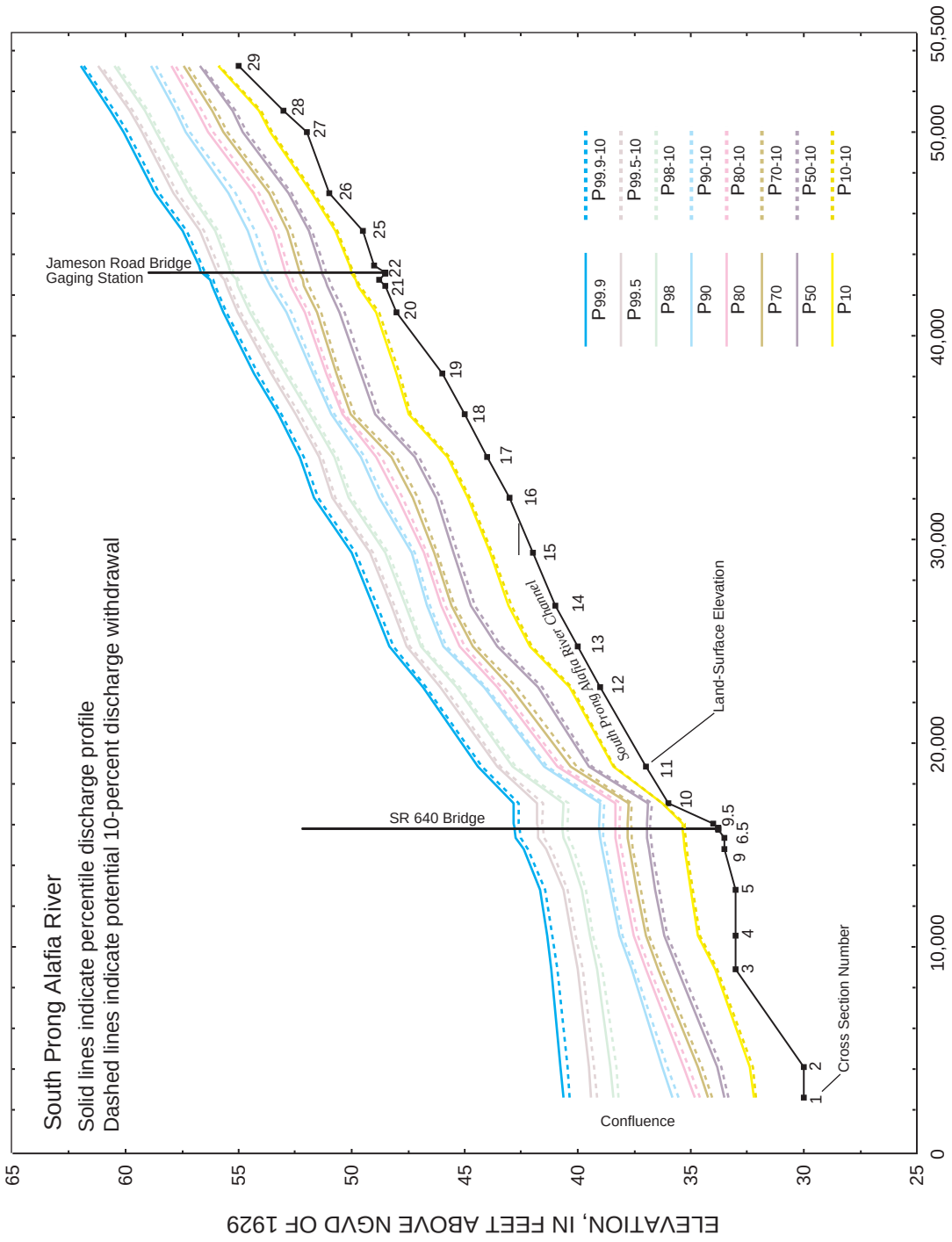


Figure 38. Water-surface profiles along the South Prong Alafia River for existing conditions and a potential 10-percent discharge withdrawal, from the confluence with the Alafia and North Prong Alafia Rivers to cross section 29.

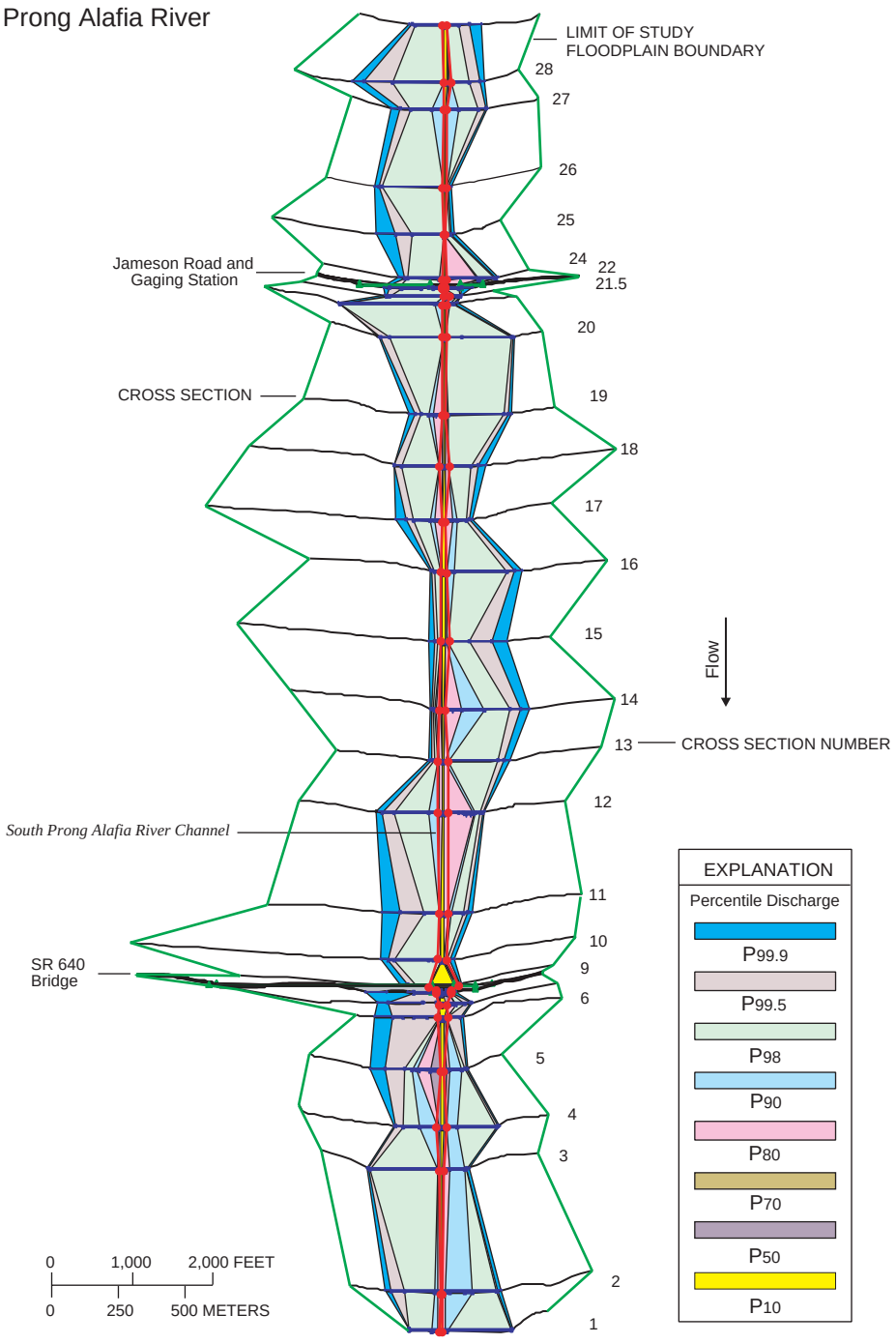


Figure 39. Extent of areal inundation along the South Prong Alafia River channel and floodplain for selected percentile discharges, from the confluence with the Alafia and North Prong Alafia Rivers to cross section 29.

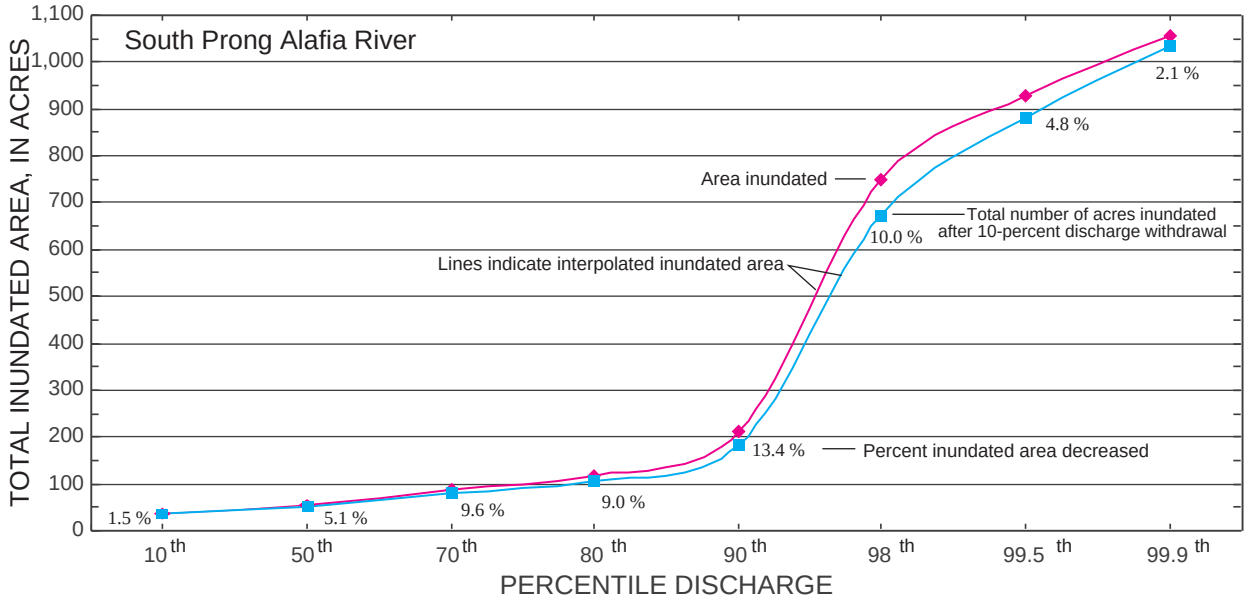


Figure 40. Estimated total inundated area along the South Prong Alafia River for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

Total inundated area of reach 2 ranged from 225 to 6,100 acres. Mean hydraulic depth ranged from 1.5 to 5.5 ft, with a maximum depth of 11 ft. The decrease in area of inundation, from a potential 10-percent withdrawal in discharge, ranged from about 6 to 370 acres. Total inundated area of reach 3 ranged from about 170 to 2,800 acres. The mean hydraulic depth ranged from 1.5 to 4.6 ft, with a maximum depth of 7.2 ft. The decrease in area of inundation, from a potential 10-percent withdrawal in discharge, ranged from about 7 to 100 acres. Total area of inundation for the three reaches of the Peace River ranged from 775 to 26,100 acres. Based on a potential 10-percent withdrawal in discharge, the decrease in area of inundation along the three reaches of the Peace River ranged from about 17 to 1,900 acres, and decreased inundation ranged from 2.1 to 13.6 percent.

The 8.2-mi-long Alafia River study channel, from the SR 640 bridge to the confluence with the North and South Prong Alafia Rivers, is deeply incised, confining most discharge at or below the 90th percentile. Total inundated area ranged from approximately 50 to 1,400 acres. Mean hydraulic depth ranged from 1.8 to 4.8 ft, with a maximum depth of 9.2 ft. Based on a potential 10-percent withdrawal in discharge, the decrease in area of inundation along the Alafia River ranged from about 1 to 90 acres, and the percent of decreased inundated area ranged from 1.0 to 19.6 percent.

The 9.5-mi-long North Prong Alafia River study channel also is deeply incised. Discharges below the 80th percentile generally are confined within the banks. Step-backwater analysis was performed at 22 cross sections. Total inundated area ranged from about 48 to 850 acres. Mean hydraulic depth ranged from 1.6 to 3.7 ft, with a maximum depth of about 7 ft. Based on a potential 10-percent withdrawal in discharge, the decrease in area of inundation along the North Prong Alafia River ranged from less than 1 to about 46 acres, and the percent of decreased inundated area ranged from about 1 to 23 percent.

The 10-mi-long South Prong Alafia River channel is deeply incised and generally contains discharges below the 80th percentile. Step-backwater analysis was performed using 31 cross sections. Total inundated area ranged from about 40 to 1,100 acres. Mean hydraulic depth ranged from 1.2 to 2.5 ft, with a maximum depth of 4.4 ft. The decrease in area of inundation, from a potential 10-percent withdrawal in discharge, ranged from less than 1 to 75 acres, for discharges at the 10th and 98th percentiles, respectively. Based on a potential 10-percent withdrawal in discharge, the percent of decreased inundated area ranged from 1.5 to 13.4 percent.

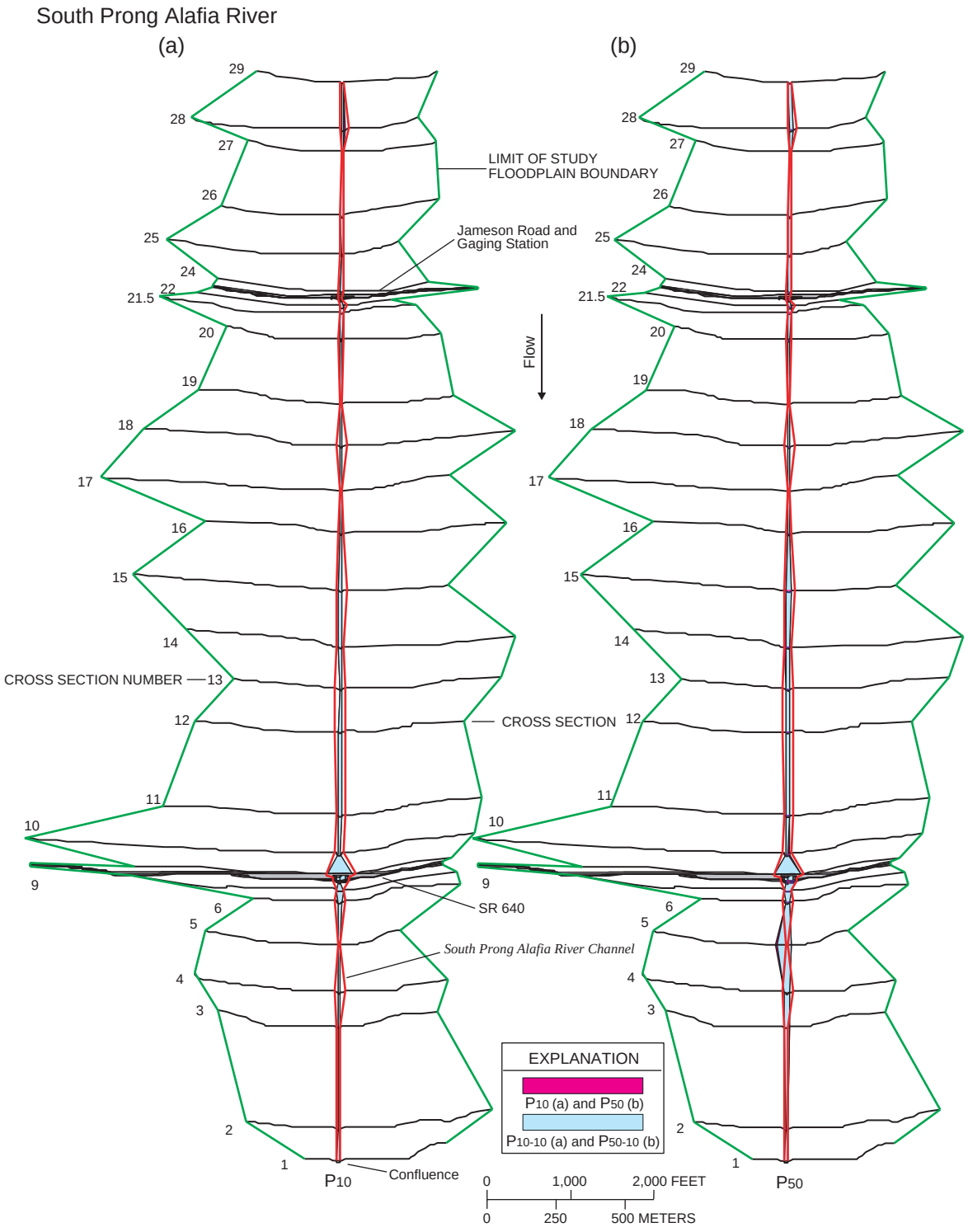


Figure 41. Extent of areal inundation along the South Prong Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and for a potential 10-percent discharge withdrawal.

