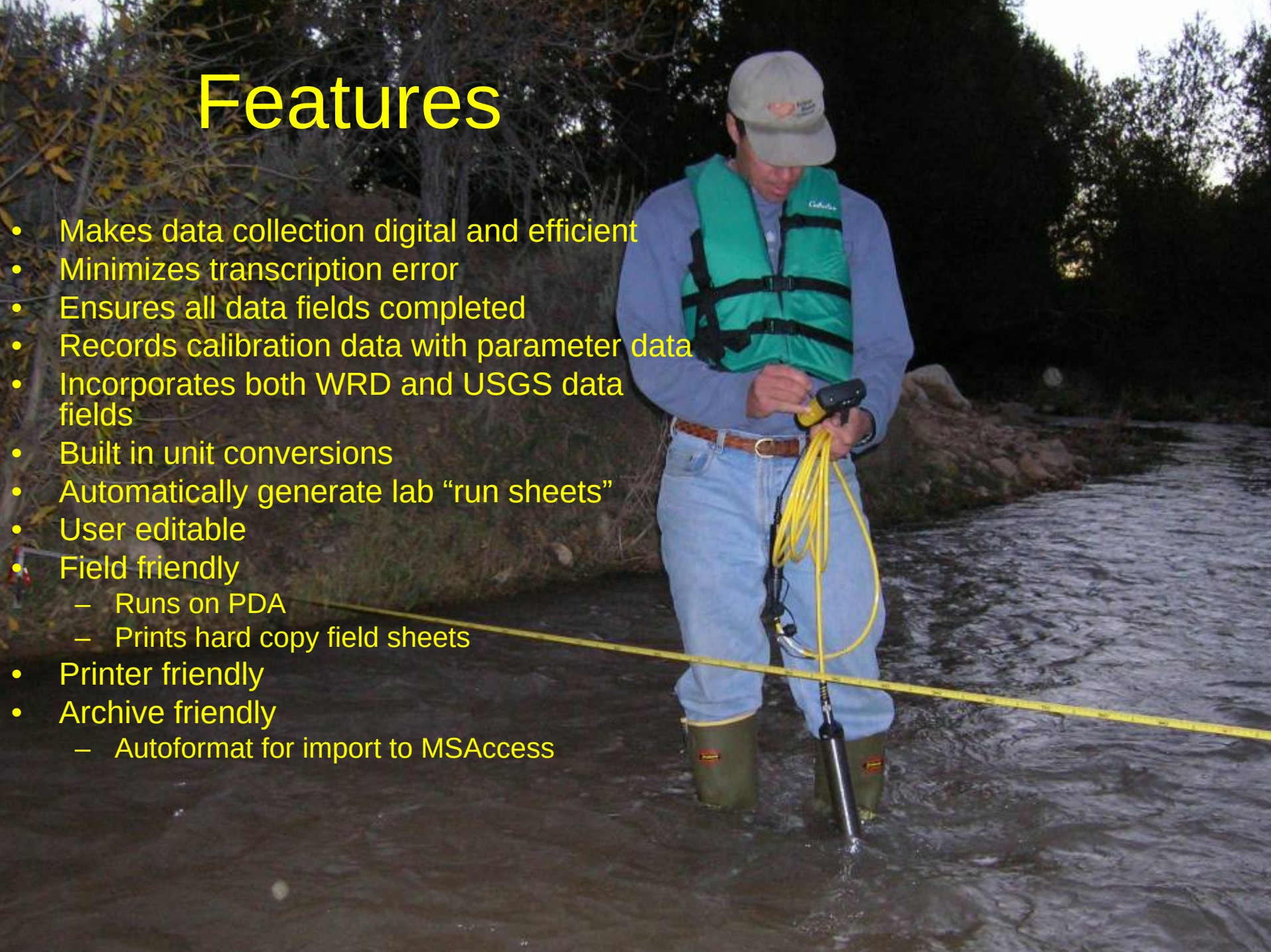
NCPN Water Quality Digital Field Form

Features

- Makes data collection digital and efficient
- Minimizes transcription error
- Ensures all data fields completed
- Records calibration data with parameter data
- Incorporates both WRD and USGS data fields
- Built in unit conversions
- Automatically generate lab “run sheets”
- User editable
- Field friendly
  - Runs on PDA
  - Prints hard copy field sheets
- Printer friendly
- Archive friendly
  - Autoformat for import to MSAccess



