

1	00:01:49:20	00:01:53:02	Annenberg Media
2	00:01:53:04	00:01:56:15	§
3	00:01:56:17	00:01:59:14	NIA CONSORTIUM
4	00:02:47:02	00:02:50:00	<i>THIS IS SAN FRANCISCO,</i>
			<i>THE CITY BY THE BAY,</i>
5	00:02:50:02	00:02:51:16	<i>AN ALLURING LOCATION</i>
6	00:02:51:18	00:02:54:17	<i>NOT ONLY TO THE 800,000</i>
			<i>WHO LIVE HERE,</i>
7	00:02:54:19	00:02:58:17	<i>BUT TO MILLIONS OF OTHERS</i>
			<i>WHO HAVE RIDDEN CABLE CARS</i>
8	00:02:58:19	00:03:00:15	<i>UP AND DOWN</i>
			<i>ITS HILLY STREETS,</i>
9	00:03:00:17	00:03:02:21	<i>CROSSED OVER ITS</i>
			<i>SPECTACULAR BRIDGES,</i>
10	00:03:02:23	00:03:05:05	<i>AND BEEN CHARMED</i>
			<i>BY ITS UNIQUE COMBINATION</i>
11	00:03:05:07	00:03:06:26	<i>OF ENTICING QUALITIES.</i>
12	00:03:09:20	00:03:12:03	<i>APART FROM ITS</i>
			<i>MANY OTHER ATTRIBUTES,</i>
13	00:03:12:05	00:03:14:03	<i>THE SAN FRANCISCO</i>
			<i>BAY AREA</i>
14	00:03:14:05	00:03:16:17	<i>BOASTS TWO MAJOR LEAGUE</i>
			<i>BASEBALL TEAMS--</i>
15	00:03:16:19	00:03:18:02	<i>THE SAN FRANCISCO GIANTS</i>
16	00:03:18:04	00:03:19:27	<i>AND THE OAKLAND ATHLETICS.</i>
17	00:03:21:18	00:03:24:17	<i>LATE ON THE AFTERNOON</i>
			<i>OF OCTOBER 17, 1989,</i>
18	00:03:24:19	00:03:28:02	<i>THE GIANTS AND THE As</i>
			<i>PREPARE TO DO BATTLE</i>
19	00:03:28:04	00:03:29:16	<i>IN THE THIRD GAME</i>
20	00:03:29:18	00:03:32:16	<i>OF THEIR CROSSTOWN</i>
			<i>WORLD SERIES MATCH-UP.</i>
21	00:03:33:26	00:03:36:07	<i>SOME 90 KILOMETERS</i>
			<i>TO THE SOUTH,</i>
22	00:03:36:09	00:03:38:28	<i>ANOTHER BATTLE</i>
			<i>IS ABOUT TO BE PLAYED OUT</i>
23	00:03:39:00	00:03:40:13	<i>BY TWO</i>
			<i>UNDERGROUND TITANS</i>
24	00:03:40:15	00:03:42:14	<i>KNOWN AS THE</i>
			<i>NORTH AMERICAN</i>
25	00:03:42:16	00:03:43:29	<i>AND THE</i>
			<i>PACIFIC PLATES.</i>
26	00:03:44:01	00:03:46:27	<i>A SECTION OF THE</i>
			<i>SAN ANDREAS FAULT</i>
27	00:03:46:29	00:03:48:12	<i>THAT MARKS THE BOUNDARY</i>
28	00:03:48:14	00:03:49:26	<i>BETWEEN THESE</i>
			<i>TECTONIC PLATES</i>
29	00:03:49:28	00:03:51:11	<i>HAS BEEN LOCKED</i>
30	00:03:51:13	00:03:53:12	<i>IN A STALEMATED</i>
			<i>TUG OF WAR</i>
31	00:03:53:14	00:03:55:01	<i>SINCE 1906.</i>
32	00:03:55:03	00:03:57:02	<i>IN A MATTER</i>
			<i>OF MOMENTS,</i>
33	00:03:57:04	00:03:58:17	<i>THAT GREAT STANDOFF</i>
34	00:03:58:19	00:04:01:01	<i>WILL COME</i>
			<i>TO AN ABRUPT END,</i>

35	00:04:01:03	00:04:02:16	<i>IN THE PROCESS</i>
36	00:04:02:18	00:04:04:01	<i>REDUCING AMERICA'S FAVORITE PASTIME</i>
37	00:04:04:03	00:04:07:05	<i>TO LITTLE MORE THAN A TRIFLING FOOTNOTE.</i>
38	00:04:07:07	00:04:09:20	<i>BUT FOR THE THOUSANDS OF FANS</i>
39	00:04:09:22	00:04:11:05	<i>PACKED INTO CANDLESTICK PARK</i>
40	00:04:11:07	00:04:12:21	<i>ON THIS OCTOBER AFTERNOON</i>
41	00:04:12:23	00:04:15:20	<i>AND FOR THE MILLIONS WATCHING THE FALL CLASSIC</i>
42	00:04:15:22	00:04:17:13	<i>AT HOME ON TELEVISION,</i>
43	00:04:17:15	00:04:19:23	<i>THERE'S NO INDICATION OF IMMINENT DANGER.</i>
44	00:04:21:26	00:04:25:02	<i>UNTIL FOUR MINUTES AFTER 5:00</i>
45	00:04:25:04	00:04:27:15	<i>PACIFIC DAYLIGHT TIME.</i>
46	00:04:34:06	00:04:36:24	<i>UH-OH. UH-OH!</i>
47	00:04:36:26	00:04:38:28	<i>OH, MY GOD.</i>
48	00:04:41:01	00:04:41:29	<i>[BELL RINGS]</i>
49	00:04:42:01	00:04:43:20	<i>AAH!</i>
50	00:04:42:01	00:04:43:20	<i>AAH!</i>
51	00:04:48:27	00:04:50:27	<i>[CAR ALARM SOUNDS]</i>
52	00:04:53:01	00:04:54:13	<i>WE'VE GOT ANOTHER EARTHQUAKE.</i>
53	00:04:54:15	00:04:56:03	<i>[BELL RINGS]</i>
54	00:04:56:05	00:04:58:04	<i>[SCREAMING]</i>
55	00:04:58:06	00:04:59:28	<i>GET OUT! GET OUT!</i>
56	00:05:00:00	00:05:01:13	<i>NO. WATCH OUT.</i>
57	00:05:01:15	00:05:03:11	<i>STAY RIGHT HERE!</i>
58	00:05:04:23	00:05:06:23	<i>[CHILD CRYING]</i>
59	00:05:06:25	00:05:08:07	<i>STEPHANIE, COME HERE!</i>
60	00:05:15:03	00:05:18:00	<i>IN LARGE PART BECAUSE OF THE WORLD SERIES,</i>
61	00:05:18:02	00:05:19:13	<i>TELEVISION CREWS</i>
62	00:05:19:15	00:05:21:20	<i>BLANKET THE ENTIRE SAN FRANCISCO REGION,</i>
63	00:05:21:22	00:05:24:21	<i>AND ONLY MINUTES AFTER A POWERFUL EARTHQUAKE</i>
64	00:05:24:23	00:05:26:18	<i>HAS RIPPED THROUGH THE BAY AREA,</i>
65	00:05:26:20	00:05:30:00	<i>THE FIRST IMAGES OF HORROR BEGIN TO EMERGE.</i>
66	00:05:30:02	00:05:33:00	<i>IN THE FRANTIC MINUTES THAT FOLLOW THE QUAKE,</i>
67	00:05:33:02	00:05:36:11	<i>FEW GEOLOGIC DETAILS ARE KNOWN.</i>
68	00:05:36:13	00:05:39:25	<i>WHAT IS RAPIDLY BECOMING CLEAR, HOWEVER,</i>
69	00:05:39:27	00:05:42:25	<i>IS THAT A DISASTER OF ENORMOUS PROPORTIONS</i>
70	00:05:42:27	00:05:44:22	<i>HAS OCCURRED.</i>
71	00:05:44:24	00:05:45:25	<i>GO HOME!</i>
72	00:05:45:27	00:05:47:06	<i>WE'VE GOT SERIOUS PROBLEMS.</i>

73 00:05:47:08 00:05:49:05 GO HOME AND SECURE
YOUR RESIDENCE.