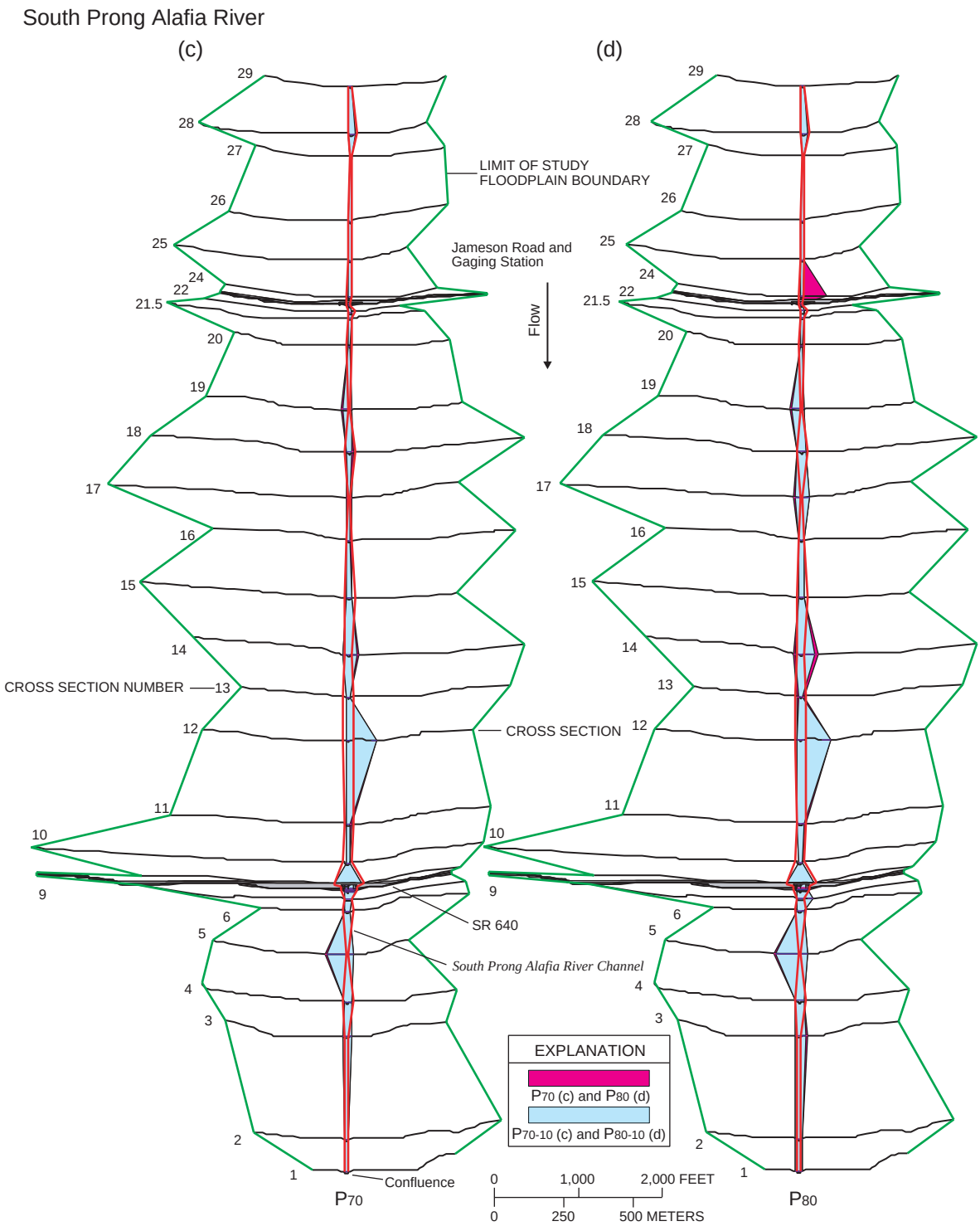


Figure 41. Extent of areal inundation along the South Prong Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and for a potential 10-percent discharge withdrawal. (Continued)

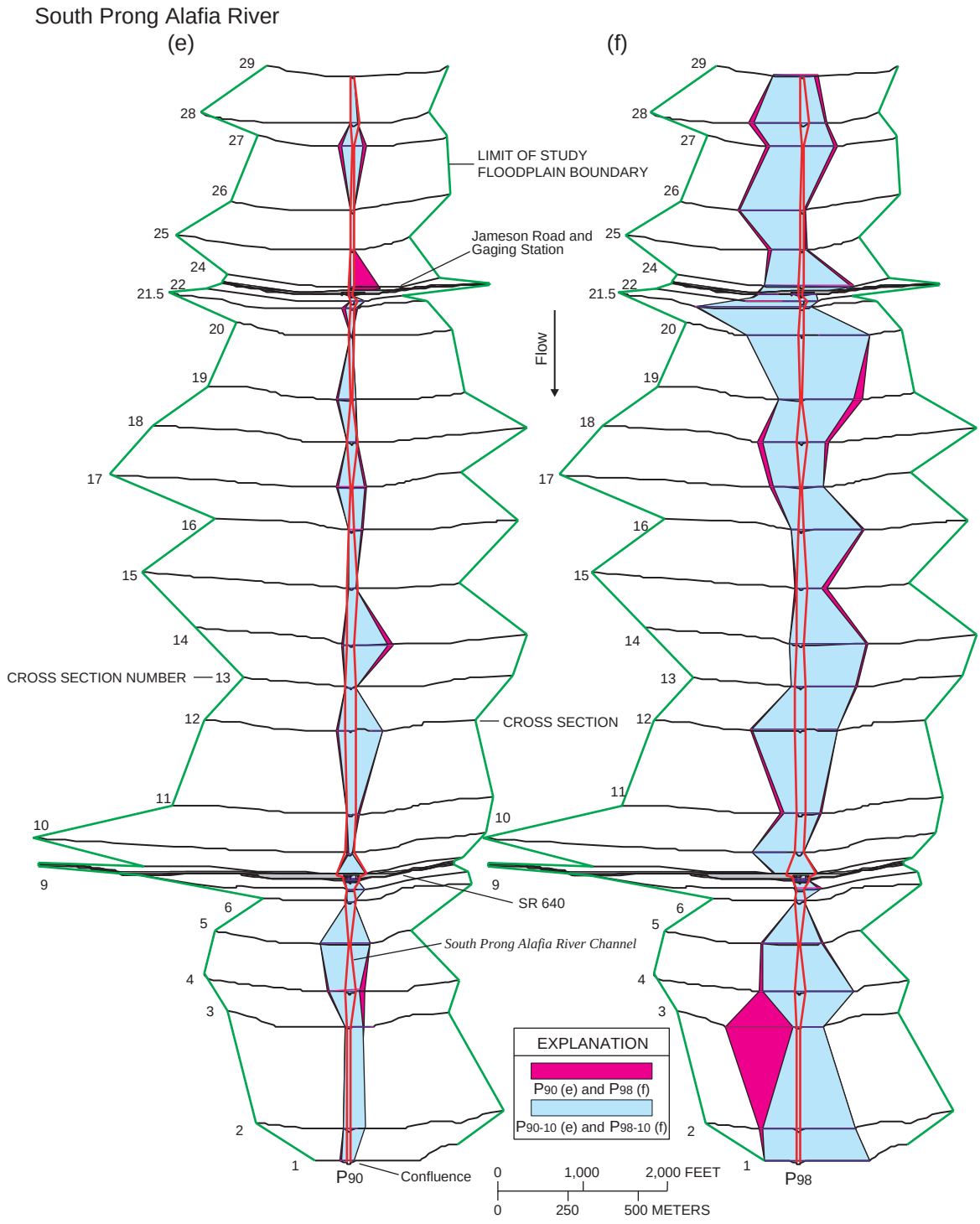


Figure 41. Extent of areal inundation along the South Prong Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and for a potential 10-percent discharge withdrawal. (Continued)

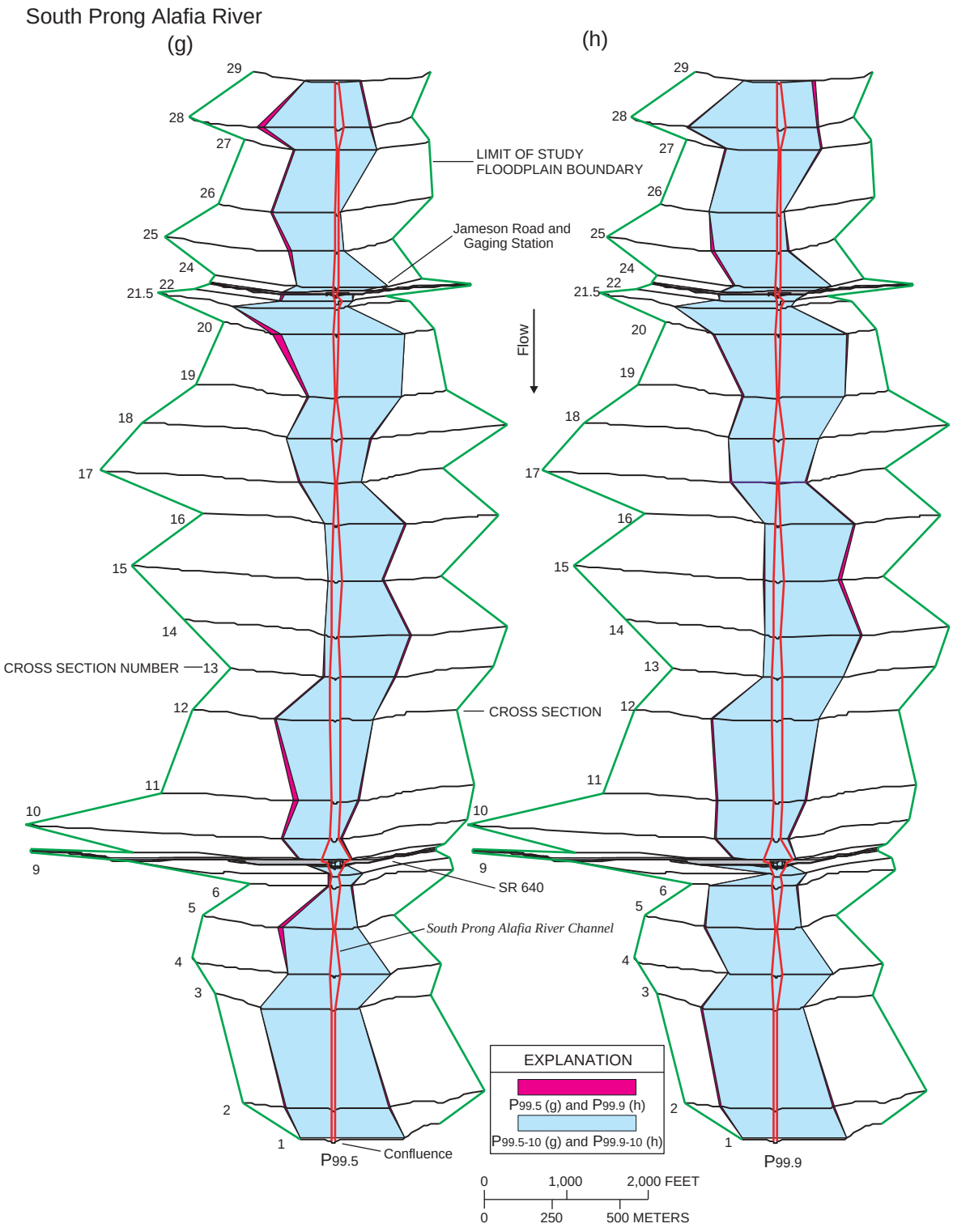


Figure 41. Extent of areal inundation along the South Prong Alafia River channel and floodplain for the (a) P_{10}, (b) P_{50}, (c) P_{70}, (d) P_{80}, (e) P_{90}, (f) P_{98}, (g) $P_{99.5}$, and (h) $P_{99.9}$ discharges for existing conditions and for a potential 10-percent discharge withdrawal. (Continued)

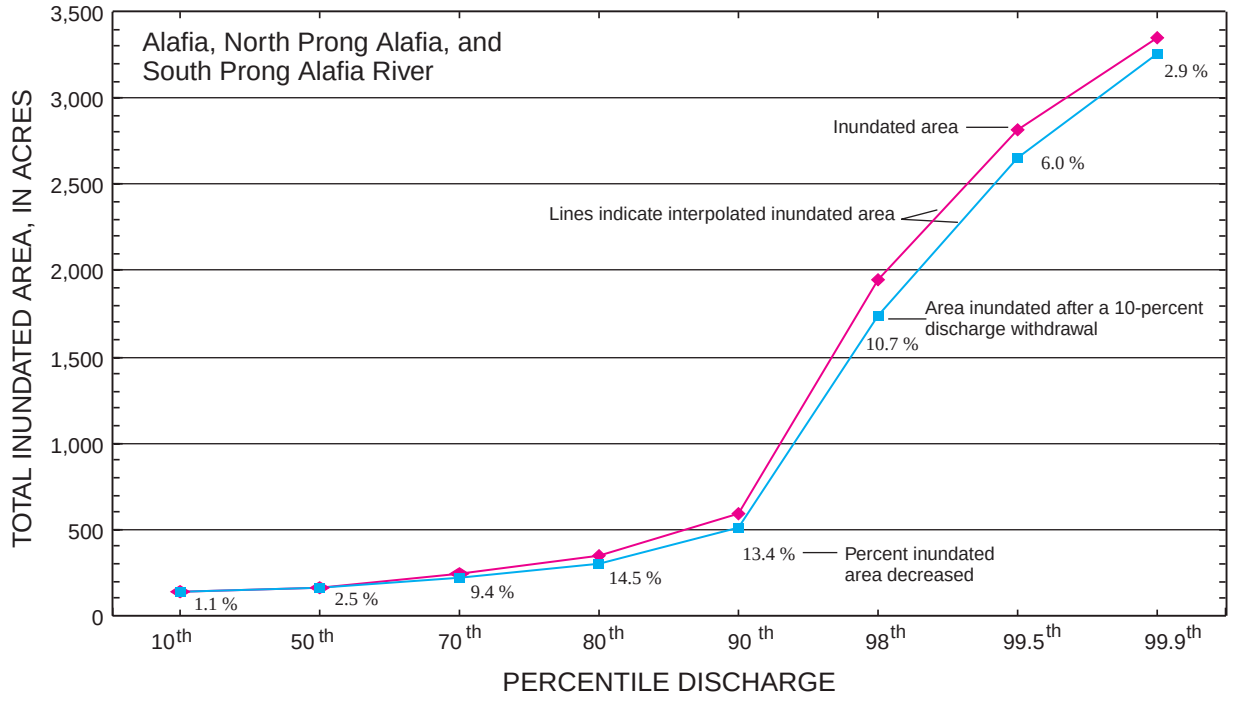


Figure 42. Estimated total inundated area along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for existing conditions and for a potential 10-percent discharge withdrawal, and percentage of inundated area decreased by a potential 10-percent discharge withdrawal for each of the selected percentile discharges.

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APPENDICES A-T

Appendix A. Extent of inundation at Cypress Creek cross sections for selected percentile discharges

Cross section	Percentiles						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet						
	Mouth						
1	6,475	7,802	7,840	7,889	7,964	8,012	8,049
2	3,002	3,966	4,231	4,482	4,828	4,989	5,072
4	2,468	2,823	2,959	3,122	3,344	3,502	3,638
6	854	1,293	1,661	2,005	2,861	3,225	3,288
6.1	112	127	130	134	214	385	507
6.2	289	608	773	1,035	1,732	2,025	2,269
7	151	360	471	616	746	1,088	1,227
8	171	277	344	447	1,049	1,225	1,531
9	142	177	197	223	254	886	1,073
9.1	SR 581 Bridge-Cypress Creek near Sulphur Springs Gage						
9.2	142	178	197	224	255	895	1,123
9.5	224	479	594	729	855	1,026	1,560
10	387	641	751	900	1,165	1,379	1,548
12	2,372	3,777	4,200	4,629	5,310	5,575	5,808
14	46.0	732	994	1,275	1,707	3,012	3,320
15	104	319	647	1,227	1,945	2,448	2,808
16	85.8	98.7	105	114	132	147	159
17	276	746	1,113	1,416	1,959	2,280	2,395
18	26.4	42.2	444	868	1,296	1,353	1,427
20	24.0	38.6	112	479	4,682	5,811	5,948
22	183	608	1,455	2,372	5,607	5,750	5,944
24	33.5	514	939	2,112	4,279	4,695	4,772
26	35.1	39.3	365	1,888	3,125	3,817	4,306
28	34.5	71.1	936	1,721	4,371	5,015	5,617
30	34.1	38.0	169	1,882	3,783	5,050	5,675
32	66.2	80.5	90.7	103	1,117	1,716	1,949
33	37.8	40.6	42.6	45.2	49.3	56.3	63.2
33.1	39.6	43.6	46.5	49.8	54.6	89.9	116
33.2	Interstate 75 Bridge (Hillsborough County)						
33.25	39.8	43.8	46.7	49.9	54.9	95.0	121
33.3	42.3	48.3	52.7	56.6	64.2	96.4	111
34	49.2	52.8	55.4	58.3	75.5	105	275
36	27.7	31.2	33.9	37.9	51.5	63.3	118
37	17.5	21.8	24.5	30.8	106	256	394
37.1	12.5	13.6	14.4	22.8	52.4	148	310
37.2	Hillsborough-Pasco County Line Bridge						
37.3	12.6	13.7	14.5	25.0	61.3	155	328
38	31.7	45.3	55.7	64.8	71.6	74.5	77.0
39	37.3	39.0	40.3	49.4	73.9	90.8	154
40	88.2	93.7	97.9	111	207	537	829
42	28.2	30.7	32.6	35.7	252	1,047	1,205
44	41.2	42.6	43.8	46.0	57.8	1,368	1,481
46	26.5	27.0	27.4	28.3	200	1,137	1,747
47	141	142	142	143	369	1,956	2,395
47.1	68.6	73.6	74.6	76.8	154	801	1,433
47.2	Interstate 75 Bridge (Pasco County)						
47.3	66.8	69.9	72.6	76.1	183	936	1,593
48	60.2	60.7	61.5	63.0	134	1,548	2,200
49	57.1	59.3	68.3	82.5	183	793	990
50	66.0	81.4	91.9	101	122	244	290
50.5	37.6	43.5	47.5	62.7	111	241	254
51	59.4	67.8	71.3	76.7	85.6	91.2	95.6
51.5	SR 54 Bridge-Cypress Creek at Worthington Gardens Gage						
51.6	64.0	72.1	74.4	78.1	85.8	91.5	96.0
52	55.0	58.4	62.2	71.3	188	291	376
53	51.1	63.1	73.1	84.6	110	150	219
53.1	41.3	50.1	55.9	59.0	65.9	77.9	111
53.2	Arch Bridge						
53.3	41.3	50.4	55.9	59.1	65.9	78.5	112.3
53.4	38.3	56.3	66.6	71.9	83.2	100.2	138.3
54	23.7	82.7	338	531	691	810	1,014
55	217	1,223	2,205	3,766	4,836	4,923	4,987
56	26.4	159.4	3,36	1,285	2,254	3,148	3,300

Appendix A. Extent of inundation at Cypress Creek cross sections for selected percentile discharges (Continued)

Cross section	Percentiles						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet						
57	27.1	28.7	726	1,426	3,802	4,276	4,546
58	26.4	28.6	327	607	1,056	1,476	1,720
60	290	504	562	638	1,023	2,984	3,126
62	25.2	26.5	28.2	261	2,508	2,944	3,060
64	38.8	2,053	2,306	2,681	2,765	2,812	2,876
66	1,103	1,991	2,399	2,697	4,838	5,177	5,966
68	33.7	33.6	35.4	38.4	1,168	1,226	1,290
70	37.8	1,661	1,701	1,769	2,169	2,267	2,355
72	1,433	1,511	1,558	5,331	5,676	5,955	6,178
74	35.2	38.0	976	2,575	3,715	3,973	4,236
76	37.9	712	1,387	2,278	3,782	6,846	6,951
78	34.1	1,579	2,019	2,587	4,666	5,149	5,562
80	57.4	80.1	95.9	148	248	357	468
80.1	137	145	149	157	177	255	367
80.2	Surface-Water Control Structure at Cypress Creek Wellfield						
80.3	138	147	153	165	401	841	3,558
80.8	60.2	60.4	60.5	60.7	61.1	61.5	62.0
81	6.0	6.0	6.0	61.0	61.0	61.0	61.0
81.5	140	153	168	252	469	967	3,815
82	140	153	168	252	471	973	3,824
84	31.9	33.9	35.7	39.0	846	1,397	1,985
85	37.1	700	1,195	1,808	2,079	3,002	3,654
86	33.6	38.2	2,471	3,793	4,655	5,393	6,504
88	38.4	1,902	2,889	3,878	5,233	5,376	5,449
90	35.9	195	694	1,445	2,029	2,455	3,057
92	64.4	422	504	597	775	941	1,107
94	142.4	159	171	196	240	267	293
94.5	15.6	30.2	37.0	44.8	57.7	62.9	70.7
95	66.0	76.2	84.3	97.5	134	174	223
96	26.4	31.9	38.9	145.4	273	349	426
97	31.5	55.2	61.9	77.2	137	220	318
98	43.2	49.8	54.8	96.0	338	516	737
99	38.2	45.5	46.1	48.1	82.6	230	786
100	SR 52 Culvert--Cypress Creek near San Antonio Gage						
Mean	267	489	667	961	1,479	1,864	2,164
Maximum	6,475	7,802	7,840	7,889	7,964	8,012	8,049
Minimum	6.0	6.0	6.0	22.8	49.3	56.3	61.0

Appendix B. Hydraulic depth at Cypress Creek cross sections for selected percentile discharges