Pre-field work instrument check

Microsoft Excel - Field_forms_06_jan.xls

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S33

	A	B	C	D	E	F	G	H	I	J	K
1	**Pre-Mobilization MP Instrument (Calibration) Log Book:**										
2											
3	Date	1/10/2006									
4	Start time	15:30 PM	End time	17:00		Sensor ID		SN34051			
5	Operator		David Thoma			Temperature					
6	Inst. Mfr.		Insitu			Conductivity		LC03535			
7	Sensor serial number		34051			pH		pH03180			
8	Model		Troll 9000			Diss. Ox.		DX033350			
9	Display		Rugged Reader			Barometric Press. (mm H)					
10	Display voltage (%)		100								
11	Display sonde (v)		2.473								
12											
13											
14											
15	**Error Check Solution: Sink water, and sodium sulfite solution**										
16	**Pre-Cal. Measurements**						**Post-Cal. Measurements**				
17											
18	MP temp OC			56.33			MP temp OC			58.45	
19	NIST Thermometer OC			56.2			NIST Thermometer OC			58.4	
20											
21											
22	SC (us/cm)			496	244.2		SC (us/cm)			524.8	
23	pH			7.86	7.38		pH			7.71	
24	DO (mg/L)			7.29	9		DO (mg/L)			5.97	
25	BP (mmHg)			571.8	571.7		BP (mmHg)			571.8	
26											
27									**%Error**	**Allowable?**	
28						**Temperature error check**			-0.08554	yes	
29											
30											
31											
32	**Specific Conductance Calibration (1413 µS/cm std.) & Error Check @ 100 and 10,000 µS/cm**										
33	**SC of std. (us/cm)**		**1413**	**100**	**10,000**		**1413**	**100**	**10,000**		
34	**temp oF**		38.47				38.47				
35											
36	**Pre-Cal. Reading (us/cm)**						**Post-Cal. Reading (us/cm)**				
37			2791				1420				
38											
39	**post calibration cell constant**				**Allowable?**				**%Error**	**Allowable?**	
40	**Kcell**	0.165	with bad sensor		no			**1413**	-0.4954	yes	
41		0.353	with new sensor		yes			**100**			
42								**10,000**			
43											
44											
45	**pH Calibration @ pH 7 & pH 10 su and Error Check @ pH 4**										
46	**Pre-Cal. Reading**							**Post-Cal.**			
47	**standard**	**reading**	**lot #**	**Exp**	**maker**	**Cat #**		**Reading**	**%Error**	**Allowable?**	
48	4	4.13	none given	8/1/05	Corning	478551		3.91	2.25	yes	
49	7	7.07	2404397	4/1/06	Corning	478552		7.05	-0.71429	yes	
50	10.01	9.8	2404414	10/1/05	Corning	478553		10.02	-0.0999	yes	
51											
52											
53	**voltage pH 4 std**					**temp deg C**					
54	**voltage pH 7 std**		5.585	mV during calibration		9.22					
55	**voltage pH 10 std**		-159.041	mV during calibration		7.84					
56											
57											
58	**post calibration**		**Slope 1 mV/pH**		-54.69		**Slope 2 mV/pH**		na		
59			**Offset 1 mV**		388.44		**Offset 2 mV**		na		
60											
61											

- Computes % error
- Determines if minimum WRD / USGS acceptable criteria are met
- Alerts users to potential error before heading into the field

Information stored in the file

- Site location, time of visit
- Sample types collected
- Flow measurements with unit conversion