74 00:05:49:07 00:05:50:19 SHUT OFF THE GAS.

75 00:05:50:21 00:05:52:03 SHUT OFF
THE ELECTRICITY.

76 00:05:52:05 00:05:53:04 STORE WATER.

77 00:05:53:06 00:05:54:19 PREPARE
FOR AFTERSHOCKS

78 00:05:54:21 00:05:56:18 AND THREE DAYS
OF NO SERVICES.

79 00:05:56:20 00:05:59:03 YOU GOT 90 MINUTES
OF LIGHT LEFT.

80 00:05:59:05 00:06:00:23 BETTER MAKE USE
OF YOUR TIME.

81 00:06:00:25 00:06:03:23 AS FIRE
AND PARAMEDIC UNITS

82 00:06:03:25 00:06:06:14 RUSH TO PROVIDE ASSISTANCE
TO QUAKE VICTIMS,

83 00:06:06:16 00:06:09:15 SCIENTISTS AT THE
UNITED STATES GEOLOGICAL SURVEY

84 00:06:09:17 00:06:11:01 IN MENLO PARK, CALIFORNIA

85 00:06:11:03 00:06:14:15 HASTILY CONVENE TO BEGIN
ANALYZING THE QUAKE...

86 00:06:15:24 00:06:17:15 AS WELL AS TO DISPENSE
INFORMATION

87 00:06:17:17 00:06:21:02 TO THE MEDIA
AND THE GENERAL PUBLIC.

88 00:06:21:04 00:06:23:01 WE'RE JUST ASKING
FOR TWO LINES.

89 00:06:23:03 00:06:26:01 THE QUAKE'S MAGNITUDE
IS PEGGED

90 00:06:26:03 00:06:28:08 AT 7.1 ON
THE RICHTER SCALE.

91 00:06:28:10 00:06:30:07 THIS HAS BEEN
A POWERFUL EARTHQUAKE

92 00:06:30:09 00:06:32:22 CAPABLE OF CAUSING
SERIOUS DAMAGE

93 00:06:32:24 00:06:35:09 TO BOTH PEOPLE
AND PROPERTY.

94 00:06:35:11 00:06:37:10 MOST OF THE WORLD'S
ATTENTION

95 00:06:37:12 00:06:40:09 REMAINS FOCUSED
ON DAMAGE IN AND AROUND

96 00:06:40:11 00:06:42:06 SAN FRANCISCO,

97 00:06:42:08 00:06:46:15 SUCH AS HERE
ON THE NIMITZ FREEWAY,

98 00:06:46:17 00:06:48:00 WHERE IT IS FEARED

99 00:06:48:02 00:06:50:13 THAT SCORES
OF MOTORISTS HAVE DIED.

100 00:06:51:22 00:06:54:15 AND HERE IN THE POSH
MARINA DISTRICT

101 00:06:54:17 00:06:55:27 WHERE PRIZED REAL ESTATE

102 00:06:55:29 00:06:59:17 HAS BEEN TWISTED
INTO GROTESQUE SHAPES.

103 00:06:59:19 00:07:02:02 BUT APART FROM SELECT
LOCALIZED AREAS

104 00:07:02:04 00:07:04:02 THAT HAVE BEEN
SEVERELY DAMAGED,
105 00:07:04:04 00:07:08:16 MOST OF SAN FRANCISCO
HAS COME THROUGH THE QUAKE
106 00:07:08:18 00:07:09:25 IN RELATIVELY GOOD
CONDITION.
107 00:07:09:27 00:07:12:28 THERE ARE PROBLEMS,
OF COURSE.
108 00:07:13:00 00:07:15:24 DELAYS IN BOTH TRANSPORTATION
AND COMMUNICATION
109 00:07:15:26 00:07:17:03 ARE WIDESPREAD,
110 00:07:17:05 00:07:20:14 BUT THE CITY
IS STILL FUNCTIONING.
111 00:07:20:16 00:07:21:27 UNFORTUNATELY,
112 00:07:21:29 00:07:24:19 A SITUATION SOME DISTANCE
TO THE SOUTH
113 00:07:24:21 00:07:26:04 IS LESS ENCOURAGING.
114 00:07:26:06 00:07:28:04 THE QUAKE'S EPICENTER
IS LOCATED
115 00:07:28:06 00:07:30:18 NEAR A PEAK
IN THE SANTA CRUZ MOUNTAINS
116 00:07:30:20 00:07:32:04 CALLED LOMA PRIETA,
117 00:07:32:06 00:07:35:02 AND IT IS COMMUNITIES
CLOSEST TO LOMA PRIETA,
118 00:07:35:04 00:07:37:26 LIKE SANTA CRUZ...
119 00:07:37:28 00:07:39:27 WATSONVILLE...
120 00:07:39:29 00:07:41:12 AND LOS GATOS,
121 00:07:41:14 00:07:43:20 THAT HAVE ACTUALLY BEEN
HIT THE HARDEST.
122 00:07:45:25 00:07:48:22 THIS RIGHT HERE IS
THE FRONT PORCH.
123 00:07:48:24 00:07:51:06 THERE'S THE HOUSE
DOWN THE HILL...
124 00:07:51:08 00:07:54:20 OR WHAT'S LEFT
OF IT, SHALL WE SAY.
125 00:08:01:23 00:08:04:18 HARRY AND I WERE
IN THE DINING ROOM,
126 00:08:04:20 00:08:07:18 EACH OF US TENDING
TO OUR CHORES,
127 00:08:07:20 00:08:08:29 UH, PHONING...
128 00:08:09:01 00:08:10:29 AND WHEN
WE FELT IT,
129 00:08:11:01 00:08:14:14 WE KNEW
RIGHT AWAY TO GO
TO THE DOORWAY--
130 00:08:14:16 00:08:15:29 THE TRADITIONAL
EARTHQUAKE
MOVEMENT--
131 00:08:16:01 00:08:18:13 AND WAIT FOR IT
TO SUBSIDE.
132 00:08:18:15 00:08:19:29 WELL, IT DIDN'T,
133 00:08:20:01 00:08:22:14 AND WE CONTINUED
DOWN THE HALLWAY
134 00:08:22:16 00:08:23:29 TO THE FRONT DOOR,
135 00:08:24:01 00:08:26:13 AND WE WERE THROWN
TO THE FLOOR

136 00:08:26:15 00:08:28:28 AND ENDED UP
IN ANOTHER DOORWAY
137 00:08:29:00 00:08:30:12 WHEN IT FINALLY
STOPPED.
138 00:08:31:28 00:08:34:25 ONLY ONE PERSON
WAS IN THE HOUSE--
139 00:08:34:27 00:08:36:11 ONE OF MY TENANTS.
140 00:08:36:13 00:08:39:11 SHE WAS UP IN THAT
LITTLE ALCOVE THERE
141 00:08:39:13 00:08:41:12 WHERE THE
TWO WINDOWS ARE.
142 00:08:41:14 00:08:43:26 HER ROOMMATE HAD
JUST COME DOWN HERE
143 00:08:43:28 00:08:46:07 TO UNLOAD SOMETHING
FROM THE CAR
144 00:08:46:09 00:08:47:09 WHEN IT HIT,
145 00:08:47:11 00:08:49:24 AND SHE COULD SEE
HER ROOMMATE
146 00:08:49:26 00:08:53:23 JUST KIND OF SWAYING
WITH THE HOUSE.
147 00:08:53:25 00:08:56:07 MEANWHILE THE PORCH
IS FALLING DOWN,
148 00:08:56:09 00:08:57:22 AND SHE'S SCREAMING.
149 00:08:57:24 00:08:58:27 IT WAS HORRIFYING.
150 00:09:01:16 00:09:04:03 *WITHIN MINUTES*
AFTER THE QUAKE HITS,
151 00:09:04:05 00:09:05:18 *RELIEF EFFORTS*
ARE UNDER WAY.
152 00:09:08:17 00:09:10:19 *THE OFFICIAL RELIEF*
APPARATUS INCLUDES
153 00:09:10:21 00:09:12:06 *VARIOUS GROUPS*
AND AGENCIES
154 00:09:12:08 00:09:14:28 *FROM ALL LEVELS*
OF GOVERNMENT.
155 00:09:15:00 00:09:18:03 *THEIR IMMEDIATE GOAL*
IS TO PROVIDE ASSISTANCE--
156 00:09:18:05 00:09:20:08 *ESPECIALLY FOOD, SHELTER,*
157 00:09:20:10 00:09:24:01 *AND MEDICAL ATTENTION*
WHEREVER IT IS NEEDED.
158 00:09:25:21 00:09:28:06 *IN THE FACE OF*
TREMENDOUS DEVASTATION,
159 00:09:28:08 00:09:30:19 *LOCAL, STATE,*
AND FEDERAL OFFICIALS
160 00:09:30:21 00:09:32:19 *RESPOND AS QUICKLY*
AS THEY CAN.
161 00:09:32:21 00:09:35:19 *STILL, THERE IS A SENSE*
OF FRUSTRATION
162 00:09:35:21 00:09:37:03 *SHARED BY NEARLY EVERYONE*
163 00:09:37:05 00:09:38:24 *ASSOCIATED*
WITH THE RELIEF OPERATION.
164 00:09:38:26 00:09:40:19 YOU'D LIKE TO GO
IN THERE
165 00:09:40:21 00:09:42:04 AND FEEL LIKE
166 00:09:42:06 00:09:44:05 YOU CAN MOVE
THE CONCRETE,
167 00:09:44:07 00:09:45:19 GET THE