Cross section	Percentiles						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet						
	Mouth						
1	1.80	2.49	2.96	3.51	4.35	4.79	5.05
2	1.42	2.05	2.39	2.81	3.47	3.82	4.05
4	1.53	2.37	2.73	3.15	3.81	4.13	4.29
6	1.31	1.77	1.80	2.02	2.26	2.51	2.81
6.1	2.75	3.47	3.87	4.33	3.33	2.24	2.00
6.2	2.83	2.17	2.13	2.10	2.05	2.25	2.36
7	1.36	1.32	1.44	1.61	2.22	2.00	2.15
8	2.30	2.30	2.28	2.28	1.65	2.01	1.96
9	2.60	3.06	3.22	3.49	4.27	4.88	4.12
9.1	SR 581 Bridge-Cypress Creek near Sulphur Springs Gage						
9.2	2.60	3.06	3.22	3.49	4.29	4.93	4.04
9.5	2.12	1.77	1.84	2.04	2.70	2.81	1.97
10	1.05	1.52	1.73	2.00	2.49	2.74	2.98
12	0.59	1.27	1.61	2.08	2.88	3.50	3.97
14	0.82	0.51	0.83	1.24	2.00	1.70	2.17
15	0.52	0.48	0.50	0.66	1.24	1.64	2.00
16	0.46	0.90	1.21	1.59	2.27	2.69	3.02
17	0.10	0.33	0.51	0.86	1.50	1.97	2.45
18	1.13	1.35	0.29	0.41	0.92	1.50	1.94
20	0.40	1.06	0.66	0.63	0.45	0.78	1.18
22	0.29	0.52	0.59	0.93	1.14	1.58	1.96
24	0.73	0.35	0.50	0.62	1.10	1.51	1.98
26	0.95	1.64	0.39	0.41	0.87	1.21	1.56
28	0.67	0.82	0.37	0.71	0.91	1.32	1.67
30	0.81	1.51	0.53	0.32	0.81	1.10	1.48
32	0.87	1.52	1.93	2.43	0.72	0.97	1.38
33	0.75	1.55	2.09	2.77	3.76	4.04	4.22
33.1	0.72	1.49	2.01	2.70	3.73	2.96	2.97
33.2	Interstate 75 Bridge (Hillsborough County)						
33.25	0.74	1.50	2.03	2.72	3.78	2.91	3.01
33.3	0.92	1.63	2.11	2.80	3.80	3.38	3.78
34	0.97	1.77	2.34	3.11	3.73	3.76	2.04
36	0.68	1.48	2.05	2.85	3.89	4.59	3.35
37	1.18	1.86	2.38	2.98	2.17	2.06	2.52
37.1	1.41	2.29	2.93	2.77	2.90	2.19	3.33
37.2	Hillsborough-Pasco County Line Bridge						
37.3	1.44	2.36	3.02	2.70	2.63	2.23	3.45
38	1.12	1.72	2.17	3.14	5.15	6.57	7.76
39	1.53	2.54	3.29	3.89	4.60	5.24	4.28
40	1.56	2.54	3.27	4.15	3.76	2.60	2.94
42	0.59	1.63	2.37	3.49	1.08	1.34	2.56
44	0.75	1.53	2.27	3.49	5.04	0.43	1.58
46	0.68	1.44	2.08	3.28	1.07	1.39	1.68
47	0.43	0.94	1.42	2.41	2.27	1.37	2.00
47.1	0.51	0.97	1.43	2.36	4.12	3.16	3.88
47.2	Interstate 75 Bridge (Pasco County)						
47.3	0.66	1.18	1.62	2.49	3.92	3.29	4.08
48	0.11	0.38	0.85	1.75	2.31	0.99	1.84
49	0.87	1.53	1.85	2.31	2.45	1.50	2.00
50	0.70	1.27	1.71	2.44	3.95	4.95	5.60
50.5	1.03	1.69	2.19	2.48	3.05	2.78	3.92
51	0.98	1.69	2.26	3.10	4.91	6.23	7.24
51.5	SR 54 Bridge-Cypress Creek at Worthington Gardens Gage						
51.6	0.97	1.70	2.31	3.22	5.08	6.41	7.44
52	1.12	1.90	2.44	3.11	2.42	2.95	3.50
53	1.17	1.73	2.13	2.82	4.19	4.42	4.26
53.1	1.17	1.76	2.23	3.14	4.97	5.70	6.35

Appendix B. Hydraulic depth at Cypress Creek cross sections for selected percentile discharges (Continued)

Cross section	Percentiles						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet						
53.2	Arch Bridge						
53.3	1.18	1.76	2.24	3.15	4.98	5.67	6.38
53.4	1.10	1.48	1.89	2.76	4.51	5.25	4.97
54	0.92	0.95	0.63	1.32	2.92	4.10	4.51
55	0.23	0.42	0.66	1.14	2.97	4.64	6.01
56	0.82	0.39	0.51	0.60	2.24	3.03	4.30
57	0.99	1.74	0.28	0.66	1.77	3.20	4.55
58	0.49	1.26	0.39	0.60	1.60	2.14	3.12
60	0.22	0.57	0.99	1.48	1.75	1.48	2.55
62	0.19	0.40	0.64	0.33	0.62	1.27	2.17
64	0.78	0.22	0.36	0.60	1.20	1.70	2.39
66	0.12	0.28	0.38	0.58	0.82	1.25	1.67
68	0.35	0.34	0.49	0.75	0.26	0.34	0.45
70	0.70	0.24	0.42	0.71	1.05	1.44	1.78
72	0.12	0.47	0.66	0.30	0.82	1.21	1.57
74	0.48	0.71	0.10	0.29	0.57	0.90	1.21
76	0.70	0.19	0.30	0.39	0.58	0.55	0.82
78	0.66	0.25	0.41	0.59	0.72	0.98	1.19
80	0.36	0.53	0.61	0.66	0.87	0.95	1.08
80.1	0.53	0.84	1.03	1.33	1.86	1.97	2.32
80.2	Surface-Water Control Structure at Cypress Creek Wellfield						
80.3	0.57	0.93	1.20	1.64	2.40	3.52	4.76
80.8	0.58	0.97	1.26	1.75	2.91	4.00	5.19
81	0.53	0.81	0.24	0.40	1.05	2.21	3.44
81.5	0.61	1.15	1.61	1.55	1.77	2.51	3.74
82	0.61	1.15	1.61	1.55	1.33	1.40	1.09
84	0.11	0.24	0.35	0.53	0.25	0.53	1.31
85	0.51	0.09	0.22	0.36	0.75	0.77	0.85
86	0.33	0.72	0.07	0.19	0.45	0.67	0.80
88	0.71	0.19	0.29	0.40	0.61	0.85	1.11
90	0.53	0.21	0.19	0.27	0.56	0.74	0.86
92	0.26	0.23	0.36	0.50	0.73	0.91	1.08
94	0.20	0.31	0.45	0.64	1.04	1.35	1.63
94.5	0.19	0.26	0.34	0.48	0.80	1.10	1.37
95	0.56	0.86	1.03	1.31	1.66	1.85	1.99
96	0.09	0.42	0.77	0.60	1.15	1.67	2.16
97	0.65	1.08	1.32	1.60	1.66	1.69	1.88
98	0.65	1.22	1.58	1.45	1.23	1.59	1.85
99	0.07	0.62	1.09	1.82	2.02	2.16	3.07
100	SR 52 Culvert--Cypress Creek near San Antonio Gage						
Mean	0.85	1.22	1.41	1.79	2.28	2.49	2.89
Maximum	2.83	3.47	3.87	4.33	5.15	6.57	7.76
Minimum	0.07	0.09	0.07	0.19	0.25	0.34	0.45

Appendix C. Acreage of areal inundation between adjacent Cypress Creek cross sections

Cross section	Percentiles						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres						
1	Mouth						
2	420	520	534	548	567	576	582
4	204	254	269	284	305	317	326
6	106	131	144	158	186	200	206
6.1	2.8	4.1	5.1	6.1	8.8	10.4	10.9
6.2	0.9	1.4	1.7	2.2	3.5	4.3	5.0
7	9.5	19.7	24.9	32.7	48.9	60.8	68.1
8	2.4	4.7	6.0	7.7	13.2	17.5	20.6
9	0.2	0.3	0.4	0.5	0.9	1.4	1.8
9.1	SR 581 Bridge-Cypress Creek near Sulphur Springs Gage						
9.2	0.6	0.8	0.9	1.0	1.2	4.1	5.0
9.5	0.4	0.6	0.8	0.9	1.1	1.9	2.6
10	9.9	18.2	21.9	26.4	32.8	38.9	49.8
12	108	170	190	212	247	266	281
14	86.4	158	182	206	244	293	311
15	5.2	36.5	57.0	87.0	127.0	190	213
16	0.4	1.0	1.7	3.1	4.8	6.0	6.8
17	0.8	1.9	2.8	3.5	4.8	5.6	5.9
18	5.5	14.2	28.1	41.3	58.9	66.0	69.5
20	1.9	3.0	17.3	41.0	176	210	216
22	4.9	15.1	37.3	68.8	214	237	244
24	7.2	35.4	74.7	141	318	337	345
26	2.1	15.0	34.9	105	195	226	242
28	3.0	4.5	45.2	130	266	309	344
30	2.0	3.2	29.4	91.2	209	260	291
32	3.8	4.5	7.9	50.4	115	157	177
33	1.4	1.7	1.8	2.1	11.5	18.8	21.5
33.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
33.2	Interstate 75 Bridge (Hillsborough County)						
33.25	0.1	0.1	0.1	0.1	0.1	0.2	0.3
33.3	0.2	0.2	0.2	0.3	0.3	0.4	0.5
34	1.3	1.4	1.5	1.6	1.9	2.6	3.4
36	3.1	3.4	3.6	3.9	4.8	5.9	10.2
37	1.4	1.6	1.8	2.1	4.1	7.2	10.8
37.1	0.1	0.1	0.1	0.1	0.4	0.8	1.4
37.2	Hillsborough-Pasco County Line Bridge						
37.3	0.0	0.0	0.0	0.0	0.1	0.2	0.3
38	0.1	0.1	0.2	0.2	0.3	0.4	0.7
39	0.1	0.1	0.2	0.2	0.3	0.3	0.4
40	1.3	1.4	1.4	1.7	2.8	5.9	9.0
42	3.7	4.0	4.2	4.7	12.7	40.0	51.5
44	2.4	2.5	2.6	2.8	8.5	58.7	65.6
46	2.3	2.4	2.4	2.5	8.6	78.4	93.8
47	5.1	5.2	5.2	5.3	13.1	66.2	89.1
47.1	0.2	0.2	0.2	0.3	0.6	3.2	4.4
47.2	Interstate 75 Bridge (Pasco County)						
47.3	0.3	0.3	0.3	0.3	0.8	4.0	6.9
48	0.1	0.2	0.2	0.2	0.4	2.8	4.4
49	2.2	2.2	2.4	2.7	5.3	31.4	42.9
50	2.3	2.6	3.0	3.4	5.2	14.6	17.7
50.5	2.7	3.3	3.7	4.2	5.8	11.5	12.8
51	0.1	0.1	0.1	0.2	0.2	0.3	0.4
51.5	SR 54 Bridge-Cypress Creek at Worthington Gardens Gage						
51.6	0.1	0.1	0.1	0.1	0.2	0.1	0.2
52	0.1	0.2	0.1	0.2	0.3	0.4	0.6
53	0.5	0.6	0.6	0.7	1.3	1.9	2.6
53.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3
53.2	Arch Bridge						
53.3	0.0	0.1	0.1	0.1	0.1	0.1	0.1
53.4	0.0	0.1	0.1	0.1	0.1	0.1	0.1
54	0.4	0.7	1.9	2.8	3.5	4.1	5.2
55	4.2	22.2	43.0	72.5	93.4	96.9	101
56	4.1	23.1	42.5	84.6	118.5	135	139
57	1.2	4.1	22.6	59.5	131.3	159	168
58	1.5	1.6	25.4	50.1	116.4	137	148

Appendix C. Acreage of areal inundation between adjacent Cypress Creek cross sections (Continued)

Cross section	Percentiles						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres						
60	12.0	18.2	29.1	41.0	71.3	160	174
62	7.0	12.1	13.4	20.3	75.5	125	131
64	2.2	70.2	79.2	99.8	169	183	190
66	38.1	136	159	181	258	271	299
68	31.8	55.8	66.8	74.9	162	173	196
70	2.0	44.5	45.6	47.4	87.4	91.5	95
72	33.0	70.5	72.4	157	174	182	189
74	57.0	60.1	98.2	306	364	385	405
76	2.5	24.3	76.1	156	241	348	360
78	2.6	76.2	113	162	280	396	413
80	4.0	71.5	91.1	118	209	234	256
80.1	0.3	0.4	0.4	0.5	0.7	1.1	1.4
80.2	Surface-Water Control Structure at Cypress Creek Wellfield						
80.3	0.1	0.1	0.1	0.1	0.2	0.4	1.6
80.8	0.0	0.1	0.1	0.0	0.1	0.2	0.8
81	0.1	0.1	0.1	0.1	0.1	0.1	0.1
81.5	0.2	0.2	0.2	0.4	0.6	1.2	4.4
82	0.5	0.5	0.6	0.9	1.6	3.3	13.2
84	7.2	7.8	8.5	11.8	50.6	90.5	219.6
85	1.3	13.4	21.2	30.8	49.4	71.0	91.0
86	1.3	13.5	62.2	91.3	112	139	172
88	2.7	60.2	172	250	317	344	380
90	2.7	73.2	124	185	252	270	292
92	3.1	18.7	36.1	61.6	84.2	102	124
94	5.5	14.4	16.7	19.6	25.2	30.0	34.8
94.5	0.3	0.3	0.3	0.4	0.5	0.5	0.6
95	0.1	0.2	0.2	0.2	0.3	0.4	0.5
96	3.2	3.7	4.2	8.2	13.6	17.4	21.6
97	1.0	1.4	1.7	3.5	6.4	8.8	11.4
98	1.1	1.6	1.8	2.6	6.6	9.9	14.0
99	0.1	0.1	0.1	0.2	0.5	0.9	1.8
100	SR 52 Culvert--Cypress Creek near San Antonio Gage						
Total	1,253	2,352	3,184	4,588	6,914	8,326	9,130

Appendix D. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at Cypress Creek cross sections

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres						
1	Mouth						
2	4.52	3.33	1.89	2.14	2.1	1.93	1.58
4	1.68	3.57	2.18	2.45	2.34	2.78	2.37
6	0.05	2.08	1.95	2.22	1.6	1.83	1.63
6.1	0.03	0.11	0.15	0.16	0.19	0.18	0.16
6.2	0.5	0.04	0.05	0.07	0.13	0.19	0.19
7	0.15	0.86	1.09	1.25	1.11	2.31	2.22
8		0.23	0.24	0.28	0.72	0.51	2.19
9			0.01	0.01	0.06	0.03	0.27
9.1	SR 581 Bridge-Cypress Creek near Sulphur Springs Gage						
9.2	0.01	0.02	0.03				0.3
9.5	0.42	0.03	0.01	0.03	0.01	0.08	0.57
10	4.43	0.83	0.64	0.75	0.65	1.6	8.19
12	3.39	5.67	2.98	3.58	3.7	4.27	4.58
14	0.4	7.31	3.3	3.97	3.49	17.93	5.62
15	0.03	4.09	4.84	3.64	4.43	22.15	5.24
16	0.06	0.08	0.24	0.14	0.21	0.28	0.13
17	0.44	0.14	0.17	0.1	0.1	0.33	0.09
18	0.03	1.16	2.39	1.99	0.88	3.06	1.09
20	0.34	0.32	3.36	3.63	20.1	1.22	1.68
22	0.48	2.15	4.84	3.58	13.28	0.97	1.28
24	0.02	4.33	8.97	11.83	3.51	1.43	1.72
26	0.03	1.39	6.11	11.34	5.29	4.29	3.28
28		1.06	7.97	9.04	6.96	8.22	8.46
30	0.04	0.81	5.9	10.27	9.26	9.26	6.64
32	0.02	0.09	1.85	8.45	6.03	6.27	4.28
33		0.02	0.02	0.03	0.36	0.64	0.69
33.1				0.01		0.02	0.02
33.2	Interstate 75 Bridge (Hillsborough County)						
33.25		0.01	0.01				0.02
33.3	0.01					0.03	0.01
34	0.01	0.01	0.01	0.02	0.11	0.08	0.3
36	0.01	0.03	0.05	0.04	0.2	0.17	1.87
37	0.01	0.03	0.03	0.06	0.34	0.63	1.25
37.1				0.02	0.03	0.09	0.28
37.2	Hillsborough-Pasco County Line Bridge						
37.3							0.06
38		0.01	0.02	0	0.02	0.02	0.31
39	0.01			0.01		0.02	0.01
40	0.01	0.01	0.01	0.05	0.51	0.65	0.34
42		0.03	0.04	0.1	4.29	4.22	1.56
44		0.01	0.02	0.03	3.2	31.41	1.79
46	0.01	0.02	0.01	0.02	5.83	46.54	4.68
47		0.01		0.01	6.34	19.8	6.59
47.1					0.25	0.95	0.32
47.2	Interstate 75 Bridge (Pasco County)						
47.3	0.01						0.68
48					0.13	0.53	0.23
49	0.03	0.02	0.05	0.06	0.57	4.89	1.48
50	0.03	0.06	0.04	0.06	0.28	1.03	0.76
50.5		0.07	0.04	0.09	0.32	0.13	0.14
51				0.01	0.01	0.01	
51.5	SR 54 Bridge-Cypress Creek at Worthington Gardens Gage						
51.6		0.01					
52			0.01		0.01	0.03	0.03
53		0.01	0.01	0.02	0.08	0.21	0.13
53.1			0.01		0.01	0.03	0.01
53.2	Arch Bridge						
53.3		0.01				0.01	0.01
53.4	0.01				0.01		
54	0.75	0.03	0.19	0.01	0.14	0.19	0.35
55	0.73	4.83	3.84	4.22	0.93	0.84	1.35

Appendix D. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at Cypress Creek cross sections (Continued)