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P39

	A	B	C	D	E	F	G	H	I	J	K	L
1				NCPN I&M WATER QUALITY FIELD FORM							quality	
2				Draft #2	12/5/2005					data collect	control	
3										finished?	finished?	RA/QC notes
4	Station #	6			Sample team			Date(m/d/y	1/13/06	finished		
5	Station nam	Yellow			David Thoma			Start time	13:40	finished		
6	Lat	37.5735						End time	15:39	finished		
7	Long	112.129			map datum			Mean time	14:39			
8	altitude (ft	6561			WGS84							
9	7.5' quad	Bryce Point										
10	Storet #	4951857										
11	Comments											
12												
13												
14				UT LABORATORY INFORMATION				All except carry bottle				
15								are from				
16	Samples collected?:		Total chem.	Filt. metals	Nutrients	Turbidity	Carry	Div. of Lab Services				
17	(y/n)_____		y	y	y	y	y	46 N. Medical Drive		finished		
18			Microbiologi	Secchi disc	Chl. a	Algae	Inverts	Salt Lake City, UT 84113				
19	(y/n)_____		n	n	n	n	n	801-584-8400		finished		
20												
21	Bottles labeled		Date & time	STORET #	Collector	Site name						
22	(y/n)_____		y	y	y	y			Filter pack	finished		
23	Sample period (m / q		q						Pall Aquapr	finished		
24			Suite	Preservativ	lot #	CAS #	Exp date		Lot #			
25	Total Chemistry		2	none	2005285	none	#####		Fm6365	finished		
26	Filtered metals		4	HNO3	2005320	7697-37-2	11/13/06			finished		
27	Nutrients		6	H2SO4	2005311	7664-93-9	11/12/06			finished		
28	Sample typ	4										
29	Source cod	3		Date shipped (m/d/yr		1/17/2006				finished		
30	Cost code	358		UPS tracking #		1Z8438720340428404				finished		
31	Agency	4		Date received (m/d/yr)						not finished		
32				FIELD MEASUREMENTS								
33	measurable	Water	Visual est.									
34	dischar. (y/	color	of mixing									
35	y	clear	well							finished		
36				units	meas type	avg veloc	vtype					
37	disch.metho	serial #	flow value	(C,G,M,blank)	(M,E,blank)	(ft/s, blank)	(M,E,blank)					
38	baski	8 inch	0.55427414	C	M					finished		
39	Gage ht.(ft)							Air Temp(oC)		finished		
40	Q inst.(cfs)	0.55427			hydrograp	flow		7		finished		
41	AquaCalc file name				stage	severity				finished		
42	current meter discharge(cfs)				base	normal				finished		
43										finished		
44	estimated discharge (		estimate type									
45										finished		
46	Volumetric						estimated	adjusted flow				
47	measurement	vol.(mL)	time (s)	(mL/s)	(gpm)	(cfs)	% loss	(cfs)				
48	1									finished		
49	2									finished		
50	3									finished		
51	4									finished		
52	5									finished		
53			stable flow?				average			finished		
54												
55	Weir		Look up				estimated	adjusted flow				
56	measurement	stage (cm?)	(gpm)			(cfs)	% loss	(cfs)				
57	1									finished		
58	2									finished		
59	3									finished		
60	4									finished		
61	5									finished		
62			stable flow?				average			finished		
63												
64	Flume		Look up				estimated	adjusted flow				
65	measurement	stage (cm?)	(gpm)			(cfs)	% loss	(cfs)				
66	1	0.37	260.00			0.5793	2	0.5911		finished		
67	2	0.37	260.00			0.5793	2	0.5911		finished		
68	3	0.35	233.00			0.5191	2	0.5297		finished		
69	4	0.35	233.00			0.5191	2	0.5297		finished		
70	5	0.35	233.00			0.5191	2	0.5297		finished		
71			stable flow?	no			average			finished		
72								0.5543			Name	Yellow
73	Discharge comments										Storet #	4951857
74											Date	1/13/06

Information stored in the file cont.