168 00:09:45:21 00:09:48:01 DO WHAT YOU CAN IN
 YOUR RESCUE EFFORTS.
 169 00:09:48:03 00:09:50:17 IF YOU LOOK
 AT THE MAGNITUDE
 170 00:09:50:19 00:09:51:19 OF THE PROBLEM,
 171 00:09:51:21 00:09:53:05 YOU'VE GOT TO
 REALIZE
 172 00:09:53:07 00:09:55:26 THAT IT'S NOT GOING
 TO BE RESOLVED
 IMMEDIATELY.
 173 00:09:58:19 00:10:01:17 *WHILE THE OFFICIAL RESPONSE*
IS WELL-COORDINATED,
 174 00:10:01:19 00:10:03:18 *THERE'S CLEARLY*
TOO MUCH DAMAGE
 175 00:10:03:20 00:10:06:17 *FOR PUBLIC AGENCIES ALONE*
TO ADEQUATELY ADDRESS.
 176 00:10:07:22 00:10:09:04 *FORTUNATELY,*
AS OFTEN HAPPENS
 177 00:10:09:06 00:10:11:18 *IN THE FACE*
OF NATURAL DISASTER,
 178 00:10:11:20 00:10:13:22 *THERE IS AN OUTPOURING*
OF SUPPORT
 179 00:10:13:24 00:10:15:07 *FROM PRIVATE CITIZENS.*
 180 00:10:15:09 00:10:18:08 *RELIEF ORGANIZATIONS*
LIKE THE RED CROSS
 181 00:10:18:10 00:10:21:04 *HELP GALVANIZE*
THIS SENTIMENT INTO ACTION.
 182 00:10:23:24 00:10:25:23 *AND A STRONG*
VOLUNTEER EFFORT
 183 00:10:25:25 00:10:29:23 *STRETCHING FROM SANTA CRUZ*
TO SAN FRANCISCO
 184 00:10:29:25 00:10:31:07 *QUICKLY TAKES SHAPE.*
 185 00:10:31:09 00:10:34:00 THE YOUNG PEOPLE
 WERE JUST WONDERFUL
 186 00:10:34:02 00:10:35:15 HOW THEY HELPED US.
 187 00:10:35:17 00:10:39:00 PEOPLE WE NEVER KNEW,
 AND THEY NEVER KNEW US,
 188 00:10:39:02 00:10:42:00 BUT THEY CARRIED US
 IN THEIR ARMS
 189 00:10:42:02 00:10:43:16 DOWN THE STAIRS,
 190 00:10:43:18 00:10:47:03 AND THEY DIDN'T
 LEAVE US ONE MINUTE.
 191 00:10:48:29 00:10:50:12 *AS RELIEF EFFORTS CONTINUE,*
 192 00:10:50:14 00:10:52:11 *GEOLOGISTS COMB*
THE SURFACE AREA
 193 00:10:52:13 00:10:53:28 *AROUND LOMA PRIETA*
 194 00:10:54:00 00:10:56:14 *COLLECTING DATA*
WHICH WILL HELP THEM
 195 00:10:56:16 00:10:58:26 *BETTER UNDERSTAND*
THIS EARTHQUAKE.
 196 00:10:58:28 00:11:01:26 *IRONICALLY, THE EFFICIENCY*
OF THE REPAIR CREWS
 197 00:11:01:28 00:11:03:27 *POSES SOMETHING*
OF A THREAT
 198 00:11:03:29 00:11:07:16 *TO THE WORK OF*

INVESTIGATING GEOLOGISTS.
199 00:11:07:18 00:11:10:00 THE CITIES AND COUNTIES
AND STATE GOVERNMENTS
200 00:11:10:02 00:11:12:16 ARE VERY EFFICIENT
AT FIXING THINGS,
201 00:11:12:18 00:11:14:18 SO, FOR EXAMPLE,
DAMAGE TO ROADS
202 00:11:14:20 00:11:16:04 AND OTHER STRUCTURES
203 00:11:16:06 00:11:17:19 ARE FIXED
VERY QUICKLY,
204 00:11:17:21 00:11:21:05 SO THAT YOU LOSE
A LOT OF THE DATA
205 00:11:21:07 00:11:23:20 IF YOU DON'T GET
OUT THERE
206 00:11:23:22 00:11:26:04 AND RECORD IT
AS SOON AS POSSIBLE.
207 00:11:26:06 00:11:27:20 *ANOTHER MAJOR OBSTACLE*
208 00:11:27:22 00:11:31:20 *FACING THE TEAMS OF*
INVESTIGATORS IS WEATHER.
209 00:11:31:22 00:11:33:07 *BOTH WIND AND RAIN*
210 00:11:33:09 00:11:36:18 *CAN WIPE OUT VITAL EVIDENCE*
FOLLOWING EARTHQUAKES.
211 00:11:36:20 00:11:38:05 *APART FROM WEATHER*
212 00:11:38:07 00:11:40:01 *AND PROMPT REPAIR*
OPERATIONS,
213 00:11:40:03 00:11:41:18 *THE U.S. GEOLOGICAL SURVEY*
214 00:11:41:20 00:11:44:26 *IS FORCED TO DEAL WITH*
ONE ADDITIONAL PROBLEM--
215 00:11:44:28 00:11:47:29 *DAMAGE TO ITS OWN*
FACILITIES.
216 00:11:48:01 00:11:50:15 LOMA PRIETA
DISRUPTED OUR
NETWORK OPERATIONS
217 00:11:50:17 00:11:53:14 FOR SEVERAL HOURS
HERE IN THE OFFICE.
218 00:11:53:16 00:11:55:00 WE LOST POWER,
219 00:11:55:02 00:11:56:29 AS DID MOST
OF THE COMMUNITY,
220 00:11:57:01 00:11:58:04 FOR ABOUT SIX HOURS.
221 00:11:58:06 00:11:59:19 WE HAVE EMERGENCY
GENERATORS.
222 00:11:59:21 00:12:02:15 WE WERE
ABLE TO RUN OUR
CENTRAL COMPUTERS
223 00:12:02:17 00:12:05:00 ON THOSE GENERATORS.
224 00:12:05:02 00:12:07:15 UH, MANY COMPUTERS
THAT WEREN'T POWERED
225 00:12:07:17 00:12:09:29 BY THE EMERGENCY
POWER WERE DOWN,
226 00:12:10:01 00:12:11:14 AND MANY FUNCTIONS
227 00:12:11:16 00:12:13:29 THAT WE WANTED
TO PERFORM
228 00:12:14:01 00:12:15:03 WERE IMPOSSIBLE.
229 00:12:17:27 00:12:22:06 *BUT DESPITE SOME PROBLEMS*
WITH ITS EQUIPMENT,
230 00:12:22:08 00:12:25:07 *THE U.S.G.S. CONTINUES*