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles						
	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres						
56	0.01	5.38	3.68	7.83	1.57	1.29	0.7
57	0.01	0.7	4.06	6.73	5.44	1.42	0.86
58	0.7	0.02	4.55	3.47	5.09	1.57	1.76
60	0.39	0.93	1.56	2.3	11.94	4.55	3.94
62	0.02	0.78	0.24	1.72	11.43	1.9	2
64	0.68	6.96	1.37	4.29	7.41	1.06	1.92
66	0.56	9.86	2.5	3.86	2.44	2.07	20.46
68	0.01	2.86	0.95	1.38	2.07	1.74	16.79
70	0.17	0.18	0.22	0.28	0.69	0.83	1.37
72	0.29	0.32	0.37	82.18	1.27	1.64	1.5
74	0.02	0.35	14.66	147.72	3.15	4.28	4.68
76	0.04	9.37	17.97	6.76	6.73	2.4	3.06
78	0.13	12.39	8.75	7.56	8.3	3.58	4.44
80		3.87	3.7	4.61	3.89	4.76	5.67
80.1		0.01	0.02	0.01	0.03	0.07	0.11
80.2	Surface-Water Control Structure at Cypress Creek Wellfield						
80.3			0.01		0.03	0.05	0.43
80.8	0.01		0.01		0.01	0.02	0.28
81							0.01
81.5	0.01	0.01		0.01	0.06	0.22	0.82
82	0.04	0.01	0.02	0.02	0.16	0.67	2.48
84	0.01	0.1	0.19	0.32	3.64	19.69	29
85	0.01	2.18	1.21	1.4	1.2	5.42	7.15
86	0.05	2.18	2.59	2.7	2.31	3.01	14.3
88	0.03	4.24	7.1	6.76	8.01	4.75	12.55
90	0.04	7.67	7.69	7.2	8.11	3.18	1.48
92	0.08	2.9	3	1.89	2.78	3.57	1.92
94		0.2	0.29	0.4	0.69	1.04	1.19
94.5			0.01	0.02	0.01	0.01	0.02
95	0.03		0.01	0.01	0.02	0.02	0.02
96	0.02	0.06	0.12	0.56	0.5	0.76	0.89
97		0.02	0.06	0.26	0.33	0.43	0.55
98	0.01	0.03	0.04	0.3	0.56	0.53	1.17
99				0.02	0.05	0.07	0.21
100	SR 52 Culvert--Cypress Creek near San Antonio Gage						
Total	22	118	152	395	210	281	233

Appendix E. Extent of inundation at cross sections along reach 1 of the Peace River for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
	Arcadia Gaging Station							
148	121	140	174	186	628	719	2,794	4,236
150	178	189	306	520	1,391	3,553	8,284	9,586
151	99	105	215	271	1,011	2,948	6,500	7,748
152	102	155	224	281	914	2,673	4,612	4,643
154	125	146	168	205	343	2,403	6,903	6,955
156	108	121	137	151	241	3,458	9,187	9,251
158	111	120	128	203	483	4,145	6,458	6,568
160	138	155	178	196	426	2,545	6,468	6,740
161				Railroad Bridge				
161.5	129	155	187	213	460	2,935	6,579	6,799
162	137	169	205	233	1,351	3,863	5,055	5,241
164	129	152	209	254	396	3,106	5,185	5,225
166	107	122	136	147	725	1,302	6,175	6,298
168	85	100	120	147	1,690	3,596	6,481	6,860
170	75	86	113	181	546	1,794	3,286	3,883
172	159	167	181	195	218	656	2,945	3,269
173	82	95	137	182	453	2,986	4,253	4,591
174	122	136	161	306	1,028	2,260	3,812	4,177
176	98	112	132	149	174	1,110	3,467	3,743
178	83	101	135	164	553	1,513	4,349	4,482
180	99	121	132	271	702	1,661	4,293	4,574
182	68	86	104	122	435	1,066	3,329	3,743
184	82	103	120	135	367	2,416	4,158	4,618
186	106	133	171	216	842	2,380	2,791	2,889
188	89	153	213	286	1,293	3,350	4,292	4,605
189	89	154	215	288	1,311	3,363	4,307	4,623
190				Brownwille Road Bridge				
190.5	90	156	219	292	1,345	3,398	4,351	4,682
191	140	176	208	231	317	3,469	4,094	4,368
196	106	163	363	1,067	1,925	5,818	6,342	6,542
198	132	155	175	190	791	4,702	5,564	5,847
200	120	150	162	170	182	3,462	6,094	6,753
202	105	134	162	181	456	2,642	3,667	4,660
204	96	109	119	126	558	2,546	3,448	3,605
206	104	119	134	144	159	2,797	4,105	4,332
208	85	96	107	115	126	2,927	4,938	5,483
210	89	109	126	139	157	721	3,426	4,067
212	86	96	108	117	207	2,484	4,948	5,052
214	104	136	169	187	347	1,135	5,002	5,382
216	84	97	118	132	468	3,053	4,549	5,184
218	58	78	105	126	194	2,055	6,542	8,915
220	78	122	318	483	1,057	3,858	6,212	8,969
222	120	149	172	619	1,329	6,683	9,684	9,983
224	110	219	348	579	1,716	5,883	7,602	8,747
226	89	114	152	331	699	5,878	8,105	8,996
228	114	129	323	773	1,419	2,615	7,692	7,772
230	78	96	112	395	893	2,127	7,427	7,883
232	82	91	101	129	179	2,660	7,149	8,624
234	86	102	117	129	150	1,571	3,842	4,642
236	84	115	131	145	168	1,378	3,256	3,843
238	95	136	166	189	325	1,103	3,018	3,643
240	100	146	197	237	429	1,237	2,599	2,936
242	73	89	106	688	2,310	2,791	4,251	5,446
244	60	70	95	113	804	2,380	2,892	3,949
246	95	110	124	174	1,738	3,326	3,759	4,660
248	98	138	200	384	783	3,514	4,987	5,370
250	93	106	150	274	1,755	4,110	5,739	5,889
252	88	121	144	161	189	4,071	8,314	8,477
254	107	137	148	156	171	4,268	5,125	5,359
256	75	108	137	160	825	2,166	2,621	2,720
258	71	100	133	194	405	2,198	2,705	3,113
260	63	94	126	148	182	1,549	3,797	4,833

Appendix E. Extent of inundation at cross sections along reach 1 of the Peace River for selected percentile discharges (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
262	99	122	143	162	192	1,792	3,732	4,918
264	153	268	369	441	554	4,268	8,831	12,410
266	78	160	287	344	538	3,957	6,869	9,514
268	74	86	98	127	459	3,410	3,611	5,441
270	83	87	90	247	501	2,187	3,347	4,249
272	101	107	114	184	279	470	1,238	1,967
274	86	93	98	114	453	2,086	4,909	7,958
276	102	123	139	321	729	2,171	3,758	4,965
278	126	161	190	234	471	2,057	3,851	4,117
279	88	95	106	118	130	452	865	976
279.1	128	144	155	160	168	264	448	972
279.2				SR 64 Bridge				
279.5	128	144	155	160	168	264	449	980
280	69	75	81	90	102	117	130	139
282	80	84	88	116	228	420	519	790
284	80	100	115	126	173	262	291	718
286	81	85	89	99	133	791	998	1,290
287	65	70	74	86	141	758	1,112	1,481
288				US 17 Bridge and Zolfo Spring Gaging Station				
Mean	99	124	161	238	625	2,521	4,529	5,181
Maximum	178	268	369	1,067	2,310	6,683	9,684	12,410
Minimum	58	70	74	86	102	117	130	139

Appendix F. Hydraulic depth at cross sections along reach 1 of the Peace River for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
	Arcadia Gaging Station							
148	2.0	3	4	5.3	3.8	7.2	3.1	2.9
150	2.2	3.4	3.7	3.4	3.4	4.4	3.7	4.2
151	2.2	3.5	3.2	4	3	4	3.8	4.2
152	2.0	2.4	3.2	4	2.4	3.7	4.7	5.7
154	1.9	3.3	4.6	5.1	5.2	2.6	3.1	4.2
156	2.1	3.6	5	6	5.8	1.3	2.8	4
158	2.2	3.9	5.5	4.7	3.8	1.8	3.8	4.9
160	2.2	3.8	5.2	6.2	7.9	5.2	5.3	6.1
161	Railroad Bridge							
161.5	2.1	3.5	4.7	5.7	7.2	4.3	5.8	6.9
162	2.0	3.3	4.6	5.6	2.1	3.9	5.7	6.6
164	2.0	3.5	4.3	5	5.4	1.9	3.9	5
166	2.1	3.7	5.3	6.4	3.3	5.5	2.5	3.7
168	2.1	3.8	5	5.6	1.8	4	4.5	5.5
170	2.5	4.2	5.1	4.5	3.3	3.1	4.1	4.6
172	2.6	4.8	6.6	7.9	9.7	5.4	3.1	4.1
173	2.1	4	4.8	5.2	4	2.5	4.8	5.9
174	1.9	3.9	5.7	4.3	3.2	4.5	5.5	6.5
176	1.3	3.3	5.5	7	9.1	2.9	3.2	4.4
178	1.2	2.6	4.4	5.7	3.2	3.5	3.6	5
180	1.1	2.2	4.1	3.4	3.6	5.5	4.7	5.8
182	1.6	2.9	4	5.1	2.6	3.7	3.4	4.4
184	1.8	3.4	5	6.3	4.6	2.3	4.2	5.1
186	1.8	3.6	5.1	5.9	2.9	4.9	7.4	8.5
188	1.7	3.5	5	5.6	7.6	6.5	9.9	11.5
189	1.7	3.5	5	5.6	7.7	6.5	10	11.6
190	Brownwille Road Bridge							
190.5	1.9	3.7	5.1	5.7	7.8	6.7	10.2	12
191	2.1	4.6	6.6	7.9	8.1	3.7	6.5	7.7
196	2.3	3.9	3.7	2.5	3.6	3.6	6.8	8.3
198	2.1	4.7	6.9	8.4	3.4	2.3	5.3	6.8
200	2.0	4.6	7.1	8.8	11	1.8	4	5.2
202	2.2	4.5	6.4	7.7	5.1	3.2	5.2	5.6
204	1.9	4.6	7	8.7	3.2	2.6	5.2	6.7
206	2.1	4.6	6.9	8.4	10.5	2.5	5	6.5
208	1.6	4.1	6.4	8	10.2	2.4	4.4	5.7
210	1.8	3.9	6	7.5	9.5	3.5	3.6	4.7
212	1.6	3.7	5.9	7.5	6.1	2.5	4.2	5.8
214	1.8	3.4	5.3	6.7	5.8	4.6	3.7	5.2
216	1.7	3.5	5.5	6.9	3.6	2.8	4.9	6
218	1.8	3.2	4.7	5.8	6.1	2.3	3.4	3.9
220	1.1	2.1	2.4	3.1	3.5	3.4	4.7	4.7
222	1.1	2.2	3.6	2	3.2	2.9	4.9	6.5
224	1.2	1.6	2.2	2.6	2.8	3.1	5.3	6.4
226	1.2	2.1	2.7	2.3	3	2	4.2	5.6
228	1.2	2.3	1.7	1.7	3	4.6	3.9	5.7
230	1.5	2.5	3.3	1.6	2.3	4.1	3.6	5.2
232	1.7	3	3.9	4.1	4.7	1.9	2.5	3.8
234	2.2	3.4	4.3	5	6.2	2.5	2.9	4.1
236	1.4	2.5	3.5	4.3	5.7	2.8	3.2	4.4
238	1.4	2.9	3.8	4.4	4.1	3.6	3.1	4.2
240	1.2	2.6	3.3	3.8	3.5	3.8	3.8	5.1
242	1.4	2.8	3.8	0.8	1.6	4.8	5.3	5.9
244	1.6	3	3.6	4	1.5	2.8	4.8	5.3
246	1.6	3.1	4.2	3.9	1.4	3.3	5.5	6.1
248	1.0	2.1	2.7	2.2	2.3	2.8	4.2	5.8
250	1.2	2.2	2.6	2.2	1.2	2.8	4.4	6.2
252	1.1	1.9	2.6	3.2	4.2	1.4	2.9	4.7
254	1.2	2.1	3	3.7	4.8	1.3	3.1	4.7
256	1.4	2.1	2.6	3	1.3	2.2	3.6	5.2
258	1.4	2.3	2.7	2.6	2.2	1.7	3.2	4.4
260	1.7	2.6	3	3.4	4	1.2	1.7	2.8

Appendix F. Hydraulic depth at cross sections along reach 1 of the Peace River for selected percentile discharges (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
262	1.8	3.1	4	4.4	5.1	1.4	1.8	2.6
264	1.4	2.2	2.8	3.3	4	1.7	2.1	2.5
266	2.3	2.6	2.4	2.9	3.2	1.5	2.1	2.7
268	2.1	3.7	4.7	5.1	2.5	2	3.7	3.7
270	1.4	3.3	4.7	2.9	2.5	2.1	2.7	3.5
272	1.8	3.6	5	4.3	4.2	5.1	2.8	3.1
274	1.9	3.7	5.1	5.7	2.7	2.7	2.2	2.7
276	1.9	3.4	4.5	3.4	2.5	3.5	3.2	4
278	1.7	3.1	4.2	4.7	4	2.3	3	4.5
279	2.0	3.7	4.9	5.6	6.9	5.4	3.5	4.7
279.1	1.4	3.1	4.4	5.5	7.2	7.0	7.2	7.9
279.2	SR 64 Bridge							
279.5	1.5	3.2	4.5	5.6	7.3	7.2	7.3	8.4
280	2.1	3.8	5.1	6.0	7	9.3	10.7	11.7
282	2.0	3.8	5.2	6.0	4.3	4.8	5.2	5.6
284	1.4	2.9	4.0	4.9	5.4	6.4	8.1	4.9
286	1.7	3.4	4.8	5.7	6.1	2.9	4.8	5.6
287	1.7	3.3	4.6	5.4	5	7.5	6.0	6.3
288	US 17 Bridge and Zolfo Spring Gaging Station							
Mean	1.7	3.3	4.4	4.9	4.6	3.6	4.5	5.4
Maximum	2.6	4.8	7.1	8.8	11	9.3	10.7	12
Minimum	1.0	1.6	1.7	0.8	1.2	1.2	1.7	2.5

Appendix G. Acreage of areal inundation between adjacent cross sections along reach 1 of the Peace River

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
148	Arcadia Gaging Station							
150	0.9	0.9	1.4	2.2	5.8	13.2	31.2	37.8
151	4.0	4.3	7.6	11.6	32.5	92.5	197.8	227.2
152	3.1	4.0	6.7	8.4	28.9	84.1	166.0	185.1
154	7.3	8.7	10.5	12.3	21.8	68.2	150.7	151.8
156	6.4	7.3	8.4	9.7	15.8	153.0	417.2	420.1
158	7.6	8.3	9.2	11.7	22.2	212.1	434.0	439.0
160	1.7	1.8	2.1	2.7	6.1	44.9	86.8	89.4
161	Railroad Bridge							
161.5	0.3	0.4	0.4	0.5	0.8	3.9	8.8	9.1
162	0.2	0.2	0.3	0.3	1.5	5.7	9.3	9.5
164	5.7	6.9	8.8	10.4	30.2	110.9	162.0	166.4
166	9.0	10.4	13.1	15.2	41.0	150.0	374.3	379.8
168	5.7	6.6	7.7	8.8	58.8	116.6	300.6	312.5
170	5.9	6.9	8.6	11.6	64.3	150.3	275.0	302.8
172	7.0	7.6	8.8	11.3	22.7	72.4	181.9	207.0
173	7.8	8.4	10.2	12.1	19.7	95.5	192.7	209.2
174	7.3	8.2	10.6	17.1	49.9	139.4	191.1	207.2
176	7.8	8.8	10.4	14.9	34.4	100.5	232.9	252.9
178	5.2	6.1	7.6	9.0	18.9	62.9	182.3	191.8
180	5.4	6.6	8.0	11.5	27.3	58.3	116.9	121.5
182	5.4	6.6	7.6	11.0	28.7	65.9	204.2	223.0
184	4.5	5.6	6.7	7.7	22.7	94.0	189.8	211.3
186	5.2	6.5	8.0	9.6	29.8	119.4	177.7	192.9
188	5.8	8.5	11.5	14.9	58.7	156.0	191.9	202.8
189	0.2	0.3	0.5	0.7	1.9	7.0	9.2	9.9
190	Brownwille Road Bridge							
190.5	0.3	0.5	0.8	1.0	4.6	11.6	14.9	16.0
191	1.2	1.7	2.2	2.7	6.5	29.0	35.5	37.8
196	8.5	11.4	18.2	33.5	54.8	229.5	257.5	269.1
198	6.3	8.2	13.0	31.9	71.9	242.8	276.2	288.2
200	6.9	8.4	9.3	9.9	25.0	227.9	330.6	357.9
202	6.2	7.8	8.9	9.7	16.1	142.3	223.0	259.3
204	6.0	7.3	8.4	9.2	30.8	156.4	215.6	251.1
206	9.2	10.5	11.6	12.4	25.6	182.8	243.8	255.3
208	5.6	6.4	7.2	7.8	8.5	170.8	269.9	292.9
210	5.8	6.8	7.8	8.4	9.4	107.9	230.7	263.0
212	8.0	9.4	10.7	11.7	15.8	120.8	337.6	365.4
214	6.6	8.0	9.5	10.5	18.5	112.7	300.1	315.3
216	6.5	8.1	9.9	11.0	24.9	117.9	265.7	293.7
218	4.1	5.0	6.4	7.4	17.6	146.3	306.9	381.5
220	4.7	6.9	14.6	21.0	40.5	171.5	356.4	492.5
222	6.5	8.9	16.0	33.4	66.8	282.6	427.5	512.5
224	7.0	11.2	15.8	33.9	79.7	298.5	405.3	437.4
226	4.3	7.3	10.8	19.1	46.2	221.1	294.4	333.7
228	7.5	9.0	16.2	35.3	65.8	255.9	474.3	503.7
230	5.3	6.2	11.0	27.6	53.5	108.8	341.0	353.0
232	4.6	5.4	6.1	13.3	27.7	119.0	368.7	418.4
234	5.8	6.6	7.5	8.9	11.3	110.7	280.1	334.8
236	3.9	5.0	5.7	6.3	7.3	56.2	134.7	161.0
238	7.4	10.4	12.3	13.8	19.4	80.8	193.8	230.4
240	2.4	3.6	4.6	5.4	9.2	27.3	63.5	74.2
242	5.8	7.6	9.4	23.8	71.5	101.2	164.8	199.4
244	3.8	4.6	5.8	18.7	66.5	108.7	150.5	198.2
246	5.2	6.0	7.3	9.3	71.6	131.1	156.4	209.8
248	5.5	7.1	8.9	14.1	56.9	151.1	192.7	220.7
250	5.5	7.0	9.1	15.2	53.0	147.7	211.0	221.6
252	5.4	6.8	8.7	12.5	52.8	222.7	379.4	387.9
254	7.2	9.5	10.7	11.6	13.2	130.4	199.8	207.1
256	4.0	5.3	6.2	6.9	26.0	177.2	207.1	214.4
258	4.7	6.7	8.7	11.2	40.0	142.7	172.3	188.7
260	5.2	7.6	10.1	12.8	19.3	90.9	150.2	181.5
262	4.9	6.4	8.0	9.2	11.2	90.0	196.7	253.7
264	7.5	11.7	15.3	18.0	22.3	122.7	247.2	343.4
266	7.2	13.3	19.2	22.7	31.1	184.2	341.3	464.4

Appendix G. Acreage of areal inundation between adjacent cross sections along reach 1 of the Peace River (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
268	5.1	8.2	12.1	14.3	25.0	169.3	237.6	330.2
270	3.6	4.0	4.3	7.3	16.3	81.7	101.3	142.1
272	6.9	7.3	7.7	12.8	20.7	57.3	94.0	124.6
274	6.2	6.6	7.1	10.0	23.5	83.9	186.9	278.3
276	5.4	6.2	6.8	13.1	34.8	108.7	223.1	358.4
278	6.6	8.1	9.4	16.5	36.5	112.5	197.0	238.3
279	3.6	4.3	4.9	5.9	10.0	41.8	78.5	84.8
279.1	0.5	0.6	0.6	0.6	0.7	1.6	3.0	4.5
279.2	SR 64 Bridge							
279.5	0.2	0.3	0.3	0.3	0.3	0.5	0.8	1.8
280	0.2	0.3	0.3	0.3	0.3	0.4	0.7	1.3
282	1.1	1.2	1.3	1.5	2.6	4.4	5.3	6.8
284	1.3	1.5	1.6	2.0	3.2	5.5	6.5	12.1
286	4.2	4.9	5.4	5.9	8.0	25.0	30.7	48.2
287	0.8	0.9	0.9	1.1	1.6	11.3	14.4	16.5
288	US 17 Bridge and Zolfo Spring Gaging Station							
Total	377	474	609	888	2,120	8,412	15,081	17,196