- Core parameters
- Calculates range and degree of stream mixing
- Calibration information
  - Multiparameter probe
    - DO, pH, Cond, temp
  - Flow meter
  - Turbidity meter

Microsoft Excel - Field_forms_06_jan.xls

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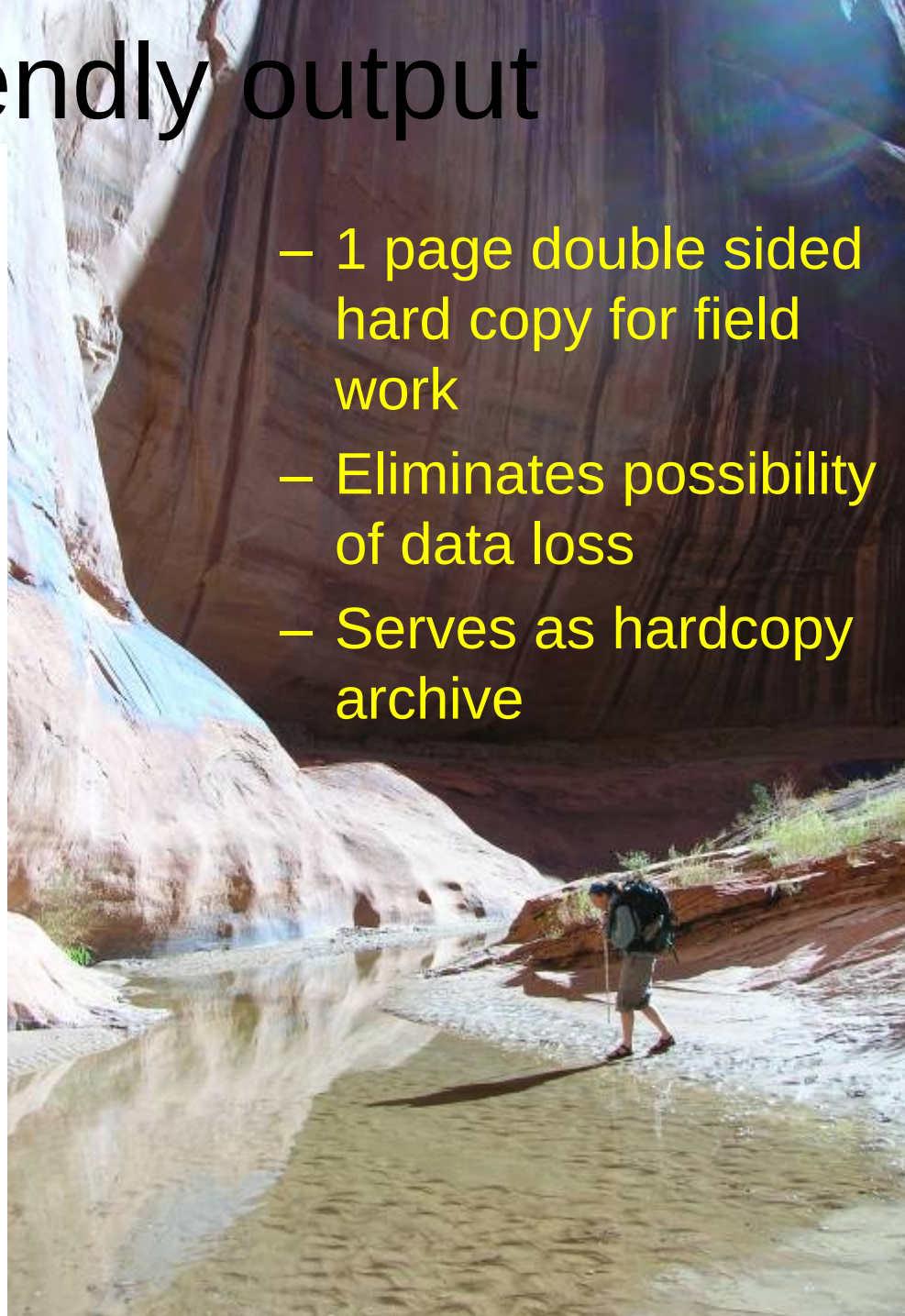
H69 =IF(F69="","",F69/(1-(G69/100)))