231 00:12:25:09 00:12:26:22 [BAKUN] FOR EXAMPLE,
 232 00:12:26:24 00:12:29:07 THE STEPS THAT
 HAD BEEN TAKEN
 233 00:12:29:09 00:12:34:15 TO INSURE THAT
 THE SEISMIC MONITORING
 NETWORK STAYED ALIVE
 234 00:12:34:17 00:12:36:09 WORKED--WORKED WELL.
 235 00:12:36:11 00:12:41:14 WE REALLY DID NOT LOSE ANY
 DOWN TIME FROM THE EARTHQUAKE,
 236 00:12:41:16 00:12:44:05 AND WE WERE ABLE
 TO ESSENTIALLY PROVIDE
 237 00:12:44:07 00:12:48:13 CONTINUOUS INFORMATION
 TO THE PUBLIC
 238 00:12:48:15 00:12:50:12 AND TO LOCAL
 AND STATE OFFICIALS
 239 00:12:50:14 00:12:53:01 ABOUT WHAT WAS HAPPENING
 DURING THE EARTHQUAKE.
 240 00:12:53:03 00:12:55:01 REALLY, THE MOST
 IMPORTANT INFORMATION
 241 00:12:55:03 00:12:57:23 TO RELAY TO THE PUBLIC
 AFTER AN EARTHQUAKE
 242 00:12:57:25 00:12:59:22 IS THE FACT
 THAT AFTERSHOCKS
 243 00:12:59:24 00:13:01:28 ARE EXPECTED TO OCCUR,
 244 00:13:02:00 00:13:05:24 AND THE QUESTION OF
 HOW LONG WE EXPECT
 THEM TO OCCUR,
 245 00:13:05:26 00:13:08:14 AND WHAT KIND
 OF ADDITIONAL HAZARD
 THEY REPRESENT.
 246 00:13:08:16 00:13:11:14 DURING THE LOMA PRIETA
 EARTHQUAKE SEQUENCE
 247 00:13:11:16 00:13:15:13 WE WERE ABLE TO SPEAK
 TO THE PUBLIC EVERY DAY,
 248 00:13:15:15 00:13:17:13 REMINDING EVERYONE
 249 00:13:17:15 00:13:19:23 THAT AFTERSHOCKS
 ARE LIKELY TO OCCUR
 250 00:13:19:25 00:13:22:09 AND THAT, ALTHOUGH
 WE CAN'T PREDICT
 251 00:13:22:11 00:13:24:24 THE TIME
 OF THE AFTERSHOCKS,
 252 00:13:24:26 00:13:27:29 THE FIRST WEEK OR TWO
 ARE THE MOST DANGEROUS
 253 00:13:28:01 00:13:29:14 AND AFTERSHOCKS
 CAN CONTINUE
 254 00:13:29:16 00:13:32:04 FOR SEVERAL MONTHS
 AFTER THE MAIN SHOCK.
 255 00:13:32:06 00:13:34:22 AS RESEARCH EFFORTS
 CONTINUE,
 256 00:13:34:24 00:13:36:26 GEOLOGISTS BEGIN
 TO RECOGNIZE
 257 00:13:36:28 00:13:39:03 THAT THERE ARE A NUMBER
 OF SURPRISING ASPECTS
 258 00:13:39:05 00:13:40:11 TO THIS QUAKE.
 259 00:13:40:13 00:13:43:10 THIS LOOKS MORE

260 00:13:43:12 LIKE A LEFT LATERAL.
 00:13:45:14 [BAKUN] ONE OF
 261 00:13:45:16 THE INTERESTING THINGS
 00:13:47:24 ABOUT THE LOMA PRIETA
 262 00:13:47:26 EARTHQUAKE WAS THAT
 00:13:52:11 THE FAULT THAT BROKE
 263 00:13:52:13 WAS NOT THE VERTICAL, UH,
 00:13:55:11 STRIKE-SLIP FAULT
 264 00:13:55:13 THAT WE TEND TO THINK OF
 00:13:57:21 AS CHARACTERIZING
 265 00:13:59:28 THE SAN ANDREAS FAULT.
 00:14:01:12 GEOLOGISTS
 266 00:14:01:14 NORMALLY EXPECT
 00:14:04:01 THE TWO SIDES
 267 00:14:04:03 OF THE SAN ANDREAS FAULT
 00:14:06:11 TO SLIP PAST EACH OTHER
 268 00:14:06:13 HORIZONTALLY,
 00:14:09:11 WITH THE WEST SIDE
 269 00:14:09:13 MOVING TO THE NORTHWEST.
 00:14:11:11 THIS DID, IN FACT,
 270 00:14:11:13 HAPPEN,
 00:14:14:11 BUT THE WEST SIDE
 271 00:14:14:13 ALSO MOVED VERTICALLY,
 00:14:18:27 RIDING UP ON THE EAST SIDE
 272 00:14:18:29 BETWEEN ONE AND TWO METERS.
 00:14:21:12 WHAT ALSO CATCHES
 273 00:14:21:14 THE ATTENTION OF GEOLOGISTS
 00:14:23:26 IS THAT THE FOCUS
 274 00:14:23:28 OF THE QUAKE
 00:14:26:22 OCCURRED 18 KILOMETERS
 275 00:14:26:24 BENEATH THE SURFACE--
 00:14:30:10 SURPRISINGLY DEEP
 276 00:14:33:29 FOR CALIFORNIA EARTHQUAKES.
 00:14:36:26 PERHAPS BECAUSE THE QUAKE
 277 00:14:36:28 WAS SO DEEP-SEATED,
 00:14:39:26 NO RUPTURE BROKE THE
 278 00:14:39:28 SURFACE ALONG THE FAULT,
 00:14:41:26 BUT NUMEROUS
 279 00:14:41:28 FISSURES RESULTED
 00:14:44:12 FROM LANDSLIDES TRIGGERED
 280 00:14:53:12 BY THE SHAKING.
 00:14:55:24 THE EARTHQUAKE WAS ALSO
 281 00:14:55:26 SURPRISINGLY BRIEF
 00:14:57:10 GIVEN ITS GREAT POWER,
 282 00:14:57:12 WITH SHAKING FELT FOR ONLY
 00:14:59:29 ABOUT EIGHT SECONDS.
 283 00:15:03:01 THE EXTENT OF THE DAMAGE
 284 00:15:05:01 IN PARTS OF SAN FRANCISCO
 00:15:07:13 AND OAKLAND--
 285 00:15:07:15 A FULL 90 KILOMETERS
 00:15:11:11 FROM THE EPICENTER--
 286 00:15:11:13 ALSO SURPRISES
 00:15:13:09 MOST PEOPLE,
 287 00:15:13:11 AND YET THE EVENT ITSELF
 00:15:18:10 WAS HARDLY A SURPRISE.
 288 00:15:18:12 EARTHQUAKES ALONG