Appendix H. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at cross sections along reach 1 of the Peace River

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
148	Arcadia Gaging Station							
150	0.01			0.2	0.6	0.8	4.9	1.4
151	0.02		0.4	1	4.2	7	35.5	4
152	0.05		0.4	0.4	10.4	6.7	22.5	2.3
154	0.04	0.03	0.3	0.6	6.5	6.3	0.5	0.4
156	0.05	0.69	0.2	0.4	2.7	63	3.4	1
158		0.57	0.2	0.6	3.9	118.7	4.6	1.6
160		0.11		0.2	1.2	19.1	1.4	1
161	0.18	0.08						
161.5	0.01	0.02	1.5		0.01	0.8	0.2	0.1
162	0.07				0.5	0.8	0.1	
164	0.08		0.4	0.4	7.3	23.9	1.5	0.5
166	0.06	0.02	0.4	0.6	5	43	30	1.6
168	0.05	0.15	0.3	0.3	8.6	10.9	43.3	2
170	0.01	0.19	0.4	0.8	10.9	27.8	28.3	5.1
172	0.04	0.09	0.3	0.6	2.3	25.9	6.9	6
173	0.06	0.14	0.5	0.6	1.7	21.8	6.0	5.9
174	0.05	0.08	0.5	2.7	5.8	19	4.1	4.7
176	0.04	0.07	0.3	2	3.4	14.2	15.9	6.2
178	0.06	0.1	0.4	0.3	0.7	17.6	9.1	3.5
180	0.07	0.11	0.3	1.6	2.1	7.1	1.7	1.6
182	0.06	0.11	0.1	1.7	9.8	5.6	15.2	7.1
184	0.05	0.11	0.2	0.2	6.9	24.2	15	6.7
186	0.08	0.11	0.2	0.7	6	22.9	6.3	3.2
188		0.11	0.6	1	30.7	8.1	3.8	3.9
189		0.18			1.1	0.4	0.2	0.3
161	Railroad Bridge							
190.5	0.02	0.01	0.1		3.3	0.6	0.4	0.4
191	0.1		0.1	0.2	3.1	1.9	0.8	0.9
196	0.04		2.0	6.5	7.1	16.6	4.0	4.1
198	0.15	0.06	1.6	12.5	11.6	26.5	4.0	3.9
200	0.17	0.5	0.2	0.2	3.8	25.5	12.1	11.3
202	0.08	0.35	0.1	0.2	0.7	14.4	14.4	19
204	0.15	0.11	0.1	0.1	2.6	44.2	12	19.7
206	0.06	0.14	0.2	0.2	1.8	52.2	3.5	4.4
208	0.07	0.13	0.2	0.2	0.2	37	7.6	7.3
210	0.11	0.14	0.2	0.1	0.1	16.6	10.1	10.6
212	0.06	0.1	0.1	0.3	2.3	53.6	10.2	9.7
214	0.05	0.11	0.3	0.2	3.7	31.1	5.5	5
216	0.04	0.16	0.2	0.2	4.6	7.8	7.7	6.5
218	0.09	0.2	0.3	0.3	3.7	25.1	9.4	36.8
220	0.1	0.23	1.5	1.7	4.9	35.7	28.5	73.6
222	0.15	0.16	1.3	5.8	6.8	27.8	33.8	41.8
224	0.11	0.36	1	6.2	7.7	37.5	13.4	4.8
226	0.11	0.33	1	2.2	5.5	66.2	17	3
228	0.07	0.46	2.4	4.1	5.7	85.1	19.3	1.8
230	0.04	0.34	1.3	2.6	3.8	14.8	3.8	4
232	0.06	0.15	0.3	1.0	3.2	16.4	9.1	21.5
234	0.07	0.1	0.2	0.4	0.7	14.7	12.1	20.5
236	0.13	0.09	0.1	0.1	0.2	6.7	9.3	6.8
238	0.03	0.11	0.3	0.5	1.4	10.3	11.9	8.5
240	0.04	0.1	0.3	0.2	1.4	2.5	3.4	2.2
242	0.03	0.26	0.3	13.3	5.9	3.9	14.3	11.2
244	0.05	0.15	0.2	12.3	6.1	7	12.6	12
246	0.09	0.27	0.2	1.4	7.3	6.5	4.4	14.8
248	0.08	0.1	0.3	3.0	5.5	3.3	5.6	10.2
250	0.08	0.11	0.5	2.5	8.3	6.9	4.5	1.9
252	0.22	0.19	0.4	1.3	7.3	36.6	2.6	1.3
254	0.12	0.19	0.2	0.2	0.3	23	2.1	2.2
256	0.12	0.18	0.1	0.2	5.6	20.7	2.3	1.8
258	0.13	0.19	0.4	0.6	8.5	13.2	3.8	4.7
260	0.09	0.12	0.5	0.6	1.9	11	11	5.9

Appendix H. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at cross sections along reach 1 of the Peace River (Continued)

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
262	0.18	0.29	0.2	0.4	0.4	16.5	19.6	10.7
264	0.14	0.38	0.7	0.7	0.8	21.8	21.9	52
266	0.03	0.21	0.9	1	1.9	38.8	36.8	43.3
268	0.02	0.51	0.5	0.5	2.9	32.3	23.4	21.8
270	0.02	1.17	0.1	0.8	2.3	2.7	3.8	14.9
272	0.03	0.83		1.9	1.6	3.1	14	7.7
274	0.04	0.03	0.1	1.5	2	5.3	18.5	29.3
276	0.08	0.05		1.9	2.3	6	9.5	38.4
278	0.04	0.05	0.3	1.9	3.1	17.7	5.3	8
279	0.01	0.09	0.1	0.3	1.2	12.7	1.4	1.5
279.1		0.18	0.1			0.4	0.1	0.7
279.2	SR 64 Bridge							
279.5		0.01			0.1			0.1
280	0.01		0.1	0.1			0.1	1.0
282	0.02			0.2	0.3	0.2	0.5	7.5
284	0.05		0.1	0.2	0.2	0.2	1.9	7.5
286		0.02	0.1	0.2	0.5	3	5.2	4.6
287		0.02		0.1	0.2	2.2	0.6	0.4
288	US 17 Bridge and Zolfo Spring Gaging Station							
Total	4.96	13.7	29.9	110	307	1,469	751	715

Appendix I. Extent of inundation at cross sections along reach 2 of the Peace River for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
286	81	85	88	95	126	855	1,010	1,291
287	65	69	73	82	134	836	1,127	1,477
288	Zolfo Springs Gaging Station at US 17 Bridge							
289	65	69	73	82	134	852	1,150	1,493
290	71	78	83	97	128	370	1,358	1,441
291	53	60	65	70	519	2,874	2,960	3,047
292	83	98	117	135	205	3,304	3,509	3,671
294	71	87	112	157	256	3,229	4,348	4,612
296	80	103	426	542	766	3,791	3,936	4,077
298	104	137	165	261	346	1,775	2,332	2,645
300	110	120	129	135	148	177	801	3,174
302	74	85	99	112	136	1,473	2,024	3,978
304	74	104	120	137	155	192	2,408	2,632
304.1	113	150	164	175	191	223	277	339
304.2	SR 652 Bridge at Wauchula							
304.3	114	152	165	176	193	226	288	355
304.4	72	121	175	196	220	268	311	2,680
305	77	88	112	124	540	867	2,908	3,063
306	85	107	140	161	711	1,130	2,552	3,643
308	98	110	144	173	215	304	3,832	4,233
310	109	122	140	201	614	1,173	3,774	4,504
310.1	159	268	512	529	1,941	2,923	3,684	3,980
310.2	SR 64A Bridge at Wauchula							
310.3	157	274	512	530	1,956	2,932	3,699	4,035
310.4	99	153	195	372	422	1,740	3,836	3,941
314	93	104	113	120	130	150	1,382	2,801
316	130	137	146	152	162	185	1,364	2,709
318	118	129	138	145	157	2,492	2,771	2,862
320	75	97	115	144	1,671	2,166	2,563	2,784
321	98	148	188	258	2,348	3,167	3,635	3,833
322	116	134	148	165	201	1,768	2,137	2,377
322.1	126	143	158	184	212	236	1,695	2,583
322.2	SR 664A Bridge near Wauchula							
322.3	126	143	158	184	212	237	1,713	2,629
324	119	143	162	185	269	1,453	1,662	2,268
326	107	124	144	191	293	677	878	1,090
327	139	190	356	463	871	1,259	1,456	1,605
327.5	173	295	426	599	1,165	1,802	1,987	2,186
328	90	125	210	513	1,542	2,147	2,329	2,408
330	75	88	127	180	246	2,587	2,766	2,927
332	69	89	117	135	1,819	2,676	3,106	3,683
334	90	107	129	144	163	2,595	3,043	3,270
336	86	96	109	118	129	1,329	2,647	2,889
337	73	105	122	389	499	980	1,314	2,589
338	84	115	137	152	172	202	1,529	1,920
339	61	80	115	139	171	1,802	2,118	2,535
340	49	89	106	119	136	1,551	2,643	2,853
341	61	78	94	107	234	1,676	2,513	2,790
342	85	105	125	143	221	1,516	2,553	3,230
342.2	SR 664 Bridge at Bowling Green							
343	85	105	125	144	222	1,517	2,554	3,232
343.5	30	38	53	67	174	1,541	2,191	2,541
344	37	56	72	98	226	596	2,842	3,191
346	62	78	97	169	543	1,364	3,726	4,440
348	96	134	180	263	568	2,313	3,491	4,091
350	67	89	114	197	507	1,252	2,225	3,100
352	50	68	87	101	279	1,132	2,118	2,635
354	76	92	115	128	144	755	2,131	2,365
354.1	61	67	104	156	234	308	2,133	2,338
354.2	SR 664 Bridge at Polk-Hardee Countyline							
354.5	61	67	106	156	234	308	2,136	2,344
356	54	81	119	156	225	456	2,121	2,442
358	57	75	93	106	131	592	2,224	2,435

Appendix I. Extent of inundation at cross sections along reach 2 of the Peace River for selected percentile discharges (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
360	59	94	105	115	134	451	2,418	2,615
362	62	83	94	103	121	1,173	1,769	2,592
364	75	95	111	123	186	1,967	2,491	2,777
366	56	79	97	111	137	532	1,360	1,955
368	42	67	96	117	154	972	1,347	2,192
370	88	121	133	142	158	191	1,076	1,208
372	63	92	111	125	148	563	1,711	2,374
374	87	121	147	165	196	422	2,641	3,683
376	97	160	234	288	381	563	688	792
378	154	239	355	477	691	1,115	1,410	1,801
380	46	152	309	448	699	1,211	1,574	1,975
382	61	77	84	92	108	367	782	1,375
384	51	66	94	114	151	238	307	1,008
386	47	54	60	102	184	361	974	1,745
388	54	73	106	127	164	541	1,086	1,697
390	69	129	180	216	276	723	1,030	1,410
391	89	113	138	251	766	1,546	2,460	2,743
392	71	92	114	130	157	293	2,468	2,942
392.1	SR 657 Bridge near Fort Meade							
392.5	72	98	120	137	164	1,384	2,575	2,970
393	83	89	113	129	142	167	1,489	2,482
396	86	115	278	565	1,396	2,007	2,170	2,278
398	63	141	477	726	1,319	1,485	1,570	1,716
400	82	199	323	393	579	1,162	1,383	1,644
402	64	83	96	124	896	1,438	1,557	1,697
404	58	150	286	390	550	1,355	1,635	2,026
405	61	71	79	84	170	561	1,635	1,794
406.2	95	226	347	596	744	897	1,002	1,282
406.3	68	106	137	158	711	816	923	1,041
406.4	Fort Meade Gaging Station at US 98 Bridge							
Mean	82	113	159	209	448	1,209	2,063	2,542
Maximum	173	295	512	726	2,348	3,791	4,348	4,612
Minimum	30	38	53	67	108	150	277	339

Appendix J. Hydraulic depth at cross sections along reach 2 of the Peace River for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
286	1.7	3.3	4.7	5.6	6.1	2.9	4.7	5.7
287	1.7	3.2	4.5	5.3	5	7.8	5.1	6.6
288	Zolfo Springs Gaging Station at US 17 Bridge							
289	1.6	3.2	4.5	5.3	4.9	7.8	4.8	6.7
290	1.7	3.2	4.5	5.1	5.8	5	5.2	7.3
291	0.9	2.3	3.6	4.6	1.1	2.6	4.9	7.3
292	0.9	1.6	2.5	3.2	3.9	1.3	3.6	6
294	1.4	2.2	2.5	2.6	3.1	2.4	4	6.2
296	1.4	2.3	0.9	1.4	2.4	2.4	4.6	6.9
298	0.8	1.7	2.3	2.1	2.8	1.8	3.4	5.3
300	1.2	2.2	2.9	3.4	4.4	6.5	1.9	2.7
302	1.5	2.4	3	3.4	4	2.5	3.9	4.1
304	1.3	2.1	2.8	3.2	4.1	5.9	1.8	3.8
304.1	1.2	2.1	3	3.5	4.6	6.6	7.3	8.8
304.2	SR 652 Bridge at Wauchula							
304.3	1.1	2.2	3	3.6	4.7	6.8	7.4	9.2
304.4	1.3	1.8	2.2	2.7	3.8	5.9	7.2	4.2
305	1.5	2.7	3	3.5	1.8	3.8	2.5	4.7
306	1.2	2.3	2.7	3.1	2.5	3.9	3.4	4.5
308	1.4	2.6	3	3.4	4.1	5.5	2.7	4.7
310	1.5	2.7	3.5	3.3	2.5	4.3	2.6	4.3
310.1	1.2	2.2	3.3	4.3	3.5	6.5	8.7	10.9
310.2	SR 64A Bridge at Wauchula							
310.3	1.2	2.1	3.3	4.3	3.5	6.5	8.8	11
310.4	0.9	1.8	2.5	2.2	3.4	3.1	3	5.2
314	1.5	2.5	3.6	4.4	5.5	7.7	4.2	4.5
316	1.4	2.7	4.1	5.1	6.7	9.9	3.8	4.7
318	1.9	3.6	5	6.1	7.9	2.8	4	5.4
320	2.4	4	5.1	6.2	1.7	3.5	4.4	5.7
321	2.2	3.6	4.6	5.4	2.1	3.5	4.6	6
322	2.5	4.5	6	7.7	8.6	2.5	3.6	4.9
322.1	2.5	4.6	6.1	7.5	9	10.3	9.5	9.7
322.2	SR 664A Bridge near Wauchula							
322.3	2.5	4.6	6.1	7.5	9	10.3	9.7	10.1
324	2.4	4.3	5.7	7.2	7	2.7	4	4.6
326	2.3	4.3	5.6	6.3	6.2	4.6	5.1	5.9
327	2.2	3.8	3.4	4.8	4.3	5.1	6.1	7.5
327.5	1.9	3.1	3.8	4.8	4.2	4.9	6.3	7.7
328	2.3	3.8	3.7	3.2	3.1	4.5	5.9	7.8
330	1.8	3.8	4.4	5.1	6	2.6	4.3	6.2
332	2	3.7	5.8	7	1.5	3	4.2	5.4
334	1.6	3.6	5.9	7.3	9	2.7	3.9	5.6
336	1.7	3.8	6.3	7.8	9.7	2.5	2.8	4.6
337	1.5	3	5.5	3.6	5.3	4.3	4.9	5.2
338	1.6	3.1	5.4	6.8	8.6	9.7	3.4	4.6
339	1.7	3.2	4.7	5.8	7.1	2.3	3.8	5.2
340	1.6	2.8	4.8	6.2	7.9	3.5	4	5.9
341	1.6	3.2	5.1	6.3	4.6	1.7	2.8	4.7
342	1.5	3.2	5.1	6.3	6.3	6.4	6.6	8.9
342.2	SR 664 Bridge at Bowling Green							
343	1.5	3.2	5	6.2	6.2	6.4	6.6	8.9
343.5	1.3	2.9	4.3	5.2	3.8	1.3	2.7	4.5
344	1.5	2.5	4	4.5	3.8	3.1	2.2	4.1
346	1.3	2.6	4	3.6	2.8	3	2.5	4.2
348	1.3	2.4	3.6	3.9	3.7	3	3.8	5.4
350	1.3	2.4	3.6	3.3	3.1	3.1	3.4	4.5
352	1.3	2.3	3.2	4.2	3.2	2.3	3	4.5
354	1.5	2.6	3.4	4.4	6.2	2.4	2.7	4.7
354.1	1.6	2.9	3	3.2	4.1	6.1	6.5	8.9
354.2	SR 664 Bridge at Polk-Hardee Countyline							
354.5	1.6	2.9	3	3.2	4.1	6.1	6.6	8.9
356	0.7	1.7	2.4	3.1	4.1	4.1	2.5	4.4
358	1.3	2	2.7	3.4	4.8	2.4	2.2	4.3

Appendix J. Hydraulic depth at cross sections along reach 2 of the Peace River for selected percentile discharges (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
360	1.7	2.3	3.1	3.8	5	3.7	2.2	4.2
362	1.2	2.2	3	3.6	4.8	1.8	2.9	3.9
364	1.3	2.3	3	3.5	3.6	2.1	3.6	5.3
366	1.4	2.2	2.8	3.3	4.1	2.7	2.3	3.5
368	1.6	2.3	2.6	2.9	3.5	2.8	3.8	4.1
370	1.4	2.5	3.4	4	5	6.6	2.3	4.1
372	1.9	2.7	3.3	3.8	4.6	2.6	2.4	3.6
374	1.6	2.6	3.3	3.8	4.6	4	2.4	3.5
376	0.9	1.9	2.3	2.7	3.3	4.7	5.7	7.1
378	1.1	1.9	2.2	2.4	2.9	4.3	5.2	6.1
380	1.2	1	1.2	1.5	2.2	3.6	4.7	5.8
382	0.8	1.7	2.1	2.5	3.3	2.6	2.7	3.4
384	0.7	1.3	1.6	1.8	2.3	3.4	4.4	2.7
386	1	1.9	2.5	1.9	1.9	2.7	2.3	3
388	1.2	1.9	2.2	2.4	2.9	2	2.4	3.3
390	0.8	1.3	1.8	2.1	2.7	2.5	3.2	4.1
391	1	1.8	2.3	2.4	2.3	3	3.3	4.9
392	1.3	2	2.5	2.8	3.4	3.4	3.5	5.4
392.1	SR 657 Bridge near Fort Meade							
392.5	1.3	2	2.5	2.9	3.5	2.2	3.8	5.8
393	1.4	2.6	3	3.3	4.2	5.7	1.5	2.5
396	1.6	2.6	1.8	1.4	1.4	2.7	4	5.4
398	1.7	2.1	1.4	1.5	1.7	3.1	4.3	5.4
400	2	2.2	2.4	2.7	2.7	2.8	3.7	4.6
402	1.7	3.3	4.2	3.9	1.2	2.6	3.8	5.1
404	1	1.8	1.9	2.2	2.6	2.6	3.4	4.3
405	1	2.5	3.5	4.1	2.8	2.1	1.7	3.1
406.2	1	1.5	2	1.8	2.7	4	4.9	5.1
406.3	0.8	1.8	2.5	2.9	1.8	3.6	4.8	6.2
406.4	Fort Meade Gaging Station at US 98 Bridge							
Mean	1.5	2.6	3.5	4.0	4.2	4.1	4.2	5.5
Maximum	2.5	4.6	6.3	7.8	9.7	10.3	9.7	11
Minimum	0.7	1.0	0.9	1.4	1.1	1.3	1.5	2.5