	A	B	C	D	E	F	G	H	I	J	K	L
75				Core Parameters								
76										data collect	quality control	
77										finished?	finished?	notes
78		DO	Baro. Press.	Spc. Cond	Water	pH		Troll 3000	file name			
79	Reading #	(mg/L)	(mm Hg)	(S/cm@25 of	temp oC	unitless		nfkvirg_1-14-06		finished		
80	1	11.22	611.656	438.24	12.9556	8.43				finished		
81	2	11.23	611.654	438.26	12.95	8.43				finished		
82	3	11.23	611.668	438.35	12.95	8.43				finished		
83	4	11.25	611.644	437.65	12.9444	8.43				finished		
84	5	11.23	611.618	437.95	12.9444	8.44				finished		
85	median	11.23	611.654	438.24	12.9389	8.43				finished		
86	range	0.07	0.05	0.7	0.01111	0.01						
87	well mxd?	yes		yes	yes	yes				finished		
88	DO sat(%)				Secchi disc (m)			no		not finished		
89	Turbid(ntu)	5.74			E. Coli (col/100mL)			no		finished		
90					Tot. Coliform (col/100mL)			no		finished		
91	Weather	2								finished		
92	Field condi	1								finished		
93				CALIBRATION INFORMATION						Calibrations	complete?	notes
94			Temperature check							temperature	finished	
95	Liquid filled	Liquid filled		Troll 3000	Troll 3000		conversion formulas					
96	air temp oC	air temp oF		air temp oC	air temp oF		(F - 32) x 5/9 = C			pygmy spin	finished	
97	9.5	49.1		12.9388889	55.29		(C x 1.8) + 32 = F			price spin	finished	
98	Liquid filled	Liquid filled		Troll 3000	Troll 3000			enter temp				
99	H2O temp oC	H2O temp oF		H2O temp oC	H2O temp oF		C to F			turb date/time/sig	finished	
100	1	33.8		1.84444444	35.32		F to C			turb lot	finished	
101	Enviro-safe liquid filled thermometer									turb exp	finished	
102	is NIST traceable									accept calib?	finished	
103	H-B Instrument Company									turb gelx stds.	finished	
104	610-489-5500											
105						Turbidity instrument				cond calib std	finished	
106	Spin test	minutes	seconds	date	pass?	Hach 2100P				cond reading	finished	
107	pygmy	1	16	1/14/2006	yes	2 detectors at 90 degrees				cond manufact	finished	
108	price AA					white light emitted from tungsten lamp				cond lot #	finished	
109						filtered to be between 400 and 600 nanometers				cond cas #	finished	
110						Conforms to USEPA method 180.1				cond exp date	finished	
111				Signal avg		Wavelength						
112	Turbidity	date	time	(on/off)		low	high			pH low std	finished	
113		1/14/2006	13:32	on		400	600			pH low read	finished	
114										pH low man	finished	
115	Turbidity standards									pH low lot #	finished	
116	manufacture	Cat #	NTU	Variation	Lot #	expiration date				pH low exp.	finished	
117	Hach	26847-01	<0.1	n/a	2248	Sep-04				pH high std	finished	
118	Hach	26848-01	20	+/- 1ntu	2297	Sep-04				pH high read	finished	
119	Hach	26849-01	100	+/- 5ntu	2275	Sep-04				pH high man	finished	
120	Hach	26605-01	800	+/- 40ntu	2248	Sep-04				pH high lot #	finished	
121										pH high exp	finished	
122	Callibration accepted? (y/n)			y								
123	Secondary gelex standards (ntu)									cond report?	finished	
124	5.43	reads	5.4			0.99				pH report?	finished	
125	54.5	reads	53.4			1.09				DO report?	finished	
126	529	reads	529			1.00				Troll data ?	finished	
127				Is recalib. necessary?		no				ACPro data?	finished	
128												
129	Conductivity standards (us/cm)											
130	Cond of std used for calibration			1413								
131	Cond. reading prior to calibration			1413								
132	manufacturer			Electronic Data Solutions, Jerome, ID 208-324-8006								
133	lot #			5018								
134	CAS#			7447-40-07								
135	expiration date			8/24/2006								
136												
137	pH standards											
138	pH low			7		pH high		10.01				
139	pH prior to calibration			6.94		pH post calibration		10				
140	manufacturer			EK Industries		manufacturer		EK Industries				
141	lot #			50568		lot #		50244				
142	expiration date			2/1/2006		expiration date		1/1/2006				
143												
144												
145												
146	DO pre cali	11.16	mg/L							DO pre calib	finished	
147	DO post ca	11.66	mg/L							DO post calib	finished	