THE SAN ANDREAS FAULT
 289 00:15:20:10 00:15:21:23 HAVE NO DOUBT OCCURRED
 290 00:15:21:25 00:15:24:08 THROUGHOUT ITS
 30-MILLION-YEAR HISTORY.
 291 00:15:24:10 00:15:28:09 WHENEVER THE PLATES ON
 EITHER SIDE OF THE FAULT LOCK,
 292 00:15:28:11 00:15:29:24 AND STRAIN
 AGAINST ONE ANOTHER,
 293 00:15:29:26 00:15:31:24 A BREAKING POINT
 IS EVENTUALLY REACHED,
 294 00:15:31:26 00:15:34:15 AND AS THE PLATES
 LURCH PAST ONE ANOTHER,
 295 00:15:34:17 00:15:36:21 AN EARTHQUAKE OCCURS.
 296 00:15:38:22 00:15:41:10 BUT THERE'S ANOTHER REASON
 WHY THIS PARTICULAR QUAKE
 297 00:15:41:12 00:15:42:25 WAS NOT UNEXPECTED.
 298 00:15:42:27 00:15:45:10 SCIENTISTS HAVE KNOWN
 FOR SEVERAL YEARS
 299 00:15:45:12 00:15:48:08 THAT THE 1,200 KILOMETER LONG
 SAN ANDREAS FAULT
 300 00:15:48:10 00:15:52:07 IS ACTUALLY COMPOSED OF
 INDIVIDUAL, DISCRETE SEGMENTS.
 301 00:15:54:00 00:15:55:28 GEOPHYSICISTS
 HAVE CALCULATED
 302 00:15:56:00 00:15:57:27 THE PROBABILITY
 OF MAJOR EARTHQUAKES
 303 00:15:57:29 00:15:59:17 IN EACH OF THESE REGIONS,
 304 00:15:59:19 00:16:02:02 ALONG WITH THE MAXIMUM
 LIKELY MAGNITUDE
 305 00:16:02:04 00:16:03:17 AT EACH LOCATION.
 306 00:16:04:29 00:16:06:13 THE LOMA PRIETA
 EARTHQUAKE
 307 00:16:06:15 00:16:09:01 OCCURRED ALONG ONE
 OF THE SIX FAULT SEGMENTS
 308 00:16:09:03 00:16:10:17 CONSIDERED MOST LIKELY
 309 00:16:10:19 00:16:14:07 TO SUSTAIN A MAGNITUDE 6.5
 OR LARGER EVENT
 310 00:16:14:09 00:16:19:02 WITHIN THE 30-YEAR INTERVAL
 BETWEEN 1988 AND 2018.
 311 00:16:22:19 00:16:24:13 ONCE THE SHAKING STOPPED,
 312 00:16:24:15 00:16:27:18 MANY PEOPLE ALMOST FELT
 A SENSE OF RELIEF,
 313 00:16:27:20 00:16:30:21 ASSUMING THAT THEY WOULD
 NO LONGER HAVE TO WORRY
 314 00:16:30:23 00:16:33:21 ABOUT ANOTHER MAJOR EARTHQUAKE
 DURING THE FORESEEABLE FUTURE.
 315 00:16:35:19 00:16:37:13 HOWEVER,
 THE LOMA PRIETA EARTHQUAKE
 316 00:16:37:15 00:16:39:25 WAS NOT THE SO-CALLED
 "BIG ONE"
 317 00:16:39:27 00:16:42:09 THAT GEOLOGISTS AND
 MILLIONS OF CALIFORNIANS
 318 00:16:42:11 00:16:43:24 HAVE BEEN WAITING FOR.
 319 00:16:45:05 00:16:47:19 [BAKUN] WE KNOW
 THAT THERE WILL BE
 320 00:16:47:21 00:16:50:13 FUTURE LARGE EARTHQUAKES

321 00:16:50:15 IN THE BAY AREA,
 00:16:52:29 PROBABLY WITHIN
 322 00:16:53:01 THE NEXT FEW DECADES,
 00:16:54:21 AND THEY'RE MUCH LIKELY
 323 00:16:54:23 00:16:57:21 TO BE CLOSER TO
 THE CENTERS OF POPULATION
 324 00:16:57:23 00:17:00:11 AND TO SHAKE THOSE
 CENTERS OF POPULATION
 325 00:17:00:13 00:17:02:11 MORE STRONGLY
 THAN LOMA PRIETA
 326 00:17:02:13 00:17:07:00 AND, ACTUALLY,
 THE STRONG SHAKING
 SHOULD LAST LONGER.
 327 00:17:09:08 00:17:11:24 AS TERRIFYING
 AS THIS TREMOR WAS,
 328 00:17:11:26 00:17:14:06 GEOLOGISTS CALL IT
 A MODERATE
 329 00:17:14:08 00:17:16:05 RATHER THAN
 A GREAT EARTHQUAKE.
 330 00:17:16:07 00:17:19:05 THE MAGNITUDE
 OF THE 1906 QUAKE,
 331 00:17:19:07 00:17:22:04 WHICH ALSO SHOOK THE
 SAN FRANCISCO BAY REGION,
 332 00:17:22:06 00:17:24:25 HAS BEEN ESTIMATED AT 8.3,
 333 00:17:24:27 00:17:28:09 MEANING IT RELEASED
 ABOUT 60 TIMES MORE ENERGY
 334 00:17:28:11 00:17:30:29 THAN
 THE LOMA PRIETA QUAKE.
 335 00:17:31:01 00:17:32:19 NONETHELESS,
 336 00:17:32:21 00:17:36:10 THERE IS A CHILLING IRONY
 THAT LINKS THE TWO EVENTS.
 337 00:17:38:12 00:17:39:25 WHEN CALIFORNIA STAGED
 338 00:17:39:27 00:17:42:21 AN INTERNATIONAL
 EXPOSITION IN 1915,
 339 00:17:42:23 00:17:44:21 THE CITY OF SAN FRANCISCO
 340 00:17:44:23 00:17:46:13 WANTED TO DIVERT
 WORLD ATTENTION
 341 00:17:46:15 00:17:47:28 FROM THE DEVASTATING QUAKE
 342 00:17:48:00 00:17:50:27 THAT HAD ROCKED THE AREA
 NINE YEARS EARLIER.
 343 00:17:52:20 00:17:54:06 IN SO DOING,
 344 00:17:54:08 00:17:57:23 IT HOPED TO MARKET ITSELF
 AS A VIABLE PACIFIC PORT.
 345 00:17:57:25 00:18:00:14 THIS LED TO THE BUILDING
 OF EXPOSITION STRUCTURES
 346 00:18:00:16 00:18:01:28 IN THE MARINA DISTRICT.
 347 00:18:03:04 00:18:04:19 THE MATERIALS SELECTED
 348 00:18:04:21 00:18:07:19 TO FILL IN THE SHALLOW
 WATER OF THE MARINA
 349 00:18:07:21 00:18:10:18 WERE A COMBINATION OF
 RUBBLE FROM THE 1906 QUAKE
 350 00:18:10:20 00:18:13:12 AND UNCOMPACTED
 MUD AND SAND.
 351 00:18:15:20 00:18:18:14 74 YEARS LATER
 THIS COMMUNITY,
 352 00:18:18:16 00:18:21:13 BUILT ATOP THE RUBBLE

353 00:18:21:15 00:18:24:03 *OF ONE EARTHQUAKE,*
 354 00:18:24:05 00:18:32:23 *WOULD SUFFER CATASTROPHE*
 00:18:32:23 *FROM ANOTHER.*
 355 00:18:32:25 00:18:34:14 [BAKUN] THOSE VERY SOFT
 356 00:18:34:16 00:18:37:04 SURFACE DEPOSITS
 00:18:37:04 SHOOK VERY VIOLENTLY,
 357 00:18:37:06 00:18:38:19 AND, IN FACT, THEY FAILED.
 00:18:38:19 YOU HAD WHAT WE CALL
 358 00:18:38:21 00:18:42:05 A LIQUEFACTION,
 00:18:42:05 WHERE THE GROUND
 359 00:18:42:07 00:18:46:10 ESSENTIALLY
 00:18:46:10 LOSES THE ABILITY
 00:18:46:10 TO SUPPORT LOADS,
 360 00:18:46:12 00:18:48:27 AND SO THE BUILDINGS
 00:18:48:27 THAT ARE SITTING
 361 00:18:48:29 00:18:51:12 ON THAT MATERIAL
 00:18:51:12 SUNK INTO THE GROUND
 362 00:18:51:14 00:18:55:05 AND SHIFTED.
 00:18:55:05 THE FOUNDATIONS OF
 363 00:18:55:07 00:18:56:21 THE BUILDING SHIFTED.
 364 00:18:56:23 00:18:58:23 [BUIKA] AND THE REASON
 00:18:58:23 FOR THAT IS BECAUSE
 365 00:18:58:25 00:19:02:01 AS THE EARTHQUAKE WAVE
 00:19:02:01 MOVED AWAY FROM
 366 00:19:02:03 00:19:04:01 THE EPICENTER,
 00:19:04:01 WHEN IT HIT
 367 00:19:04:03 00:19:08:12 THIS GEOLOGY,
 00:19:08:12 THIS LOOSE,
 368 00:19:08:14 00:19:09:26 UNCONSOLIDATED SOIL,
 369 00:19:09:28 00:19:14:02 THE GROUND MOTION
 00:19:14:02 ACTUALLY WAS AMPLIFIED
 370 00:19:14:04 00:19:16:07 OR INCREASED FIVE TIMES
 00:19:16:07 WHAT IT WAS A MILE UP ON
 371 00:19:16:09 00:19:18:01 SOLID BEDROCK UP HERE,
 372 00:19:18:03 00:19:19:11 SO GEOLOGISTS
 373 00:19:19:13 00:19:21:22 HAVE UNDERSTOOD,
 00:19:21:22 IN THE LAST 10 YEARS,
 374 00:19:21:24 00:19:24:26 WHERE TO BUILD--
 00:19:24:26 NOT ONLY HOW TO BUILD,
 375 00:19:24:28 00:19:28:17 BUT WHERE TO BUILD,
 00:19:28:17 AND WE HAVE MAPS
 376 00:19:28:19 00:19:31:16 SHOWING WHERE AREAS
 00:19:31:16 OF LOOSELY
 377 00:19:31:18 00:19:33:01 CONSOLIDATED GROUND,
 378 00:19:33:03 00:19:36:01 AND THIS IS
 00:19:36:01 ONE OF THEM HERE,
 379 00:19:36:03 00:19:37:12 AND IF WE LOOK
 00:19:37:12 ALL AROUND THE EDGE OF
 380 00:19:37:14 00:19:39:27 THE SAN FRANCISCO BAY--
 00:19:39:27 DOWNTOWN,
 381 00:19:39:29 00:19:45:02 THE EMBARCADERO,
 00:19:45:02 THE EMBARCADERO FREEWAY,
 382 00:19:45:04 00:19:46:25 SOUTH OF MARKET--
 00:19:46:25 THESE ARE SMALL PACKETS
 OF LIQUIFIABLE SOILS,
 AND THESE ARE WHERE