Appendix K. Acreage of areal inundation between adjacent cross sections along reach 2 of the Peace River

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
288	Zolfo Springs Gaging Station at US 17 Bridge							
289	0.3	0.3	0.3	0.4	0.4	1.0	1.9	2.2
290	0.2	0.3	0.3	0.3	0.4	1.7	3.3	4.3
291	1.9	2.1	2.2	2.5	7.8	46.9	63.7	65.9
292	1.6	1.8	2.1	2.3	7.4	63.1	66.0	68.4
294	4.3	5.1	6.3	8.0	12.7	132.3	156.7	165.3
296	3.5	4.4	11.3	14.6	21.3	139.4	164.6	172.6
298	4.9	6.4	14.5	19.5	26.6	129.3	145.5	156.2
300	9.1	10.9	12.5	15.8	19.0	61.6	98.1	180.5
302	6.3	7.1	7.9	8.5	9.8	59.8	95.8	217.9
304	3.1	3.9	4.5	5.1	6.0	32.9	87.0	138.4
304.1	0.5	0.7	0.7	0.8	0.9	1.1	6.9	7.7
304.2	SR 652 Bridge at Wauchula							
304.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5
304.4	0.4	0.6	0.8	0.8	0.9	1.1	1.4	8.3
305	1.0	1.4	2.0	2.2	4.5	7.1	19.0	32.5
306	0.7	0.9	1.1	1.3	5.7	9.2	25.1	30.8
308	1.9	2.2	2.9	3.4	8.9	14.0	63.0	78.3
310	4.0	4.5	5.5	7.4	16.7	28.2	144.6	165.4
310.1	0.8	1.1	1.9	2.1	7.3	11.8	21.4	24.3
310.2	SR 64A Bridge at Wauchula							
310.3	0.4	0.6	1.2	1.2	4.5	6.7	8.5	9.2
310.4	0.9	1.5	2.4	3.1	8.2	16.1	25.9	27.5
314	6.3	8.4	10.0	14.5	16.1	48.8	135.6	173.0
316	3.8	4.2	4.5	4.7	5.0	5.8	47.6	95.8
318	6.5	7.0	7.5	7.8	8.4	70.1	112.2	147.5
320	6.0	7.0	7.8	9.0	48.1	116.7	133.2	140.9
321	3.0	4.2	5.2	6.9	61.2	81.2	94.4	101.0
322	2.3	3.1	3.7	4.6	37.1	72.7	84.9	90.7
322.1	0.3	0.3	0.3	0.4	0.5	2.3	4.4	5.7
322.2	SR 664A Bridge near Wauchula							
322.3	0.2	0.3	0.3	0.3	0.4	0.4	1.3	1.8
324	0.4	0.5	0.5	0.6	0.9	2.9	5.1	8.8
326	3.9	4.6	5.3	6.5	9.5	28.9	34.9	44.9
327	3.1	4.0	6.2	8.1	14.3	23.7	28.6	33.0
327.5	2.9	4.4	7.1	9.6	18.2	27.4	30.7	33.8
328	1.8	2.9	4.4	7.7	18.6	27.2	29.7	31.6
330	3.8	4.9	7.7	15.9	39.7	103.3	111.2	116.3
332	4.9	6.1	8.4	10.7	66.0	166.9	186.1	209.4
334	4.9	6.1	7.6	8.6	35.5	86.6	100.2	112.7
336	5.4	6.3	7.4	8.1	9.0	115.7	167.6	181.3
337	2.9	3.7	4.2	10.3	13.0	41.8	71.6	94.4
338	2.3	3.3	3.9	7.8	9.6	16.7	39.8	64.8
339	1.7	2.2	2.9	3.3	3.9	21.3	38.1	47.0
340	2.2	3.3	4.3	5.0	6.0	56.6	81.4	92.3
341	1.8	2.8	3.3	3.8	6.4	54.3	86.2	94.3
342	0.3	0.4	0.4	0.5	0.8	4.1	7.7	9.3
342.2	SR 664 Bridge at Bowling Green							
343	0.2	0.2	0.2	0.3	0.4	1.2	1.8	2.3
343.5	0.4	0.5	0.6	0.7	1.4	10.5	16.3	19.9
344	0.7	1.0	1.3	1.7	4.2	22.4	52.8	60.0
346	1.1	1.5	1.9	2.8	7.1	17.4	55.7	65.2
348	0.9	1.2	1.6	2.4	6.2	20.1	39.5	46.6
350	4.9	6.7	8.8	12.5	24.4	72.5	113.7	141.9
352	3.4	4.5	5.8	8.3	20.6	61.4	111.4	146.9
354	2.7	3.4	4.3	4.9	8.3	34.3	76.0	89.6
354.1	0.3	0.4	0.5	0.6	0.9	2.4	9.5	10.0
354.2	SR 664 Bridge at Polk-Hardee Countyline							
354.5	0.1	0.1	0.2	0.2	0.3	0.4	1.5	1.7
356	0.4	0.5	0.8	1.1	1.6	2.7	16.4	18.2
358	1.8	2.5	3.4	4.2	5.7	14.0	51.8	57.9
360	4.7	6.8	8.0	8.9	10.6	30.0	118.0	128.0
362	3.6	5.3	5.9	6.5	7.6	35.1	90.3	111.2
364	3.8	4.9	5.6	6.2	8.1	68.5	92.0	115.0
366	3.0	4.0	4.8	5.4	7.4	50.7	78.0	96.6

Appendix K. Acreage of areal inundation between adjacent cross sections along reach 2 of the Peace River (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
368	3.6	5.4	7.1	8.4	10.7	31.7	51.2	73.1
370	2.7	3.9	4.7	5.4	6.4	19.9	38.0	52.8
372	5.2	7.3	8.4	9.2	10.5	23.0	76.8	97.5
374	4.3	6.1	7.4	8.3	9.9	23.5	106.0	149.5
376	5.3	8.1	10.7	12.6	15.8	26.2	85.4	114.3
378	5.8	9.0	11.6	14.2	18.7	27.4	33.5	40.6
380	6.9	13.3	21.1	28.6	42.0	68.8	87.7	110.3
382	2.2	4.7	7.9	10.7	15.9	30.3	45.0	63.8
384	1.8	2.3	2.8	3.2	3.9	8.6	15.3	33.7
386	2.1	2.6	3.1	3.9	5.4	8.8	15.3	29.1
388	2.1	2.6	3.4	4.4	6.3	15.1	34.6	57.9
390	3.8	5.5	7.4	8.8	11.0	26.4	41.7	59.5
391	4.2	5.4	6.5	8.7	16.6	33.6	51.1	60.4
392	0.4	0.6	0.7	1.1	2.4	4.6	12.7	14.8
392.1	SR 657 Bridge near Fort Meade							
392.5	0.2	0.2	0.3	0.3	0.4	2.1	6.4	7.5
393	0.3	0.4	0.5	0.5	0.6	3.8	9.2	11.8
396	2.9	3.5	6.1	10.0	20.7	28.8	47.6	61.5
398	4.4	7.3	19.5	32.5	66.9	85.8	91.8	98.0
400	3.7	7.5	15.7	21.4	35.3	48.0	53.4	60.5
402	3.5	6.7	9.9	12.1	34.8	60.4	68.3	77.6
404	3.6	7.0	10.5	13.4	31.6	59.1	67.0	77.7
405	2.2	4.1	5.9	7.0	9.4	19.0	29.9	34.4
406.2	3.8	6.5	8.9	13.8	18.2	28.4	49.5	57.7
406.3	0.7	1.3	1.9	3.0	5.8	6.9	7.7	9.3
406.4	Fort Meade Gaging Station at US 98 Bridge							
Total	225	312	431	565	1,118	3,082	4,892	6,065

Appendix L. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at cross sections along reach 2 of the Peace River

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
286								
287					0.1	2.4	0.4	0.3
288	Zolfo Springs Gaging Station at US 17 Bridge							
289			0.1			0.1	0.4	0.1
290					0.1	0.2	0.3	0.1
291		0.1		0.1	4.3	0.3	0.5	0.5
292			0.1	0.1	4	4.3	0.5	0.4
294		0.1	0.4	0.5	1.1	15	2.3	1.5
296	0.1	0.1	6.2	1.1	1.5	8.7	2	1.4
298	0.2	0.2	7.2	1.1	1.6	9.8	2.7	2.5
300		0.2	0.3	0.6	0.8	11.5	22.1	6.1
302	0.2		0.2	0.2	0.2	3.7	15.9	7.3
304		0.1	0.1	0.1	0.2	2	2.5	4.6
304.1			0.1				0.4	0.2
304.2	SR 652 Bridge at Wauchula							
304.3		0.1			0.1			
304.4				0.1		0.1	0.1	0.3
305	0.1		0.1		0.1	1.5	3.4	0.5
306			0.1	0.1	0.2	2.5	5.5	1.1
308		0.1	0.1	0.1	0.1	3.8	6.6	2.8
310		0.1	0.3	0.8	0.3	9.1	14.8	1.6
310.1		0.1		0.1	1.5	1.8	2.2	0.2
310.2	SR 64A Bridge at Wauchula							
310.3	0.7	0.1	0.1		1.2	0.2		0.1
310.4		0.2			1.8	1.2	0.6	0.3
314	0.2	0.3	0.2	0.3	0.3	5.9	36.1	1.8
316			0.1	0.1	0.1	0.1	20.9	2
318	0.1	0.1	0.1	0.1	0.1	29.3	1	2.9
320	0.2	0.2	0.1	0.3	37.9	30.1	0.8	0.8
321	0.1	0.1	0.2	0.5	23.4	1.8	1.1	0.7
322		0.1	0.2	0.3	1.2	2.4	1.4	1.2
322.1	0.1				0.1	0.1	0.1	0.2
322.2	SR 664A Bridge near Wauchula							
322.3		0.1					0.1	
324		0	0.1		0.1	0.3	1	0.2
326	0.1	0.1	0.1	0.3	1.2	2.9	1	1.7
327	0.1	0.1	0.4	0.3	1.2	1.2	1	1.1
327.5	0.1	0.3	0.4	0.6	2.7	1	0.6	0.7
328	0.1	0.1	0.6	0.8	3.2	0.6	0.5	0.5
330		0.2	1.3	2.2	5.2	3	1.5	1.2
332	0.1	0.1	0.4	0.6	46.1	5.1	4.4	4.9
334	0.1	0.2	0.1	0.2	22.5	1.7	2.2	3.2
336			0.2	0.2	0.1	35.8	2.7	3.2
337	0.1	0.1	0.1	5.9	0.2	21.1	2.9	1.3
338	0.1	0.1	0.1	3.6	0.1	2.1	4	2.2
339			0.1	0.2	0.1	8.4	2.7	3.1
340	0.1	0.1	0.1	0.2	0.2	12.8	2	4
341		0.1	0.2	0.1	0.6	0.7	1.5	1.7
342	0.1				0.1	0.3	0.1	0.4
342.2	SR 664 Bridge at Bowling Green							
343					0.1	0.1	0.1	
343.5			0.1	0.1		4.3	0.4	0.7
344		0.1	0.1	0.2	0.4	13.5	1.9	0.8
346				0.6	0.7	2.7	4.6	3.2
348			0.1	0.6	0.6	1.9	3.3	2
350	0.1	0.3	0.3	2.3	1.9	6.6	7.7	1.9
352	0.1	0.1	0.3	1.6	2.2	9.7	10.8	1.9
354	0.1	0.1	0.2	0.1	0.6	7.6	4.8	2.4
354.1			0.1	0.1	0.1	0.5	0.8	0.1

Appendix L. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at cross sections along reach 2 of the Peace River (Continued)

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
354.2	SR 664 Bridge at Polk-Hardee Countyline							
354.5							0.1	0.1
356			0.1	0.1	0.1	0.3	1.3	0.4
358		0.1	0.2	0.2	0.3	2.9	3	1.1
360	0.1	0.2	0.3	0.3	0.3	4.7	8.1	1.5
362		0.1		0.1	0.2	14.5	7.8	5.1
364	0.1	0.1	0.2	0.3	0.9	18.8	5.4	5.9
366	0.1	0.1	0.1	0.1	0.9	4.5	3.7	4.3
368	0.1	0.3	0.4	0.4	0.5	2.3	2.7	3.8
370	0.1	0.1	0.2	0.2	0.3	0.8	2	2.4
372	0.2	0.3	0.2	0.3	0.3	1.1	6.5	4.4
374	0.1	0.2	0.2	0.3	0.3	2	6.5	4.2
376	0.2	0.3	0.5	0.5	0.7	2	3.2	1.7
378	0.1	0.3	0.6	0.8	1	1.3	1.3	1.8
380	0.2	1	1.9	2.4	2.9	3.6	4.1	5.6
382		0.5	0.7	0.8	1.2	2.1	3.5	4.5
384		0.1	0.1	0.1	0.2	0.8	1.8	4.4
386	0.1		0.2	0.3	0.3	0.5	1.6	3.2
388	0.1	0.2	0.1	0.3	0.4	2	4.6	5.1
390		0.2	0.3	0.4	0.5	2.9	3.5	4
391	0.1	0.1	0.2	0.3	1.6	1.6	3	1.9
392		0.1			0.1	0.3	0.7	0.1
392.1	SR 657 Bridge near Fort Meade							
392.5						1.4	0.4	0.1
393		0.1	0.1	0.1	0.1	2.9	1.1	0.3
396		0.1	1	1.1	0.5	0.7	4.9	2
398	0.1	0.5	3.7	3.6	1.9	1.8	1	2.3
400	0.2	0.6	1.5	1.5	2.4	1	1.3	2.5
402	0.1	0.5	0.6	1	2.6	1.5	1.9	2.3
404	0.2	0.4	0.6	1	0.9	1.4	2.2	2.1
405		0.2	0.4	0.3	0.8	0.6	1.2	0.8
406.2	0.1	0.3	0.4	1.4	1.6	1.1	1.4	3
406.3		0.2		0.2	0.2	0.2	0.1	0.6
Total	5.6	11.7	36.5	45.8	196	373	297	165

Appendix M. Extent of inundation at cross sections along reach 3 of the Peace River for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
406.5	71	112	148	208	730	847	946	1,072
406.6	71	156	232	307	577	1,061	1,542	2,170
407	63	84	103	163	286	896	1,272	1,639
408	82	179	338	644	922	1,142	1,286	1,432
410	78	154	612	982	1,210	1,520	1,819	1,945
412	65	159	317	670	847	1,610	1,807	2,029
414	57	303	950	1,378	1,657	1,938	2,322	2,519
416	100	443	1,000	1,320	1,512	1,674	1,792	2,626
417	68	133	329	396	485	647	718	1,660
418	77	157	327	384	472	662	745	1,708
418.5	Phosphate Mine Bridge							
419	79	165	337	390	482	672	750	836
420	50	67	83	94	121	310	435	577
422	40	139	376	1,098	1,436	1,888	1,984	2,075
424	46	136	759	934	1,209	1,658	1,823	1,869
426	57	387	1,134	1,213	1,346	1,501	1,582	1,670
428	71	359	633	857	1,267	1,851	2,285	2,368
430	64	993	1,284	1,509	1,633	1,916	2,281	2,508
432	74	502	987	1,106	1,388	2,357	2,727	3,133
434	65	919	1,304	1,520	1,667	1,823	2,006	2,639
436	97	315	386	429	502	642	746	966
438	68	584	726	835	988	1,218	1,608	1,895
440	69	115	129	710	824	852	1,038	1,085
442	44	123	603	1,173	1,192	1,228	1,259	1,294
443	48	97	1,158	1,412	1,905	2,125	2,352	2,781
444	47	98	1,178	1,431	1,912	2,129	2,357	2,790
444.5	SR 640 Bridge at Homeland							
445	48	159	1,209	1,456	1,928	2,147	2,460	2,919
446	68	660	1,880	2,049	2,181	2,357	2,456	2,540
448	46	736	1,154	1,432	1,603	1,919	2,177	2,342
450	68	557	1,268	1,364	1,516	1,799	2,026	2,543
452	91	788	948	976	1,092	1,392	1,881	2,133
454	56	787	957	1,021	1,135	1,437	1,535	1,626
456	1,807	2,374	2,482	2,591	2,929	3,061	3,122	3,168
458	81	125	144	158	182	228	264	1,713
460	159	678	1,003	1,060	1,288	1,817	1,890	1,983
462	57	7,79	1,117	1,253	1,454	1,691	1,711	1,737
464	80	709	1,089	1,170	1,323	1,447	1,468	1,495
466	38	540	881	988	1,171	1,194	1,213	1,236
467	70	206	466	644	821	1,972	2,004	2,346
468	124	233	470	608	739	961	1,072	1,502
468.5	Clear Springs Mine Bridge							
469	124	236	471	615	748	967	1,158	1,521
470	129	217	397	563	665	1,363	1,651	1,939
472	71	105	127	1,193	1,290	1,415	1,470	1,537
474	89	1,671	1,869	1,896	1,922	1,969	2,004	2,042
476	56	733	1,251	1,258	1,270	1,290	1,306	1,325
478	91	522	1,016	1,110	1,182	1,249	1,300	1,340
480	86	246	717	1,048	1,112	1,183	1,225	1,253
481	144	291	768	1,054	1,119	1,195	1,235	1,277
482	Abandoned Mine Bridge							
483	144	295	785	1,056	1,121	1,196	1,238	1,278
484	45	331	1,632	1,654	1,697	1,747	1,786	1,825
486	46	90	109	118	135	168	354	642
488	72	852	1,026	1,126	2,237	3,530	4,001	4,067
490	24	527	1,382	1,451	1,539	1,688	2,177	2,204
492	90	922	2,812	2,886	2,987	3,041	3,110	4,552
494	83	268	397	406	423	456	483	3,213
498	61	93	211	430	792	1,002	1,335	1,358
500	36	132	373	589	818	1,025	1,293	1,450
501	Bartow Gaging Station at SR 60							
Mean	104	424	819	1,007	1,096	1,466	1,641	1,953
Maximum	1,807	2,374	2,812	2,886	2,987	3,530	4,001	4,552
Minimum	24	67	83	94	121	168	264	577