More quality control

Printer friendly output

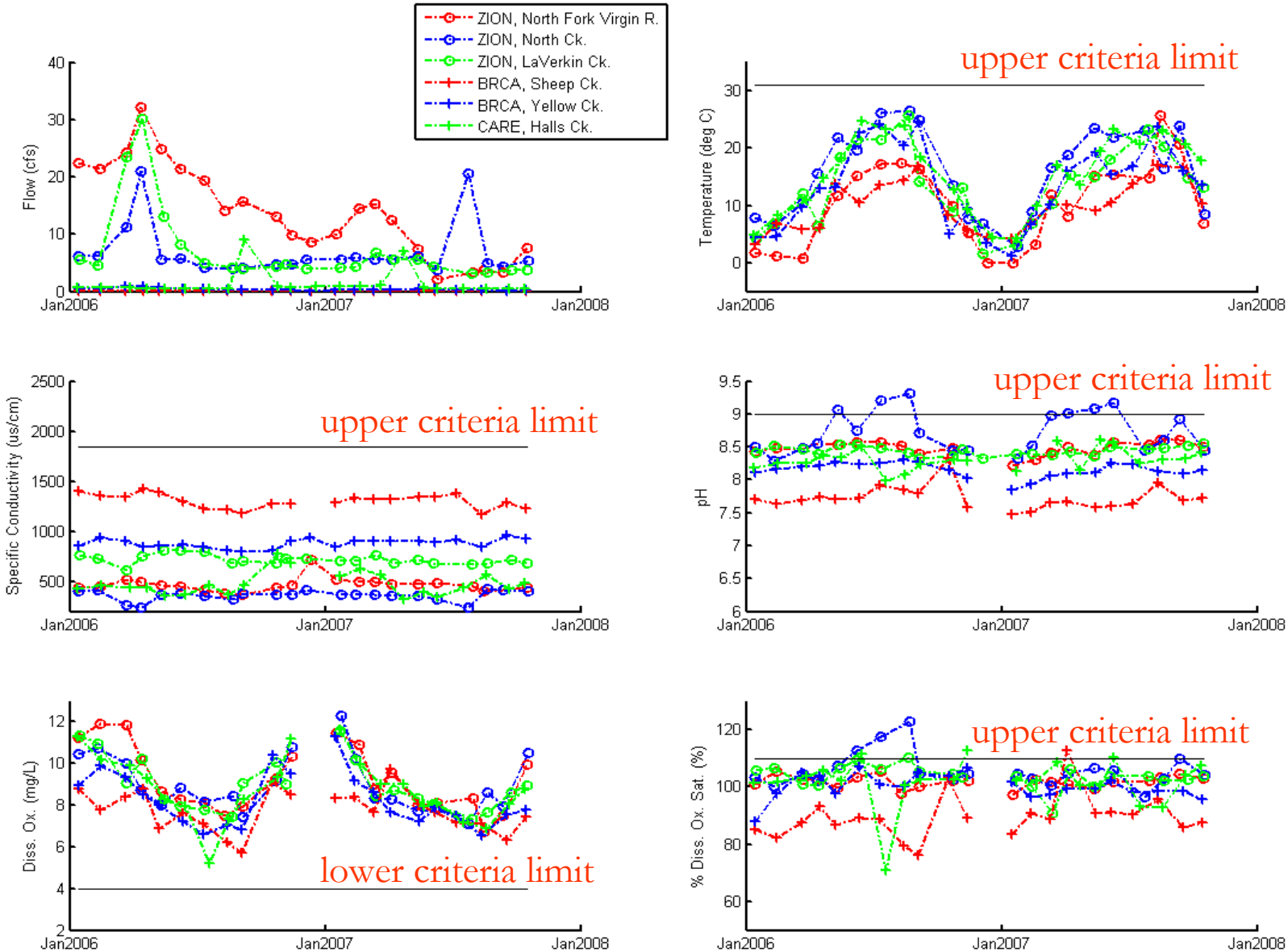
			NCPN I&M WATER QUALITY FIELD FORM							quality	
			Draft #2	12/5/2005					data collect	control	
									finished?	finished?	QA/QC notes
Station #	6			Sample team			Date(m/d/yr)	1/13/06	finished		
Station name	Yellow			David Thoma			Start time	13:40	finished		
Lat	37.57349						End time	15:39	finished		
Long	112.12945			map datum			Mean time	14:39			
altitude (ft)	6561			WGS84							
7.5' quad	Bryce Point										
Storet #	4951857										
Comments											
			UT LABORATORY INFORMATION				All except carry bottle				
							are from				
Samples collected?:		Total chem.	Filt. metals	Nutrients	Turbidity	Carry	Div. of Lab Services				
(y/n).....		y	y	y	y	y	46 N. Medical Drive		finished		
		Microbiology	Secchi disc	Chl. a	Algae	Inverts	Salt Lake City, UT 84113				
(y/n).....		n	n	n	n	n	801-584-8400		finished		
Bottles labeled		Date & time	STORET #	Collector	Site name						
(y/n).....		y	y	y	y			Filter packs	finished		
Sample period (m / q)		q						Pall Aquapro	finished		
		Suite	Preservative	lot #	CAS #	Exp date		Lot #			
Total Chemistry		2	none	2005285	none	10/21/07		Fm6965	finished		
Filtered metals		4	HNO3	2005320	7697-37-2	11/19/06			finished		
Nutrients		6	H2SO4	2005311	7664-93-9	11/12/06			finished		
Sample type	4										
Source code	3		Date shipped (m/d/yr)		1/17/2006				finished		
Cost code	358		UPS tracking #		1Z8498720340428404				finished		
Agency	4		Date received (m/d/yr)						not finished		
			FIELD MEASUREMENTS								
measurable	Water	Visual est.									
dischar. (y/n)(	color	of mixing									
y	clear	well							finished		