383 00:19:46:27 00:19:49:09 WE HAVE THE MOST
DOCUMENTED DAMAGE
384 00:19:49:11 00:19:51:22 IN THE ENTIRE
SAN FRANCISCO AREA.
385 00:19:54:08 00:19:56:21 THE FACT THAT GEOLOGISTS
386 00:19:56:23 00:19:59:06 AND MANY PUBLIC OFFICIALS
HAVE KNOWN FOR SOME TIME
387 00:19:59:08 00:20:01:24 WHICH AREAS ARE MOST
VULNERABLE TO EARTHQUAKES
388 00:20:01:26 00:20:04:21 IS OF LITTLE COMFORT
TO THOSE WHOSE LIVES
389 00:20:04:23 00:20:07:05 HAVE BEEN DEVASTATED
BY THIS DISASTER.
390 00:20:10:01 00:20:13:14 AS THE FOCUS SHIFTS FROM
THE HORROR OF LOMA PRIETA
391 00:20:13:16 00:20:15:29 TO THE INEVITABILITY
OF FUTURE QUAKE,
392 00:20:16:01 00:20:18:19 THE RACE TO INCREASE
OUR KNOWLEDGE AND SOMEHOW
393 00:20:18:21 00:20:22:22 PREPARE FOR THESE
SEISMIC GIANTS INTENSIFIES.
394 00:20:22:24 00:20:26:29 THE APPROACH THAT GENERALLY
ATTRACTS THE MOST ATTENTION
395 00:20:27:01 00:20:29:07 AND CONTINUES TO BE
THE MOST ELUSIVE
396 00:20:29:09 00:20:30:21 IS EARTHQUAKE PREDICTION.
397 00:20:35:02 00:20:37:06 SCIENTISTS
ARE STUDYING EVERYTHING
398 00:20:37:08 00:20:38:21 FROM MAGNETIC FIELDS
399 00:20:38:23 00:20:40:07 TO GROUND WATER LEVELS
400 00:20:40:09 00:20:42:29 AND DEFORMATION
OF THE EARTH'S CRUST
401 00:20:43:01 00:20:44:13 TO DEVELOP A FORMULA
402 00:20:44:15 00:20:46:04 THAT CAN ACCURATELY
PREDICT EARTHQUAKES.
403 00:20:46:06 00:20:48:24 WHILE SOME PROMISING WORK
HAS BEEN DONE,
404 00:20:48:26 00:20:52:11 A DEFINITE EARTHQUAKE
PREDICTION TECHNIQUE
405 00:20:52:13 00:20:54:22 HAS YET TO BE DEVELOPED.
406 00:20:56:10 00:20:59:12 THE LOMA PRIETA QUAKE,
HOWEVER, HAS CONTRIBUTED
407 00:20:59:14 00:21:01:19 WHAT MAY BE
AN IMPORTANT CLUE
408 00:21:01:21 00:21:03:07 TO THE PREDICTION RIDDLE.
409 00:21:03:09 00:21:05:27 AT STANFORD UNIVERSITY,
410 00:21:05:29 00:21:08:02 PHYSICIST
ANTONY FRASER-SMITH
411 00:21:08:04 00:21:11:15 STUDIES LOW-FREQUENCY
ELECTROMAGNETIC WAVES.
412 00:21:12:19 00:21:14:15 EVERYTHING
WILL BE VERY SOLID.
413 00:21:14:17 00:21:17:00 IN PART, TO AVOID
EXTRANEIOUS SIGNALS
414 00:21:17:02 00:21:19:00 FROM THE
SAN FRANCISCO AREA,

415 00:21:19:02 00:21:20:19 FRASER-SMITH LOOKED SOUTH
416 00:21:20:21 00:21:22:19 TO THE SANTA CRUZ
MOUNTAINS
417 00:21:22:21 00:21:24:19 TO FIND
A SUITABLE LOCATION
418 00:21:24:21 00:21:28:02 IN WHICH TO PLACE
HIS RESEARCH EQUIPMENT.
419 00:21:28:04 00:21:32:04 WHAT HE DIDN'T REALIZE
WAS THAT THE SPOT HE CHOSE
420 00:21:32:06 00:21:35:14 WOULD TURN OUT TO BE
ALMOST AT THE EPICENTER
421 00:21:35:16 00:21:38:10 OF THE LOMA PRIETA
EARTHQUAKE.
422 00:21:38:12 00:21:41:10 OUR FIRST THOUGHT
AFTER THE LOMA PRIETA
EARTHQUAKE
423 00:21:41:12 00:21:44:25 WAS THAT WE'D
PROBABLY NEVER SEE
OUR EQUIPMENT AGAIN
424 00:21:44:27 00:21:46:26 BECAUSE THERE WAS
A LOT OF DAMAGE
425 00:21:46:28 00:21:48:11 ALL IN THAT AREA.
426 00:21:48:13 00:21:49:27 POWER HAD BEEN LOST.
427 00:21:49:29 00:21:51:11 COMMUNICATION
HAD BEEN LOST.
428 00:21:51:13 00:21:53:12 THE TELEPHONE LINES
WERE DOWN.
429 00:21:53:14 00:21:56:25 WE JUST DIDN'T KNOW
WHAT HAD HAPPENED
DOWN THERE.
430 00:21:56:27 00:21:59:11 REMARKABLY, FRASER-SMITH'S
EQUIPMENT SURVIVED INTACT,
431 00:21:59:13 00:22:01:25 AND WHEN
ONE OF HIS COLLEAGUES
432 00:22:01:27 00:22:03:12 CHECKED OUT THE DATA
433 00:22:03:14 00:22:05:13 THAT HAD BEEN RECORDED
PRIOR TO THE QUAKE,
434 00:22:05:15 00:22:07:27 HE FOUND SOMETHING
UNEXPECTED
435 00:22:07:29 00:22:10:12 AND QUITE EXTRAORDINARY.
436 00:22:10:14 00:22:13:15 THERE WERE
VERY BIG SIGNALS
COMING THROUGH,
437 00:22:13:17 00:22:15:28 AND THE THING THAT
MOST EXCITED HIM
438 00:22:16:00 00:22:18:28 WAS A BIG INCREASE
ABOUT THREE HOURS
439 00:22:19:00 00:22:20:15 BEFORE
THE EARTHQUAKE,
440 00:22:20:17 00:22:23:15 WHERE THE SIGNALS
HAD GROWN SO LARGE,
441 00:22:23:17 00:22:26:16 THAT THE COMPUTER
THAT RUNS OUR SYSTEM
442 00:22:26:18 00:22:28:16 WAS PUTTING OUT
WARNING MESSAGES
443 00:22:28:18 00:22:31:16 SAYING THAT