Appendix N. Hydraulic depth at cross sections along reach 3 of the Peace River for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
406.5	0.9	1.9	2.7	3.2	1.8	3.4	4.5	4.9
406.6	0.9	1.5	2.2	2.5	2.4	2.7	2.9	3.6
407	1.3	2.3	3.1	2.7	2.7	2.4	2.7	3.5
408	1.6	2.1	2.0	1.8	2.4	3.5	4.4	5.3
410	1.1	2.0	1.2	1.4	2.3	3.4	4.1	5.3
412	1.4	1.6	1.7	1.4	2.0	2.3	3.3	4.3
414	1.4	1.0	0.9	1.2	1.8	3.1	3.6	4.7
416	1.3	1.0	1.1	1.3	1.9	3.2	4.1	4.0
417	1.2	1.8	1.4	1.6	2.1	2.9	3.7	2.4
418	1.4	1.9	1.6	1.9	2.3	2.9	4.0	5.4
418.5	Phosphate Mine Bridge							
419	1.4	1.9	1.6	1.9	2.3	2.9	4.1	5.5
420	1.7	2.7	3.1	3.2	3.3	2.3	2.6	3.2
422	1.8	1.6	1.3	1.0	1.5	2.5	3.5	4.7
424	1.9	1.8	1.0	1.2	1.6	2.4	3.2	4.5
426	1.7	0.9	0.9	1.3	1.9	3.0	3.9	4.9
428	2.1	1.7	1.7	1.6	1.8	2.3	2.9	4.0
430	0.8	0.8	1.5	1.7	2.4	3.3	3.8	4.7
432	1.5	0.6	0.9	1.3	1.8	2.1	2.9	3.7
434	1.3	0.7	1.1	1.4	2.0	3.2	3.9	4.0
436	1.5	1.5	1.9	2.1	2.5	3.2	3.8	4.1
438	2.3	0.9	1.4	1.7	2.3	3.3	3.6	4.3
440	1.8	2.7	3.3	0.9	1.6	3.0	3.6	4.8
442	1.7	1.8	0.8	1.0	1.7	3.0	4.1	5.3
443	1.9	2.5	0.8	1.1	1.5	2.6	3.4	4.1
444	1.6	2.4	1.9	1.8	2.0	3.3	4.4	5.8
444.5	SR 640 Bridge at Homeland							
445	1.7	1.6	1.9	1.8	2.1	3.5	4.7	6.1
446	1.9	0.9	1.1	1.5	2.2	3.4	4.5	5.7
448	1.5	0.9	1.5	1.7	2.2	3.2	4.0	5.1
450	1.5	0.9	1.2	1.6	2.2	3.2	4.0	4.5
452	1.1	1.0	1.6	2.0	2.6	3.4	3.5	4.4
454	1.3	0.6	1.1	1.5	2.1	3.1	4.0	5.1
456	0.2	1.0	1.5	1.9	2.5	3.8	5.0	6.3
458	1.3	1.5	1.9	2.2	2.6	3.4	4.1	1.4
460	0.8	0.9	1.2	1.6	2.1	2.7	3.6	4.8
462	1.6	0.8	1.1	1.4	2.0	3.1	4.1	5.4
464	1.3	0.6	1.0	1.3	1.9	3.1	4.1	5.3
466	2.0	0.6	0.9	1.1	1.6	2.8	3.8	5.0
467	2.1	1.8	1.5	1.5	1.8	1.9	2.8	3.6
468	2.4	3.2	4.0	4.3	4.8	5.3	5.3	3.2
468.5	Clear Springs Mine Bridge							
469	2.5	3.3	4.0	4.3	4.8	5.4	5.0	3.6
470	2.4	3.0	2.3	2.0	2.4	2.3	2.8	3.7
472	2.5	3.3	3.5	0.7	1.5	2.7	3.7	4.9
474	2.1	0.6	1.3	1.9	2.7	4.0	5.0	6.3
476	1.7	1.0	1.3	1.8	2.6	4.0	5.1	6.4
478	2.2	1.0	1.2	1.6	2.3	3.6	4.6	5.8
480	1.6	1.7	1.1	1.2	2.0	3.3	4.3	5.6
481	1.7	2.7	3.1	3.7	4.5	6.0	7.2	5.9
482	Abandoned Mine Bridge							
483	1.8	2.7	3.2	3.7	4.6	6.1	7.2	5.8
484	1.6	0.9	0.8	1.3	2.1	3.6	4.6	5.9
486	1.3	2.2	2.6	2.8	3.2	3.9	2.5	2.4
488	1.4	0.9	1.6	1.9	1.6	2.3	3.1	4.5
490	1.7	0.4	0.6	1.0	1.7	3.0	3.4	4.7
492	0.9	0.4	0.5	0.9	1.7	3.1	4.2	4.0
494	0.4	0.9	1.2	1.6	2.3	3.5	4.4	1.8
498	1.0	1.4	1.1	0.9	1.1	2.0	2.4	3.7
500	0.8	0.9	0.8	0.9	1.4	2.5	3.0	4.2
501	Bartow Gaging Station at SR 60							
Mean	1.5	1.5	1.7	1.8	2.3	3.2	4.0	4.6
Maximum	2.5	3.3	4.0	4.3	4.8	6.1	7.2	6.4
Minimum	0.2	0.4	0.5	0.7	1.1	1.9	2.4	1.4

Appendix O. Acreage of areal inundation between adjacent cross sections along reach 3 of the Peace River

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
406.4	Fort Meade Gaging Station at US 98 Bridge							
406.5	0.2	0.2	0.3	0.4	1.3	1.4	1.5	1.8
406.6	0.7	1.4	1.99	2.6	5.6	8.0	10.3	13.0
407	0.8	1.9	2.83	4.1	7.4	14.9	20.7	27.3
408	3.1	5.2	8.16	13.9	20.1	33.1	41.3	49.2
410	4.4	8.4	22.3	37.5	49.0	61.1	71.2	77.4
412	3.1	6.2	17.23	30.3	37.4	56.5	65.1	70.9
414	3.1	10.2	26.12	41.5	50.6	71.3	83.4	92.1
416	4.0	16.3	42.55	58.7	68.0	75.9	82.8	103.7
417	3.3	9.9	20.34	25.8	30.3	36.3	39.7	63.0
418	0.1	0.2	0.38	0.4	0.6	0.8	0.8	1.9
418.5	Phosphate Mine Bridge							
419	0.2	0.4	0.75	0.9	1.1	1.4	1.5	1.1
420	0.4	0.7	1.2	1.4	1.7	2.8	3.4	4.1
422	1.3	2.8	5.81	14.3	18.5	25.9	28.5	31.1
424	1.7	5.1	20.27	34.2	45.0	61.0	65.1	67.5
426	2.4	10.2	35.02	39.7	47.2	58.4	63.0	65.5
428	2.2	11.5	25.42	29.4	36.6	47.7	56.1	58.9
430	2.6	24.6	34.79	42.8	52.3	68.0	82.5	88.0
432	2.9	30.1	45.07	52.0	59.9	84.9	99.7	112.0
434	2.2	15.7	24.96	28.8	33.3	45.7	51.6	61.4
436	2.4	16.0	21.81	25.1	27.9	31.6	35.2	46.0
438	3.0	15.7	19.55	22.2	26.1	32.5	40.8	49.8
440	2.5	10.9	13.32	25.6	29.9	33.8	42.0	46.9
442	2.2	4.6	14.29	36.4	38.9	40.2	44.5	46.1
443	1.5	3.5	28.31	41.5	49.6	53.8	57.9	65.3
444	0.1	0.2	2.69	3.3	4.4	4.9	5.4	6.4
444.5	SR 640 Bridge at Homeland							
445	0.1	0.3	2.74	3.3	4.4	4.9	5.5	6.5
446	0.3	1.3	6.84	8.1	9.8	10.7	11.8	13.3
448	2.1	25.4	51.82	58.3	63.1	70.9	76.6	80.3
450	2.8	21.3	44.31	53.0	60.0	72.9	83.4	99.8
452	3.6	30.6	45.91	48.2	53.0	63.3	75.7	88.7
454	3.3	33.7	40.89	42.9	47.9	61.0	73.7	81.2
456	37.0	61.1	66.21	69.4	77.7	85.8	88.7	91.3
458	26.5	36.2	38.13	40.0	45.8	48.4	49.8	72.3
460	4.6	14.7	20.55	21.8	26.1	36.5	38.5	65.4
462	3.8	24.4	34.38	37.4	43.9	56.2	57.7	59.6
464	2.2	19.7	29.21	32.1	36.7	41.5	42.1	42.8
466	2.2	18.7	28.92	31.6	36.3	38.4	38.9	39.6
467	2.1	13.2	22.79	27.7	33.8	55.3	56.2	61.7
468	0.3	0.7	1.4	1.9	2.3	4.4	4.6	5.7
468.5	Clear Springs Mine Bridge							
469	0.3	0.4	0.58	0.7	0.8	1.0	1.3	2.3
470	0.2	0.4	0.7	0.9	1.1	1.9	2.3	2.8
472	1.8	3.0	4.75	15.6	17.3	25.1	28.2	31.4
474	3.5	34.2	38.41	55.5	57.6	60.6	62.2	64.2
476	3.3	48.7	62.9	63.6	64.3	65.7	66.7	67.8
478	3.9	26.7	45.14	47.3	49.0	50.8	52.1	53.3
480	4.7	16.5	34.45	42.1	44.7	47.3	49.2	50.6
481	0.4	0.9	2.56	3.6	3.8	4.1	4.2	4.4
482	Abandoned Mine Bridge							
483	0.3	0.5	0.99	1.3	1.3	1.4	1.4	2.2
484	0.2	0.7	2.77	3.1	3.2	3.4	3.5	3.6
486	1.5	7.0	24.35	24.8	25.7	26.9	30.5	34.9
488	2.2	16.4	19.72	21.6	41.0	63.9	75.2	81.3
490	2.8	31.6	55.82	59.6	84.6	114.9	134.9	137.0
492	1.6	18.9	52.56	54.3	56.7	59.2	66.5	85.3
494	3.3	20.8	43.24	44.1	45.5	46.7	48.0	102.0
498	1.2	2.5	3.46	4.8	7.0	8.8	11.5	30.2
500	0.3	0.6	1.68	2.8	4.3	5.2	6.5	7.0
501	Bartow Gaging Station at SR 60							
Total	173	744	1,266	1,537	1,798	2,196	2,449	2,828

Appendix P. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at cross sections along reach 3 of the Peace River

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
406.4	Fort Meade Gaging Station at US 98 Bridge							
406.5	0.1				0.2			0.2
406.6		0.1	0.1	0.3	0.6	0.3	0.9	0.3
407		0.2	0.2	0.6	0.7	0.7	2.3	0.7
408	0.1	0.2	1.5	1.6	0.7	0.8	2.9	1.6
410	0.2	0.4	4.5	3.8	1.4	1.9	2.4	1.5
412	0.1	0.5	2.4	2.1	1.6	1.6	2.1	1.4
414	0.1	1.3	3.1	1.3	2.1	1.2	5.6	2.2
416	0.1	2.7	4.8	2.7	1.3	0.6	3.2	2.3
417	0.1	1.3	1.7	1.4	0.8	0.8	0.9	12.8
418					0.1	0.1		0.5
418.5	Phosphate Mine Bridge							
419		0.1	0.1	0.1	0.1			0.1
420		0.1	0.1	0.1	0.1	0.2	0.1	0.2
422		0.1	0.5	0.5	1.1	0.8	0.6	0.4
424		0.4	1.6	1.5	2.7	1.5	0.5	0.4
426	0.1	2.6	1.4	1.3	1.6	1.2	0.6	0.5
428	0.1	1.8	1.1	1.1	1.5	2.2	0.6	0.6
430	0.6	1.7	1.6	1.6	1.9	3.2	2.3	0.6
432	0.7	3.0	2.1	1.1	1.1	5.8	2.9	2.0
434	0.1	1.2	1.5	1.1	0.5	3.0	1.3	4.4
436	0.2	0.8	0.9	1.0	0.4	0.6	1.6	5.8
438	0.2	0.6	0.7	0.8	0.8	1.4	2.0	2.1
440		0.4	0.5	11.0	0.7	1.0	1.5	0.8
442		0.2	3.9	12.7	0.4	0.2	0.3	0.4
443		0.2	9.8	2.5	0.4	0.4	1.0	2.0
444			0.6	0.2	0.1	0.1	0.1	0.3
444.5	SR 640 Bridge at Homeland							
445		0.1	0.2	0.1			0.2	0.2
446		0.3	0.4	0.4	0.1	0.1	0.3	0.5
448		3.8	1.2	3.8	0.9	1.3	1.4	0.6
450	0.1	2.5	1.1	6.1	1.4	2.1	2.7	1.1
452	0.1	2.0	0.9	0.7	1.3	1.5	3.1	1.6
454	0.2	1.8	0.8	0.6	1.5	1.4	3.0	2.0
456	0.9	1.5	0.7	1.4	1.7	0.8	0.5	0.7
458	0.6	0.3	0.3	0.9	1.3	0.4	0.3	9.1
460	0.7	0.8	0.3	0.4	0.9	0.4	0.5	12.4
462	0.6	1.3	1.0	0.8	1.4	0.3	0.4	0.6
464	0.1	1.7	1.0	0.8	1.0	0.1	0.1	0.2
466	0.1	1.9	1.0	0.8	0.9	0.1	0.1	0.2
467	0.1	1.1	0.9	1.0	1.1	0.2	0.2	5.0
468		0.1		0.1	0.1	0.1	0.1	0.5
468.5	Clear Springs Mine Bridge							
469							0.2	0.1
470						0.1	0.2	0.1
472		0.1	0.3	0.3	0.3	0.4	0.8	0.5
474		18.2	0.6	0.3	0.4	0.4	0.4	0.5
476	0.1	19.3	1.6	0.2	0.1	0.3	0.3	0.2
478	0.1	3.5	1.2	0.6	0.2	0.3	0.3	0.2
480	0.1	2.5	2.2	1.5	0.4	0.4	0.5	0.2
481		0.1	0.3	0.1				0.1
482	Abandoned Mine Bridge							
483			0.1	0.1				
484		0.1	0.1	0.0				0.1
486		1.0	0.1	0.2	0.2	0.2	2.9	2.0
488		1.2	0.1	1.5	3.9	3.6	3.2	2.8
490	0.1	3.6	3.5	2.1	5.1	4.6	0.4	0.6
492	0.1	3.1	6.7	0.4	0.4	0.3	0.3	4.0
494	0.2	3.0	4.1	0.2	0.1	0.2	0.4	7.2
498	0.1	0.1	0.1	0.3	0.4	0.1		1.9
500			0.2	0.3	0.3	0.1	0.1	0.1
501	Bartow Gaging Station at SR 60							
Total	6.5	94.9	75.6	76.7	48.1	49.0	58.6	99.3

Appendix Q. Extent of inundation at cross sections along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
Alafia River								
73	29	40	42	42	44	48	950	1326
74	SR 640 Bridge and Alafia River near Lithia Gaging Station							
75	36	37	38	39	40	44	759	2,494
76	16	25	31	34	55	983	1,657	2,010
77	66	78	86	92	386	2,322	2,679	3,313
78	43	45	46	47	49	319	1,983	2,806
79	68	75	80	84	90	156	1,512	2,671
80	57	71	83	93	107	447	1,411	2,364
81	42	43	44	45	46	50	864	1,401
82	70	73	76	78	82	348	1,311	1,914
83	Railroad Bridge							
84	54	58	61	64	73	422	1,241	1,728
85	41	43	44	45	47	141	896	1,016
86	62	63	64	65	67	356	927	1,173
87	42	44	45	46	48	1,191	1,866	1,958
88	42	44	45	46	48	1,695	1,924	2,025
89	60	76	87	96	110	1,799	2,628	2,907
90	33	36	38	39	236	1,967	2,599	2,680
91	36	52	62	69	235	1,846	2,016	2,199
92	40	43	49	57	72	1,890	2,340	2,620
93	179	198	210	219	238	1,644	1,801	1,988
94	SR 39 Bridge							
95	190	199	206	211	217	1,306	1,624	1,899
96	72	104	239	338	478	813	948	1,202
Mean	61	69	80	88	132	942	1,616	2,081
Maximum	190	199	239	338	478	2,322	2,679	3,313
Minimum	16	25	31	34	40	44	759	1,016
North Prong Alafia River								
1	35	37	39	40	98	1,004	1,519	1,600
2	35	38	39	45	311	931	1,187	1,278
3	35	38	49	123	243	1,291	1,398	1,471
4	38	44	48	94	262	683	1,319	1,421
5	30	31	32	42	77	113	126	146
6	Railroad Bridge							
7	30	31	33	50	84	114	128	193
7.5	31	32	33	33	34	57	126	216
8	34	36	38	39	49	442	1,215	1,362
9	33	35	36	37	39	348	946	1,234
10	32	35	36	38	40	596	1,250	1,386
11	Railroad Bridge							
12	32	35	36	38	40	690	1,268	1,391
13	37	39	41	42	44	900	1,381	1,553
14	272	278	282	286	293	783	1,157	1,865
15	SR 676 Bridge and Gaging Station							
16	276	280	284	287	293	783	1,165	1,869
16.5	278	280	282	284	288	712	1,417	1,908
17	43	49	53	56	65	400	985	1,439
18	54	69	78	83	103	270	868	1,240
19	36	39	181	240	378	719	887	1,026
20	35	38	40	584	1,093	1,247	1,360	1,470
21	35	39	115	180	379	827	1,068	1,179
22	36	40	151	531	982	1,062	1,117	1,176
23	35	40	264	369	491	641	699	781
Mean	68	72	100	160	258	664	1,027	1,237
Maximum	278	280	284	584	1,093	1,291	1,519	1,908
Minimum	30	31	32	33	34	57	126	146

Appendix Q. Extent of inundation at cross sections along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for selected percentile discharges (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
South Prong Alafia River								
1	35	39	57	98	180	1,268	1,279	1,291
2	28	30	56	94	275	1,146	1,314	1,425
3	29	72	116	153	348	1,189	1,220	1,268
4	39	65	85	109	460	1,139	1,263	1,298
5	37	204	348	414	609	744	1,008	1,211
6	40	49	64	73	82	105	597	1,095
6.5	78	82	84	169	190	334	845	1,035
7	34	108	132	140	151	181	488	839
8	SR 640							
9	34	108	132	140	151	182	490	847
9.5	185	210	221	233	302	538	662	759
10	28	34	43	48	55	510	693	914
11	39	47	66	95	150	482	821	1,106
12	24	29	128	190	368	919	1,238	1,337
13	21	33	53	75	122	792	896	1,009
14	29	65	193	310	611	953	1,098	1,222
15	37	51	64	75	93	385	706	971
16	33	38	46	60	164	889	1,017	1,126
17	24	28	82	211	348	646	786	941
18	19	30	81	101	124	850	1,039	1,127
19	25	29	130	173	230	1,020	1,166	1,263
20	17	20	22	23	25	1,313	1,627	1,668
21	33	36	38	39	190	1,392	1,420	1,455
21.5	28	32	35	37	145	871	902	947
22	25	28	30	32	34	567	832	1,087
23	Jameson Road and Gaging Station							
24	25	28	30	31	33	585	853	1,093
24.5	25	31	35	39	111	1,074	1,138	1,221
25	22	24	26	27	29	458	686	973
26	27	30	33	35	38	804	870	944
27	23	26	27	29	335	846	1,042	1,196
28	43	58	68	76	88	942	1,425	1,638
29	30	35	40	43	48	539	705	884
Mean	36	55	83	109	197	763	972	1,135
Maximum	185	210	348	414	611	1,392	1,627	1,668
Minimum	17	20	22	23	25	105	488	759