			units	meas type	avg veloc	vtype					
disch.method	serial #	flow value	(C,G,M,blank)	(M,E,blank)	(ft/s, blank)	(M,E,blank)					
basic	8 inch	0.55427414	C	M					finished		
Gage ht.(ft)							Air Temp(oC)		finished		
Q inst(cfs)	0.5542741			hydrograph	flow		7		finished		
AquaCalc file name				stage	severity				finished		
current meter discharge(cfs)				base	normal				finished		
									finished		
estimated discharge (cfs)		estimate type									
									finished		
Volumetric						estimated	adjusted flow				
measurement	vol (mL)	time (s)	(mL/s)	(gpm)	(cfs)	% loss	(cfs)				
1									finished		
2									finished		
3									finished		
4									finished		
5									finished		
		stable flow?				average			finished		
Weir		Look up				estimated	adjusted flow				
measurement	stage (cm?)	(gpm)			(cfs)	% loss	(cfs)				
1									finished		
2									finished		
3									finished		
4									finished		
5									finished		
		stable flow?				average			finished		
Flume		Look up				estimated	adjusted flow				
measurement	stage (cm?)	(gpm)			(cfs)	% loss	(cfs)				
1	0.37	260.00			0.5793	2	0.5911		finished		
2	0.37	260.00			0.5793	2	0.5911		finished		
3	0.35	233.00			0.5197	2	0.5297		finished		
4	0.35	233.00			0.5197	2	0.5297		finished		
5	0.35	233.00			0.5197	2	0.5297		finished		
		stable flow?	no			average			finished		
							0.5543			Name	Yellow
Discharge comments										Storet #	4951857
										Date	1/13/06



- 1 page double sided hard copy for field work
- Eliminates possibility of data loss
- Serves as hardcopy archive

Results

Site-specific near real-time reporting generated with Matlab



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