THESE SIGNALS
 WERE NOW SO LARGE
 444 00:22:31:18 00:22:34:15 THAT WE NO LONGER
 COULD TRUST
 THE DATA.
 445 00:22:34:17 00:22:36:15 THE MEASUREMENTS
 WERE ACTUALLY
 SMALLER
 446 00:22:36:17 00:22:38:00 THAN THE REAL
 SIGNALS.
 447 00:22:38:02 00:22:40:01 THEY WERE
 NO LONGER CAPABLE
 448 00:22:40:03 00:22:41:18 OF FOLLOWING
 THE REAL SIGNALS.
 449 00:22:43:07 00:22:45:19 *WHAT IS INTRIGUING*
ABOUT THESE FLUCTUATIONS
 450 00:22:45:21 00:22:47:04 *IN THE*
ELECTROMAGNETIC SIGNALS
 451 00:22:47:06 00:22:50:05 *IS THAT THEY*
MAY HAVE BEEN RELATED
 452 00:22:50:07 00:22:52:05 *TO THE LOMA PRIETA*
EARTHQUAKE.
 453 00:22:52:07 00:22:55:04 *FRASER-SMITH IS QUICK*
TO POINT OUT, HOWEVER,
 454 00:22:55:06 00:22:57:19 *THAT IT'S TOO EARLY*
TO CLAIM
 455 00:22:57:21 00:23:00:03 *THAT THEY CAN*
DEFINITELY BE CONSIDERED
 456 00:23:00:05 00:23:01:09 *EARTHQUAKE PRECURSORS.*
 457 00:23:03:27 00:23:05:25 *WHILE IT'S UNCERTAIN*
WHETHER FRASER-SMITH'S RESEARCH
 458 00:23:05:27 00:23:08:11 *WILL LEAD*
TO AN EFFECTIVE METHOD
 459 00:23:08:13 00:23:09:26 *OF EARTHQUAKE PREDICTION,*
 460 00:23:09:28 00:23:13:10 *THERE'S NO DOUBT*
THAT SOMETHING NEEDS TO BE DONE
 461 00:23:13:12 00:23:15:24 *TO MINIMIZE THE LEVEL*
OF DESTRUCTION
 462 00:23:15:26 00:23:17:09 *THAT LARGE QUAKES CAUSE.*
 463 00:23:19:27 00:23:21:25 *OF PARTICULAR CONCERN*
ARE EARTHQUAKES
 464 00:23:21:27 00:23:23:11 *THAT OCCUR ALONG FAULTS*
 465 00:23:23:13 00:23:25:25 *SITUATED CLOSE TO MAJOR*
POPULATION CENTERS,
 466 00:23:25:27 00:23:27:11 *FOR EXAMPLE,*
THE HAYWARD FAULT,
 467 00:23:27:13 00:23:29:25 *WHICH LIES JUST EAST*
OF SAN FRANCISCO BAY.
 468 00:23:29:27 00:23:31:10 *IF AN EARTHQUAKE*
 469 00:23:31:12 00:23:34:10 *OF THE SAME MAGNITUDE*
AS THE LOMA PRIETA QUAKE
 470 00:23:34:12 00:23:37:10 *WERE TO OCCUR*
ON THE HAYWARD FAULT,
 471 00:23:37:12 00:23:41:10 *A POPULATION*
15 TIMES LARGER
WOULD BE AT RISK.

472 00:23:42:28 00:23:45:19 *ENGINEERS AT THE UNIVERSITY
OF CALIFORNIA AT BERKELEY*

473 00:23:45:21 00:23:49:00 *CONTEND THAT RAPID,
UNCHECKED GROWTH
IN SUCH AREAS*

474 00:23:49:02 00:23:51:23 *REFLECTS A DANGEROUS
LACK OF PLANNING.*

475 00:23:51:25 00:23:58:15 *THE HAYWARD FAULT
RUNS EXACTLY
ALONG THE FREEWAY.*

476 00:23:58:17 00:24:01:15 *THE FREEWAY RUNS
EXACTLY ALONG
THE FAULT.*

477 00:24:01:17 00:24:04:15 *AND THEN THERE ARE
MOSTLY HOSPITALS
ALONG THERE.*

478 00:24:04:17 00:24:06:15 *THERE IS
A NAVY HOSPITAL,*

479 00:24:06:17 00:24:08:15 *AND MANY SCHOOLS
ARE THERE.*

480 00:24:08:17 00:24:10:14 *THIS IS WHAT I MEAN,*

481 00:24:10:16 00:24:12:15 *THE LACK OF DISASTER
PREVENTION POLICY.*

482 00:24:12:17 00:24:15:16 *THESE BUILDINGS
SHOULD NOT BE
BUILT THERE.*

483 00:24:15:18 00:24:17:26 *THESE HIGHWAYS
SHOULD NOT
BE BUILT.*

484 00:24:19:09 00:24:21:12 *AND YET, HOSPITALS,
SCHOOLS, AND HIGHWAYS*

485 00:24:21:14 00:24:22:28 *HAVE BEEN BUILT*

486 00:24:23:00 00:24:24:27 *IN THE VICINITY
OF DANGEROUS FAULTS.*

487 00:24:26:25 00:24:29:22 *CLEARLY, THE PROSPECT
OF TEARING THESE
STRUCTURES DOWN*

488 00:24:29:24 00:24:33:08 *AND RELOCATING
THE MILLIONS OF PEOPLE
WHO UTILIZE THEM*

489 00:24:33:10 00:24:34:23 *IS NOT FEASIBLE.*

490 00:24:35:29 00:24:37:23 *THE MOST PRACTICAL
ALTERNATIVE*

491 00:24:37:25 00:24:41:01 *SEEMS TO BE RETROFITTING
EXISTING STRUCTURES*

492 00:24:41:03 00:24:43:01 *SO THAT THEY'LL BE
MORE LIKELY*

493 00:24:43:03 00:24:44:21 *TO SURVIVE
A MAJOR EARTHQUAKE.*

494 00:24:46:05 00:24:47:22 *MOST CASUALTIES
ASSOCIATED WITH EARTHQUAKES*

495 00:24:47:24 00:24:50:26 *ARE CAUSED NOT BY
THE QUAKES THEMSELVES,*

496 00:24:50:28 00:24:53:26 *BUT BY THE FAILURE OF
BUILDINGS, BRIDGES,*

497 00:24:53:28 00:24:56:07 *AND OTHER STRUCTURES.*

498 00:24:56:09 00:24:57:22 [BERTERO]
THIS IS ONE

499 00:24:57:24 00:24:59:13 OF THE MOST
SERIOUS PROBLEMS--

500 00:24:59:15 00:25:03:28 THE PROBLEM
OF WHAT TO DO
WITH BUILDINGS

501 00:25:04:00 00:25:07:19 OR A STRUCTURE
THAT WE KNOW
THAT ARE BUILT

502 00:25:07:21 00:25:10:03 ON SOIL THAT
WILL SUFFER DAMAGE.

503 00:25:10:05 00:25:12:00 AT THE MOMENT,
504 00:25:12:02 00:25:15:28 ANYTHING THAT WE DO
WILL BE VERY EXPENSIVE.

505 00:25:16:00 00:25:17:28 IT'S A VERY EXPENSIVE
OPERATION.

506 00:25:18:00 00:25:19:19 IT CAN BE DONE,
507 00:25:19:21 00:25:25:23 HOWEVER, IT WILL REQUIRE
A TREMENDOUS ECONOMIC
EFFORT.

508 00:25:25:25 00:25:27:23 *THERE IS
YET ANOTHER STRATEGY*

509 00:25:27:25 00:25:31:04 *FOR MINIMIZING THE IMPACT
OF EARTHQUAKES--*

510 00:25:31:06 00:25:33:04 *A SEISMIC
EARLY-WARNING SYSTEM,*

511 00:25:33:06 00:25:35:03 *STILL IN THE
EXPERIMENTAL STAGE,*

512 00:25:35:05 00:25:36:18 *THAT WAS INSTALLED*
513 00:25:36:20 00:25:38:17 *FOLLOWING THE LOMA PRIETA
EARTHQUAKE.*

514 00:25:39:19 00:25:41:02 *WITH THIS SYSTEM,*
515 00:25:41:04 00:25:44:20 *THE INSTANT A LARGE
EARTHQUAKE IS RECORDED,*

516 00:25:44:22 00:25:46:07 *GROUND SENSORS
TRANSMIT A SIGNAL*

517 00:25:46:09 00:25:49:04 *TO RECEIVING STATIONS
THROUGHOUT THE AREA.*

518 00:25:50:17 00:25:54:15 YOU'RE TAKING ADVANTAGE
OF THE IDEA

519 00:25:54:17 00:25:57:16 THAT ONCE AN EARTHQUAKE
OCCURS AND IT'S DETECTED,
520 00:25:57:18 00:26:00:14 YOU CAN
ESSENTIALLY OUTPACE
THE SEISMIC WAVES

521 00:26:00:16 00:26:02:29 THAT ARE PROPAGATING
THROUGH THE GROUND

522 00:26:03:01 00:26:05:13 BY SENDING
A RADIO SIGNAL AHEAD.