Appendix R. Hydraulic depth at cross sections along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
Alafia River								
73	0.6	1.2	2.1	2.9	4.1	7.5	2.4	4.4
74	SR 640 Bridge and Alafia River near Lithia Gaging Station							
75	2.0	2.7	3.4	4.0	5.1	8.3	2.6	4.3
76	1.6	2.5	3.1	3.4	3.2	1.5	2.4	3.7
77	3.1	4.4	5.1	5.7	1.8	2.0	3.3	4.2
78	2.5	4.4	5.5	6.4	7.6	1.9	1.1	2.1
79	1.8	3.4	4.4	5.2	6.3	5.8	1.6	1.8
80	1.5	2.5	3.3	3.9	4.7	2.3	1.9	2.2
81	2.0	3.3	4.2	5.0	6.2	9.2	1.7	2.3
82	3.3	4.5	5.4	6.1	7.2	3.1	2.2	3.6
83	Railroad Bridge							
84	3.4	4.5	5.4	6.1	6.6	2.8	2.3	3.7
85	0.9	2.5	3.6	4.5	5.9	3.8	1.3	2.6
86	1.7	2.9	3.9	4.7	6.0	2.5	2.7	3.5
87	1.6	2.9	3.8	4.5	5.7	0.9	1.9	3.2
88	1.9	3.3	4.3	5.0	6.2	1.3	2.2	3.2
89	1.6	2.6	3.2	3.7	4.5	1.1	1.6	2.5
90	2.0	3.3	4.1	4.7	1.2	1.4	2.1	3.0
91	1.7	2.5	3.1	3.5	1.8	0.9	1.7	2.6
92	2.4	3.9	4.5	4.7	4.8	0.9	1.5	2.2
93	1.3	2.8	3.8	4.5	5.3	6.2	6.1	6.9
94	SR 39 Bridge							
95	0.9	2.6	3.6	4.4	5.4	6.0	6.3	7.3
96	1.0	1.8	1.6	1.8	2.3	3.5	4.0	4.1
Mean	1.8	3.1	3.9	4.5	4.8	3.5	2.5	3.1
Maximum	3.4	4.5	5.5	6.4	7.6	9.2	6.3	7.3
Minimum	0.6	1.2	1.6	1.8	1.2	0.9	1.1	1.8
North Prong Alafia River								
1	2.7	4.0	4.7	5.2	2.9	1.6	2.1	3.5
2	2.8	4.1	4.8	4.8	1.0	2.2	3.0	4.2
3	2.3	3.7	3.7	1.9	1.8	1.3	2.5	3.8
4	1.7	3.0	3.7	2.3	1.6	2.2	2.4	3.6
5	1.6	3.0	3.8	3.4	2.7	4.0	4.9	5.5
6	Railroad Bridge							
7	1.2	2.4	3.1	2.6	2.4	3.9	4.8	4.2
7.5	1.5	2.6	3.5	4.1	5.0	4.7	3.1	3.0
8	1.8	2.9	3.6	4.1	4.4	1.9	2.1	3.2
9	1.9	3.2	3.9	4.5	5.5	1.8	1.5	2.4
10	1.1	2.2	2.9	3.4	4.4	0.9	1.8	3.1
11	Railroad Bridge							
12	1.1	2.0	2.7	3.1	4.1	0.9	1.9	3.2
13	1.2	2.0	2.6	3.0	3.9	1.1	1.9	2.8
14	0.6	1.4	1.9	2.4	3.3	5.5	6.4	6.7
15	SR 676 Bridge and Gaging Station							
16	0.7	1.4	2.0	2.4	3.3	5.6	6.4	6.9
16.5	0.7	1.4	2.0	2.4	3.3	3.1	2.5	3.0
17	1.0	1.4	1.6	1.9	2.4	1.2	1.5	2.1
18	1.6	2.3	2.8	3.0	3.1	2.8	1.5	1.8
19	2.2	3.3	1.2	1.3	1.5	2.5	3.3	3.9
20	2.2	3.6	4.4	0.5	0.8	2.1	3.1	4.1
21	2.3	3.8	1.8	1.6	1.2	1.4	1.9	2.8
22	2.6	4.3	1.7	0.8	1.0	2.3	3.2	4.1
23	1.9	3.5	1.0	1.1	1.4	2.4	3.3	4.1
Mean	1.6	2.8	2.9	2.7	2.8	2.5	3.0	3.7
Maximum	2.8	4.3	4.8	5.2	5.5	5.6	6.4	6.9
Minimum	0.6	1.4	1	0.5	0.8	0.9	1.5	1.8

Appendix R. Hydraulic depth at cross sections along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for selected percentile discharges (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Feet							
South Prong Alafia River								
1	2	3.1	2.7	2	1.9	1.9	3.0	4.3
2	2.2	3.5	2.5	2	1.2	1.7	2.5	3.6
3	0.7	1.4	1.5	1.6	1.3	0.9	1.8	2.9
4	1.6	2.1	2.3	2.3	0.8	1.3	2.0	3.0
5	1.8	0.9	1.2	1.5	1.6	2.5	2.5	3.1
6	1.5	2.7	2.8	3	3.3	3.8	1.1	1.5
6.5	1.5	3	3.8	2.3	2.7	2.7	1.9	2.4
7	0.9	1.1	1.7	2.2	2.7	3.7	3.5	4.2
8	SR 640							
9	0.9	1.1	1.7	2.2	2.7	3.7	3.5	4.2
9.5	0.9	2.3	3.1	3.4	3.2	3.0	3.5	3.9
10	0.3	0.8	1.4	1.8	2.2	1.0	1.7	2.2
11	1.2	2.1	2.1	1.9	1.7	1.3	1.3	1.7
12	1.2	2.3	1.3	1.4	1.1	1.2	1.5	2.1
13	1.3	1.9	2.1	1.9	1.8	1.2	1.6	2.2
14	1.5	1.7	1.1	1	1.0	1.4	1.9	2.4
15	1.2	2.3	2.6	2.6	2.6	1.1	1.2	1.5
16	1.3	2.5	2.9	2.8	1.6	1.3	1.8	2.4
17	1.4	2.5	1.3	1	1.1	1.5	1.9	2.3
18	1.2	2	1.4	1.5	1.7	0.8	1.2	1.9
19	1.8	3.1	1.3	1.4	1.5	1.0	1.5	2.1
20	0.8	2.2	3	3.4	3.9	0.6	0.9	1.5
21	1.2	2.4	3.2	3.7	1.2	1.2	1.7	2.2
21.5	1	2.1	2.9	3.4	1.4	0.8	1.3	1.9
22	1.2	2.4	3.1	3.6	4.3	1.3	1.8	2.4
23	Jameson Road and Gaging Station							
24	1.3	2.4	3.2	3.6	4.4	1.4	1.9	2.5
24.5	1	2	2.7	3.1	1.6	1.0	1.5	2.1
25	1.1	2.2	3	3.5	4.3	0.9	1.2	1.5
26	0.7	1.6	2.3	2.8	3.7	0.9	1.6	2.2
27	1.5	2.5	3.2	3.7	0.7	1.2	1.5	2.1
28	0.9	1.7	2.3	2.7	3.2	1.0	1.2	1.9
29	0.8	1.5	2	2.3	2.9	0.8	1.3	1.7
Mean	1.2	2.1	2.3	2.4	2.2	1.6	1.8	2.5
Maximum	2.2	3.5	3.8	3.7	4.4	3.8	3.5	4.3
Minimum	0.3	0.8	1.1	1	0.7	0.6	0.9	1.5

Appendix S. Acreage of areal inundation between adjacent cross sections along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for selected percentile discharges

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
Alafia River								
73	SR 640 Bridge and Alafia River near Lithia Gaging Station							
74								
75	0.1	0.1	0.1	0.1	0.1	0.1	1.3	2.4
76	0.8	0.9	1	1.1	1.4	12.7	29.4	54.6
77	2.3	3	3.4	3.6	10.9	74.4	97.5	119.8
78	4.5	5.1	5.5	5.8	12.7	63.4	109.8	143.2
79	3.7	4	4.2	4.4	4.7	14.5	96.4	151.3
80	3.8	4.5	5	5.4	6	15.3	61.6	103.7
81	3.2	3.6	4.1	4.4	4.9	12.9	50.2	78.7
82	1.1	1.2	1.1	1.2	1.3	4.0	22.4	34.1
83	Railroad Bridge							
84	0.1		0.1	0.1	0.1	0.5	1.4	1.8
85	3	3.3	3.4	3.5	3.8	15.3	54.6	70.0
86	3.2	3.3	3.3	3.4	3.5	11.8	38.7	46.2
87	5	5.1	5.3	5.3	5.5	44.8	70.4	78.2
88	2.5	2.6	2.7	2.8	2.8	47.1	60.2	63.1
89	3.9	4.6	5	5.3	6	90.8	118.1	127.9
90	3.5	4.2	4.8	5.1	9.5	74.9	103.0	110.0
91	1.5	2	2.1	2.4	8.2	62.3	75.3	79.6
92	2.9	3.6	4.2	4.8	8.4	73.7	85.5	94.1
93	3.8	4.1	4.5	4.7	5.2	33.6	39.1	43.3
94	SR 39 Bridge							
95	0.6	0.6	0.7	0.7	0.8	2.3	2.5	2.8
96	3.7	4.4	6.2	7.5	9.4	27.5	33.4	40.2
Total	53	60	67	72	105	682	1,151	1,445
North Prong Alafia River								
1								
2	1.2	1.3	1.3	1.4	5.9	26.9	37.5	39.9
3	3.3	3.6	4.0	5.8	14.4	51.8	59.9	63.6
4	2.0	2.3	2.6	4.9	10.5	38.5	52.5	55.9
5	1.4	1.6	1.7	2.6	5.8	12.8	22.6	24.5
6	Railroad Bridge							
7	0.1	0.1	0.2	0.2	0.4	0.5	0.6	0.7
7.5	0.2	0.2	0.2	0.2	0.3	0.5	0.7	1.1
8	2.5	2.7	2.8	2.9	3.2	13.2	32.6	38.1
9	2.8	2.9	3.1	3.2	3.6	24.0	63.6	76.2
10	1.6	1.8	1.8	1.9	2.0	17.0	38.7	46.1
11	Railroad Bridge							
12	0.1	0.1	0.1	0.1	0.1	1.4	2.4	2.6
13	0.3	0.3	0.4	0.4	0.4	5.3	8.7	9.6
14	1.9	1.9	1.9	2.0	2.0	9.9	14.8	19.8
15	SR 676 Bridge and Gaging Station							
16	0.6	0.6	0.6	0.6	0.6	1.1	1.5	2.1
16.5	2.2	2.3	2.3	2.3	2.3	6.0	10.4	15.2
17	7.3	7.5	7.7	7.8	8.1	22.6	47.0	64.9
18	3.6	4.3	4.8	5.1	5.9	13.9	31.1	43.2
19	2.0	2.4	4.7	5.7	8.1	15.7	27.1	34.7
20	2.1	2.3	5.4	18.5	32.5	43.1	49.2	54.6
21	3.4	3.7	5.9	22.7	42.1	58.5	68.2	74.2
22	5.5	6.1	15.2	36.7	68.0	93.5	108	116
23	4.2	4.7	16.6	33.9	54.2	62.4	66.5	71.5
Total	48.2	52.5	83.1	159	270	518	743	854

Appendix S. Acreage of areal inundation between adjacent cross sections along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for selected percentile discharges (Continued)

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
South Prong Alafia River								
1								
2	1.1	1.2	1.8	2.8	6.3	32.2	34.5	36.1
3	3.1	5.3	7.6	10.1	22.6	79.6	86.2	91.5
4	1.3	2.5	3.5	4.6	12.7	35.7	38.1	39.3
5	2.0	5.6	8.8	10.6	20.1	33.9	40.9	45.2
6	1.8	4.9	7.7	9.0	12.6	15.5	28.6	40.6
6.5	0.8	0.8	0.9	1.4	1.5	2.3	7.0	10.1
7	0.5	0.9	1.0	1.3	1.5	2.1	5.8	8.2
8	SR 640 Bridge							
9	0.1	0.2	0.3	0.3	0.3	0.4	0.6	0.8
9.5	0.5	0.7	0.8	0.9	1.0	1.6	2.7	3.7
10	2.4	2.8	3.0	3.2	4.1	10.4	13.0	15.8
11	1.4	1.7	2.3	3.0	4.0	16.3	24.5	32.4
12	2.8	3.4	7.4	10.7	17.3	40.9	58.3	68.4
13	1.0	1.4	3.8	5.5	9.9	31.7	39.2	43.0
14	1.1	2.3	4.8	7.2	13.2	29.4	33.4	37.2
15	2.0	3.5	6.5	9.1	15.5	28.2	37.3	44.8
16	2.2	2.7	3.4	4.2	7.2	31.4	42.1	51.0
17	1.3	1.5	2.7	5.3	9.7	28.1	32.9	37.6
18	1.0	1.4	3.6	6.4	9.5	28.1	34.1	38.5
19	1.0	1.4	4.1	5.2	6.6	30.9	36.2	39.1
20	1.4	1.7	4.4	5.6	7.1	60.7	72.6	76.2
21	0.7	0.8	0.9	0.9	3.1	38.9	43.8	44.9
21.5	0.2	0.2	0.3	0.3	1.1	8.2	8.4	8.7
22	0.2	0.2	0.2	0.2	0.5	5.2	6.3	7.3
23	Jameson Road and Gaging Station							
24	0.0	0.1	0.0	0.0	0.0	0.6	0.8	0.9
24.5	0.2	0.2	0.2	0.3	0.5	6.1	7.3	8.5
25	0.9	1.1	1.2	1.3	2.6	26.6	31.6	38.0
26	1.1	1.2	1.3	1.3	1.4	24.8	30.5	37.6
27	1.7	1.9	2.1	2.2	9.0	36.9	42.6	47.6
28	0.8	1.0	1.2	1.3	6.4	28.7	39.8	45.7
29	1.8	2.3	2.7	3.0	3.4	33.5	47.7	56.3
Total	36.6	54.9	88.4	117	211	749	927	1,055

Appendix T. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at cross sections along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for selected percentile discharges

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
Alafia River								
73	SR 640 Bridge and Alafia River near Lithia Gaging Station							
74								
75							0.3	0.1
76					0.1	0.7	2.8	1.6
77		0.1	0.1	0.1	6.6	2	6.7	2.4
78	0.1	0.1	0.1	0.1	6.6	4.4	7.7	2.7
79			0.1	0.1	0.1	5.6	7.3	13.1
80	0.1	0.1	0.1	0.1	0.2	6.1	6.8	12.8
81		0.1	0.1	0.2	0.1	5.6	6.9	5
82	0.1					1.2	3	2.1
83	Railroad Bridge							
84					0.1		0.2	
85		0.1			0.1	2.2	2.4	26
86	0.1	0.1				0.8	1.2	17.4
87			0.1			5.2	2.3	0.4
88				0.1		6.2	1.4	0.4
89	0.1	0.2	0.1	0.1	0.2	14.7	3.7	1
90			0.2	0.1	2.4	12.7	2.7	0.7
91		0.2		0.1	2.5	4.9	0.8	1
92	0.1		0.1	0.3	0.9	1.1	1.7	1.3
93			0.1		0.1	0.3	0.9	0.4
94	SR 39 Bridge							
95	0.1		0.1		0.1			0.1
96		0.2	0.4	0.5	0.5	1.7	1.1	1
Total	0.7	1.2	1.6	1.8	20.6	75.4	59.9	89.5
North Prong Alafia River								
1								
2			0.5	0.6	3.9	1.2	0.9	0.8
3	0.1		0.2	1.1	6.2	7.7	1	0.9
4			0.2	1.7	1.3	8.5	0.7	0.7
5			0.1	0.9	0.7	2.4	0.4	0.5
6	Railroad Bridge							
7	0.1				0.1			
7.5				0.1	0			0.2
8					0.1	0.3	0.5	0.9
9				0.1	0.1	1.3	5.8	1.6
10			0.1	0.1	0.1	5.1	4.2	0.9
11	Railroad Bridge							
12						0.4		
13						1.3	0.3	0.2
14			0.1		0.1	1	2	0.8
15	SR 676 Bridge and Gaging Station							
16							0.2	0.2
16.5						0.4	1.8	0.8
17					0.1	4.9	5.1	3.4
18	0.1	0.1	0.2	0.2	0.3	3.1	3.8	1.8
19			0.8	0.5	1	0.8	3	1.1
20			0.9	6.1	3.5	1	1.2	1.2
21	0.1	0.1	1.7	7.8	4.5	2.1	1.5	1.1
22		0.1	4.4	10.4	4.6	3.3	2.4	1.2
23		0.2	3.6	8.2	2.5	0.7	0.8	1.3
Total	0.4	0.4	12.8	37.8	29.1	45.5	35.6	19.6

Appendix T. Decrease of inundated acreage resulting from a potential 10-percent discharge withdrawal at cross sections along the Alafia, North Prong Alafia, and South Prong Alafia Rivers for selected percentile discharges (Continued)

[Blanks indicate no decrease in inundated acreage]

Cross section	Percentiles							
	P_{10}	P_{50}	P_{70}	P_{80}	P_{90}	P_{98}	$P_{99.5}$	$P_{99.9}$
	Acres							
South Prong Alafia River								
1								
2			0.3	0.5	1.8	0.6	0.3	0.4
3	0.1	0.2	0.6	1.1	3.8	28.7	0.9	1.2
4		0.2	0.2	0.4	3.5	13.2	0.2	0.3
5		0.7	0.5	0.6	4.3	0.9	1.4	0.5
6		0.6	0.4	0.4	0.3	0.4	3.7	0.6
6.5						0.2	0.9	0.2
7		0.1				0.1	0.3	0.9
8	SR 640 Bridge							
9								0.1
9.5					0.1	0.1	0.1	0.4
10	0.1	0.1		0.1	0.6	0.5	0.5	0.5
11			0.3	0.2	0.3	1.1	2.0	0.9
12			1.1	1.0	1.2	2.3	6.2	1.2
13		0.1	0.4	0.7	0.7	1.1	3.2	0.8
14		0.2	0.6	1.3	1.4	0.8	0.8	0.8
15		0.3	0.7	1.2	1.5	2.0	1.4	1.7
16		0.1	0.3	0.3	0.8	2.3	1.8	1.9
17			1.0	0.9	1.1	1.2	1.0	1.1
18			1.1	0.9	0.7	2.5	0.8	1.0
19			0.4	0.3	0.3	3.4	0.6	0.4
20			0.4	0.4	0.4	3.5	6.0	0.5
21					0.8	0.7	3.1	0.3
21.5					0.3	0.1	0.1	0.1
22					0.1	0.2	0.3	0.1
23	Jameson Road and Gaging Station							
24								
24.5					0.2	0.2	0.3	0.1
25					0.9	1.0	1.2	1.4
26						1.2	1.3	1.6
27					1.8	1.4	1.0	0.8
28					1.3	2.4	2.3	0.8
29		0.1	0.1	0.1	0.1	2.9	3.1	1.4
Total	0.2	2.7	8.4	10.4	28.3	75.0	44.8	22.0