523 00:26:05:15 00:26:07:28 SO, THE FARTHER AWAY
YOU ARE,

524 00:26:08:00 00:26:10:16 THE MORE TIME OF WARNING
THAT YOU HAVE.

525 00:26:11:26 00:26:14:19 *THE ACTUAL TIME SAVED
BY SUCH A SYSTEM*

526 00:26:14:21 00:26:17:20 MIGHT ONLY AMOUNT
 TO 10 OR 20 SECONDS,
 527 00:26:17:22 00:26:20:04 BUT THIS COULD BE
 LONG ENOUGH
 528 00:26:20:06 00:26:21:27 TO DIVERT OR
 TEMPORARILY IMMOBILIZE
 529 00:26:21:29 00:26:24:01 PUBLIC
 TRANSPORTATION SYSTEMS...
 530 00:26:25:23 00:26:28:22 OR TO SIMPLY WARN PEOPLE
 TO TAKE COVER
 531 00:26:28:24 00:26:30:21 AND POSSIBLY
 SAVE THEIR LIVES.
 532 00:26:31:26 00:26:35:20 SO, I THINK IT HAS
 SOME POSSIBILITIES,
 533 00:26:35:22 00:26:39:19 AND THE STATE
 AND LOCAL OFFICIALS
 ARE EVALUATING
 534 00:26:39:21 00:26:43:29 HOW SUCH A SYSTEM
 MIGHT BEST BE USED
 IN FUTURE EARTHQUAKES.
 535 00:26:45:17 00:26:48:28 FOR THE RESIDENTS OF
 THE SAN FRANCISCO BAY REGION,
 536 00:26:49:00 00:26:52:12 THE IMPACT OF THE LOMA PRIETA
 EARTHQUAKE WAS ENORMOUS.
 537 00:26:53:27 00:26:56:17 63 PEOPLE LOST THEIR LIVES,
 538 00:26:56:19 00:26:59:12 AND ANOTHER 3,800
 WERE INJURED.
 539 00:26:59:14 00:27:02:26 MORE THAN 28,000 HOMES
 AND BUSINESS WERE DAMAGED,
 540 00:27:02:28 00:27:04:27 AND THE OVERALL
 FINANCIAL COST
 541 00:27:04:29 00:27:07:16 WAS ABOUT \$6 BILLION.
 542 00:27:07:18 00:27:09:05 STILL...
 543 00:27:09:07 00:27:11:19 THE RESULTS WERE
 FAR LESS CATASTROPHIC
 544 00:27:11:21 00:27:14:00 THAN THEY MIGHT HAVE BEEN.
 545 00:27:14:02 00:27:17:00 HAD THE WORLD SERIES
 NOT BEEN IN PROGRESS,
 546 00:27:17:02 00:27:20:29 MORE PEOPLE
 WOULD PROBABLY HAVE BEEN
 ON THE NIMITZ FREEWAY
 547 00:27:21:01 00:27:22:26 WHEN IT COLLAPSED.
 548 00:27:22:28 00:27:25:18 AND IF THE QUAKE
 HAD OCCURRED CLOSER
 549 00:27:25:20 00:27:27:18 TO A DENSELY
 POPULATED AREA,
 550 00:27:27:20 00:27:30:22 THE DEATH TOLL
 COULD HAVE BEEN
 IN THE THOUSANDS.
 551 00:27:40:05 00:27:41:14 WHILE EARTHQUAKE PREDICTION
 552 00:27:41:16 00:27:43:14 MAY NEVER BECOME
 A PRACTICAL TOOL,
 553 00:27:43:16 00:27:45:25 WE CAN USE WHAT WE KNOW
 ABOUT EARTHQUAKES
 554 00:27:45:27 00:27:47:24 TO LIMIT THEIR IMPACT
 ON OUR LIVES.

555 00:27:47:26 00:27:49:09 FOR EXAMPLE, WE CAN AVOID
 BUILDING IN AREAS
 556 00:27:49:11 00:27:51:22 WHERE THE GROUND
 WILL RUPTURE OR SUBSIDE
 557 00:27:51:24 00:27:53:10 DURING A QUAKE
 558 00:27:53:12 00:27:56:23 AND IN AREAS
 WHERE LIQUEFACTION
 IS LIKELY TO OCCUR.
 559 00:27:56:25 00:27:59:11 WE CAN DESIGN
 NEW BUILDINGS AND HOMES
 560 00:27:59:13 00:28:01:25 TO WITHSTAND
 THE SHAKING OF EARTHQUAKES.
 561 00:28:01:27 00:28:04:09 OLD BUILDINGS CAN BE
 REINFORCED OR TORN DOWN.
 562 00:28:04:11 00:28:06:08 THE CONTENTS
 OF ALL STRUCTURES
 SHOULD BE SECURED
 563 00:28:06:10 00:28:09:07 TO AVOID INJURIES
 CAUSED BY TOPPLING FURNITURE
 564 00:28:09:09 00:28:10:23 AND FALLING OBJECTS.
 565 00:28:10:25 00:28:13:07 WE CAN ALSO PREPARE
 FOR EARTHQUAKES
 566 00:28:13:09 00:28:14:23 BY STORING
 EMERGENCY SUPPLIES
 567 00:28:14:25 00:28:17:23 AT HOME, IN OUR CARS,
 AND AT WORK,
 568 00:28:17:25 00:28:20:09 AND BY ARRANGING
 FOR EARTHQUAKE PLANS
 569 00:28:20:11 00:28:22:23 WITH OUR FRIENDS,
 OUR FAMILIES, AND COWORKERS.
 570 00:28:22:25 00:28:25:23 AND FINALLY, WE CAN REQUIRE
 OUR ELECTED REPRESENTATIVES
 571 00:28:25:25 00:28:28:07 TO CREATE A COMPREHENSIVE
 EARTHQUAKE POLICY
 572 00:28:28:09 00:28:31:09 TO STRENGTHEN BUILDING CODES
 AND PUBLIC STRUCTURES.
 573 00:28:31:11 00:28:34:09 SUCH A POLICY WOULD EMPLOY
 THE BEST CURRENT TECHNOLOGY
 574 00:28:34:11 00:28:37:09 TO ENSURE THAT HIGHWAYS,
 BRIDGES, AND DAMS
 575 00:28:37:11 00:28:40:00 CAN WITHSTAND THE EARTHQUAKES
 WE KNOW WILL COME.
 576 00:28:40:02 00:28:42:00 WE UNDERSTAND
 WHY EARTHQUAKES HAPPEN.
 577 00:28:42:02 00:28:43:15 WE CAN SOMETIMES FORECAST
 578 00:28:43:17 00:28:44:28 THE GENERAL EPICENTER
 LOCATION,
 579 00:28:45:00 00:28:46:28 THE INTENSITY
 OF THE SHAKING,
 580 00:28:47:00 00:28:50:13 AND EVEN WHERE THE EARTH
 WILL RUPTURE AND SUBSIDE.
 581 00:28:50:15 00:28:52:13 BUT KNOWLEDGE ALONE
 ISN'T ENOUGH.
 582 00:28:52:15 00:28:55:13 WE MUST HAVE
 THE COLLECTIVE WILL TO APPLY IT
 583 00:28:55:15 00:28:58:14 AND TO FINANCE THE CHANGES

584 00:28:58:16 THAT MUST BE MADE.
00:29:01:13 ONLY THEN, CAN WE
MAKE OUR WORLD,
585 00:29:01:15 00:29:02:28 IF NOT EARTHQUAKEPROOF,
586 00:29:03:00 00:29:05:03 AT LEAST RELATIVELY
EARTHQUAKE-SAFE.
587 00:29:09:02 00:29:11:29 CAPTIONING PERFORMED BY
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